



CHLOGUARD USER'S MANUAL



DOCUMENT No. CHL07-M
PART No. CHL01
REVISION 3.1.6
20/12/2015



IMPORTANT INFORMATION

The equipment described in this manual is designed to be used in conjunction with liquefied chlorine gas which is hazardous to personnel safety. It is important that persons employed in the vicinity of a chlorine installation be given an appropriate level of training in chlorine safety practices and know the location of safety equipment. Orica has wall charts and handbooks available which describe safe practice in storing and handling chlorine.

This manual is provided for information purposes only.

All information included herein is subject to change without notice.

Orica should not be held responsible for any damages, direct or indirect, arising from or related to use of this manual.

TABLE OF CONTENTS		Page
1	General	5
1.1	Typical Setup (70 kg cylinders)	5
1.2	Typical Setup 920Kg Drums.....	6
2	Key Components	7
2.1	Control Panel	8
2.1.1	DC (UPS) power supply	11
2.1.2	PLC (Programmable Logic Controller)	11
2.1.3	GMS wireless module	11
2.1.4	Warning LED's: Visual Alarm	11
2.2	Support Bracket	12
2.3	Connecting Transmitting Key	12
2.4	Actuator Types	13
2.5	Chlorine Transmitter & Sensor	13
3	OPERATION	15
3.1	Overview	15
3.1.1	Power Supply.....	15
3.1.2	Battery Back-Up.....	15
3.1.3	PLC Programmable Logic Controller.....	15
3.1.4	DC (UPS) power supply	15
3.1.5	Chlorine Sensor/Transmitter	15
3.1.6	Closing Actuators.....	16
3.1.6.1	Electric Actuators	16
3.1.6.2	Pneumatic Actuators	16
3.1.6.3	Air Regulator	16
3.1.6.4	Air Pressure Switch	16
4	Functional Description	17
4.1	Control Panel	17
4.1.1	PLC- Programmable Logic Controller.....	17
4.1.2	Back-Up Power Supply	17
4.1.3	Relay Interface.....	18
4.1.4	GSM Modem.....	18
4.1.5	Solenoid Valve (Pneumatic Version Only).....	18
4.1.6	Pressure Switch (Pneumatic Version Only).....	18
4.1.7	SCADA Digital Outputs	19
4.1.8	Mains Power Input	22
4.1.9	Chlorine Sensor Pin Inputs	22
4.1.10	Electric Actuator Pin Inputs	22
4.1.11	Pneumatic Actuator Inputs	23
4.1.12	Chlorine Transmitter/Sensors	23

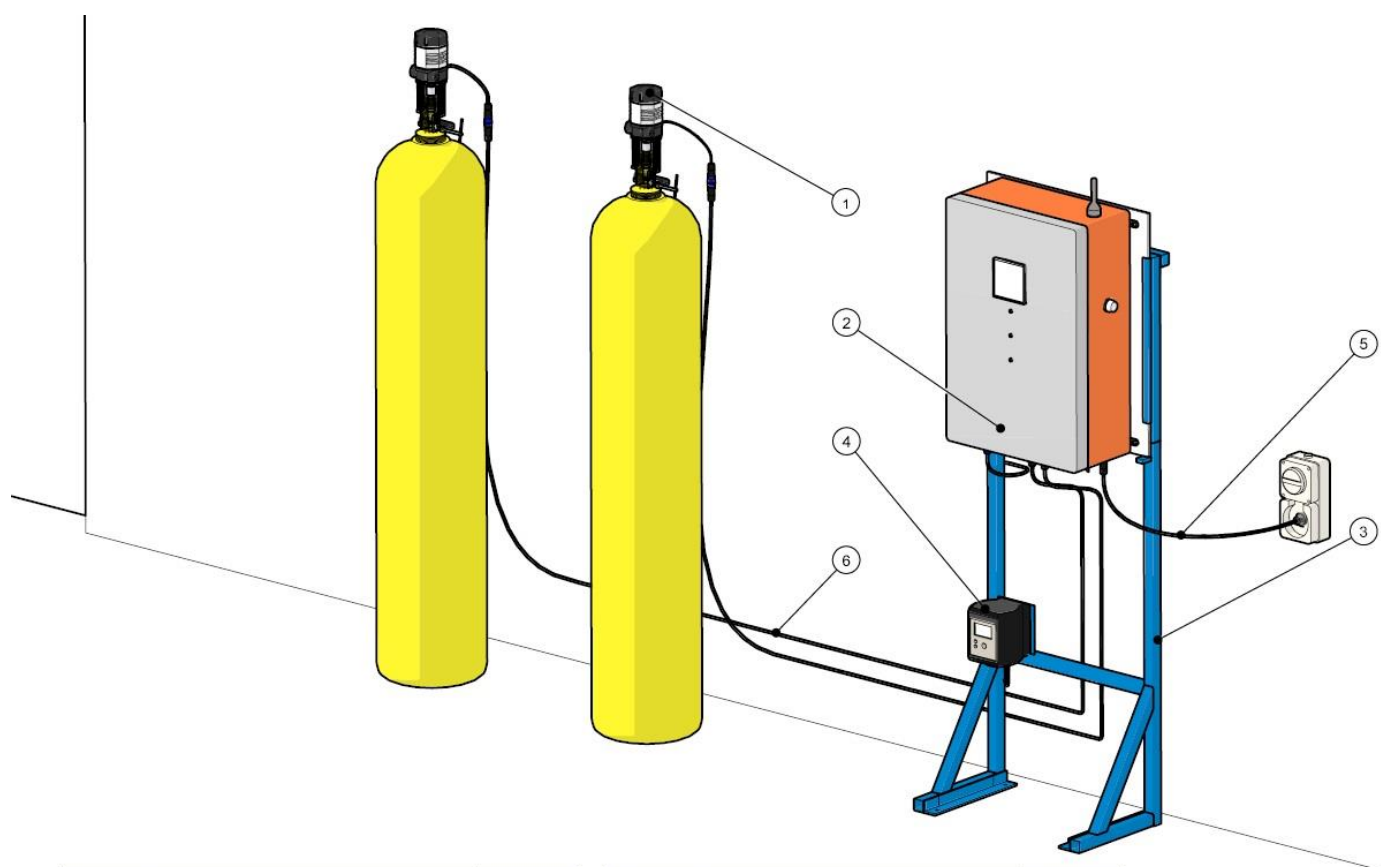
4.1.13	Electric Actuator and Support Bracket Assembly	23
4.1.14	Electric Actuator Fitted to Standard Chlorine Valve.....	24
4.1.15	Electric Actuator Fitted to Chlorine Institute Yoke & Siemens Vacuum Regulator .	26
4.1.16	Electric Actuator Fitted to International Yoke & Acromet/Prominent Vacuum Regulator	27
4.1.17	Pneumatic Actuator and Support Bracket Assembly	28
4.1.18	Pneumatic Actuator Fitted to Chlorine Institute Yoke and Siemens Vacuum Regulator	29
4.1.19	Pneumatic Actuator Fitted to International Yoke and Acromet/Prominent Vacuum Regulator	30
4.1.20	PLC Touch Screen Operation Menus.....	31
5	Appendices	37

1 GENERAL

Features of the ChlorGuard System

ChlorGuard provides an automatic emergency isolation system for chlorine cylinders and drums. Operation of the system is initiated by an integral PLC and a Chlorine Sensor/Transmitter local to the chlorine container. Further means of initiation can be by remote manual push buttons and trip inputs from the user's process.

