OPERATING INSTRUCTIONS

RM350

Contents

Safety

Please read the following information carefully before installing and using the equipment.

Compressed air and gases can be EXTREMELY dangerous and MUST be treated with extreme care. This equipment works at pressures up to 620 Bar (8990 psi) and uses single and 3 phase electrical power (certain models).

REMEMBER: Nitrogen gas is an asphixiant. Never breathe in gas escaping from the system. Nitrogen gas is not poisonous, but can overcome a person in a confined space. Always stay alert when venting Nitrogen gas.

REMEMBER: don't be fooled by the size of the high-pressure receiver. A 50-litre receiver charged to 350 Bar contains the equivalent of 17500 liters of gas at atmospheric pressure.

REMEMBER: unlike hydraulic oil, gas is compressible, and will continue to expand until the pressures inside and outside the system equalise.

NEVER commence any maintenance or servicing work on the equipment without ensuring that the system is depressurised.

NEVER adjust a pipefitting that is under pressure.

NEVER adjust a safety valve to achieve a lifting pressure higher than that set at the Maximator factory. A safety valve is provided to prevent over pressurisation of the system and overloading of the compressor. Tampering with a safety valve can cause serious damage or injury.

NEVER run the equipment without the guards it was supplied with.

NEVER re-use damaged fittings, especially if they rely on threads for security (i.e. pipe fittings, nuts, bolts, etc).

NEVER attempt to straighten badly bent pipes

NEVER allow any part of your body or any person to be in front of an opening that is venting gas. Particles from inside the system can become embedded in the skin and cause serious injury or death.

ALWAYS take care when opening valves or venting the system, and open the valve

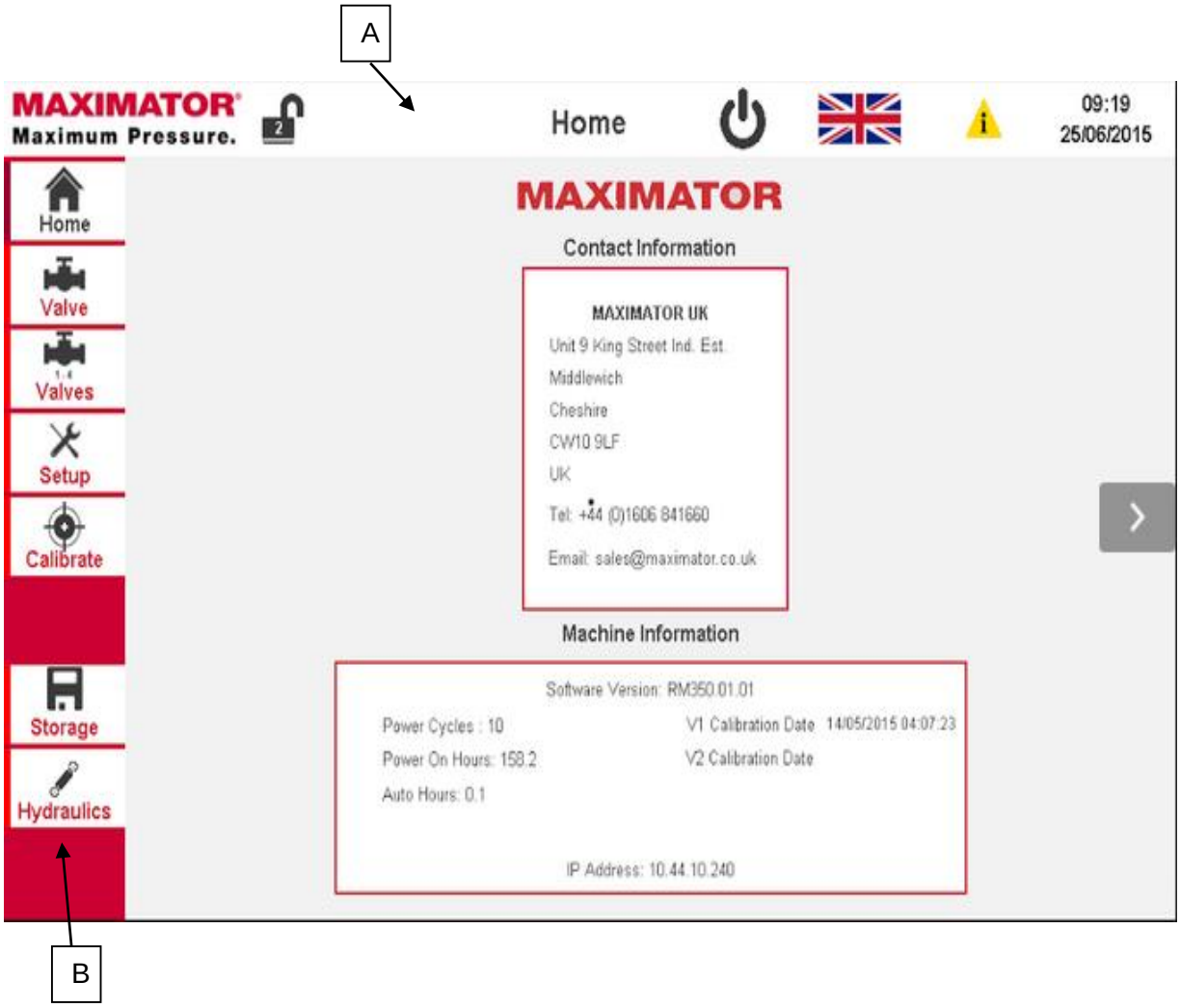
slowly. **ALWAYS** isolate the electric power supply before commencing work on the system.

