

Dynasafe[®] mk4-Lt intelliflow control system

Fume Cupboard
.... Idle



Complies with AS2243.8

Operation manual

Dynasafe – MK4 LT - intelliflow control system

January 2009

1.0 System Introduction

The MK4 - LT Control System is a state-of-the-art intelligent microprocessor control panel. This controller is used exclusively to control the functions of modern day fume cupboards enabling them to meet the Australian standard AS2243.8 – 2001.

These include;

- BATTERY BACKUP
- FAN BOOST (Automatic)
- PRE & POST-PURGE
- EMERGENCY ISOLATION
- VISUAL ALARM
- AUDIABLE ALARM
- MAINS POWER FAILURE DETECTION

2.0 Key features

- 2 line by 16 character Liquid Crystal Display (LCD)
- Touch panel integrated graphic overlay
- Large, latching emergency isolator
- LED key status indicators
- Audible alarms
- Expandable I/O
- Active and passive real-time airflow control
- Serial (MODBUS) connection for interfacing to Building management systems
- Expandable power module supply for future upgrades

Individual keys for

- Light
- Fan
- Spray (option)
- Pump (option)
- Alarm and alarm mute

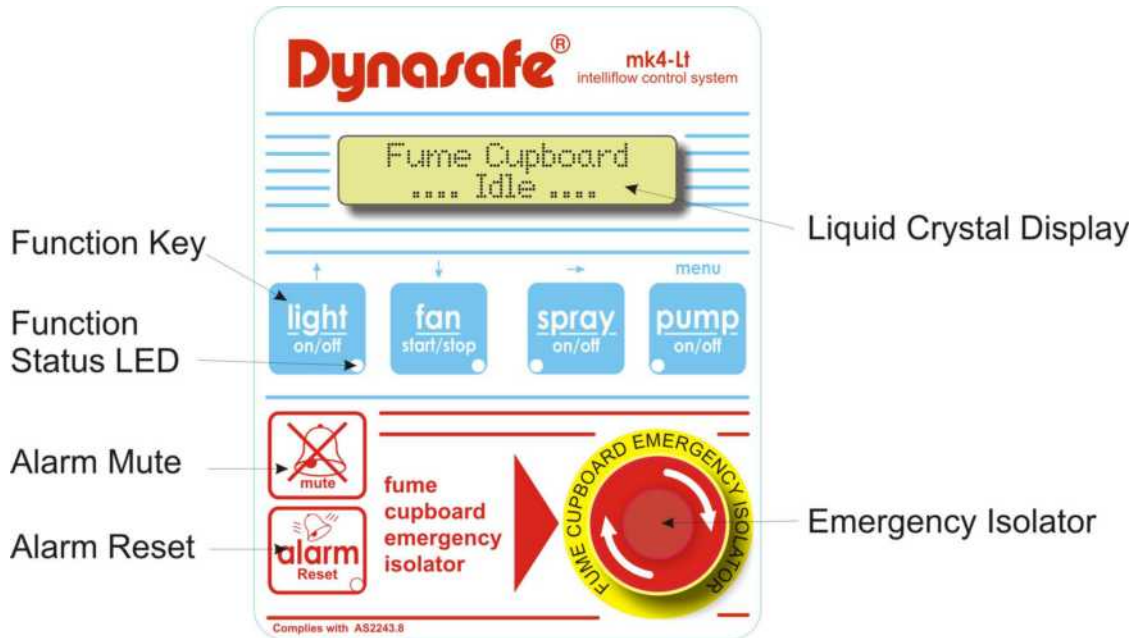


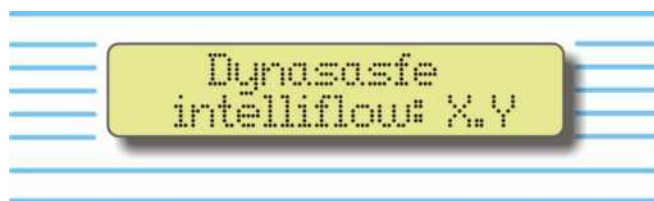
Figure 1 (Panel Layout)

3.0 SYSTEM OPERATION

The fume cupboard control system operates in a manner that follows a predetermined series of operational states. These states are set out in the Australian Standard 2243.8 -2006, and include a pre and post purge, alarm and battery backup conditions.