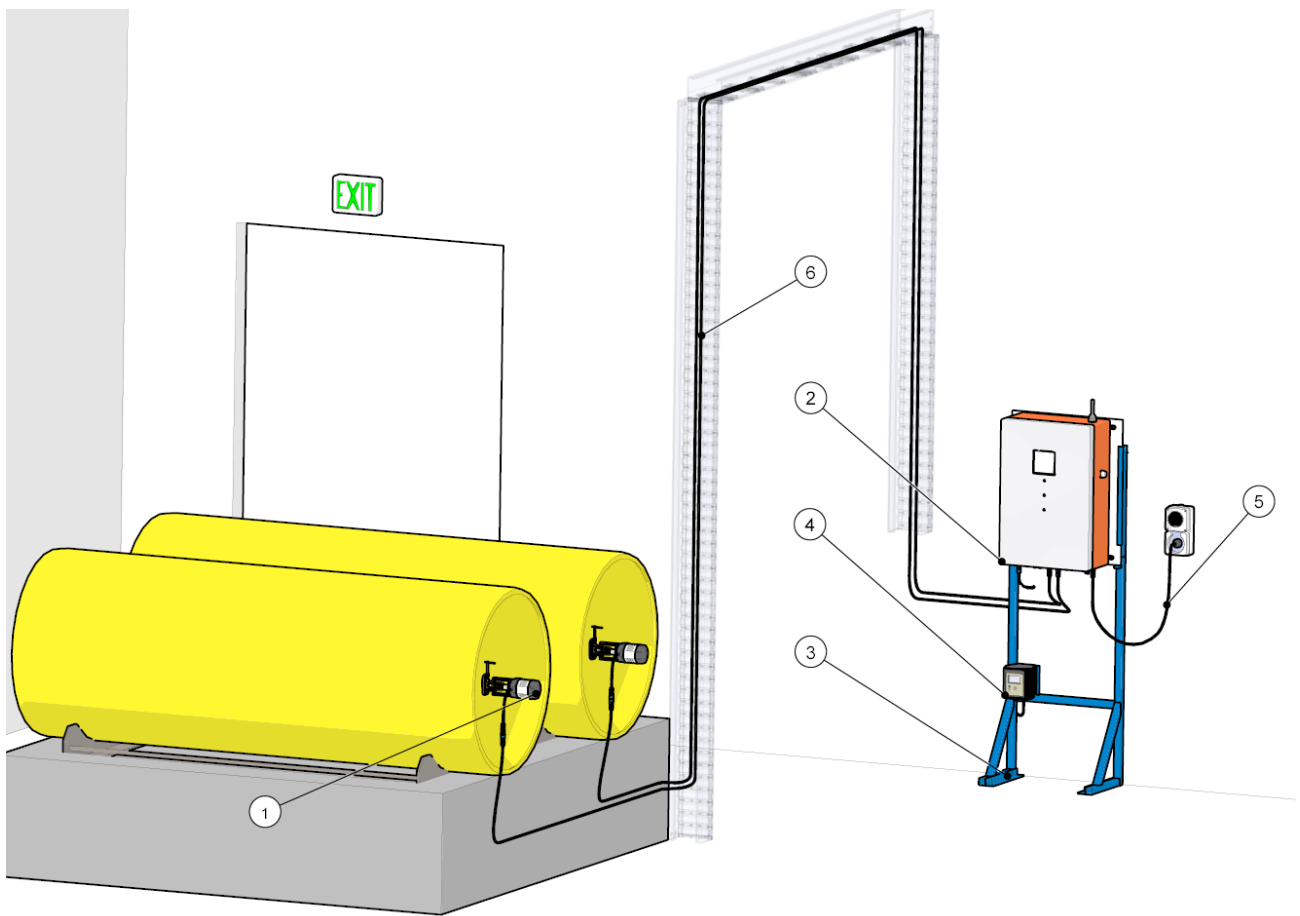
1.1 Typical Setup (70 kg cylinders)



Description	BOM ID
Electric Actuator	1
Control Panel	2
Frame	3
Chlorine Sensor/ Transmitter	4

Description	BOM ID
Panel - 240 VAC Supply Cable	5
Actuator - Panel 24 VDC Supply Cable	6

1.2 Typical Setup 920Kg Drums



Description	BOM ID
Electric Actuator	1
Control Panel	2
Frame	3
Chlorine Sensor / Transmitter	4

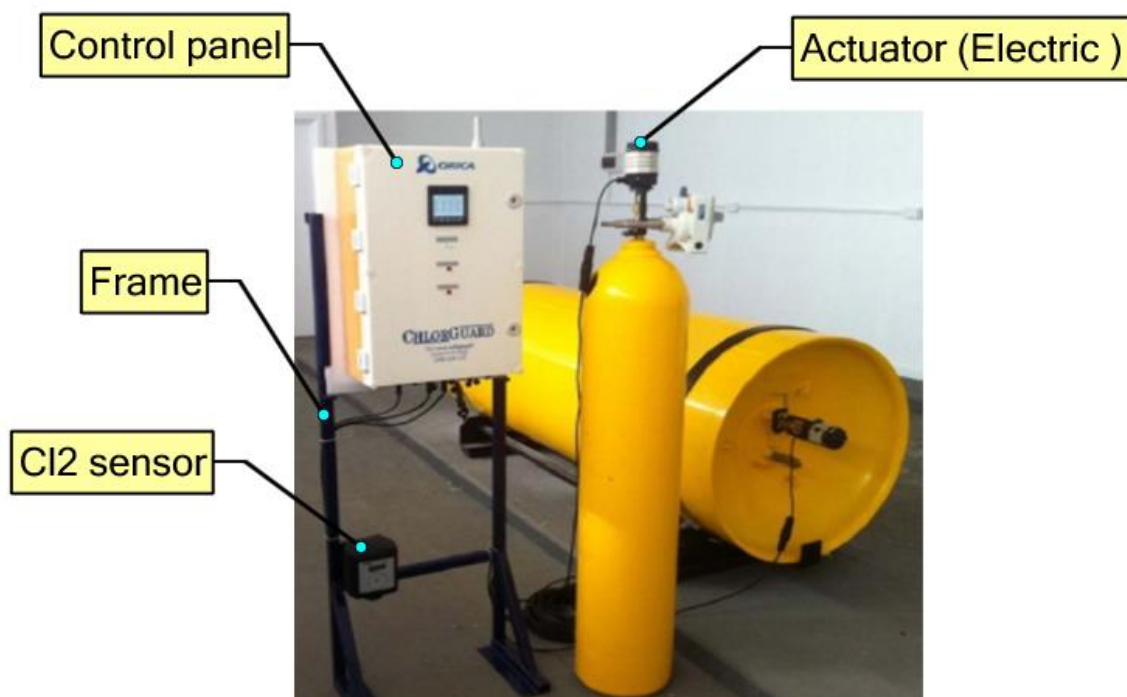
Description	BOM ID
Panel - 240VAC Supply Cable	5
Panel -Actuator 24 VDC Supply Cable	6

2 KEY COMPONENTS

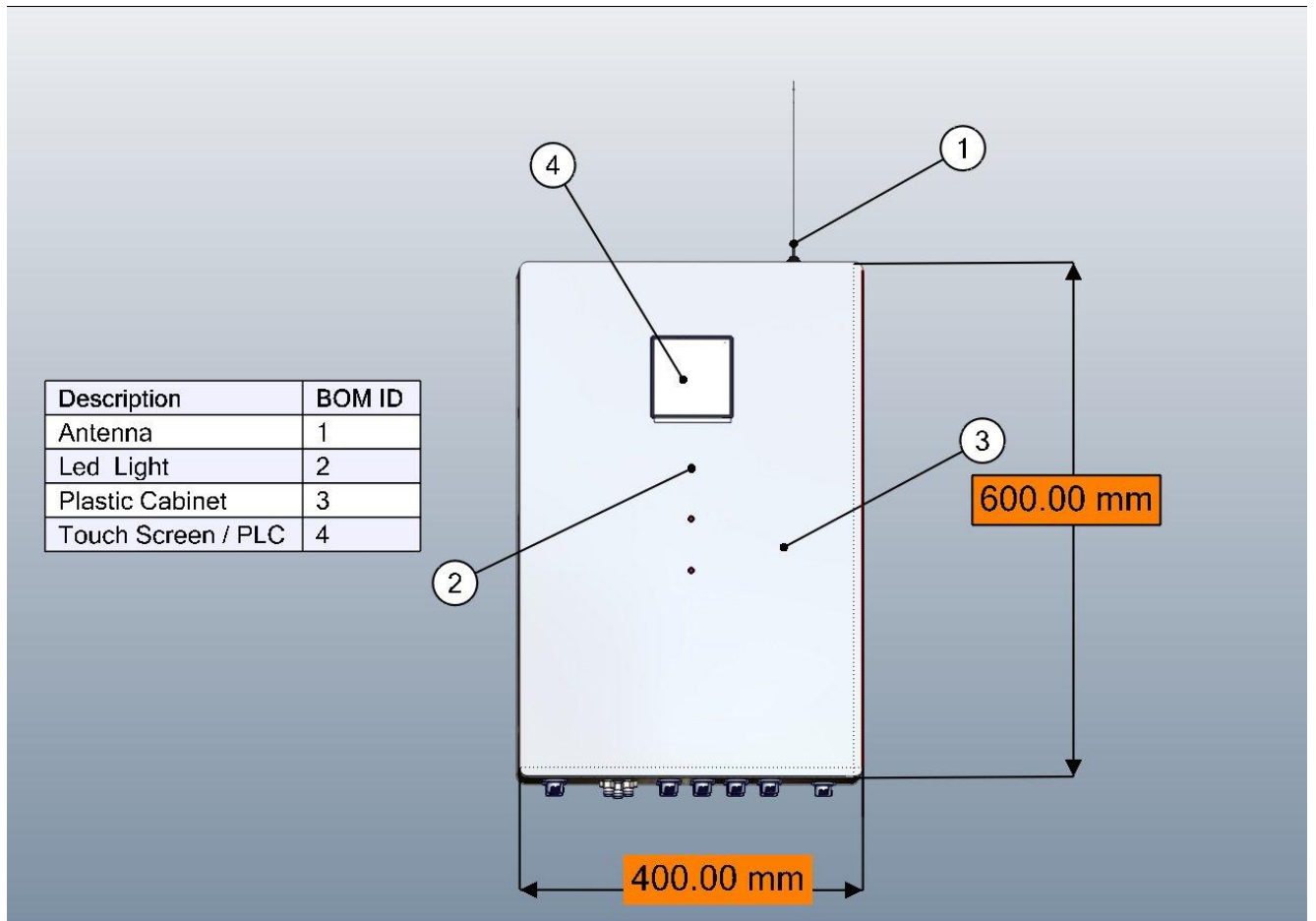
The chlorguard system includes the following key components