ALWAYS entrust electrical work to a qualified electrician.

ALWAYS comply with local, regional and national legislation.

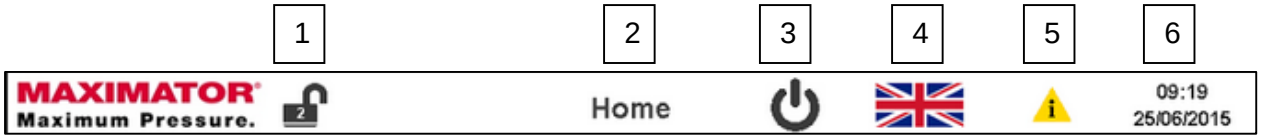
REMEMBER:
COMPRESSED GAS AND ELECTRICITY CAN KILL.
TREAT THEM WITH RESPECT.

Home Screen



A **Banner**

The banner is always visible



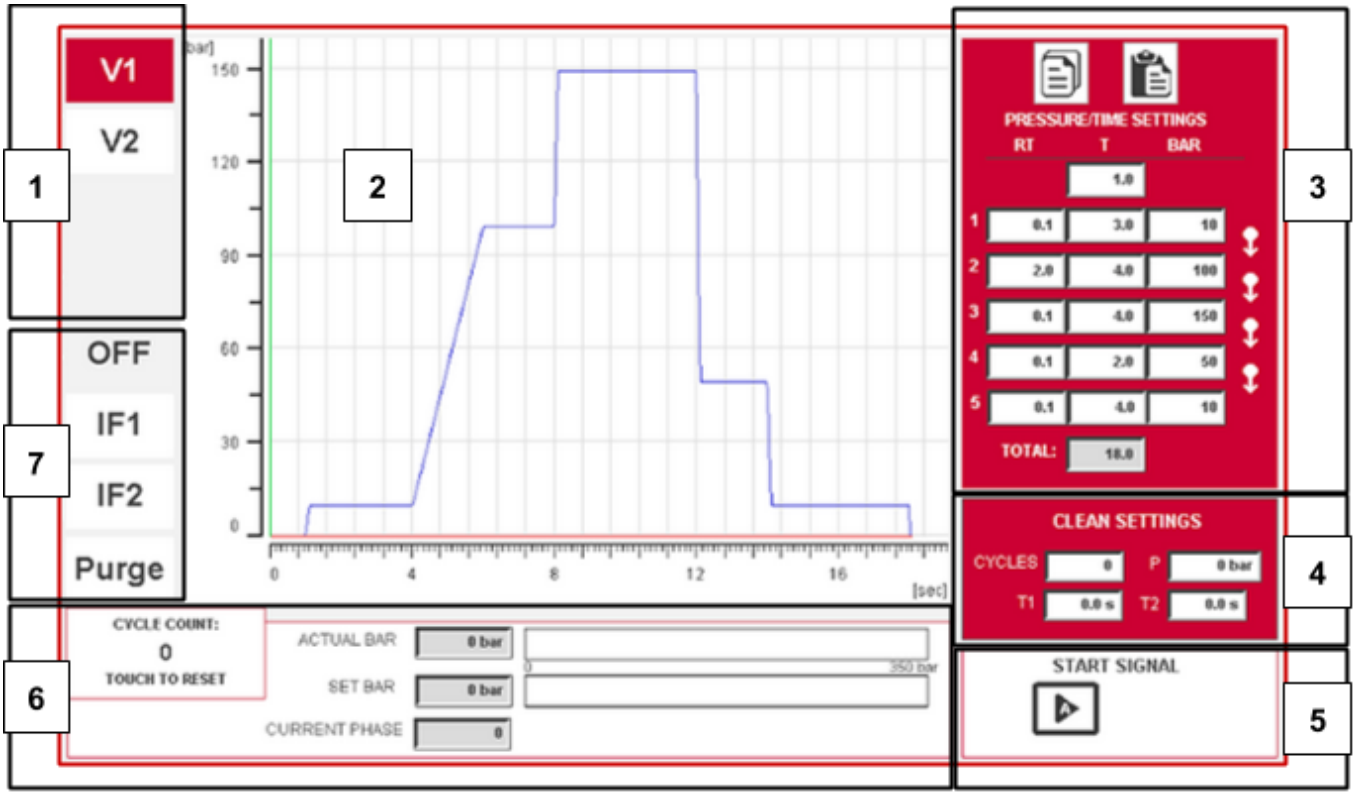
1	Change Security Level	Press button and enter appropriate password to change security level
2	Current screen	Current screen name display
3	Auto/Manual	Touch for Auto mode, touch again for OFF. Green = Auto
4	Flag	Touch to select language
5	Status	Changes colour to indicate fault. Yellow = normal, red = fault. Touch to go to status screen
6	Current time and date	Touch to change system time and date

Security Level	Password	Function
0	9999	User can operate machine and view settings. Data cannot be changed. Calibration cannot be carried out.
1	Look up from password list, with reference to security code.	User can operate machine and view/change settings. Calibration cannot be carried out.
2		User can operate machine and view/change settings. Calibration can be carried out

B **Button Bar**
The Button Bar is always visible. Press the buttons to go to the appropriate screens

Valve Screen

The valve screen is the process setting screen, where the times and pressures and other settings for the process can be set. The process can also be monitored here for one valve at a time.