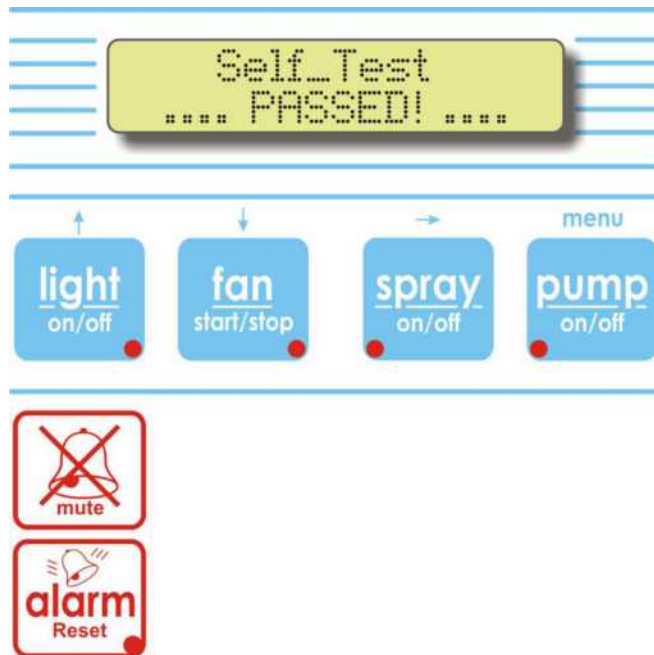
3.1 POWER UP AND SELF TEST

On power up of the control system the display will indicate the software revision of the controller and then perform a “self test” for several seconds.



During the self test the LCD will display a message indicating the controller is performing the “self test” and the controller will cycle through and illuminate all the LED’s on the control panel.

After a short delay the controller will indicate the result of the “self test” and display a message indicating a pass or in the unlikely event of a problem, a fail and in this case an accompanying diagnostic code.

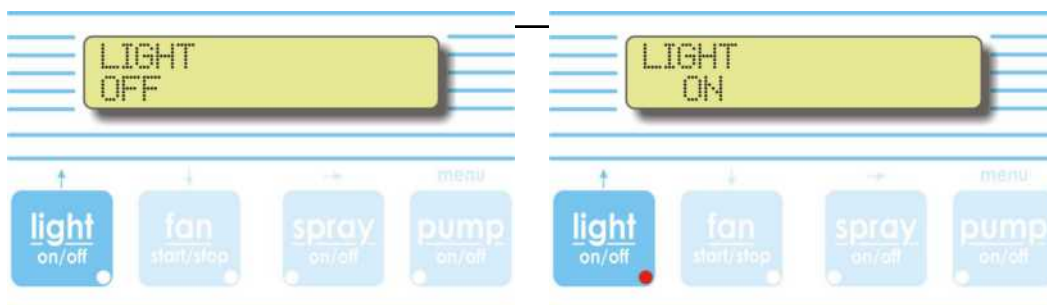


Note: The controller will emit three “beeps” to audibly indicate a pass, or one long “beep” for a fail.

LIGHT

The light operation is independent of the rest of the system and can be switched on and off as required.

Pressing the “light” key will turn on the fume cupboards chamber illumination light.



Note:

The red LED on the “light” key will illuminate and a message will flash on the LCD display to indicate the state of the fume cupboards light, repeated pressing of the light key will toggle the light ON and then OFF.

3.2 IDLE STATE

Once the control system has passed the self test stage the controller will enter the idle state.



From the idle state the operator can access all the functions and services connected to the fume cupboard. To start the fume cupboard into operation press the “fan” key.

3.3 Operational Mode

3.3.1 STARTING THE FAN

The fan is activated by the “fan” key, this will also activate an automatic PRE-PURGE on start up, and POST-PURGE on shut down.

3.3.2 PRE-PURGE (IN PROGRESS)

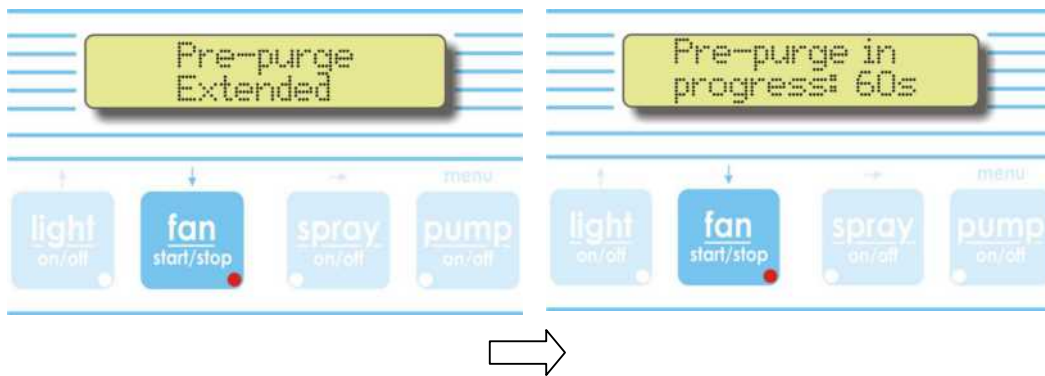
Pressing the “Fan” key from the idle state will activate the fume cupboards extraction fan and commence the pre-purge state. The pre-purge will run for 60 seconds.

