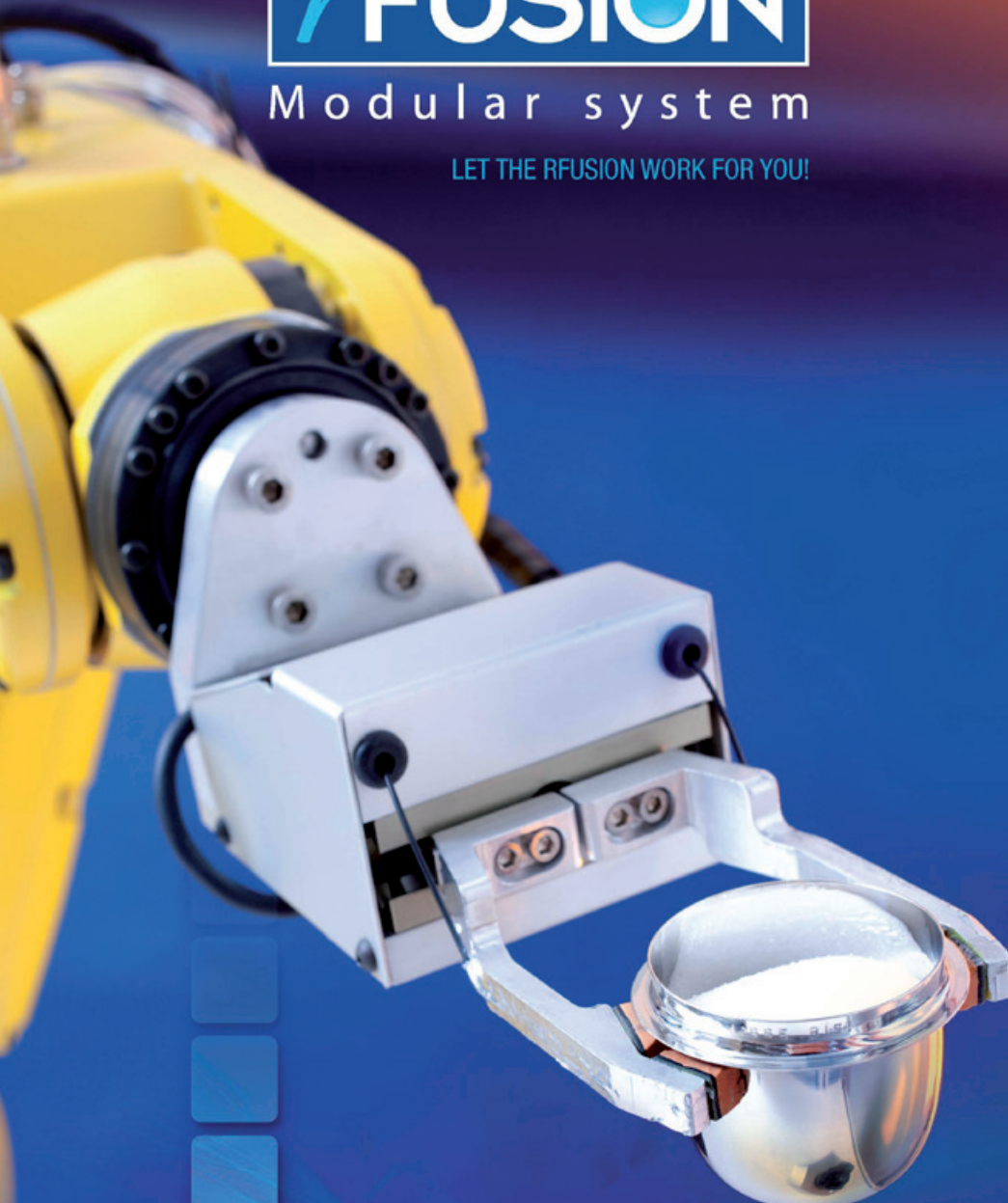


# r FUSION

Modular system

LET THE rFUSION WORK FOR YOU!



At Claisse, innovation is where vision and technology intersect the needs of our customers. From developing new products to performing fundamental and applied research, our chemists and engineers are focused on open innovation, exploration and discovery so you always benefit from the best products, services and solutions.

# r FUSION

Modular system

LET THE RFUSION WORK FOR YOU!