1. Show Valves

Touch the valve number to show the valve screen for that valve.
If 4 valves are fitted, V3 and V4 buttons will be visible also.
All valve screens have their own colour.

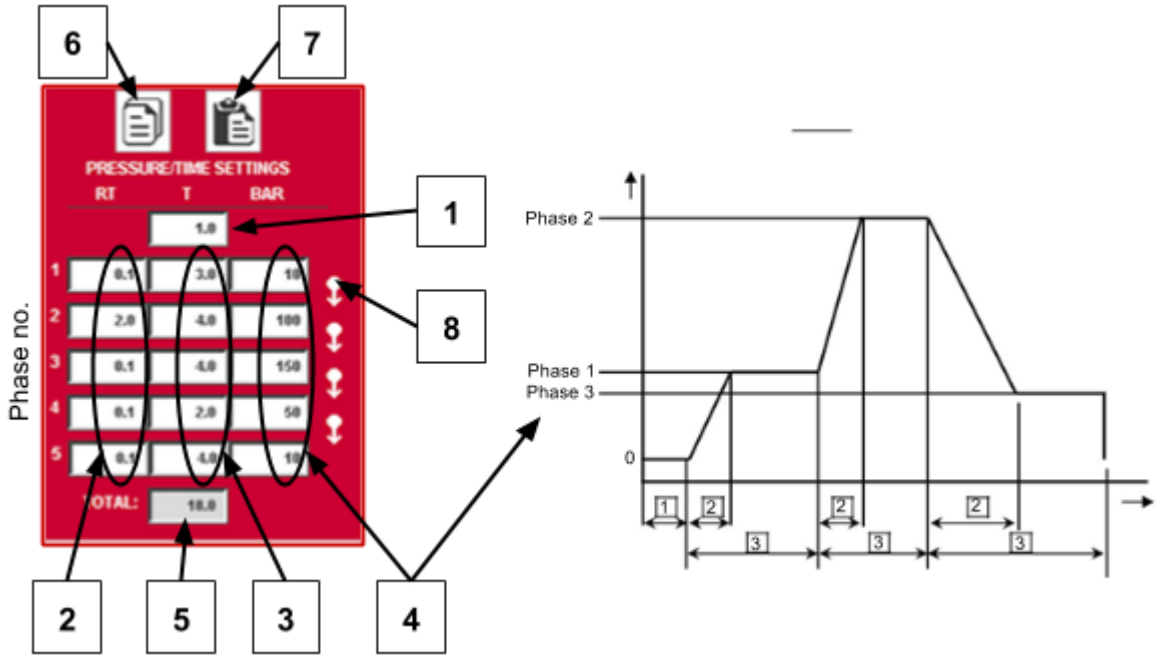
2. Graph

Graph displays users pressure and time settings in blue, actual values for last cycle in red.

How to set pressure and time profiles

3. Cycle Settings panel

The gas controller controls gas each cycle according to settings in the cycle settings panel. The cycle starts from the gas start signal. A delay is available, followed by 5 phases of pressure control according to the the model below:



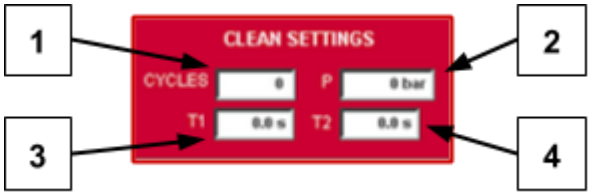
1	Delay
2	Ramp time
3	Phase time (includes ramp time)
4	Phase pressure
5	Total cycle time (calculated)
6	Copy all settings
7	Paste all settings
8	Copy phase settings to next phase

Note:

- It is not necessary to use all 5 phases.
- Ramp time [2] can be zero.
- Phase time [3] can be the same as ramp time, but cannot be less than ramp time

Purge and clean function

4. Clean settings panel



The Clean (purge) function sets an output pressure for a valve. It is normally used to test the flow from a gin pin, or to provide a short blast to blow accumulated dirt and contamination from the gas pins.
Clean function can be oprated manually by touching the “purge” button, or automatically.
Whether manual or automatic, the pressure is set in the clean settings panel.
Automatic clean periodically operates the clean function after the gas cycle has finished and the mould closed signal is lost (to allow venting through the gas pins while the mould is open)

1	The number of cycles between automatic clean operations
2	Clean pressure
3	The time from the opening of the mould to the start of the automatic clean operation
4	The time that the pressure is set for the automatic clean operation.

5. Start signal select

There are two signals in each interface that can be used to start a gas cycle. If this function is enabled, you will be able to select start signal A or B for this valve.

