Temporary Gas Dosing Container

(single gas)

CHEMIDOSE LIMITED

For temporary or emergency gas dosing

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Introduction

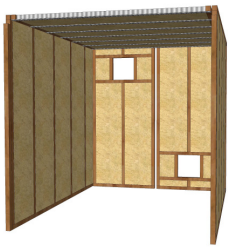
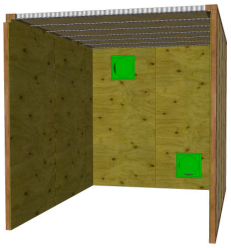
Chemidose Limited has developed this self-contained and secure unit to facilitate emergency dosing requirements or provide a temporary system while gas installations or upgrades are taking place on site.

Housed in a secure shipping container, the system is designed as a “drop and go” unit with external connections for power, telemetry, motive water inlet and treated water outlet.

The system offers comprehensive safety and security including:

- Steel outer shell with high security lockbox
- External audio visual alarms wired to gas detection system with external test switch
- High secure LPCB level 2 cylinder clamps for gas cylinders contained within the container
- Telemetry outputs for system and gas detection status

The container is fully insulated with heating and ventilation linked to a controller to maintain optimal operating conditions.

	2” x 2” tanalised timber is used to provide a framework for lining the steel container.
	Aluminium T-bar sections are used to support the roof insulation.
	50mm Celotex insulation is then fitted between the timber frame, the roof supports and also to the inside of the doors.
	Finally, ½” exterior grade ply is used to line the internal walls and doors. Metal vents are inserted for ventilation and extraction and colour matched to the shipping container.

Internal equipment

A. Vacuum regulators	J. Booster pump
B. Gas detection controller	K. Pump starter
C. Marshalling unit	L. Gas dosing controller
D. Connection to audio visual beacon	M. Extraction unit
E. Gas changeover board	N. Power distribution board
F. Rotameter board	O. Gas detector
G. Gas injector	P. Room heater
H. Air inlet	Q. Power and signals JBs to external enclosure
I. LPCB level 2 cylinder clamps	

Functionality

The system houses two 71kg gas cylinders (supplied by the customer) in secure cylinder clamps that are attached to the container floor. Vacuum regulators are directly mounted to the cylinders. The vacuum regulators allow the gas to be pulled under vacuum to the injector and also provide a barrier between the pressurised cylinder and the vacuum line.

The two cylinders operate on a duty / standby cycle with the cylinders switching automatically to the reserve bank when the duty bank has been depleted.

The vacuum is generated via the injector by using a motive water pump that is also located in the container.

On the outside of the container, there are two enclosures. One is for water connections with motive water in and treated water out. The second enclosure has a three phase appliance connector for power and a control junction box for easy connection of controls and signals.

Two automatic Chlorine gas feeders to run in duty/standby mode. An LED display Aquacontroller provides operator interface.

A 4-20mA signal is presented to the container from site which is in turn wired to the gas controller. This adjusts the metering valve proportionally.

Output signals are also available from the junction box within the external enclosure.

Gas monitoring equipment linked to a controller provides intelligence and controls how the extractor fan and alarm beacons operate.

A warning beacon stack with sounder is fitted to the top of the container door to show the status inside.

A 2kW heater with thermostat is installed to keep the room above 15 deg C and an extractor fan linked to another thermostat can be adjusted to prevent overheating in the summer.

Operation

The system has been designed for minimal maintenance.

The only checks that should be required is that the alarm beacon status is green (signifying that the system is functioning normally) and to check whether the gas supply has switched to the reserve drum.

This can be done either by checking the “No reserve” orange lamp status on the Chemichangeover unit, or if connected to the signal JB, via site control.

Vacuum changeover system

The vacuum changeover unit will automatically switch to the reserve cylinder once the gas has run out in the duty cylinder and show that the reserve is in use by activating the “No Reserve” amber warning light. This information is also available remotely using the control outputs.

At this point, a new delivery should be booked.

Once a new cylinder has been installed, the “No Reserve” light should be turned off by pressing the “Reserve Reset” button.

Alarm conditions

Two gas sensors have been placed either side of the container near to the gas equipment.

In normal operation, gas levels in the room should be under 2ppm. During this condition, the external green light will be lit and room extraction will cut in and out as required dependent on the room temperature.

It is quite normal for levels to rise slightly above 2ppm if for instance, the cylinder is being changed. If the level is above 2ppm but under 8ppm, the external red light will flash and the fan should come on to remove the excessive gas.

If the chlorine gas level rises above 8ppm, the external red light will flash and the external sounder will activate. This will also stop the extraction (regardless of room temperature) in an attempt to contain the gas leak.

The system also monitors the health of the gas sensors. If one sensor fails, the red light will be activated. If both sensors fail, this will be classed as a major failure and the red light will flash and the sounder will activate.

To summarise:

Light status	Sounder status	Safety level	Action
Steady green	Off	Safe	Safe to use
Flashing red	Off	Warning	Check status on the alarm panels or via feedback to control room
Flashing red	On	Danger	Check control panel status from control room and only enter container with full BA

External connections

Power and signal enclosure

Facility to connect power, signals and also to test external audio visual alarm without needing to enter the container.

Water connections enclosure

Connections presented for motive water inlet and treated water outlet.
The treated water outlet allows for dual containment via a two size hosetail arrangement.