BUILT BY THE  
FUSION SPECIALISTS,  
THE rFUSION  
MODULAR SYSTEM  
DOES THE WEIGHING,  
MIXING AND FUSING  
AUTOMATICALLY

The process begins by filling the porcelain crucibles with the sample. No need to weigh the sample precisely at this step. The operator simply scoops a volumetric amount of sample into the porcelain crucibles, places the rack on the rFUSION Modular System, selects the appropriate program on the touch screen and presses the start button.

First, the robot puts an empty platinum crucible into the weighing module, TheAnt, which dispenses a first shot of flux. Then, it adds the sample and puts the platinum crucible back into the TheAnt, which precisely catches the sample weight and dispenses the residual flux to reach the desired sample/flux ratio with an accuracy of up to one tenth of a milligram.

After a few seconds of mixing on the VortexMixer, the robot loads the crucibles on the fusion machine and starts the fusion cycle.

Fusion begins! Automatic ignition... Automatic agitation of the crucibles... Dissolution and perfect homogenization of the sample in the flux...

When the heating stage has terminated, the fusion instrument pours the contents of the crucibles into the pre-heated molds and automatically extinguishes the burners.

After a short cooling time, the robot removes the disks and the empty crucibles. Then, it loads other crucibles that have already been prepared while the fusion was going on.

#### MODULAR SYSTEM

- [ 1 ] System made up of widely used advanced stand-alone modules
- [ 2 ] Back-up modules can be used during maintenance
- [ 3 ] System can be upgraded gradually module by module, requiring smaller investments
- [ 4 ] Standard configuration parts available from stock

#### UNMATCHED FLEXIBILITY

- [ 1 ] Standard and/or customizable workstations available
- [ 2 ] The weighing and fusion stations can be operated separately or in a combined mode
- [ 3 ] Claiss fusion instrument capability to fuse all samples
- [ 4 ] Mining, cement, steel, refractory, catalyst and glass plants can all use the same rFUSION standard workstation configuration

#### SIMPLIFIED MAINTENANCE

- [ 1 ] Best-in-class industrial robot
- [ 2 ] rFUSION standard configuration has a known maintenance history and comes with a complete maintenance manual
- [ 3 ] Weekly maintenance can be done by a lab technician
- [ 4 ] Easy access to all components

#### OPTIMIZED UPTIME

- [ 1 ] Sturdy and reliable workstation
- [ 2 ] Each fusion and weighing module can be used as a stand-alone as well as combined in a fully automated program. Glass disks can be prepared even if one component is down.
- [ 3 ] Simplifies training for new and/or unskilled personnel
- [ 4 ] Remote web troubleshooting available

#### FAST COMMISSIONING TIME

- [ 1 ] Standard configurations are built and shipped within a few months
- [ 2 ] On-site installation and startup are completed in a few weeks
- [ 3 ] Standard power requirements
- [ 4 ] No need for oxygen, compressed air and water cooling installations

## KEY FEATURES

### FOUR BENEFITS TO INVESTING IN A CLAISSE rFUSION MODULAR SYSTEM

#### [ 1 ] GREAT RETURN ON INVESTMENT

The rFUSION Modular System reduces labor time by 90% and cuts the costs associated with lab technicians, not only in term of wages, but also in terms of additional costs associated with recruitment, training, workspace and employee administration.

#### [ 2 ] INCREASES AND STABILIZES ANALYSIS OUTPUT RATES

The rFUSION Modular System's multitask programming allows the robot to manipulate several crucibles simultaneously for optimal productivity. Labor operations are limited to simply loading and unloading the station. This allows consistent output rates independent of working shifts. The system can be operated with little supervision so it can be used during night and weekend shifts.

#### [ 3 ] MORE EFFICIENT MANAGEMENT OF LAB PERSONNEL

The rFUSION Modular system's autonomy allows personnel to work on other tasks while the sample preparation by fusion is done automatically.

#### [ 4 ] IMPROVES ANALYTICAL RESULTS

With the rFUSION Modular System, you will always get repeatable analytical results, as it will never suffer from fatigue, distraction and other effects of repetitive and tedious tasks.

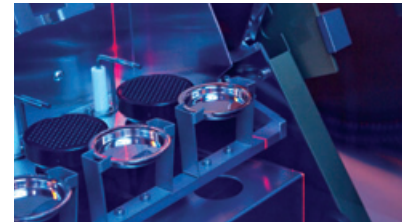
#### [ 1 ] SAFETY FIRST

The rFUSION Modular System is equipped with two emergency pushbuttons, auto lock doors and safety light curtains that protect the operators from moving objects. For workstations containing gas fusion instruments, gas detectors are installed to prevent and stop leakage, and to avoid excessive or insufficient gas pressure. For Claisse, workplace and operator safety are an absolute priority.