6. Monitoring panel

Cycle counter: displays the number of completed cycles. Touch to reset the counter
Preset and actual pressure settings are shown for the current pressure control phase

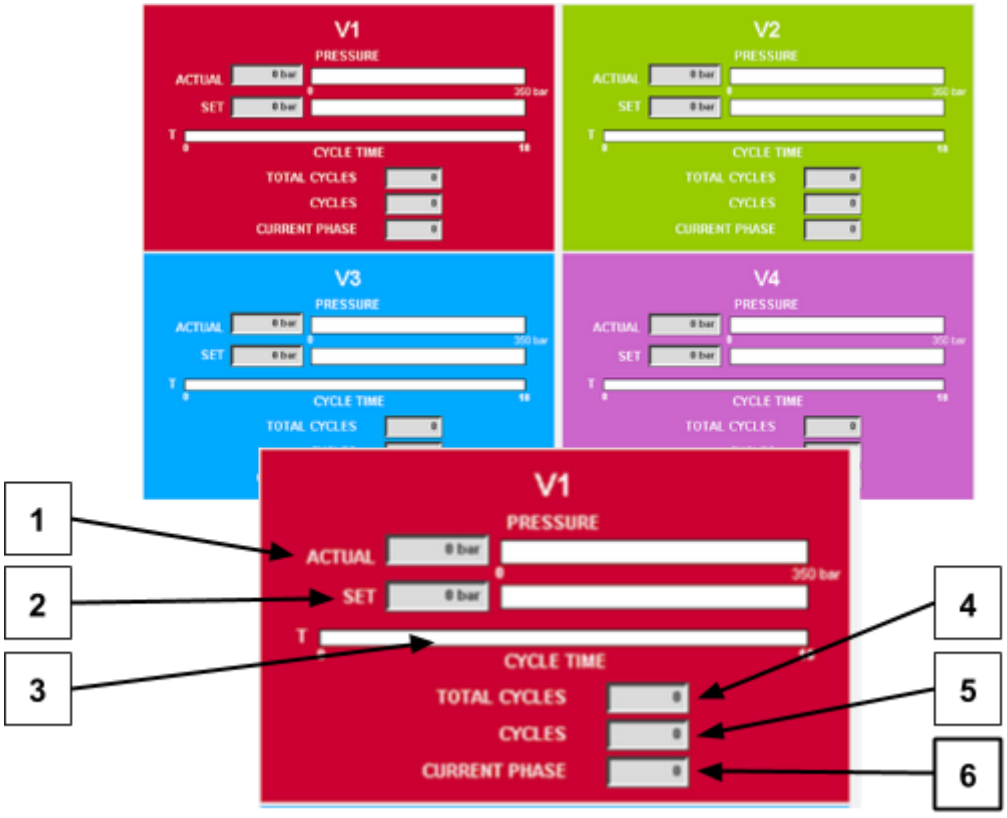
7. Select valve and purge controls

OFF	This valve is turned off and will not run
IF1	This valve is connected to interface 1 and will start when the unit is in automatic mode and a start signal is received at interface 1
IF2	This valve is connected to interface 2 and will start when the unit is in automatic mode and a start signal is received at interface 2
Purge	Touch to purge from this valve at the set clean pressure.

Valves view screen

Viewing all valves operating at the same time

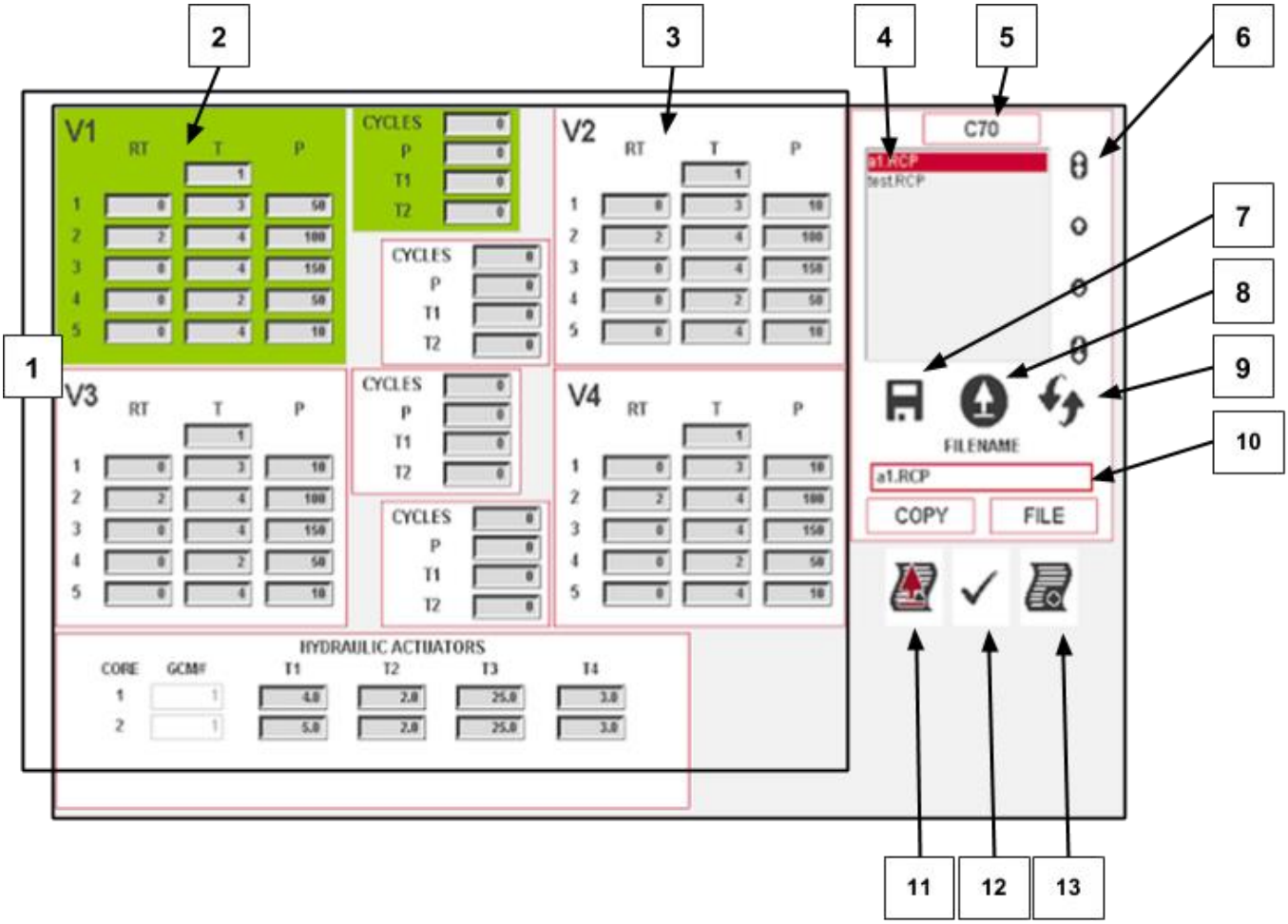
The valves view screen shows all of the installed valves at the same time. Here you can see all valves pressure preset and actual pressure values, cycle counts and cycle progress.



