

# SureSense Range

**charis**  
MEASUREMENT & CONTROL SYSTEMS



Let Charis Technology supply the answer to your expensive water based foam problems with the SureSense range of Foam and Foam and Level Control Systems.....

- Suitable for all water based foam applications
- Efficient, microprocessor control
- Proven technology
- Unique IMA Sensing® technology ensures reliability
- Cuts antifoam costs
- Increases throughput by reducing downtime
- Hygienic and steam-sterillisable sensors
- Large range of fittings to suit all sizes and make of vessel
- Range of enclosures; Wall, Rack, Benchttop.
- Suitable for use in hazardous areas
- Both Foam Control and Foam and Level Control Systems available



## Charis Technology SureSense Range of Foam Control Systems for use in water-based foam applications

The SureSense range of water based foam control systems provide an efficient, reliable and cost-effective solution to foam control in a diverse collection of industries where the production and control of foam causes a problem.

Foam generation can cause a variety of expensive and time consuming problems. Excess foam can severely limit throughput of product in a process, there can be high cost implications in clearing up and loss of production should foam overflow, and there is a possibility of pollution and damage to equipment if the situation were to become critical.

Whilst the addition of antifoam may solve the problem it is difficult to know when to add it to the process so it tends to be added in quantities based on maximum demand, which is not only extremely expensive but wasteful as well..

The SureSense range allows for the accurate control of foam by sensing when the foam reaches an unacceptable level and then adding the antifoam agent as and when needed rather than continually. This not only increases the efficiency of the process it also saves money on expensive antifoam.

All Charis Technology Foam Control Systems benefit from the unique **IMASensing®** technology which allows the sensor to continue functioning accurately even when fouled with residual foam or product, thus providing efficient operation with minimum maintenance.

SureSense Foam Control Systems are in use around the world to effectively control water based foam in Biotech, Waste Water, Food Production, Pharmaceutical, Sugar, Brewing and other similar applications.

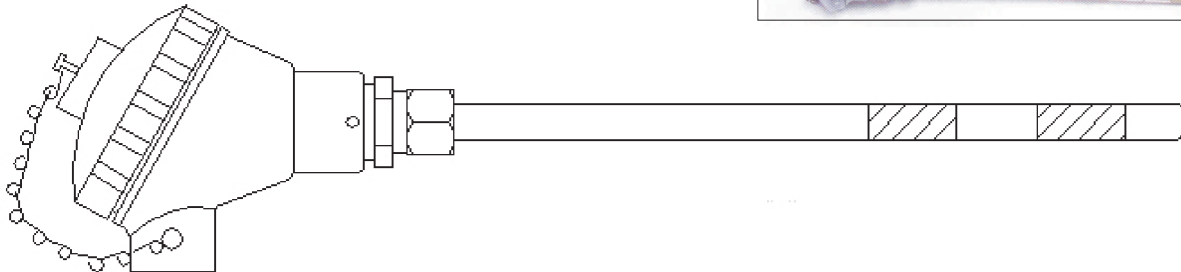
We hope you find the information in this file useful and should you wish to take your enquiry further please don't hesitate to contact Charis Sales on +44 (0)1622 751731.

# SureSense Range Foam Sensors

Charis Technology's **SureSense Sensors**, when used with an appropriate Charis Foam Controller, provide efficient and cost effective foam control over a wide range of water based process applications.

Although outwardly similar, each stainless steel sensor can be customised to suit the client's needs. Different heads, process fittings and lengths are available making Charis sensors the first choice for many applications throughout the world.

The sensors are hygienic and steam sterillisable, and thanks to Charis's patented **IMA Sensing®** technology they are able to discriminate between the residual build up of foam on the sensor and the foam created during the process. Thus Charis sensors are able to continue to efficiently monitor foam levels regardless of how fouled the sensor may become.



## Heads

The standard head design used on Charis SureSense sensors is seen in the picture right. It is available in aluminium, stainless steel or heavy duty plastic. Alternatively, if space is limited the sensor can be supplied fitted with a mini aluminium head.

The only exception to this head design is the SureSense Laboratory Sensor which is fitted with a Lemo connector.