#### [ 2 ] ARTIFICIAL VISION

Using a 3D vision smart camera, the rFUSION Modular System can see the crucible holder (clips) of the fusion instrument and control the installation and removal of each platinum crucible with extreme precision. The 3D smart camera functions as the eyes of the rFUSION Modular System.



#### [ 3 ] RELIABLE AUTOMATIC WEIGHING

The Claisse weighing module, TheAnt, serves to automatically weigh the sample and dispense the flux according to a programmed sample to flux ratio with an accuracy of up to one tenth of a milligram. TheAnt is equipped with a high-performance industrial balance that is specially designed for automated processes.



#### [ 4 ] HMI TOUCH SCREEN CONTROL PANEL

The touch screen control panel allows the operator to control, monitor, diagnose and manage all the rFUSION Modular System operations with ease and convenience. Workstation programming is protected by three levels of access with security codes: operator, lab manager and Claisse engineers. The lab manager access allows enabling, disabling and editing of rFUSION's programs. The operator level limits the decision making to starting and stopping enabled programs.



#### [ 5 ] CLAISSE FUSION INSTRUMENT AND APPLICATION SUPPORT

Fusion instruments bearing the Claisse signature stand out for exceptional analytical performance, reliability and ease of use and maintenance. They are the standards in the market. Claisse fusion systems are also supported by a team of experienced fusion application specialists that can develop highly effective fusion programs for all installations and provide after sales service.



#### [ 6 ] REMOTE WEB TROUBLESHOOTING AND LIMS CAPABILITIES

Via web communication, Claisse can communicate with any rFUSION workstation anywhere in the world given user authorization. Troubleshooting diagnosis and software upgrades can be done remotely to save time and money. rFUSION also generates log files that can be imported into a LIMS.



[ A ]

The **rFUSION Weighing Station** performs the weighing of flux according to a preset absolute mass or to a preset sample-to-flux ratio. It contains the robot and the control panel, so it is the core of each workstation. A mixing device ensures good homogenization of sample with flux before fusion.

▪ **Electrical Requirements/Power:**

Single phase 240 VAC, 50/60 Hz, 20 A  
Power = 1450 W

▪ **Dimensions (HxDxW):**

213 cm (28") x 135 cm (53") x 190 cm (75")

▪ **Weight:** 600 kg (1325 lb)

▪ **Component Modules:**

- i. **Robotic Arm:** A six-axis electro-servo-driven industrial robot equipped with optic-fiber sensors for crucible detection.
- ii. **Claisse TheAnt:** An automatic flux dispenser with a maximum accuracy of 0.1mg equipped with a high performance analytical balance with a maximum precision of 0.1mg and an overload protection for vertical and horizontal loads. Can be used as a stand-alone.
- iii. **Claisse VortexMixer:** A homing mixer with programmable speed.

[ B ]

The **rFUSION M4 Fusion Station** is an add-on for the rFUSION Weighing Station. It performs the preparation of glass disks for XRF analysis with up to two, three positions gas burner type fluxers.

▪ **Gas Requirements:**

Propane or LPG 9 psi ( $\pm 1$ ), 62 kPa ( $\pm 7$ )  
Natural gas 10 psi ( $\pm 1$ ), 69 kPa ( $\pm 7$ )

▪ **Electrical Requirements/Power:**

Single phase 240 VAC, 50/60 Hz, 20 A  
Power = 1450 W

▪ **Dimensions (HxDxW):**

244 cm (96") x 82 cm (32") x 254 cm (100")

▪ **Weight:** 575 kg (1275 lb)

▪ **Component Modules:**

- i. **Claisse M4 Fluxer:** A 3-position gas fusion instrument with programmable heating and agitation by rotation on an inclined axis. Capability for multi-temperature fusion cycles of up to 15 steps. Doesn't require the use of compressed air and oxygen. Can be used as a stand-alone. Two M4 Fluxers can be installed in the station for a total of 6 positions. Capability to shut down fusion positions to save operating costs.
- ii. **Artificial Vision:** 10000 3D profiles per second smart camera for advanced and tough industrial environments.

[ C ]

**General Specifications**

▪ **Control**

- i. HMI touch screen control panel
- ii. Capability to store 10 automated programs
- iii. Parameter editing rights management through 3 levels protected by passwords

▪ **Communication**

- i.i. Ethernet
- ii.i. LIMS ready
- iii.i. Remote troubleshooting via Internet connection



**CLAISSE**

*The First and Finest in Fusion*

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