- A. Control panel
- B. Actuator (Electric or Pneumatic)
- C. Cl_2 sensor
- D. Frame (support of control panel)
- E. Air Systems (only if the systems is pneumatic)
- F. Support bracket
- G. Connecting Transmitting Key

The following chlorguard assembly diagram to illustrates the main components of the system:



2.1 Control Panel



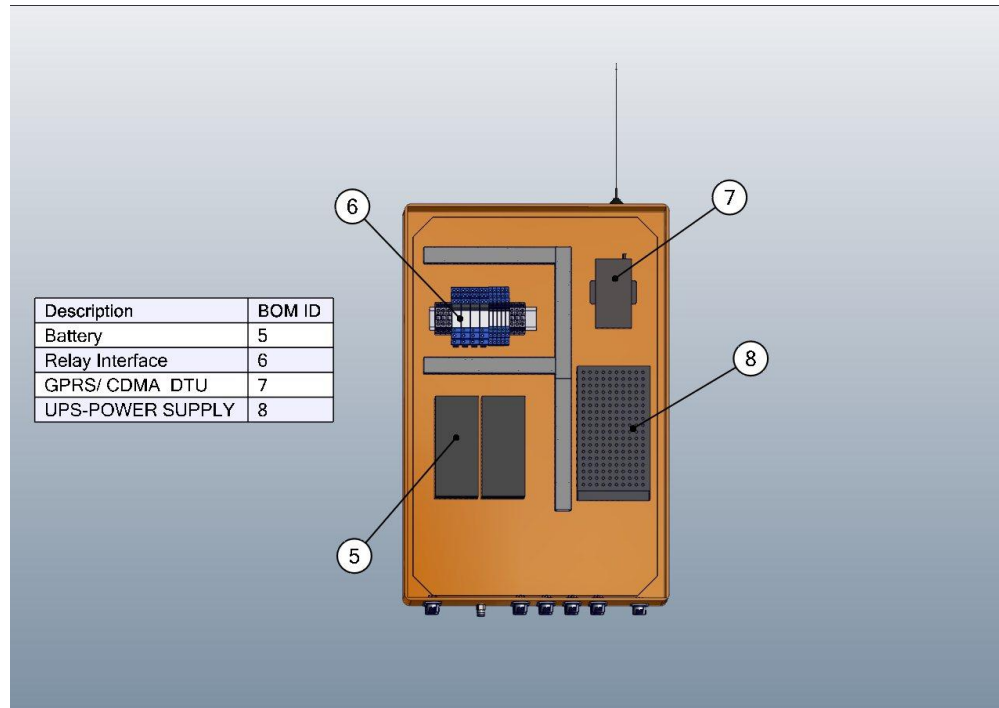
The Control Panel cabinet includes ports for:

- Power
- Sensors
- Up to 8 Actuators (electrical or pneumatic)
- Pneumatic solenoid valve input and output.
- External devices (SCADA, Alarms etc.)

The Control Panel internal distribution design differs in the cabinet regarding if the actuator is electric or pneumatic ; they're illustrated in the following drawings:

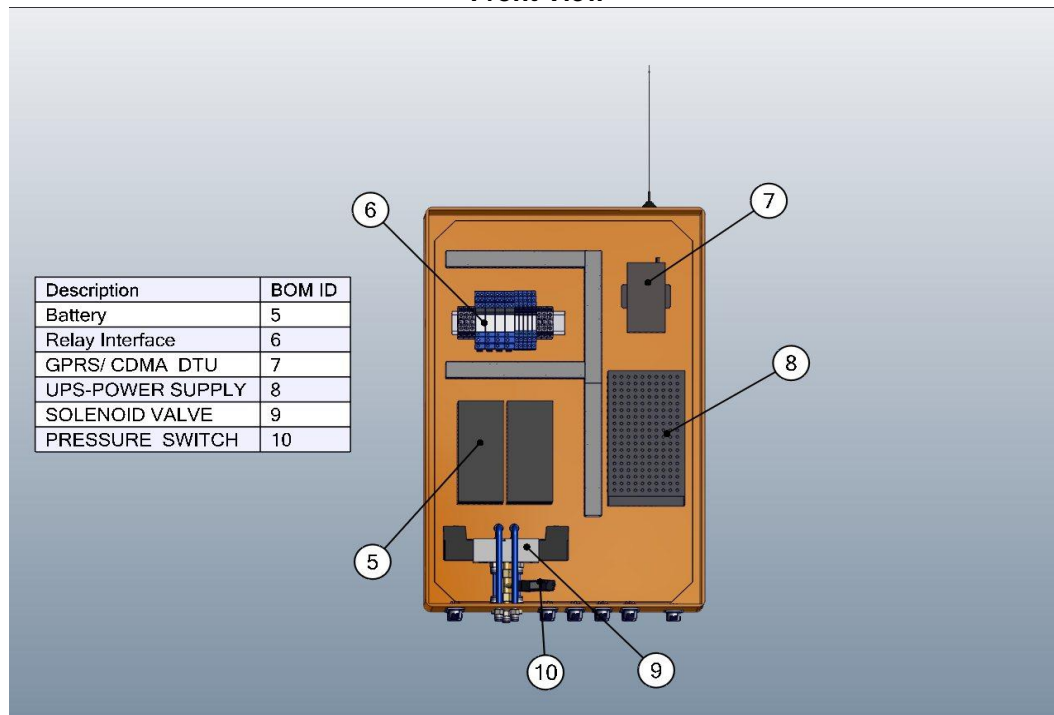
Control Panel Electric

Front View



Control Panel Pneumatic

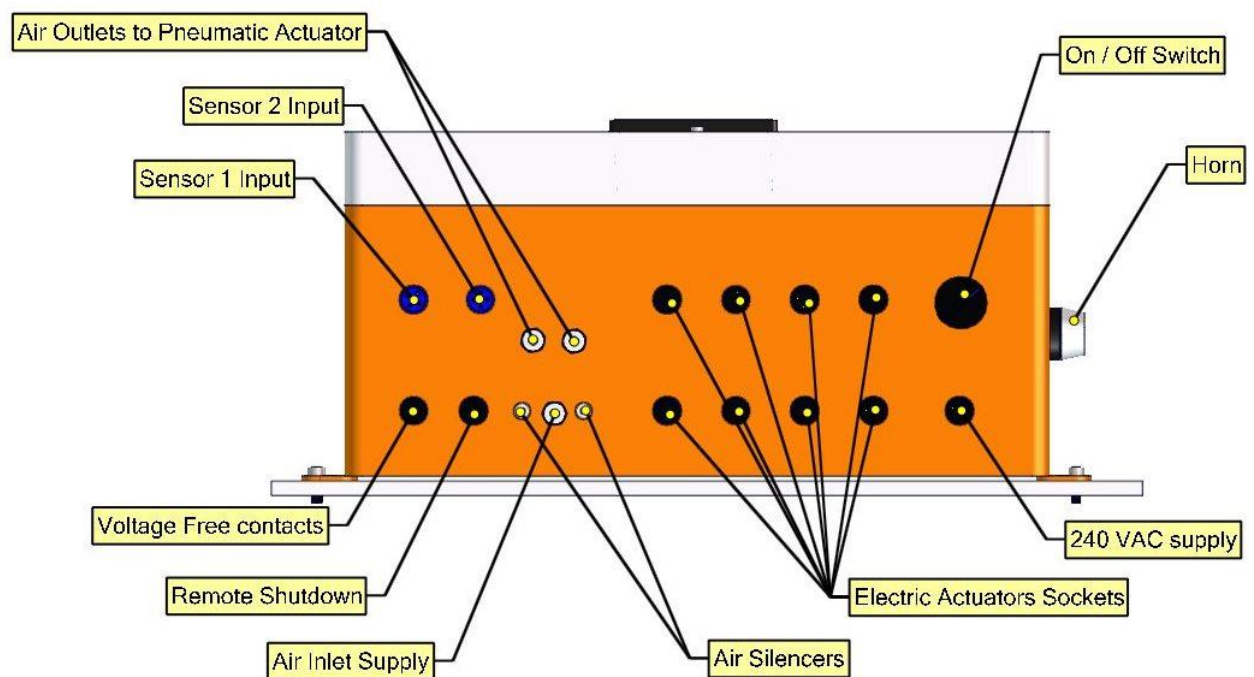
Front View



The following are the list of all components inside the cabinet :

	Components	Control Panel	
		electronic	Pneumatic
a	Cabinet-plastic box	✓	✓
b	DC (UPS) power supply	✓	✓
c	PLC (Programable Logic Controller)	✓	✓
d	GMS wireless module	✓	✓
e	Battery	✓	✓
f	Relays (Auxiliary relay, base of the relay and auxiliary relay)	✓	✓
g	Warning LED's: Visual Alarm (3 Flashing light)	✓	✓
h	Connectors (Heavy load connector)	✓	✓
i	Pressure switch		✓
j	Solenoid Valve		✓
k	Sockets and plugs	✓	✓

The connection points the Control Panel are shown if the diagram below.



2.1.1 DC (UPS) power supply

The DC Uninterrupted Power Supply (UPS) provides reliable 24 VDC Power Supply load to the ChlorGuard system.

