## Technical Information

### Interfacing

*Input/Output Modules:*

6 Output Modules and 4 Input Modules are provided as standard. These modules are supplied for 110v, 24v DC or can be customised to your specification.

Only the water valve must be connected.

All other outputs/inputs are optional and can be connected as appropriate for each configuration (Note: no connection to material load cells are required).

*RS232 Communication:*

For reading and writing information relating to recipe parameters, as well as selecting active recipe.

### Technical specification

*Supply voltage:*

24v DC, 30w for Hydro-Control V and Hydro-Mix VI Higher power may be required for powering valves and other outputs.

*Operating temperature range:*

0 – 50°C.

*Keyboard:*

Sheet keyboard with polyester overlay.

*Graphic display:*

120mm x 90mm 1/4 VGA display with backlight.

*Recipes:*

Memory for 99 recipes.

*Security:*

Open access for operators; critical operations protected by three levels of pass codes.

*Communications:*

RS232 for connection to batch computer or remote recipe module.

RS485 communications to Hydronix sensor.

*Sensor connection:*

The Hydro-Mix VIor Hydro-Probe Orbiter Microwave Sensor is connected to the Hydro-Control V by two pairs twisted (4 cores total) screened (shielded) cable with 22 AWG, 0.35mm² conductors suitable for up to 100m. Separate cable run to any heavy equipment power cables.

*Electromagnetic compatibility:*

Meets the requirements of the Electromagnetic Compatibility Directive 89/336/EEC.

**Dimensions**

*Operator panel (for panel mounting):*

Panel cut-out size 232mm wide x 178mm high.

*Steel Enclosure (Optional):*

400mm wide x 400mm high x 200mm deep. Door hinged from left. IP65 rated.

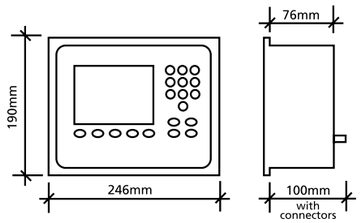



**Figure 7: Steel enclosure unit**

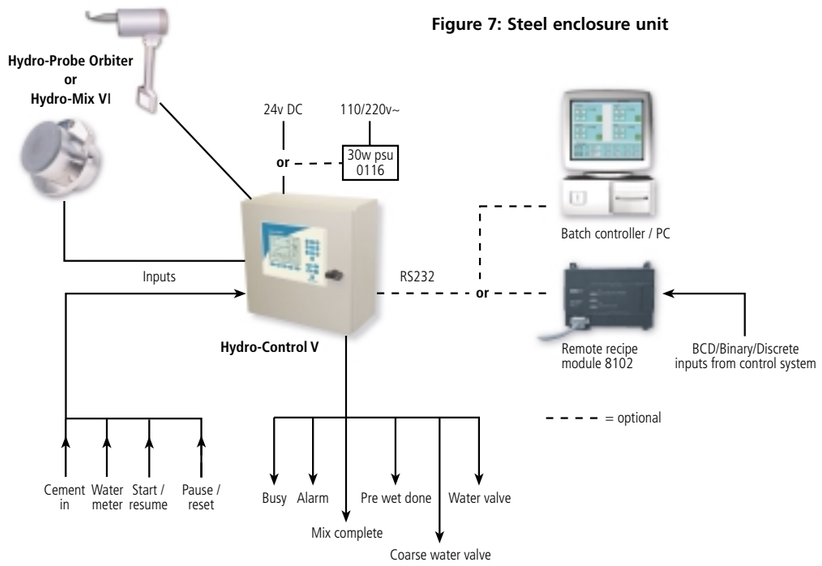



**Figure 8: System interfacing schematic**

Hydronix

Hydronix Ltd
7 Riverside Business Centre
Walnut Tree Close
Guildford
Surrey GU1 4UG
England

