Electrothermal

STEM Integrity 10

Reaction Station

The STEM Integrity 10 Reaction Station is an excellent screening tool that can be used in most laboratories. It has:

- 10 individual cells in one reaction block
- Individual control of temperature and stirring rate for each cell
- Temperature range of -30°C to 150°C
- Stirring rate of 350 rpm - 1200 rpm
- Cell working volume of 2ml - 25ml
- Optional attachments for refluxing, and working under vacuum or inert gas conditions
- Optional multi-infrared probes for solubility / crystallisation studies
- Automatic microprocessor control through a touchscreen

It has potential applications in a range of industries, including the petrochemical, chemical, pharmaceutical and food processing industries; in fact almost every laboratory could use this highly efficient screening tool.

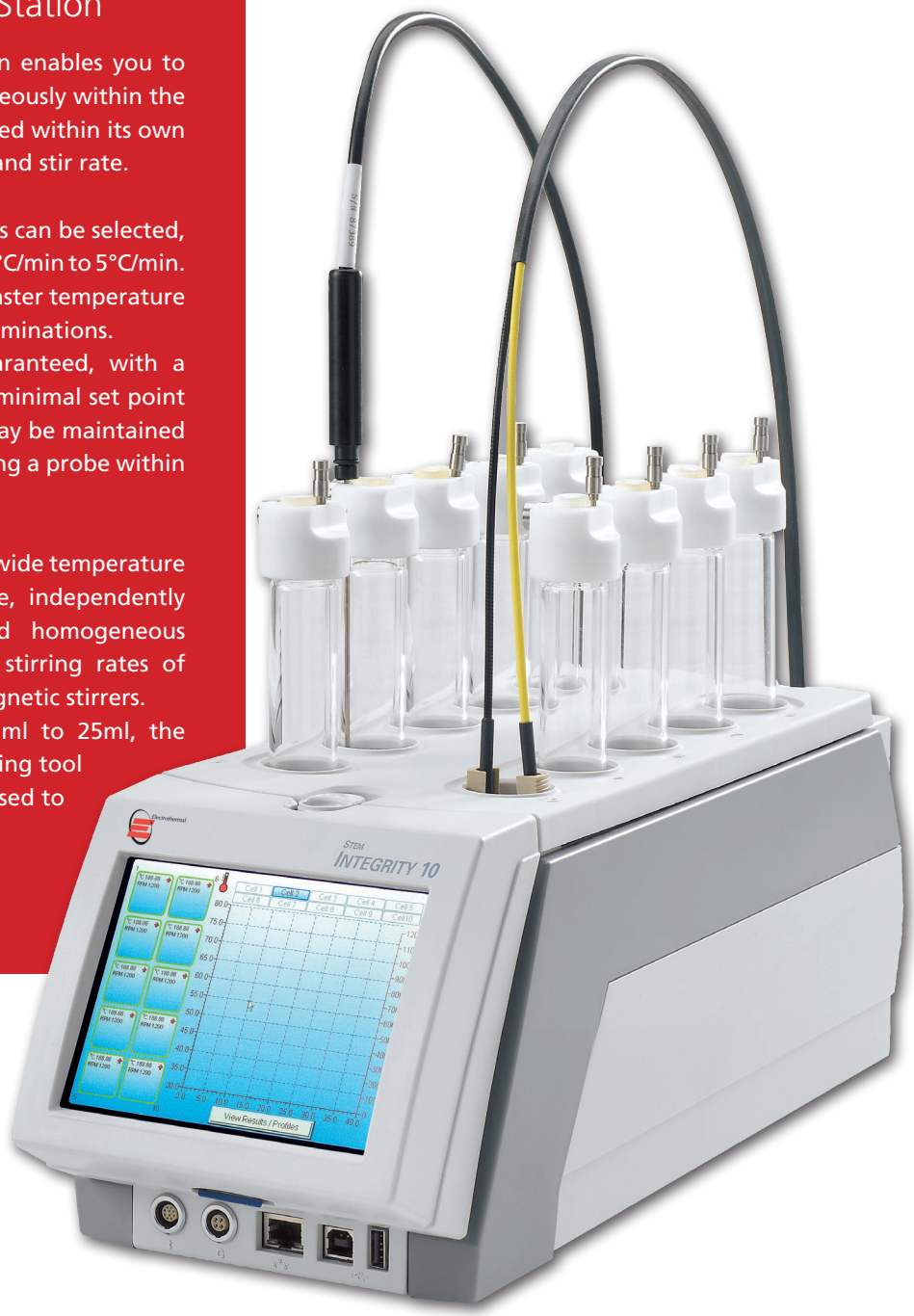
Introducing the Integrity 10

STEM Integrity 10 Reaction Station

The STEM Integrity 10 Reaction Station enables you to conduct 10 different reactions simultaneously within the same unit, each reaction being conducted within its own cell, at its own individual temperature and stir rate.

If desired, fast heating and cooling rates can be selected, with temperature ramps of between 0.1°C/min to 5°C/min. There is also a crash function for even faster temperature changes, which is ideal for kinetic determinations.
Extreme temperature accuracy is guaranteed, with a temperature stability of ± 0.5°C and a minimal set point overshoot of 0.5°C. The temperature may be maintained either through the block itself or by using a probe within each cell's solution.

This accuracy can be maintained over a wide temperature range of -30°C to 150°C, with precise, independently controlled temperature profiles, and homogeneous sample mixing may be assured with stirring rates of between 350rpm to 1200rpm using magnetic stirrers.
With working volumes of between 2ml to 25ml, the STEM Integrity 10 is an excellent screening tool for most laboratories and can also be used to establish ideal process conditions.



Optimised cell design

Temperature range:	-30°C to 150°C
Temperature ramp rate:	0.1°C/min to 5°C/min
Temperature stability	± 0.5°C
Minimal set point overshoot:	0.5°C
Stirring rates:	350rpm – 1200rpm
Working volumes:	2ml- 25ml

Key features

- 10 individual cells in one unit