1	Actual pressure value and bargraph display
2	Preset pressure value and bargraph display
3	Current cycle progress bargraph
4	Total cycle count for this valve. Not-resettable
5	Cycle count for this valve (can be reset by user)
6	Current phase number.

Data Storage Screen

Use the data storage screen to save data settings into permanent storage on the machine, and to retrieve settings for a particular mould.



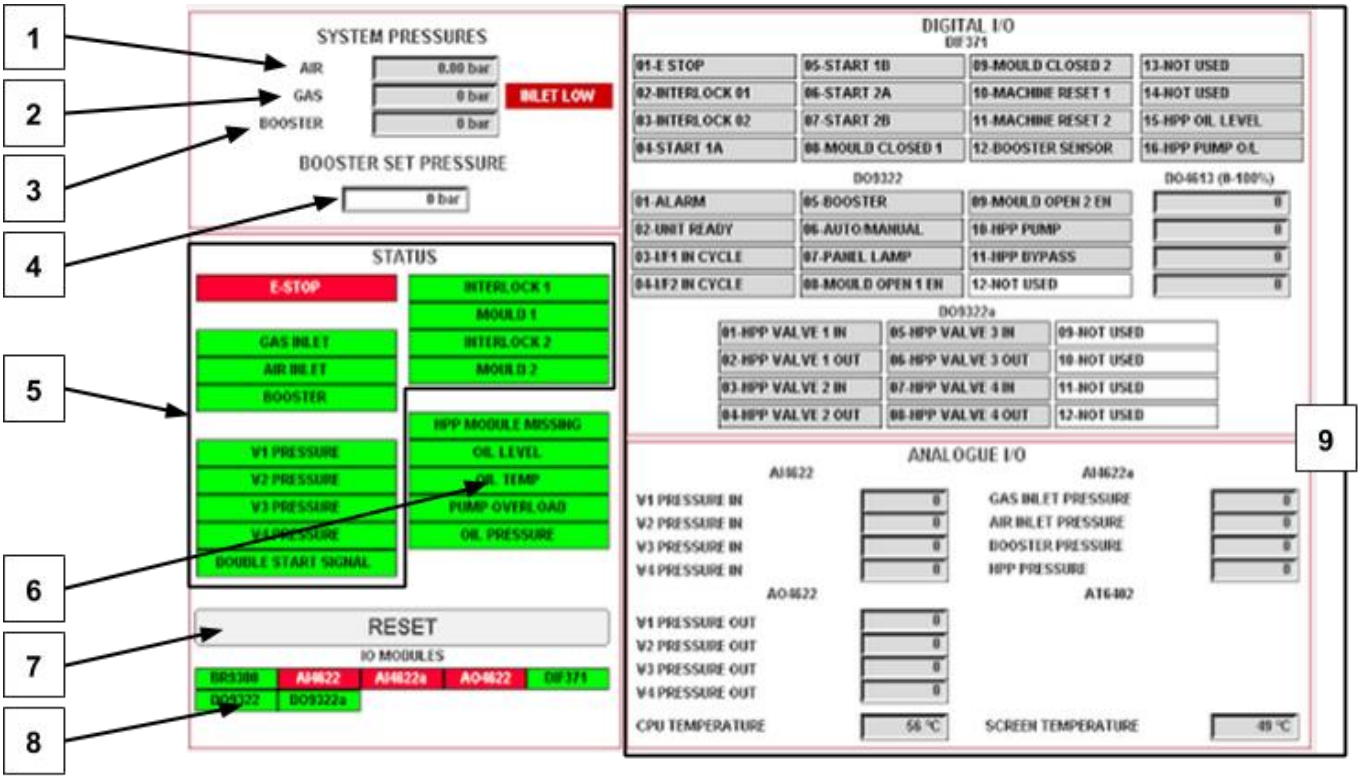
1	Display of current and proposed values
2	Green panel shows that current data will be over-written with values from loaded settings. Values from data in clipboard will be shown.
3	White panel shows that current data will be kept and not over written
4	List of files of data settings on this machine
5	Currently selected file name
6	Navigation buttons. Use these to bring the required file into view in the file list.
7	Save. Saves the current data held on the mahine for all valves and hydraulics to memory, using the file name in the file name box [10]
8	Touch to transfer the currently selected file to clipboard
9	Refresh the file list.
10	File name box. Enter file name here before touching save [7]
11	Load all contents of clipboard to data panels (all panels will show clipboard data and will turn green)
12	Finish button. Touch to load all data in green panels to the machine settings
13	Clear panels button. Touch to clear clipboard data from panels and turn them white.