Tel: +44 (0)1483 468900
Fax: +44 (0)1483 468919

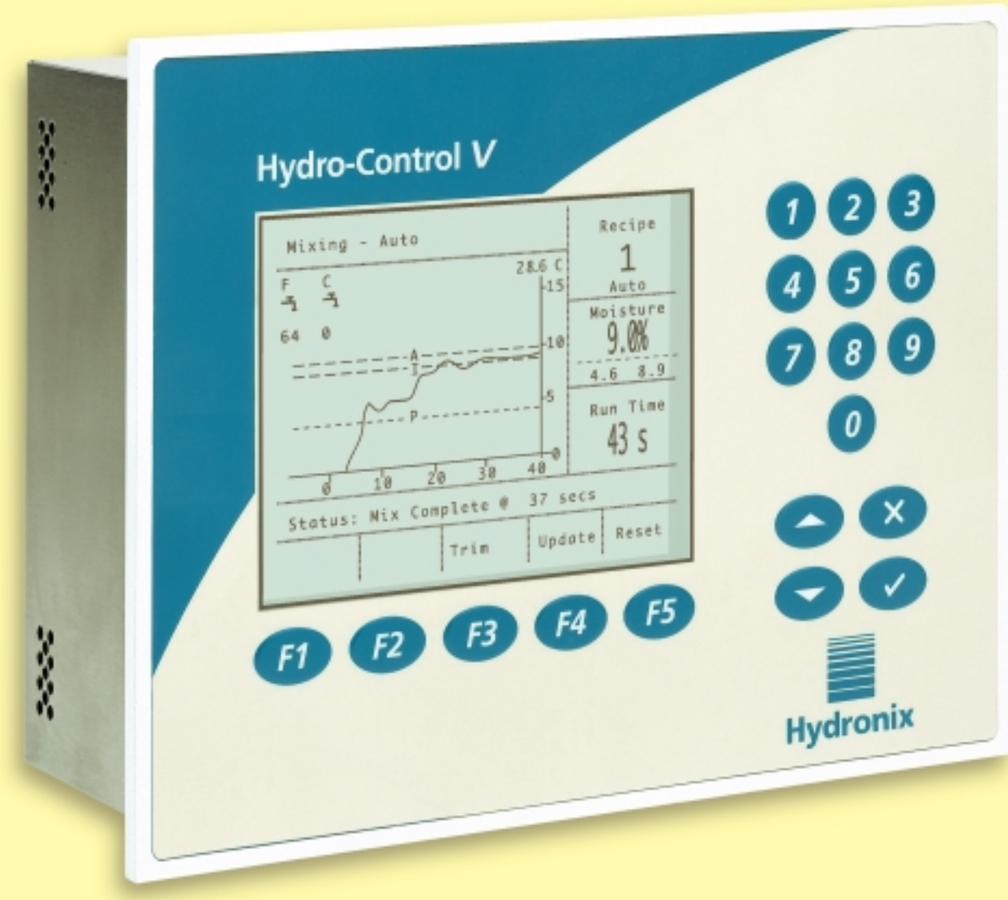
www.hydronix.com



HCV:01:2003

# Hydro-Control V

## *product information sheet*




*The most accurate, versatile water control system for concrete production*

Hydronix

# Hydro-Control V

*the ultimate water control system for your mixer*

*The Hydro-Control V uses the digital technology of the Hydro-Mix VI and the Hydro-Probe Orbiter to precisely control the addition of water in the mixer, irrespective of the variation of moisture in the aggregates.*

*Designed for simplicity of use and installation, the display clearly indicates the mix cycle status with a continuous graphical display of moisture content.*

*Three selectable control modes ensure optimum performance is achieved for all recipes.*

## Key features

*Compact and powerful –* suitable for all mixer applications. Supplied for panel mounting or for mounting in an enclosure.

*Direct communication –* links to the latest Hydronix digital microwave sensors, the Hydro-Probe Orbiter for static pan or rotating pan mixers, or the Hydro-Mix VI for static pan or horizontal shaft mixers.

*System integration –* RS232 communication allows setting and reading of recipe number and data from the main control system, or simple installation using the inputs/outputs included in the unit.

*Easy to read display –* continuous graphical display of moisture and mix cycle status. Mix log, sensor diagnostics and many other selectable screens.

*Versatile –* three selectable control modes for controlling water addition in the mixer. Enables the most suitable mode to be selected for any given mix recipe.

*User-friendly –* easy to install and easy to use.

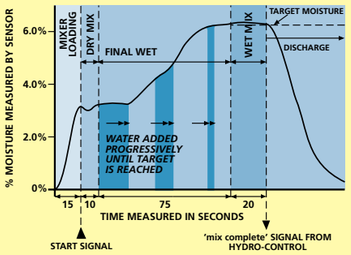



**Figure 1: Typical mix cycle – Auto mode**

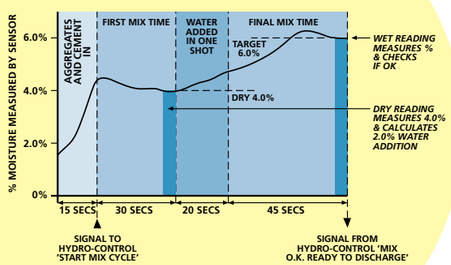



**Figure 2: Typical mix cycle – Calculation mode**

## Control modes

Three selectable control modes allow the most suitable mode to be selected for any given application or recipe. This enables the optimum performance for mix cycle time and moisture accuracy to be achieved.

*Preset mode –* water added as a fixed quantity.

A fixed quantity of water is added as defined by the recipe. This is useful when setting up recipes and commissioning equipment. This mode can also be used without a sensor connected.

*Auto mode –* water added progressively.

Water is added quickly at first but more slowly as the moisture 'target' for the selected recipe is approached. Water flow is controlled by a unique algorithm developed by Hydronix to ensure optimum performance for mix cycle time and accuracy.

Only a short 'dry mix' time is required and because the water is added progressively, only a short 'final wet mix' time is necessary.

No calibration is needed and although the use of a water meter is recommended, it is not essential in this mode.