- Individual control of temperature and stirring rate for each cell
- Temperature range of -30°C to 150°C
- Stirring rate of 350 rpm- 1200 rpm
- Cell working volume of 2ml- 25ml
- Optional attachments for refluxing, and working under vacuum or inert gas conditions
- Optional multi-infrared probes for solubility/ crystallisation studies
- Automatic microprocessor control through a touchscreen

For more information, please visit: http://www.electrothermal.com/product.asp?dsl=783

A highly efficient screening tool…

The STEM Integrity 10 Reaction Station is a very time-efficient way of conducting chemical experiments, speeding up investigative chemistry by up to 10-fold. Chemical reactions, involving either synthetic chemicals or naturally occurring substances, are universally impacted by heat and the STEM Integrity 10 lets you assess the impact of both temperature and stirring rate upon reactions.

The beauty of the STEM Integrity 10 is that it combines flexibility with accuracy: It allows you to run 10 experimental variants simultaneously within the same unit, whose temperature and stir rate you can precisely and individually control. You can design temperature profiles for each individual experiment and record everything electronically; all results are captured and stored automatically, so you can be working (or relaxing) elsewhere whilst the STEM Integrity 10 has everything under control.

You can add further refinements to increase the usefulness of this apparatus, for example, by adding reflux condensers to maintain sample volumes. As an accessory ,PTFE gas inlet/outlet heads permit working under vacuum conditions or inert gas conditions with a nitrogen or argon blanket. The possibilities for attachments are endless, and to illustrate this, we have developed a Clarity System which utilises the STEM Integrity 10 to conduct solubility and crystallisation studies.

…and for establishing ideal process conditions

Whilst there is obvious potential for screening reactions in investigative chemistry or drug discovery laboratories, let's not forget about process monitoring laboratories. The STEM Integrity 10 can be very useful for establishing the ideal reaction conditions of many industrial chemical processes and can more than earn its keep as a great trouble-shooter, pinpointing the cause of process malfunctions due to temperature.