2.1.2 PLC (Programmable Logic Controller)



The ChlorGuard PLC includes a touch screen that provides system information and access to menus within the program for those authorised.

2.1.3 GMS wireless module

The GSM transfers information on the status and alarm conditions of the ChlorGuard system for up to 4 operator phone contacts if required. Important information such as chlorine releases and alarms are immediately transferred by wireless to operators letting them know when and how much chlorine is in the work area. Operators can use their phones to log into the ChlorGuard system to check the status of the system at any time.



2.1.4 Warning LED's: Visual Alarm

Indicating lights on the front of the panel include the following.


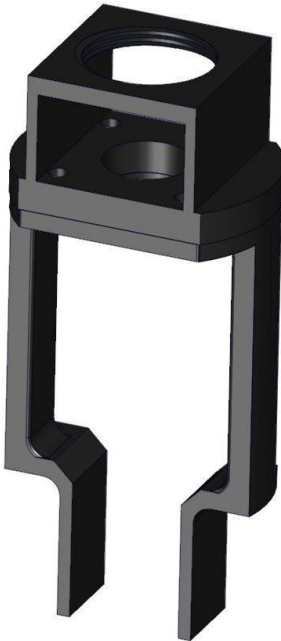


The other indication light such as Low air pressure, etc., is show in the PLC screen.

Allowance made to connect up a flashing “Warning Light” and “Audible” alarm connection so the Customer can connect to.

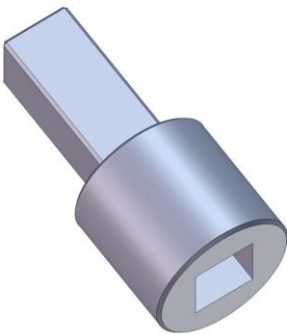
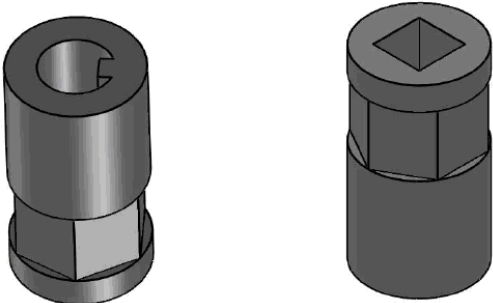
2.2 Support Bracket

The patented support bracket has capability of attachment to both the pneumatic or electric type actuators and is made from mild steel and powder coated.

Electric Support Bracket	Pneumatic Support Bracket
	

2.3 Connecting Transmitting Key

A small key which connects the actuator to the valve spindle.

Electric Actuator Key	Pneumatic Actuator Key
	

2.4 Actuator Types

The ChlorGuard system provides a choice of using a 24V electric powered geared motor actuator or alternatively using a pneumatically powered geared ratchet actuator.

Electric Actuator & Bracket Assembly



Pneumatic Actuator & Bracket Assembly



2.5 Chlorine Transmitter & Sensor

The standard chlorine sensor for the ChlorGuard 7 system is the Drager Polytron 7000 Transmitter/Sensor system. The transmitter/sensor has a Safety Integrity Level 2 (SIL2) rating, which assures reliable performance. The transmitter produces a 4-20 mA signal which is proportional to the gas concentration and in combination with the controller system (PLC) can be used to activate safety relevant functions in compliance with the requirements of the IEC 61508 / IEC 61511-1.

The Transmitter meets the following requirements:

- Functional Safety acc. To IEC 61508 / IEC 61511-1
- Explosion protection acc to EN 50014 and EN 50020
- Electromagnetic Compatibility (EMC) acc. To EN 50270

The Sensor consists of a gel which creates a signal when it comes into contact with chlorine gas. The sensor can be easily removed by just unplugging the sensor from the Transmitter.

The Polytron 7000 Transmitter/sensor should be Proof tested annually for accurate results and corrects any small drift in span of the sensor.

The Transmitter transmits the signal from the chlorine Sensor and converts this to a reading of what the chlorine level being detected to the ChlorGuard Control Panel PLC. The Transmitter also provides a digital reading of the chlorine level.

The chlorine sensor Warning is set at 3ppm and alarm is set at 5ppm.

- Warning of 3 ppm alerts personnel of presence of chlorine.
- Alarm of 5pp will alert and activate the ChlorGuard system to shut the actuators on the chlorine containers.

DRAGER SENSOR



DRAGER TRANSMITTER



3 OPERATION

3.1 Overview

ChlorGuard provides an automatic emergency isolation system for chlorine cylinders and drums. Operation of the system is initiated by an integral PLC and a Chlorine Sensor/Transmitter local to the chlorine container. Further means of initiation can be by remote manual push buttons and trip inputs from the user's process.

3.1.1 Power Supply

Power supply to the ChlorGuard7 is a standard 240V mains power plug and pin cable arrangement.

3.1.2 Battery Back-Up

Power backup consists of a pair of sealed lead acid batteries that provides 24V back-up power for a minimum of 4 hours under load and 24 hours in Stand-By.

3.1.3 PLC Programmable Logic Controller

The touch screen PLC contains all the menus and control functions for the ChlorGuard7 system. The program logic is fixed by Orica and cannot be tampered without Orica's approval and access password. Menus can be accessed by touching the screen and following the instructions on the screen. A full description of the PLC menus is outlined in Appendix A.

3.1.4 DC (UPS) power supply

The DC Uninterrupted Power Supply (UPS) provides reliable 24 VDC Power Supply load to the ChlorGuard system. If there is AC input, it will provide power supply for the load and at the same time recharge the chargeable battery. If there is no AC input, the battery will provide power supply to the load. There is a management circuit for the chargeable battery inside (including charging constant current circuit, battery protection, battery discharge control and automatic battery swift transfer circuit).

3.1.5 Chlorine Sensor/Transmitter

Orica have chosen the Drager Polytron 7000 Chlorine Sensor/Transmitter which has a SIL2 certification (Safety Integrity Level). This provides an assurance of 99.9% reliability on the sensor and transmitter provided the system is calibrated as instructed. The transmitter transfers the signal from the chlorine sensor to the ChlorGuard PLC which in turn activates the actuators on the chlorine contains to close. The Polytron 7000 transmitter also displays the level of chlorine via a digital display. Up to 2 chlorine sensors can be connected to the ChlorGuard system control panel if required. Other brands of sensor/transmitters can be used and connected to the analogue inputs to the Control Panel.

3.1.6 Closing Actuators

3.1.6.1 Electric Actuators

Inputs activate the PLC and associated relays to activate an electric actuator(s) attached to the container valve to close. The electric actuator is set to close the container valve at a set torque of 30Nm and once this is achieved the electric actuator is stopped via current feedback and timer. The torque for the electric actuator is set in the factory by adjustment of a potentiometer inside the cover of the motor and tested using a torque wrench. The timer will cut the power to the electric actuator once the set time programmed in the PLC is reached.

The sequence of shutdown is set to activate the actuator, close the container valve, stop the electric actuator once the desired torque is reached and electric current feedback signal is reached. To prevent the electric actuator from running if there is no feedback electric current signal a timer has been set to stop the electric actuator after a set time that assures the valve is closed.

3.1.6.2 Pneumatic Actuators

These inputs activate the PLC and associated relays to activate an pneumatic actuator(s) attached to the container valve to close. The pneumatic actuator is set to close the container valve at a set torque of 20-30Nm and once this is achieved the pneumatic actuator is stopped via a timer which shuts the air supply to the actuator after 5 seconds.

The torque for the pneumatic actuator is set by the air pressure supply.

The sequence of shutdown is set to activate the actuator, close the container valve, stop the pneumatic actuator once the desired torque is reached and timer feedback signal is reached.

3.1.6.3 Air Regulator

The Air regulator provides a regulated (400 kPa Minimum-600 kPa Maximum) air pressure supply to operate the pneumatic actuator.

3.1.6.4 Air Pressure Switch

Senses the pressure in the compressed air supply to the system and provides an output to the Control Panel if the working air pressure is less than the set point (normally 400 kPa).

4 FUNCTIONAL DESCRIPTION

4.1 Control Panel

The Control Panel is IP65 rated cabinet that consists of the following elements and functions:

- PLC- Programmable Logic Controller
- Back-Up Power Supply
- UPS Power Supply
- Relay Interface
- GPSM Modem Module
- Solenoid Valve (Only for Pneumatic Version)
- Pressure Switch (Only for Pneumatic Version)
- External Contacts Analogue Plug Inputs
- Mains Power Input
- Chlorine Sensor Pin Inputs
- Electric Actuator Pin Inputs
- Pneumatic Actuator Inputs

4.1.1 PLC- Programmable Logic Controller

Function:

The touch screen PLC manages the operating function for the ChlorGuard 7 system. Each ChlorGuard 7 system PLC is programmed prior using standard logic. Once the PLC is programmed and set there is no further need to adjust the PLC and therefore maintains the integrity of the ChlorGuard operating system

Touch Screen

The touch screen displays the following:

- Chlorine Alarm
- Actuators Closing
- Health Status
- Menus and Functions

Just press the screen to activate the menus.

Menus

Refer to screen menus page 28.

4.1.2 Back-Up Power Supply

The Back-Up power supply provides uninterrupted 24 volt power supply. Consists of 2x12 Volt Seth batteries which provide sufficient charge to maintain power for at least 4 hours power under load and up to 24 hours in backup mode.