Status Screen

The status screen allows the user to set the booster pressure if the unit has one.
Alarm status is shown on this screen
Information about the inputs and outputs of the machine are shown for maintenance and troubleshooting purposes.

How to show the status screen

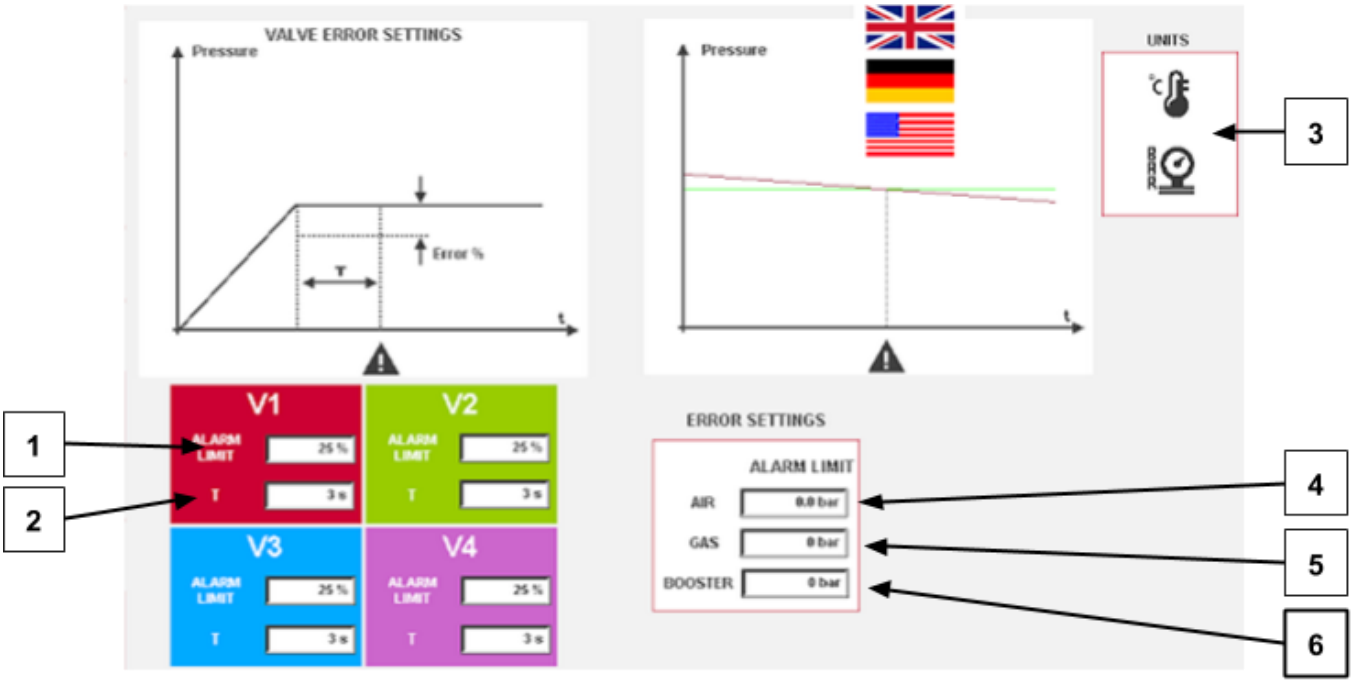
Press the exclamation mark button in the header bar.