Note: all services will be disabled until the Pre-purge has successfully completed.

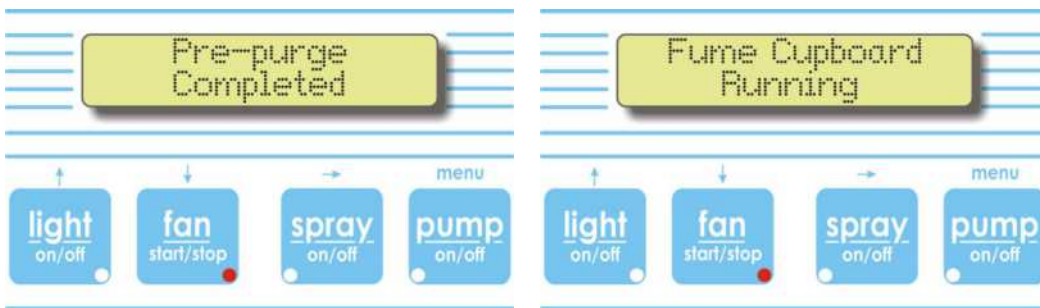


3.33 PRE-PURGE EXTENDED

If insufficient extraction is available during the pre-purge, a message PRE-PURGE EXTENDED will be displayed followed by an audible alarm. No services will be activated until the extraction is sufficiently established; when this occurs the controller will restart the Pre-purge countdown as normal or if no extraction can be established for 20 seconds then the controller will go into the airflow alarm state.



Three beeps will sound when the PRE-PURGE has been completed successfully and the extraction requirements have been established, the screen will display the following:



This screen shows the fume cupboard in its normal operation mode.
Note: the fan LED Indicator is "ON"

3.4 FUME CUPBOARD OPERATIONAL

The fume cupboard can now be used, the controller will constantly monitor the sash position and correct the airflow as necessary, if the sash is moved the system will send a signal to the fan to adjust its speed to satisfy the new airflow requirements.

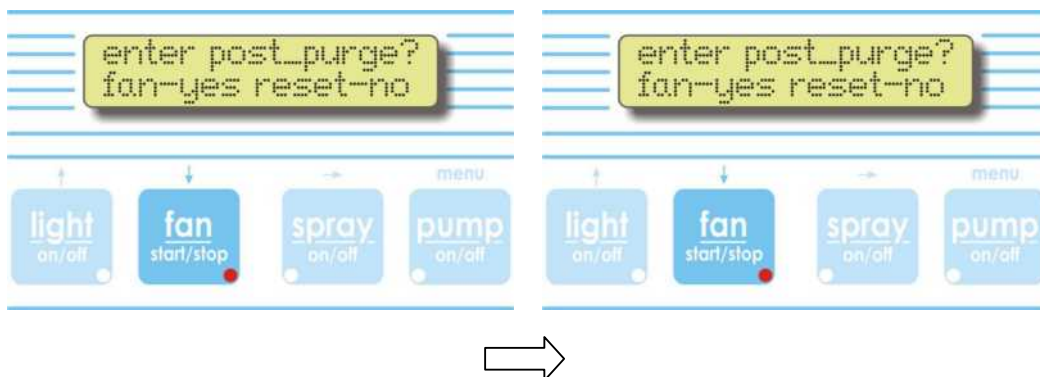
3.5 STOPPING THE FAN (ENTERING POST-PURGE)

In order to switch the fume cupboard fan off from the run state, you must press the “fan” key.

The display prompts the operator to confirm they wish to switch OFF the fan and enter into the POST-PURGE mode, you must acknowledge this by pressing the “fan” key a second time; this will put the controller into the POST-PURGE mode in preparation for de-activating the fan.

If you don't wish to stop the fan press the reset key and the panel will return to normal operational state.

Note: If you don't acknowledge this message, the panel will automatically go into the post-purge state after a 10 second timeout.



3.5.1 POST_PURGE (IN PROGRESS)

The purpose of the POST-PURGE feature is to purge the fume cupboard and connecting ducts of all fumes and volatiles, to do this the fan is kept running for 20 minutes after the operator requested the fan to stop, this also applies to the spray bar (15 minutes) and fume scrubber pump if fitted.

When the post purge time has expired the fan will automatically stop and the fume cupboard will return to the idle state.