4.1.3 Relay Interface

Contact relays inside the Control Cabinet relay electronic signals to perform the following functions:
Supply power to devices such as lights, alarm, actuators, and solenoid valves.

4.1.4 GSM Modem

Only applies on Leased ChlorGuard7 systems.

The GSM transfers information on the status and alarm conditions of the ChlorGuard system for up to 3 operator phone contacts if required. Important information such as chlorine releases and alarms are immediately transferred by wireless to operators letting them know when and how much chlorine is in the work area. Operators can use their phones to log into the ChlorGuard system to check the status of the system at any time.

HOW TO SET THE MODEM

- Place SIM card in modem.
- Add phone number via screen menu using F2 using format +614XXXXXX.

4.1.5 Solenoid Valve (Pneumatic Version Only)

The solenoid valve allows compressed air to flow to the pneumatic actuators when activated at the chlorine alarm point and when the operator wishes to manually activate the pneumatic actuators.

4.1.6 Pressure Switch (Pneumatic Version Only)

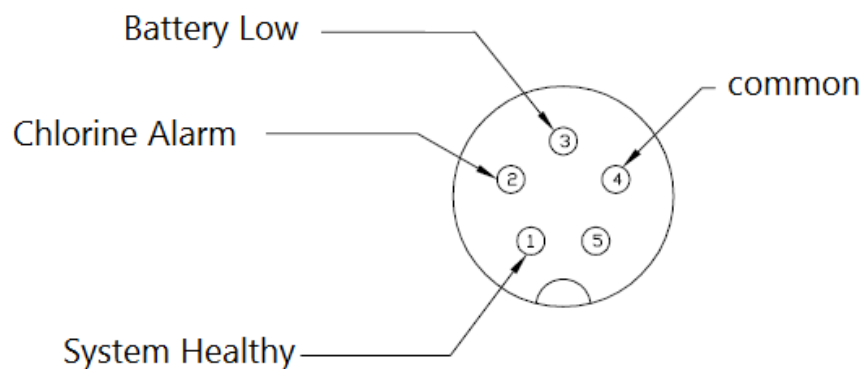
This switch activates the solenoid valve to open and close.

4.1.7 SCADA Digital Outputs

The control panel includes a set of voltage free contacts for SCADA connection. Each contact has a predefined function as follow:

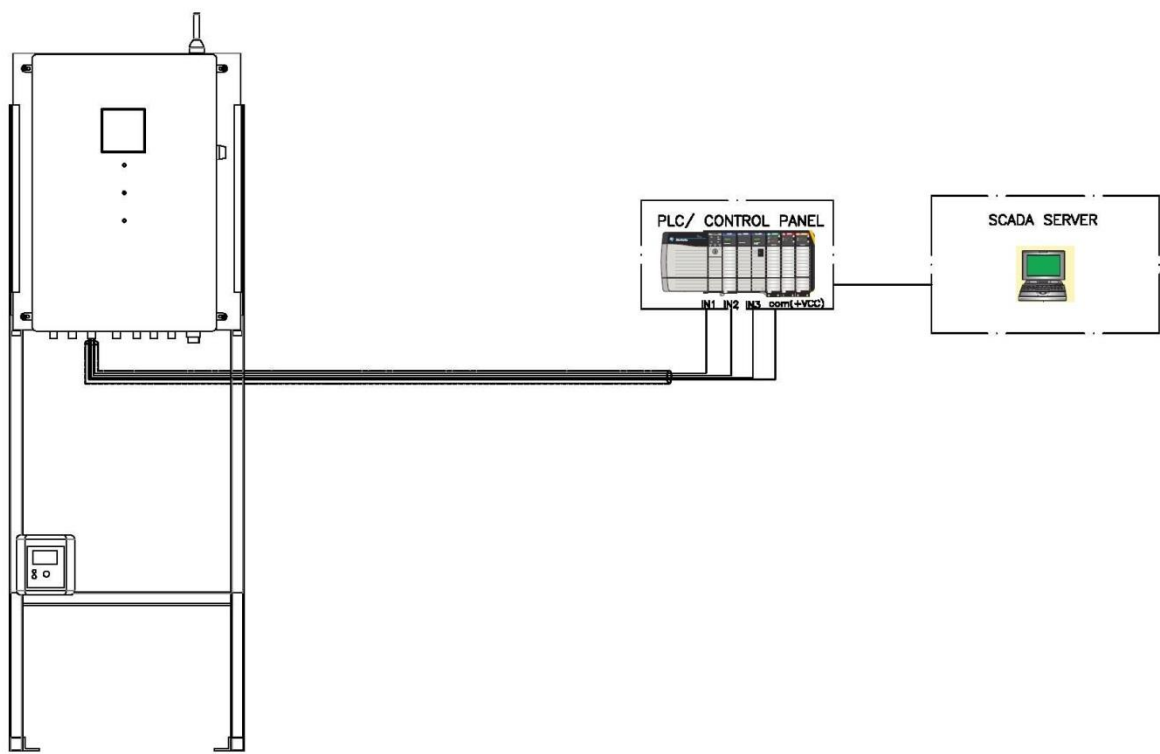
- System Healthy
- Chlorine alarm
- Low battery

EVENT	SCADA OUTPUT	PIN NUMBER	CONTACT RESPONSE
<ul style="list-style-type: none">- Total loss of power AC- and low battery charge.- PLC failure- Sensor Failure (Drager Polytron 7000)- Low air Pressure (pneumatic model)	System Healthy	1	Open in the event
Chlorine leak is detected or emergency shutdown is perform	Chlorine Alarm	2	Close in the event
AC power loss and battery Charge close to be finish	Low battery	3	Close in the event

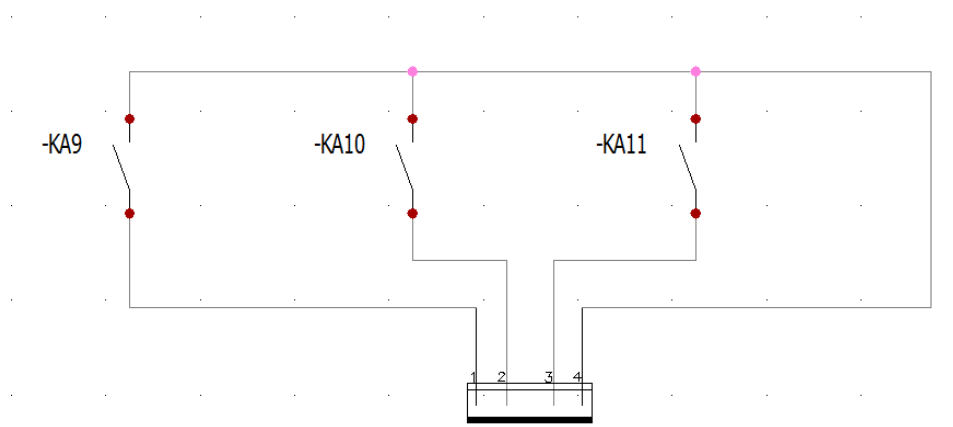


Socket Pins Designation

SCADA DIGITAL OUTPUT DIAGRAM.



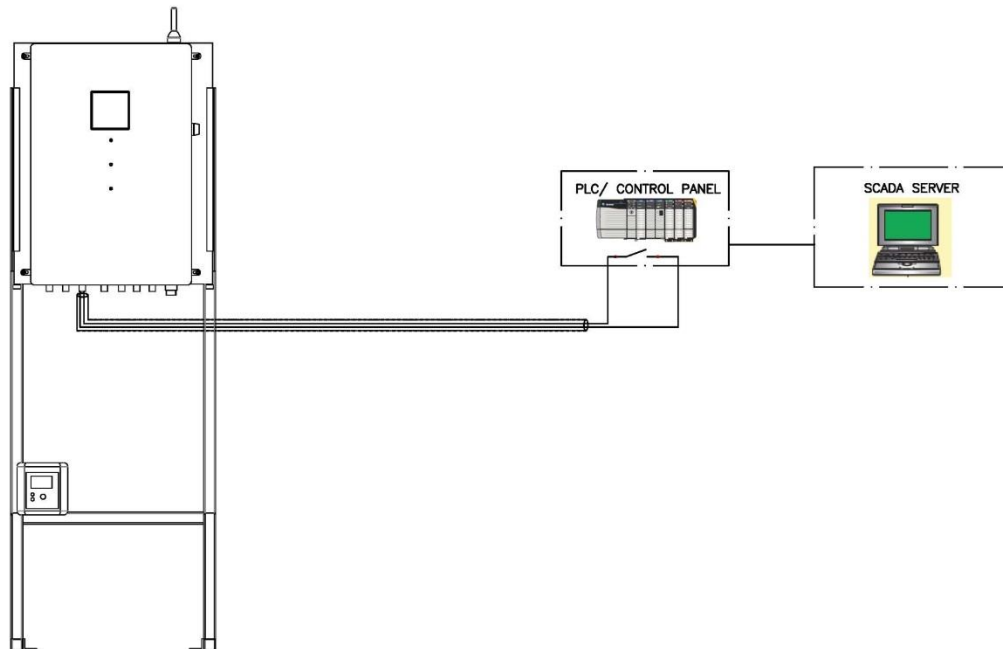
Socket Circuit Diagram (at Chlorguard panel bottom)



