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Features & functions   in detail...

Main Display Screen - features panel re-sizing, giving the option of either detailed zone information or progressively more condensed panels to show more zones per page, up to 252 on our biggest console. Each panel displays Set, Actual, Power (either % or Amps) and deviation (not MTS). Red, yellow and green colour signaling for Alarm, Warning or Normal conditions respectively on each panel easily show the controller status at a distance. By fitting various optional signal cards in the cabinet the screen can be configured with colour coded panels to show other data including water flow, steel/water temperature, pressure or chiller temperatures. A page print function is available for output to a colour printer.

3D graphing (not MTS) - The graph page show a 3D perspective tape graph for up to 20 zones, selected in any order against a 5 or 30 minute time scale. The graph can be smoothly rotated by touch and drag for the best view. The data is constantly updated and auto scaled to fit the plot. There are page up/down buttons that allow you to scroll through the zones and a print button that produces a coloured plot output in the resolution of your printer. In addition the Timeline function displays the same 5 or 30 minute graphs using data recorded over the last 24 running hours. You can scroll back over time or select a particular time segment from a list.

2D graphing (MTS only) - The graph page show a 2D line graph with   coloured plots for up to 6 zones, selected in any order. There are page up/down buttons that allow you to scroll through the zones and a print button that produces a coloured plot output in the resolution of your printer. The graph can be manually scaled in both the X and Y axis, to zoom into a more detailed view, which can then be scrolled around with touch and drag.

Zoom Page - For greater detail the zoom page shows all information and settings for any single selected zone. There are also two additional 3D graphs displayed on the page (not MTS), deviation and % power output, available in 5 and 30 minute auto scaling plots.

Picture Store (not MTS) - Drawings, photos or documents are stored in bitmap format for display in the picture store viewer. Other file formats can be easily converted if required. Large images can be scrolled around the screen using touch and drag. A large thumbnail picture and image description is shown with each file entry for quick reference. Pictures are loaded from or backed up to floppy disk or USB media.

Easyview (not MTS) - An option button in the Picture Store links any selected image with the current running tool setup. This relationship is then also stored in the tool store for future use. Once the link is made the user can place live mini panels onto a photo, drawing or sketch of the hot runner or cavity layout, placing or moving them by touch and drag from a list of zone names. On the Easyview page the live panels can be set to display various process variables. Setting changes can be made directly from the Easyview page using a similar select and set method, as used throughout the software. A print option outputs the image with mini panels displayed

Tool Store - The system has the ability to store up to 200 mould setups (100 for MTS). These setup files can be backed up or transferred to other controllers via floppy disk or USB media. Settings in the Tool Store page also allow for connecting to another controller via an Ethernet connection. It's possible for one touch screen to be used for controlling several slave cabinets via a wired or wireless connection.

Upgrade - The system software has the ability to be upgraded if required without stopping the moulding process, via either floppy disk or USB media.

Operating Modes - The system includes various modes of hot control for starting and stopping the heating process. Available on the main display page the modes are…

Stop - all power outputs set at zero, but set points can be adjusted.

Startup - uses various start-up methods, previously configured in the Setup page, to bring all hot runner zones to set point.

Manifolds only - This heats the manifold zones close to setpoint before bringing up the probe zones. It allows for expansion of the hot runner system in the x-axis before expanding the probes in the y-axis, thus reducing long term wear of the hot runner components, and reducing the possibility of material degradation.

Follow Manifolds - In this mode the probes track the slower moving manifold zones to the set point, automatically switching to Run mode once set point is reached, again reducing component wear and material degradation.

Staged Startup - For more complex hot runner designs, it may be desirable to start the groups of zones in sequence. Example, heat the bridge manifold first, then satellite manifolds then probes. Staged Startup allows this, configured in the Setup page for up to 9 groups.

Boost - This mode temporarily increases the set points of all zones, for a user defined boost time period. Boost values can be individually set by zone in the Setup page. For example it may be desirable to boost only probe zones, some more than others. It's fully flexible. Tip Boost - Individual zones can also be boosted from the main display page.

Standby - This reduces set points, typically below the material melting point, In the event of a pause in production, to prevent material degradation. Again the standby values can be set individually by zone in the Setup page. For example, it may be desirable to reduce the probes to a lower temperature than the manifolds to allow for a fast restart.

Run - Normal running mode. All zones follow their individual set points.

Shutdown - This is the reverse of the Startup mode. It brings the temperature of the hot runner system down uniformly across all zones, rather than just switching off. This can also reduce component wear long term.

Utilities Menu - This page contains various useful functions…

Event log - Every setting change of any kind, alarm status change or any other event of consequence is logged in a database. This can be searched in various ways to look back in time in the event of a problem. You can search by zone, event or setting variable.

Data Export - Recorded temperature measurements, deviation and power output values can be exported in CSV file format (comma separated variable) to your PC spreadsheet, database or QA program via floppy disk, USB media or network connection. Data can be selected by range of zones and time/date span for up to 24 hours (MTS does 30mins).

Network settings - Setup the console network settings for either fixed IP or automatic using DNS.

Printer settings - Most printers are catered for by selecting the appropriate driver from a list.

Password setting - There is a two level password system. The user password allows day to day setting of process variables, running modes, tool loading and various page displays. The System password allows additional setting capability in the Setup page for process limits, alarm limits and other settings.

Testing Page - The touch screen has a diagnostics feature, which allows the mould to be fully tested for various wiring or component faults. Testing is done sequentially across a user specified range of zones, applying small amounts of power to each zone and looking for a corresponding temperature rise. The system also measures the current passing in each zone and compares it with previously recorded values to pre-warn the user of a possible failing heater. Test passes or failures, including crossed wired zones, cross linked zones or other wiring faults are listed in a plain English report that can be printed if required.