A 'trim' function enables manual intervention if required, and is used to establish the appropriate 'moisture target' for any given mix recipe.

*Calculation (Calc) mode –* water added in 'one shot'.

The quantity of water to be added is calculated from the difference between the 'dry mix' moisture reading by the sensor and the final required moisture for the selected recipe. In this mode, the water is added in 'one shot'.

Although a longer 'dry mix' time is required for many applications, this provides the shortest possible overall mix cycle time.

## Mix sequence for the 'calculation mode'

A typical mix cycle is illustrated in figure 2.

## Calibration

Using the calculation mode, it is necessary to calibrate the system. This is very easily performed by the operator using the automatic calibration cycle.

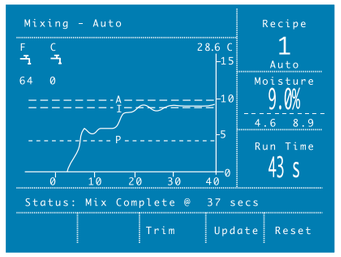



**Figure 3: 'Mix cycle' display**

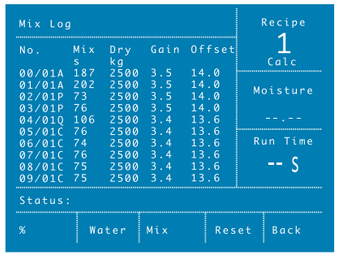



**Figure 4: 'Select recipe' display**

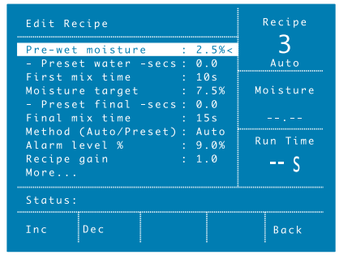



**Figure 5: 'Edit recipe' display**

## Pre-wet mode

A pre-wet cycle, in which the aggregates are wetted prior to cement addition, is available with all modes of operation. Particularly useful when the aggregates are very dry (below ssd), or are very absorbent. The pre-wet cycle may use a fixed amount of water or a moisture target.

## Recipes

99 recipes are available which may be selected locally via the Hydro-Control V keypad or remotely using RS232 serial communication from the plant control system, or via an optional remote recipe module using discrete, binary or BCD inputs.

## Security

Three levels of pass code are provided, one of which is customer defined.

## System interfacing

The Hydro-Control V will operate as either a stand-alone system where the mix cycle is started and reset using the keypad function keys, or as an integral part of a fully automated system using digital I/O for controlling the mix sequence. RS232 communication for selecting the recipe number and batch size (see figure 8).

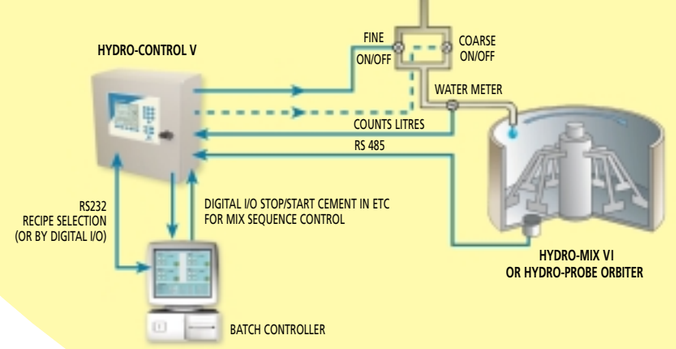



**Figure 6: System overview integrated with batch control system**

## Display information

Navigation through the system is intuitive. Menus are accessed using the function keys on the front panel:

*'Start Menu' –* is displayed when the system is idle. Graphical moisture content is shown. In this mode access to other menus is enabled.

*'Mixing' –* displays the status and a graphical display of moisture during a mix cycle.

*'Select recipe' –* shows an overview of recipes and allows selection of recipes from the front panel.

*'Edit recipe' –* allows editing of any recipe.

*'Mix log' –* records moisture, mix time and control parameters for the last 99 recipes.

*'System set up' –* screens are used during commissioning, also provides access to system test functions.

*'Diagnostics' –* screens provide direct communication with the Hydro-Probe Orbiter or Hydro-Mix VI sensors and enable the set up parameters within the sensor to be viewed and changed.

## Guidance notes

When ordering, the relevant order codes should be specified. These notes are to assist with the correct identification of the components appropriate to your application. Please read these in conjunction with the Technical Details overleaf, and the current price list prevailing at the time. Items marked with a * are optional.

- The standard system comprising the front panel unit. Input/output voltage requirement must be specified at the time of ordering (110v AC, 24v DC or ask for details to customise to your own requirements).
- The units may be supplied with an IP65 steel enclosure unit (6107* figure 7).
- A 30w DC power supply (0116*) for sites without a 24v DC supply.
- A remote recipe selection module (8102*) enables remote recipe selection via digital inputs (not required when using serial communication).