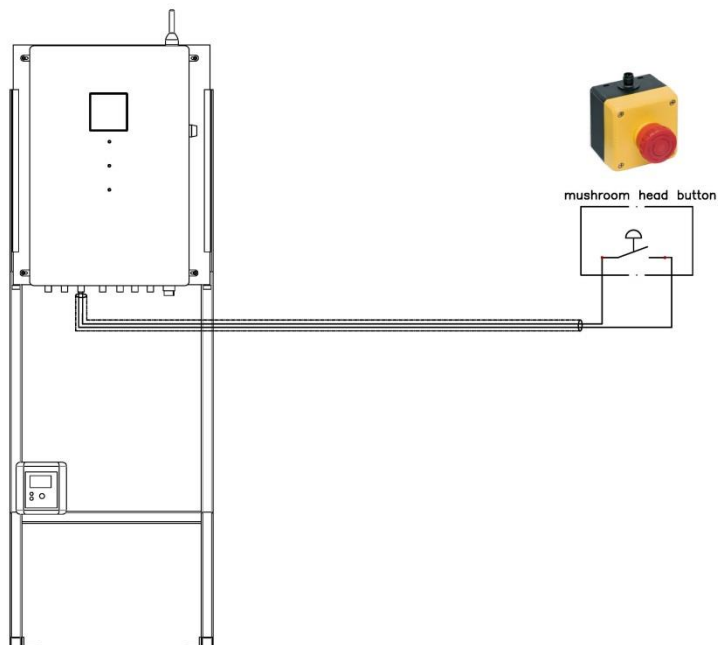
REMOTE CLOSE INPUT

The remote close input connection will trip the Shutdown sequence when is activated.
This input could be connected to external devices like a Mushroom Style Button or SCADA platform.

SCADA DIGITAL INPUT DIAGRAM

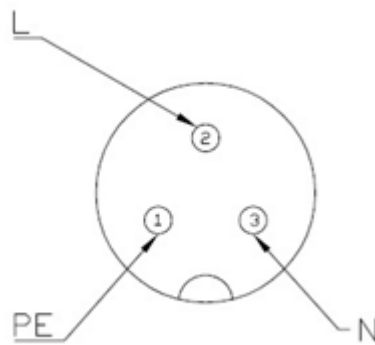


Emergency Shutdown Button –Digital Input Diagram.



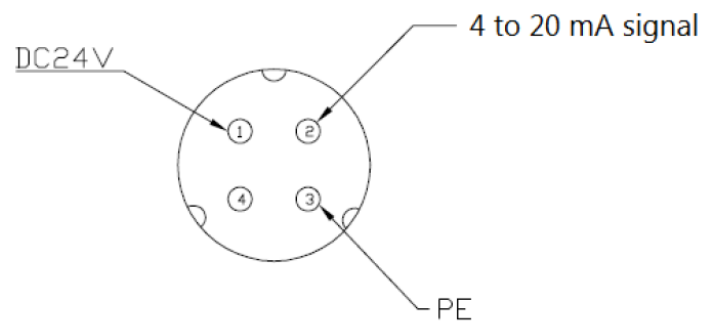
4.1.8 Mains Power Input

Provides 240V Mains Power input to the ChlorGuard7 Control Panel and operating system.



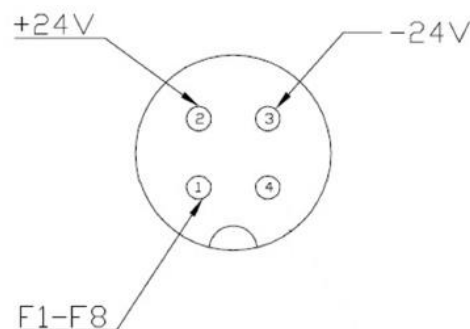
4.1.9 Chlorine Sensor Pin Inputs

There are two chlorine sensor inputs (analogue) which can be used to activate the ChlorGuard system to close the chlorine container valves.



4.1.10 Electric Actuator Pin Inputs

Up to eight electrical actuators can be connected to the ChlorGuard7 system.



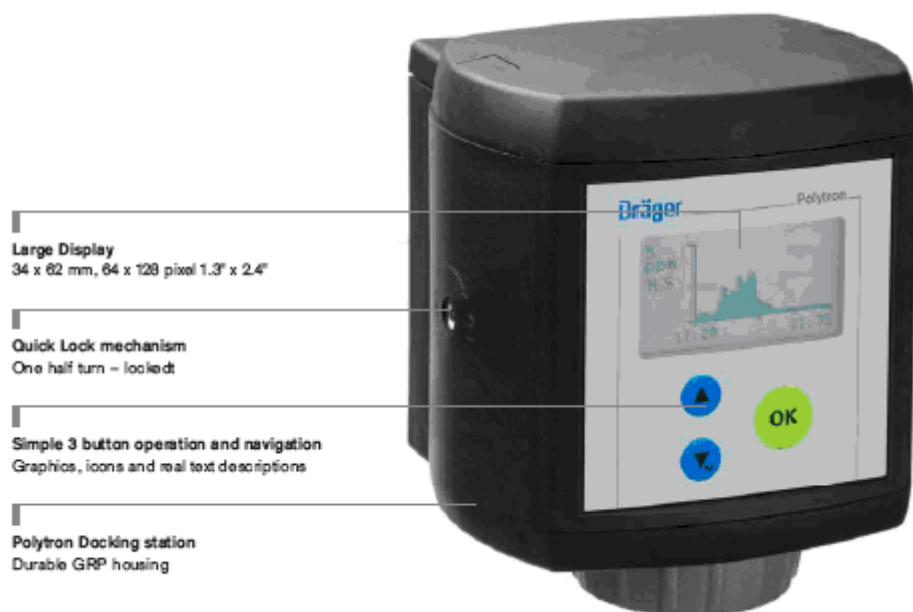
4.1.11 Pneumatic Actuator Inputs

Up to eight pneumatic actuators can be connected to the ChlorGuard7 system. Flexible 8mm air hoses are connected to the inlet and outlet ports.

4.1.12 Chlorine Transmitter/Sensors

The standard ChlorGuard7 system includes one Dräger Polytron 7000 chlorine Transmitter and sensor assembly.

The big graphic display shows status information with the help of pictograms and plain text and guides the user through calibration and configuration. The built-in sensor data memory contains all the relevant information. This allows for the use of pre-calibrated sensors so that the Dräger Polytron 7000 can be used as a virtually maintenance free transmitter.

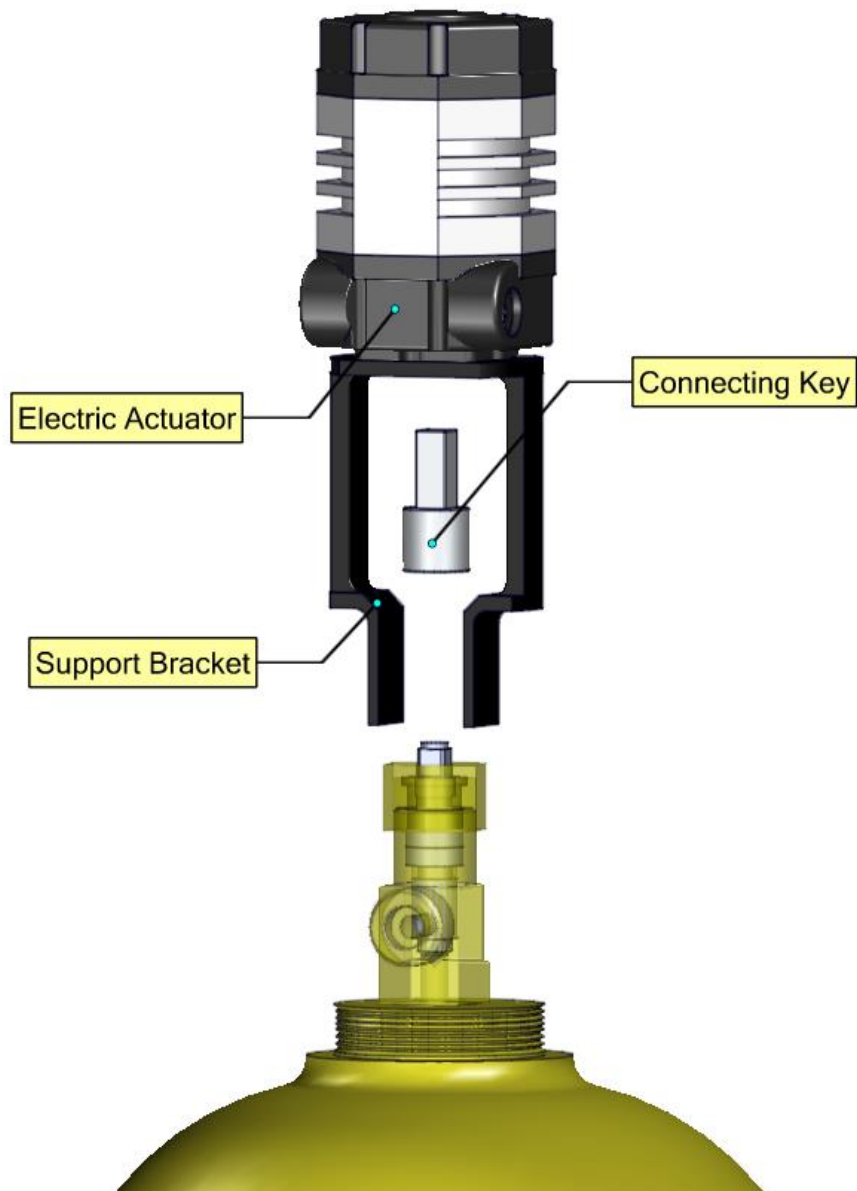


4.1.13 Electric Actuator and Support Bracket Assembly

The electric actuator/support bracket and interconnecting key assembly is used to close the chlorine container valves. The electric actuator is set for a specified torque of 30Nm which is sufficient to tightly close the container valves.