It saves time, bench space and electricity, is easy to clean, and since the working volume of each reaction cell is between 2 and 25ml, it is very economical on reagents as well.

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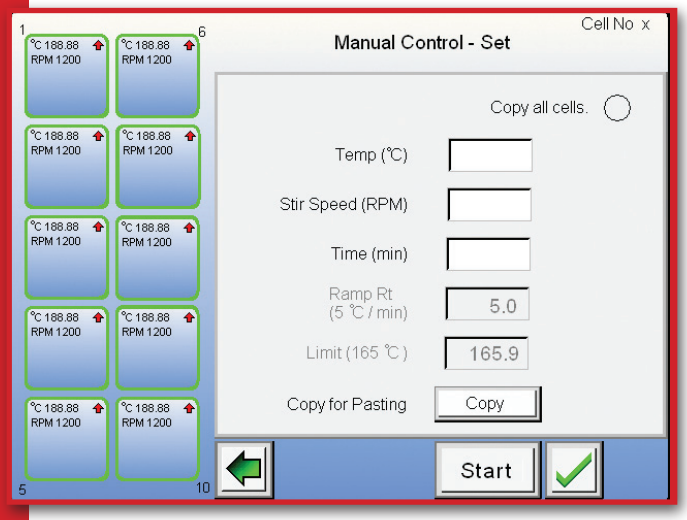
Intuitive and easy operation

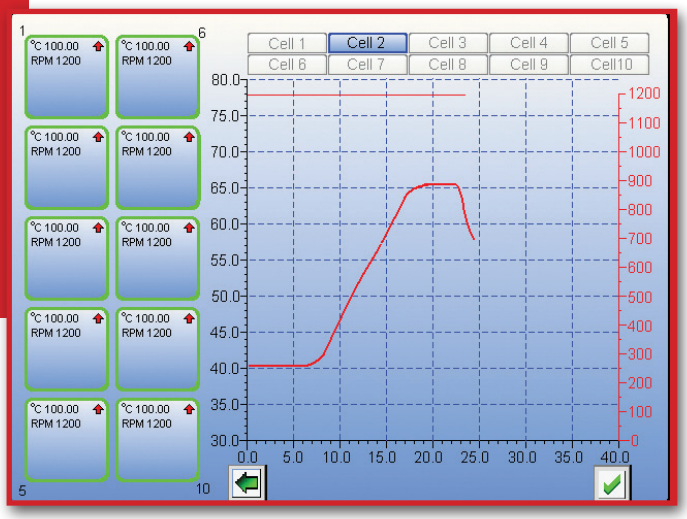
Complete control at your fingertips

Although a sophisticated tool, the STEM Integrity 10, whether operating by itself or as part of the full Clarity System, is a joy to use and does not require formal training; it is designed to be "out of the box" to operational within 10 minutes.

The integrated microprocessor is controlled through a user-friendly 145 mm touchscreen, which greatly simplifies operation and enables rapid "at a glance" assessment of each critical parameter in the reaction. The course of the reaction within each cell may be monitored directly on this touchscreen, enabling trend analysis (e.g. for solubility tests using turbidity measurements) to be done without needing to connect to a laptop. However, should you require this, all data is downloadable through a USB port to a PC, USB storage device or SD card.

The touchscreen menu is intuitive, with clear icons to reduce the potential for costly errors. Pre-programmed profiles may be set up for routine measurements, and there is also a manual override option to programme 'set points' and ramps for individual processes if required.





Simplicity itself:

5 Step touchscreen operation

1 Cell/position selection

The touchscreen automatically appears when the unit is powered up and the software has loaded. You may then select your cell/position on the touchscreen.

2 Choose your profile

The options on the touchscreen offer you the choice of running a manual or automatic profile.

3 Inclusion of heating/cooling ramps

The touchscreen allows you to set up cooling and heating ramps and establish a temperature profile for each cell. You can set up cycle runs too by choosing how many times you would like this profile to repeat.

4 Automatic warnings

In the event of any problem, you are automatically alerted through warnings on the touchscreen.

This ensures that you remain in control of the process, and that the profile you have programmed is running as planned.