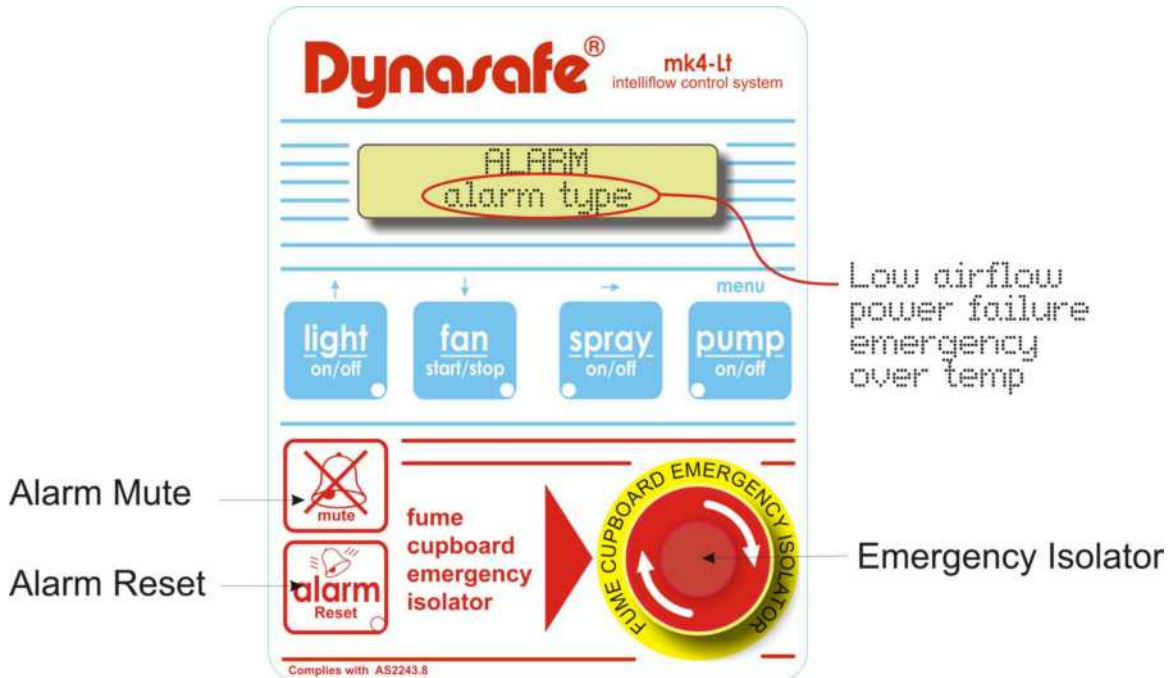
Note: During the post purge state all the services are disabled except the fume cupboard illumination light.

4.0 ALARMS

The control panel has many alarm states, the operator must take action to acknowledge the alarm and perform or arrange for service personnel to take the required corrective action.

4.1 ALARM OVERVIEW

A critical alarm will shutdown all services rendering the fume cupboard safe. This type of alarm will emit an audible tone indicating the alarm state and will also flash the backlight of the LCD. The operator can mute this type of alarm, but must rectify the cause before it can be reset. The panel will not allow the services to be reconnected without firstly going through a fresh PRE-PURGE.



Typical Critical Alarms are;

- Insufficient airflow
- Mains power failure
- Emergency stop
- Over temperature sensor tripped (If fitted)

The active alarm will be indicated on the LCD as shown above and the LED indicator on the alarm / alarm reset key will flash along with an audible alarm tone.

4.11 Insufficient airflow

This alarm is caused by a lack of airflow into the fume cupboards chamber. This can be caused by various situations including a fan or fan controller failure, foreign object obstructing the airflow in the chamber, duct or fan or highly turbulent airflow around the fume cupboard. To rectify this situation please inspect the fume cupboard for foreign objects like plastic bags restricting the airflow.

If this alarm persists then you must call for service or consult an electrician.

4.12 Mains power failure

This alarm is caused by a mains power failure or brownout. The panel will operate for 20 minutes on the internal battery backup with a mains power failure. Once the power is reestablished the panel can be restarted.

4.13 Over temperature sensor tripped (If fitted)

This alarm indicates that the top of the fume cupboards chamber has exceeded the maximum temperature allowed. This can be a pre-cursor to a fire, a fire or another thermal condition that should be avoided.

If this alarm has been activated it is imperative that the laboratory safety manager checks the fume cupboard before re-instating it for operation.

4.14 Emergency stop

If an emergency situation occurs such as a chemical spill, gas leak or fire, then the operator should press the emergency isolator.

The sole purpose of the emergency isolator is to stop all electrical and gas services inside the fume cupboard and activate an audible alarm.

This style of isolation switch latches in and needs to be turned clockwise to reset.

Note: when in this alarm state the airflow will continue at a higher rate (Boost), and the gas and power services will be disabled.