To attach the actuator to the drum or cylinder just simply slip on the bracket and interlocking key over the valve and attach it to the spindle on the valve. A slight alignment of the interlocking key to the spindle can be done by simply turning the actuator manually with an Allan Key provided.

To fix the support bracket to the container valve a simple G Clamp is used. It is essential that the G Clamp is tightened firmly to ensure all the torque from the actuator is transferred to the valve spindle and not the support bracket. If the bracket is not firmly tightened the valve will still be closed to the required torque but it may be difficult to remove the support bracket due to the torque being applied to the bracket rather than the valve spindle.






4.1.14 Electric Actuator Fitted to Standard Chlorine Valve

The actuator/support bracket and interlocking key assembly can be connected easily with various vacuum regulators supplied by equipment suppliers.

- If a Chlorine Institute yoke is used to fit the vacuum regulators (Siemens equipment) the support bracket simply fits between the valve body and yoke.
 - a) For 70kg cylinders there is no requirement for additional adaptors
 - b) For 920kg drums using vacuum regulators with heater tubes (Siemens equipment) a small 80mm extension that is attached to the heater tube will be required to provide adequate clearance for the actuator from the regulator body.



Type of Fitting	Container Size	Assembly
Standard Fitting with No Vacuum Regulators	70kg Cylinder	
	920kg Drums	

4.1.15 Electric Actuator Fitted to Chlorine Institute Yoke & Siemens Vacuum Regulator

Type of Fitting	Container Size	Assembly
Standard Fitting with No Vacuum Regulators	70kg Cylinder	
Chlorine Institute Yoke with vacuum regulators (Siemens equipment)	For 70kg cylinders there is no requirement for additional adaptors If a Chlorine Institute yoke is used to fit the vacuum regulators (Siemens equipment) the support bracket simply fits between the valve body and yoke.	
	For 920kg drums using vacuum regulators with heater tubes (Siemens equipment) a small 80mm extension that is attached to the heater tube will be required to provide adequate clearance for the actuator from the regulator body.	

4.1.16 Electric Actuator Fitted to International Yoke & Acromet/Prominent Vacuum Regulator

- If an International yoke is used to fit the vacuum regulators (Acromet or Prominent equipment) the support bracket simply fits between the valve body and yoke by using a small spacer on the yoke which allows for easier fit of the bracket.

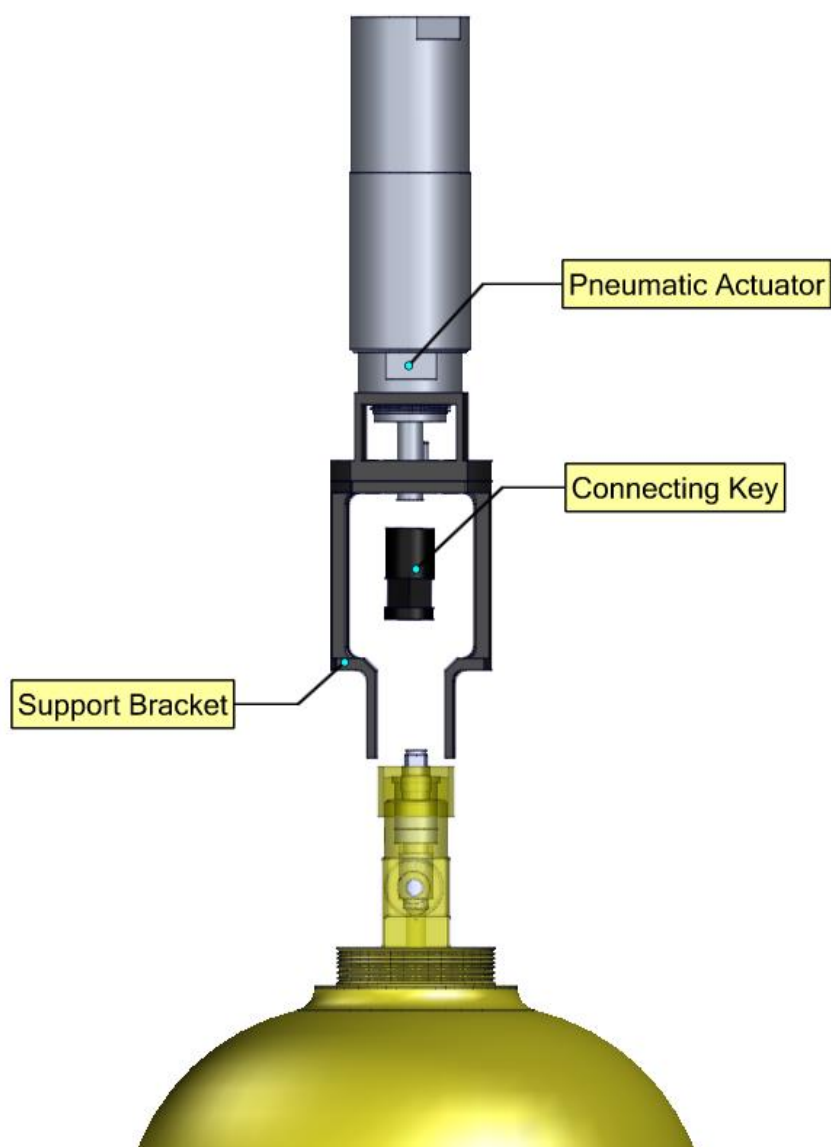
Type of Fitting	Container Size	Assembly
International yoke is used to fit the vacuum regulators (Acromet or Prominent equipment)	<p>For 70kg cylinders a small 20mm spacer will be required to be used between the yoke clamp and valve body to allow an easy fit of the support bracket and interconnecting key.</p> <p>If an International yoke is used to fit the vacuum regulators (Acromet or Prominent equipment) the support bracket simply fits between the valve body and yoke by using a small spacer on the yoke which allows for easier fit of the bracket.</p>	
	<p>For 920kg drums using vacuum regulators (Acromet or Prominent equipment) a small 20mm spacer will be required to be used between the yoke clamp and valve body to allow an easy fit of the support bracket and interconnecting key.</p>	

4.1.17 Pneumatic Actuator and Support Bracket Assembly



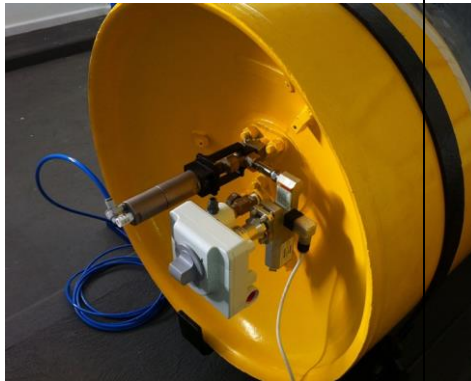
The pneumatic actuator/support bracket and interconnecting key assembly is used to close the chlorine container valves. The pneumatic actuator is set for a specified torque of 20-30Nm which is sufficient to tightly close the container valves.

To attach the actuator to the drum or cylinder just simply slip on the bracket and interlocking key over the valve and attach it to the spindle on the valve. A slight alignment of the interlocking key to the spindle can be done by simply turning the actuator manually with your fingers or open end spanner.

To fix the support bracket to the container valve a simple G Clamp is used. It is essential that the G Clamp is tightened firmly to ensure all the torque from the actuator is transferred to the valve spindle and not the support bracket. If the bracket is not firmly tightened the valve will still be closed to the required torque but it may be difficult to remove the support bracket due to the torque being applied to the bracket rather than the valve spindle.





4.1.18 Pneumatic Actuator Fitted to Chlorine Institute Yoke and Siemens Vacuum Regulator

Type of Fitting	Container Size	Assembly
Standard Fitting with No Vacuum Regulators	70kg Cylinder	
Chlorine Institute Yoke with vacuum regulators (Siemens equipment)	For 70kg cylinders there is no requirement for additional adaptors If a Chlorine Institute yoke is used to fit the vacuum regulators (Siemens equipment) the support bracket simply fits between the valve body and yoke.	
	For 920kg drums using vacuum regulators with heater tubes (Siemens equipment) a small 80mm extension that is attached to the heater tube will be required to provide adequate clearance for the actuator from the regulator body.	