5 Monitor results visually

Monitor the results of your experiments as they happen, displayed on the monitor.

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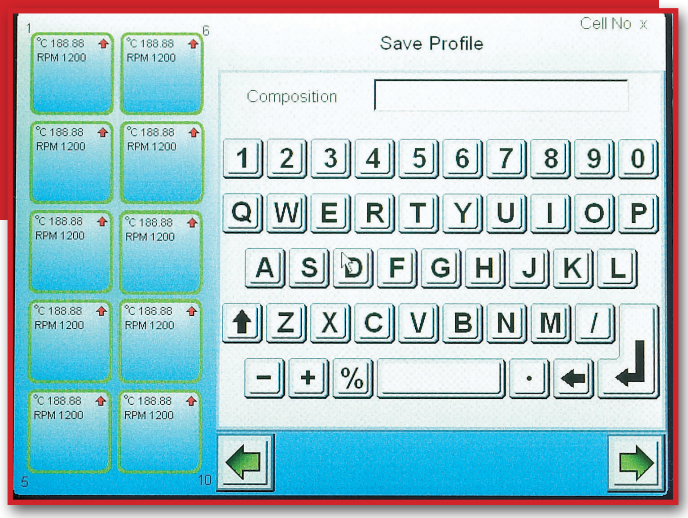
Microprocessor touchscreen

Complete control at your fingertips

The front-mounted 145 mm microprocessor touchscreen is simplicity itself to operate, giving you complete control over the temperature and stirring conditions of each cell in the reaction block.



Key features of the user friendly menu

- Choice of temperature profile and stirring parameters
- Prompts to guide you in your selections
- Intuitive icons to reduce the potential for costly errors
- Real-time editing of ramp rates, run times and set points
- Tailored temperature profiles
  - o Curves can be programmed into the temperature profiles
  - o Integrated data base options for frequently used profiles
- Flexibility as all parameters can be changed during the process
- Visibility of each cell on the microprocessor screen to provide immediate and on-going access to the progress of the reactions within each cell
- At-a-glance display of the results graphically
- Automatic functions for:
  - o Recording of the reaction profile for each cell for all important parameters
  - o Scaling of data
  - o Self-diagnostic warning system to flag any errors immediately
- Historical records:
  - o All data is captured and can be viewed historically
  - o Extensive storage capability
  - o Protection of run event history logs through user pass codes and control lockouts
- Data is extractable to a PC via a USB port or SD card for more in-depth analysis and evaluation of the results

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Choice of formats

The STEM Integrity 10 Reaction Station is available in two formats depending upon your needs:

- Option 1: STEM Integrity 10 Reaction Station by itself
- Option 2: Clarity System, which consists of the STEM Integrity 10 Reaction Station, with additional solubility and crystallisation evaluation apparatus and software.

Option 1

The STEM Integrity 10 unit

Option 1, the STEM Integrity 10 unit by itself, is generally useful for a wide range of reactions or processes in which temperature plays a major role, regardless of the industry. Within a temperature band of -30°C to 150°C, it is applicable whether these processes are derived from the petrochemical, chemical, pharmaceutical or food processing industries.

Different attachments may be added to these reaction cells, such as reflux heads to minimise evaporation and loss of liquid, or PTFE caps for maintaining an inert gas environment, to expand the range of uses for the STEM Integrity 10 Reaction Station.

One attachment that has been specifically designed for the STEM Integrity 10 is a multi-infrared (IR) probe, which is available in intrusive or non-intrusive formats. This probe detects infrared transmission, and via turbidity measurements, can be used to determine solubility characteristics of solutions. This is available as Option 2, the full Clarity System.

Option 2

The Clarity System

Option 2, the Clarity System, is finding increasing use in the pharmaceutical, petrochemical and food industries for specialist applications. Developed in collaboration with partners at Pfizer and the Illinois Institute of Technology, the Integrity 10 STEM reaction station with integrated software is a powerful tool for determining solubility and crystallisation profiles. Precise heating and data collection of up to 10 reactor cells in parallel provides rapid measurement of solubility under a range of conditions, whilst individual infrared transmission detectors allow turbidity/solubility measurements to be performed to a standardised endpoint (threshold).