Setup Page - This page allows the user to configure the controller for the current application, or saved Tool Store files, using the System level password if enabled. The spreadsheet style page has several variables that can be edited individually by zone, range or group…

Alias - Every zone can be given a name that displays throughout the software that relates more to the user. Examples, Cavity 47, L/Bracket, Sprue etc.

T/C open - What to do with this zone/zones if the T/C fails. You can select the following options…

  Normal - Signal a fault and shut down power
  Auto Man - Use a percentage power calculated from historical averages and automatically continue moulding seamlessly.
  Auto Slave - Slave to a similar computer selected zone, duplicating the output power and automatically continue moulding seamlessly.
  Slave - Manually pre-define which zone to slave to in the event of a failure and automatically continue moulding seamlessly.

Standby - Set by zone, range or group the Standby drop in temperature.

Boost - Set by zone, range or group the Boost increase in temperature.

Master - Defines the manifold zone for each zone, range or group of probes to follow in Startup mode.

Warning High/Low - Set the deviation limits before the warning status is displayed.

Alarm High/Low - Set the deviation limits before the Alarm status is displayed and alarm signalling is triggered.

Maximum Temperature - You can pre-define the maximum temperature an operator with the User password is allowed to enter. If a value entered exceeds the limit, then a warning is displayed and the upper limit is used as set point.

Maximum Power - Upper limit power setting when working in open loop mode.

Display Group - The main display can be configured in several ways to group zones into multiple pages. Each zone is given a group page number for the zone to display in.

Staged Startup/Shutdown - Each zone can be allotted a group number when using the staged start up and shutdown. Groups of zones then heat up sequentially, one group after the other.

Speed - The control cards use an auto-tune system to determine what kind of load is attached to the output. However it is possible to manually override the automatic settings if required.

T/C offset - It is desirable in certain circumstances to adjust the display of measured temperatures to enable a more accurate representation of the actual melt temperature in some combined heater and T/C formats, where accurate offset values are known.

Cycle Sync - For hot runner systems using thermal gate control there are additional variables to be set for timings and power output.

Config Page - This section allows the user to display and edit settings that relate to the whole system.

Language - Includes English, German, French, Spanish, Portuguese, Polish and Chinese. Language can be changed on the fly.

Temperature Scale - C or F can be changed on the fly.

Console Startup - Switch on in Stop, Startup, Standby or Run mode.

Auto Standby mode - Using a cycle signal, automatically go into Standby mode if the moulding machine has been stopped for more than a predefined Auto Standby Time to prevent material degradation.

Allow Tool load - Enable/disable tool settings to be loaded when in Run mode.
Blanking Delay - Screen saver timeout.
Boost Time - Duration of Boost mode in seconds.
Deferred alarm mode - Delay an alarm event by up to 999 seconds.

Help pages - A comprehensive on-screen manual is always available including a Trouble shooting section, Glossary and helpful "How do I…" index.

Communication - The console has several methods available for communication between devices…

SPI server - Plastics industry standard for serial communication of settings and control data.
Modbus server - Serial communication protocol for transmission of settings and control data.
VNC server - Allows the user to run a mimic control screen on a remote PC via a network.
X-Windows server - Run one or more mimic control screens on remote PC's via a network.
Data Exchange server - Exchange live data from the touch screen directly into your Windows application in real time via a network.
HTTP server - Access control data using you web browser via a network.

Signalling - K-Series controls come with input/output ability as standard.
Machine signal Input - All touch screens in the range include a signal input for connection to the moulding machine. The software can be configured to use this signal in various ways for switching modes to Boost, Standby or delayed Auto Standby. The input is also used for thermal gate control systems for cycle synchronisation timing.

Alarm output - Every K-Series cabinet has an alarm output connector with voltage free contacts for machine signalling.

Optional Cards - To further enhance the capabilities of the controller there are several special cards and other items available…
HRC-IO3 - I/O card with 4 inputs, 4 outputs. Includes injection disable function and remote mode switching of the controller from the machine.
HRC-WT3 - 12 zone resistive sensor RTD input card. Used for steel and water circuit temperature measurement.
HRC-AI - 8 zone analogue input card for 4-20mA sensors. Used for water flow and pressure measurement.
HRC-DI - 8 zone digital input card. Used with turbine flow sensors. Includes 8 additional signal inputs.
HRC-AB - alarm tower with integral sounder and sounder disable keyswitch.
HRC-KT - Optional trolley for the K5 desk mounting model.

Control Cards - Standard versions are 6MODC - 6 zone x 5A, 3MODC - 3 zone x 15A, 2MODC - 2 zone x 20A and 1MODC - 1 zone x 30A. There is also a special card available, the 4SMOD, for Thermal gate control of 2 x two zone, cycle synchronized probes.
T/C fusing - 62mA nano fuses in both legs.
Power fusing - Suitably rated FF semi-conductor fuses in both legs.
Range - 0-470C, 32-880F.
Control Method - Phase angle or time-proportioned firing
Environment - 0-50C, 32-120F: Humidity <90% non-condensing.
Frequency - 50 or 60 Hz, automatic switching.
Card dimensions - Eurocard 220 x 160mm, 4HP pitch.
Temperature display resolution - 1C, 1F. For RTD's 0.1C, 0.1F
Temperature readings per second - 100 per zone.
Isolation - The low voltage electronics is 100% optically isolated from the mains voltage circuits.
LEDs - Indicators visible through the cabinet door - Scan, T/C fault, Fuse Fault and Load indication for all zones.
Calibration - Via built in software routine and T/C calibration device.
Certification - CE tested and marked, certificate available on request.
Cabinet supply voltage - 380-440v 3 phase Star, or 200-240v 3 phase Delta.