4.1.19 Pneumatic Actuator Fitted to International Yoke and Acromet/Prominent Vacuum Regulator

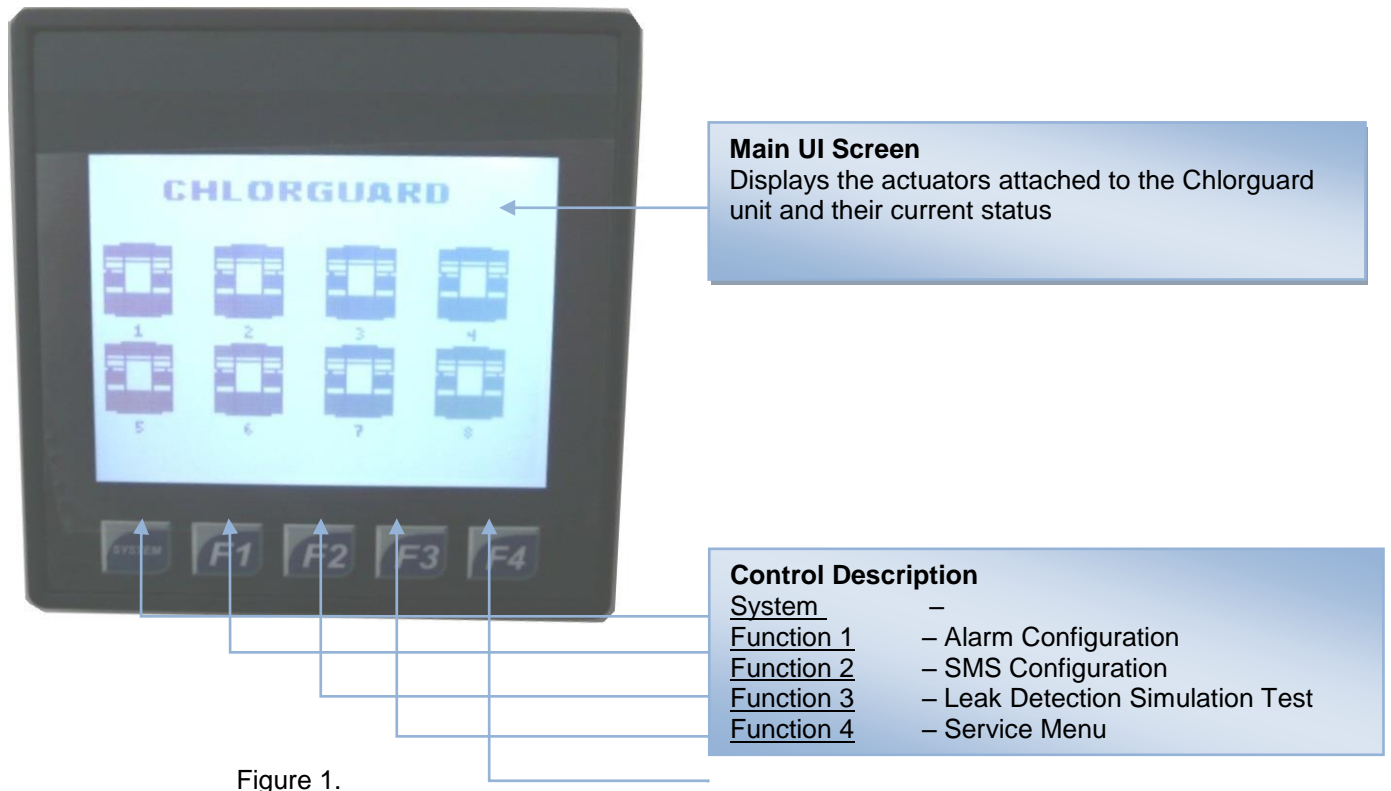
- If an International yoke is used to fit the vacuum regulators (Acromet or Prominent equipment) the support bracket simply fits between the valve body and yoke by using a small spacer on the yoke which allows for easier fit of the bracket.

Type of Fitting	Container Size	Assembly
International Yoke with vacuum regulators (Acromet & Prominent equipment)	For 70kg cylinders a small 20mm spacer will be required to be used between the yoke clamp and valve body to allow an easy fit of the support bracket and interconnecting key.	
	For 920kg drums using vacuum regulators (Acromet or Prominent equipment) a small 20mm spacer will be required to be used between the yoke clamp and valve body to allow an easy fit of the support bracket and interconnecting key.	

4.1.20 PLC Touch Screen Operation Menus

The following information can be obtained via the Touch Screen.

Chloguard Main Screen



Function 1 – Alarm

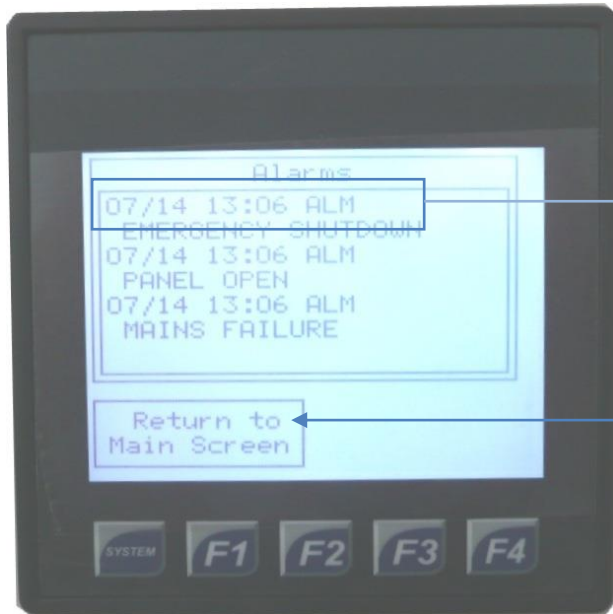


Figure 2.

Alarms

Displays the date, time and description of the most recent alarm activities.
By pressing the touch screen in the alarms field you'll open the Alarm Log (see fig 3.)

To return to the Main Screen, press the "Return to Main Screen" on the touch screen interface



Figure 3.

Alarm Log

Displays the date, time and description of all alarm activities.
The Arrow keys allow you the scroll up and down through the alarm log entries.
The Escape key will return you to the previous screen (see fig 2.)
The Clear key will erase the highlighted entry; the Clear All key will erase all the entries.

SMS Configuration Security



SMS Configuration Security

Before access can be granted to the SMS Configuration, the correct Password must be entered.

To access the password entry screen (see fig 5.), you must press the touch screen in the Password field.

To return to the Main Screen, press the "Return to Main Screen" on the touch screen interface

Figure 4.



SMS Configuration: Password Entry

Displays a Password Entry screen; only with the correct password can you access the SMS Configuration screen.

Dial in the password using the number pad on the touch screen

To return to the previous screen press

Once finished, press Enter

Figure 5.

SMS Configuration



Figure 6.

SMS Configuration

Displays phone numbers programmed to receive SMS from the Chloguard. Touching the screen will allow you to change the phone number to the desired number. 3 are available.

To return to the Main Screen, press the "Return to Main Screen" on the touch screen interface



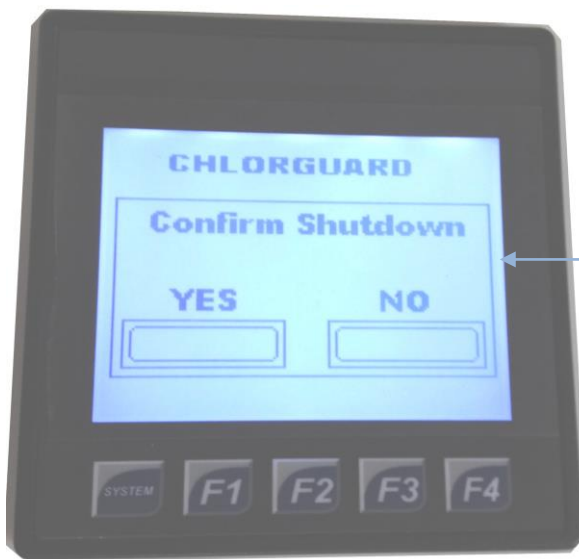
Figure 7.

SMS Number Entry

Displays a phone number entry screen that allows change to the selected number (see fig 6.) the Chloguard will send an SMS to. The keypad is to enter the desired phone number.

The arrow keys are to scroll between already enter numbers (highlighted at the top). To return to the previous screen press Escape Once finished, press Enter

Leak Detection Simulation



Leak Detection Simulation

Simulates a leak detection, causing all actuators to react and close the cylinder/drum valves connected to the Chlorguard.

Displays which valves have been closed, and which are still in the process of closing.

Once all the valves have close, you'll be taken back to the main screen (see fig 1.) Until then, you'll not be able to do anything until it's finished

Service Menu



Service Menu

Displays the attached actuators and serial number of the Chlorguard Unit. After pressing the Manual Override you'll be able to run individual actuators by pressing the according actuator.

Multiple actuators can be running simultaneously, and will only stop when pressed a second time.

The Serial Number of the unit is located at the bottom of the screen. Press "Main Screen" to return to the main screen (fig 1.)

5 APPENDICES

ChlorGuard Assembly Diagram Figure 6
Control Module Functional Block Diagram W0500389
Electrical Schematic W0500456