1	Air inlet pressure display. (units with booster only)
2	Gas inlet pressure display.
3	Booster outlet pressure display. (units with booster only)
4	Booster outlet pressure setting box.
5	Alarms status flags. Green = OK, red = fault
6	Additional alarm status flags for when hydraulic power pack is fitted
7	Reset button. Touch to silence an alarm. Touch again to clear alarm
8	I/O modules list. Shows red for modules not fitted or with a module fault. Note: red flags do not signify a problem. If modules are not fitted because an option is not included, their positions will show red.
9	I/O status information. Shows the current values of digital and analogue I/O

Setup Screen

Use the setup screen to set machine alarm levels and to change pressure units



1	Valve alarm limit - %. When running a cycle, if the machine cannot achieve the preset pressure to within this percentage, for the time set in [2], then a “Valve Vx” pressure alarm will be displayed on the status valve for the affected valve. The affected valve cycle will be ended. The machine will continue to run, and the machine will continue to attempt to cycle the affected valve.
2	Time setting for valve pressure alarm
3	**How to change units to Bar or psi** Touch the units panel
4	Air pressure alarm setting. If the air inlet pressure drops below this value when the machine is cycling, the alarm will sound and air pressure alarm will be shown
5	Gas inlet pressure alarm setting. If the gas inlet pressure drops below this value when the machine is cycling, the alarm will sound and gas inlet pressure alarm will be shown. This value cannot be set above the booster pressure alarm - 20 Bar (290 psi)
6	Booster outlet pressure alarm setting. If the booster outlet pressure drops below this value when the machine is cycling, the alarm will sound and booster pressure alarm will be shown. This value cannot be set below the gas inlet pressure alarm + 20 Bar (290 psi)

Calibration Screen

The calibration screen is used to carry out the pressure calibration process for each of the valves fitted to the machine.

When to do Pressure calibration

Carry out this procedure:

- After a software upgrade
- If actual pressure does not match set pressure
- After servicing valves

To calibrate successfully you must:

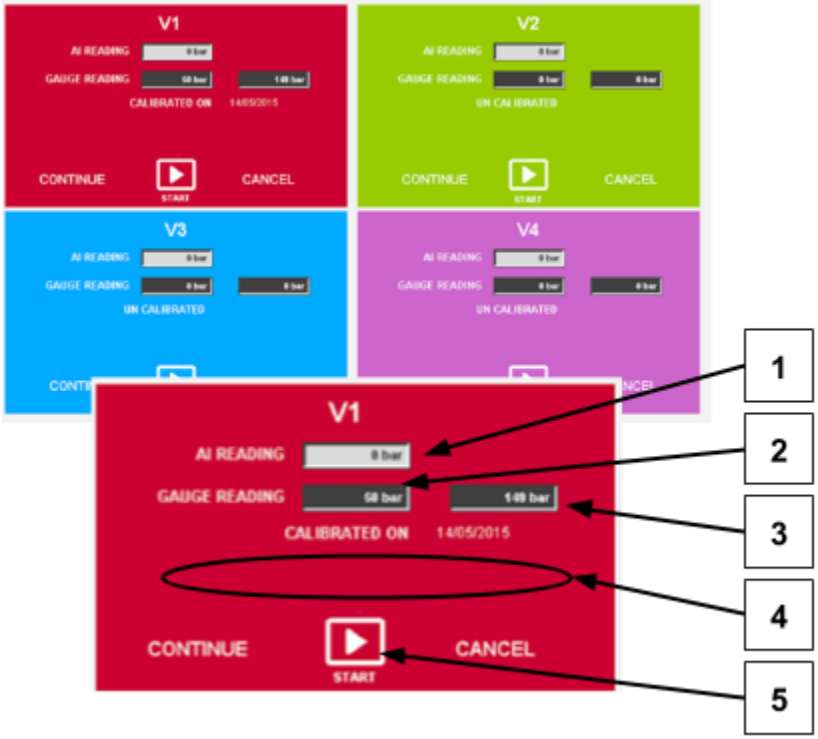
- Turn off the valve being calibrated
- Connect a calibration gauge

What are the requirements of a calibration gauge?

Use a pressure gauge to tell you what actual pressure the gauge is showing during the calibration process. The better the pressure gauge, the better the calibration. Gauges that may be fitted to an RM350 unit are for indication only and it is not advised that these are used for calibration. However, if there is no alternative and the unit has gauges fitted, you can use these by fitting a blanking plug to close off the valve outlet.

Maximator can supply digital pressure gauges which give good readings for a calibration.

It is not possible to calibrate successfully if the valve outlet is open (i.e. if there is nothing connected to the valve outlet), or if there is a leak in the fittings.



1	Machine Analogue input value – uncalibrated value
2	Gauge value enry box.
3	Calibrated input value.
4	Messages area. Prompts are shown here throughout the calibration process
5	Start button. Touch to start the calibration process
	Press CONTINUE at each step to continue with the calibration procedure as prompted Press CANCEL to stop the calibration procedure