It is envisaged that the full Clarity System would be a great aid in determining the solubility of drugs, the biodegradability of oils, and the crystallisation characteristics of cocoa butter to name just a few potential applications.

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Ordering information

Catalogue no.	Description
PS20000 For 110V, add X1 suffix For 230V with EU plug, add X6 suffix	Integrity 10 with 10 individually controlled cells
ATS20000	Integrity 10 reflux condenser
ATS10377	PTFE cap with valve and sensor inlet (pack of 10)
ATS10075	Glass tubes 24/150mm (pack of 10)
AZ4206	Stirrer bars 10/6mm (pack of 10)
AZ4235	Stirrer bars 12/4.5mm (pack of 10)
ATS10001	Multi-Temp10 Module
ATS10027	Thermocouple probe (pack of 6)
ATS11005	Integrity software
ATS10360-1	Non-intrusive IR sensor
ATS10230	Intrusive IT probe in stainless steel
ATS10230H	Intrusive IR probe in Hastelloy (nickel-based alloy with high corrosion resistance)
ATS10232	Multi-IR box

Technical specification

Number of cell positions	10
Cell cavity diameter	25.5mm
Glass vessel fill level	2- 25ml
Temperature range	-30°C to 150°C
Temperature difference between any two positions	180°C
Temperature overshoot (maximum)	0.1°C
Maximum heating/cooling rate	5°C/min
Temperature ramp rate	0.1°C/min to 5°C/min in 0.1°C/min steps
Stir speed range	350 – 1200 rpm
Maximum viscosity capacity	Glycerine at 25°C
Recommended stir bars	12/4.5mm (cylindrical) or 10/6mm (oval)

Measurement

Temperature:

• Range	-40°C to 160°C
• Resolution	0.01°C
• Accuracy	±0.5°C

Stirrer:

• Speed range	350 – 1200 rpm
• Resolution	1 rpm/min
• Accuracy	±10 rpm/min

Measured external temperature (optional thermometer) range

• Range	-40°C to 160°C
• Resolution	0.01°C
• Accuracy	0.5°C

- Minimum temperature is linearly dependent upon the temperature of the cooling fluid. Specified range assumes a cooling fluid temperature supply of 5°C at a flow rate of ≥ 2.5L/min and a cooling capacity of 1100W
- Stir performance only guaranteed using recommended stir bars

Also available in the Electrothermal range

STEM Omni 1025 Reaction Station

10 place Reaction Station with touch pad interface allows up to 10 reactors with a working volume of 2 -25ml. Select cartridges can also be used in conjunction with a cooling plug to extend the temperature range from - 30°C to 220°C

STEM Omni 6050, 6100, 6250 Reaction Stations

6 place Reaction Stations with touch pad interface allow up to 6 reactors with working volumes of 5- 50ml (OS6050), 50- 100ml (OS6100) and 100- 250ml (OS6250). Select cartridges can also be used in conjunction with a cooling plug to extend the temperature range from - 30°C to 220°C

STEM RS600 Reaction Station

6 position Reaction Station with a working sample volume of up to 250ml for RS600 only, Operational temperature range of ambient to 150°C, with optional higher temperature model RS600H for up to 300°C

STEM RS900 Reaction Station

10 position Reaction Station, with working sample volumes of between 10-30ml; operational temperature range of ambient to 150°C

STEM RS1000 Reaction Station

10 position Reaction Station, with working sample volumes of between 10-30ml. Operational temperature range of ambient to 150°C, with optional higher temperature model RS1000H for up to 300°C

STEM RS2500 Reaction Station

25 position Reaction Station, with working sample volumes of between 10-30ml. Operational temperature range of ambient to 150°C, with optional higher temperature model RS2500H for up to 300°C

STEM RS5000 Reaction Station

50 position Reaction Station, with working sample volumes of between 10-30ml; operational temperature range of ambient to 150°C

Electrothermal
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