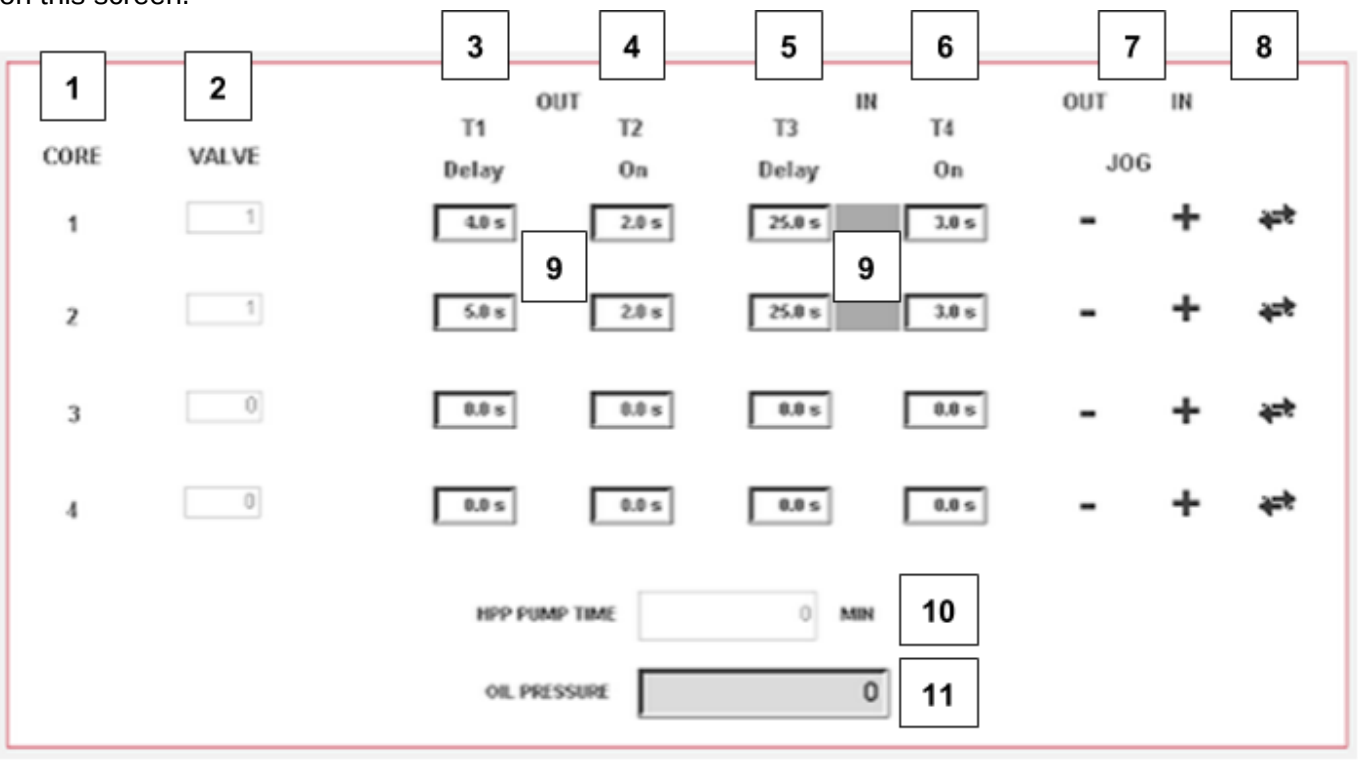
How to carry out a valve calibration:

1. Fit calibration gauge or plug to the valve that is being calibrated
2. Fit blanking plugs in the remaining valve outlets
3. Go to calibration screen (see above)
4. Press the start button on the screen for the required valve
5. Follow the instructions on the screen and make sure that the results are within 1 bar of the actual pressure.
6. Repeat for all valves fitted, making sure each time that the gauge is correctly fitted before starting the procedure.

Hydraulics Screen

When a hydraulic power pack or signal controls option is fitted to an RM350 unit, use the hydraulics screen to control the hydraulic core movements.

Each hydraulic core can be connected to any valve fitted to the unit. When the valve that a hydraulic core is connected to receives its start signal, the hydraulic cycle for the core starts using the timings set on this screen.



1	Hydraulic core number
2	Valve number that this core is connected to
3	Delay from the start signal to the first hydraulic core movement
4	Time of actuation of the hydraulic core valve during the first core movement
5	Time from the beginning of the first hydraulic core movement to the beginning of the second hydraulic core movement
6	Time of actuation of the hydraulic core valve during the second core movement
7	Manual jog buttons.
8	Swap function – press to swap in/out core operations. Can be used to avoid having to disconnect the hydraulic hoses.
9	Movement indicator. Yellow = core valve currently on. Grey = this core was last moved this way.
10	Hydraulic pump timeout. Pump stops if no cores are actuated for this length of time
11	Hydrualic pump pressure. Shows hydraulic pressure only when one or more cores are energised. Otherwise, the pump bypasses to tank and no pressure will be shown.

Hydraulic power pack notes:

1. When the machine is switched to Auto, every core that is connected to an active valve will energise its second core movement (Normally, cores “IN”)
2. When a valve is selected to an interface, any hydraulic cores connected to it will energise its second core movement (Normally, cores “IN”)
3. It a hydraulic core is connected to a valve that is connected to an interface, it will energise its second core movement (Normally, cores “IN”)
4. It no time is set for T4, any automatic core movements will be for 2 seconds.

How to start the machine

1. Make sure that the machine has been installed and commissioned according to the instructions:
2. Read these operating instructions
3. Ensure that the connections (Hydraulic, Electrical, Air, Gas, GCM) have been made in accordance with the installation instructions.
4. Pull out the Emergency stop button and press the reset button (refer to operating instructions)
5. Turn on the gas and air supply (air supply if booster fitted only)
6. Set a booster set pressure greater than the process pressure required, if a booster is fitted, or ensure that the inlet gas pressure is higher than the required pressure if no booster is fitted
7. Enter required process parameters. (Refer to operating instructions)
8. Select automatic mode
9. Select the appropriate interface
10. Operate the moulding machine and the controller will run accordingly