## Process Fittings

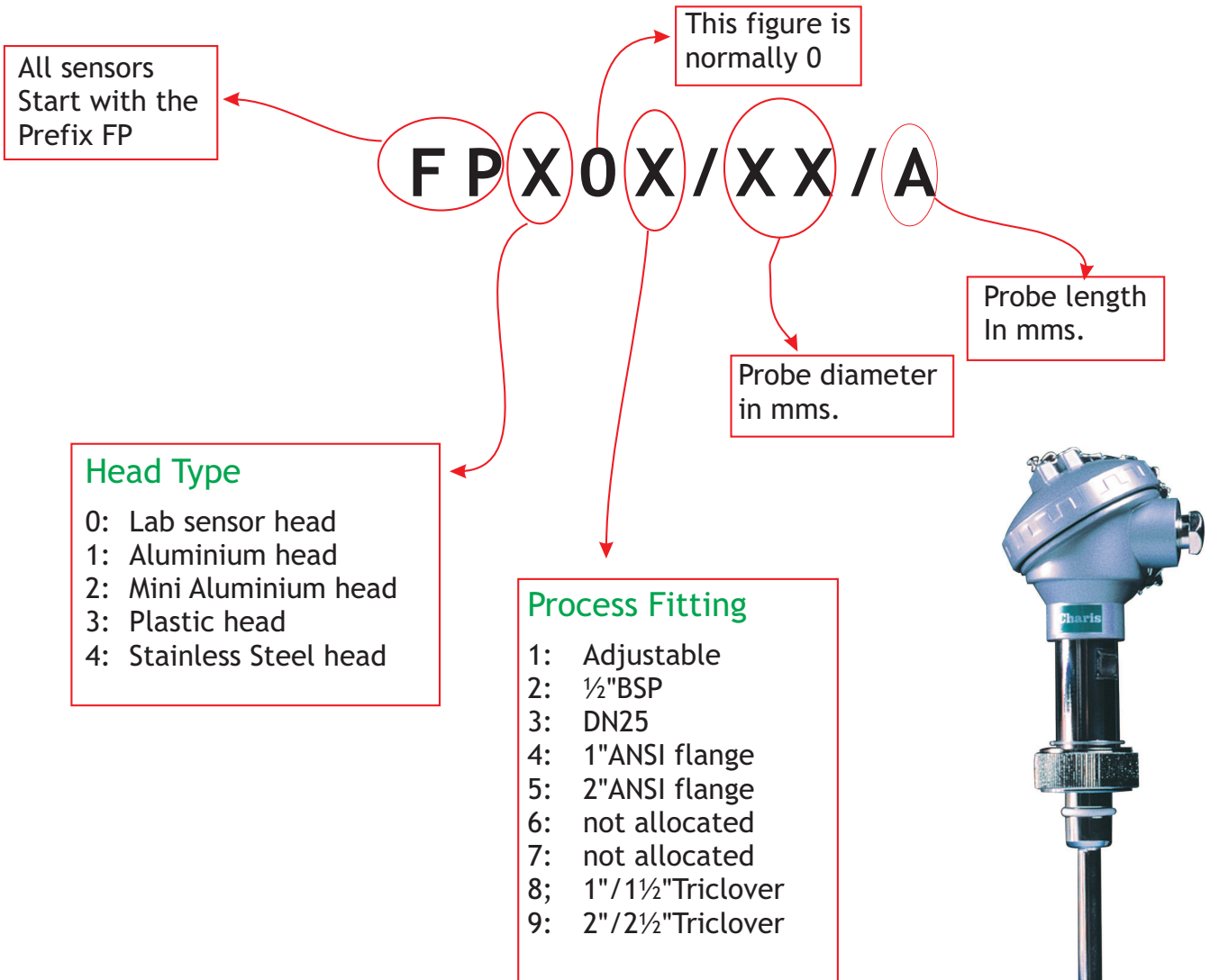
With a wide range of applications our sensors are available with an equally wide range of process fittings. If the level of foam is variable then sensors can be made adjustable, or if the optimum level is known then the sensor can be set at a fixed length. Fittings available for use with SureSense sensors are ½" BSP, DN25, 1"ANSI 316 SS pipe flange, 2"ANSI 316 SS pipe flange, 1.5" Triclover, 2" Triclover.

## Mechanical and Electrical Data

Body Material	316 Stainless Steel
Insulator Material	Vitrex Peek 450g Engineering Thermoplastic
Termination	Heavy duty die-cast alloy industrial termination lead. Ip66. 2-way ceramic block with screw terminals
Cable Entry	20mm ISO Conduit entry
Cable	Screened twisted pair - eg, Belden 8760
Temperature	Maximum continuous operating temperature 150°C Peak temperature 170°C
Pressure	10 Bars (higher pressure available to special order)

Making Sense of SureSense sensor part numbers.....

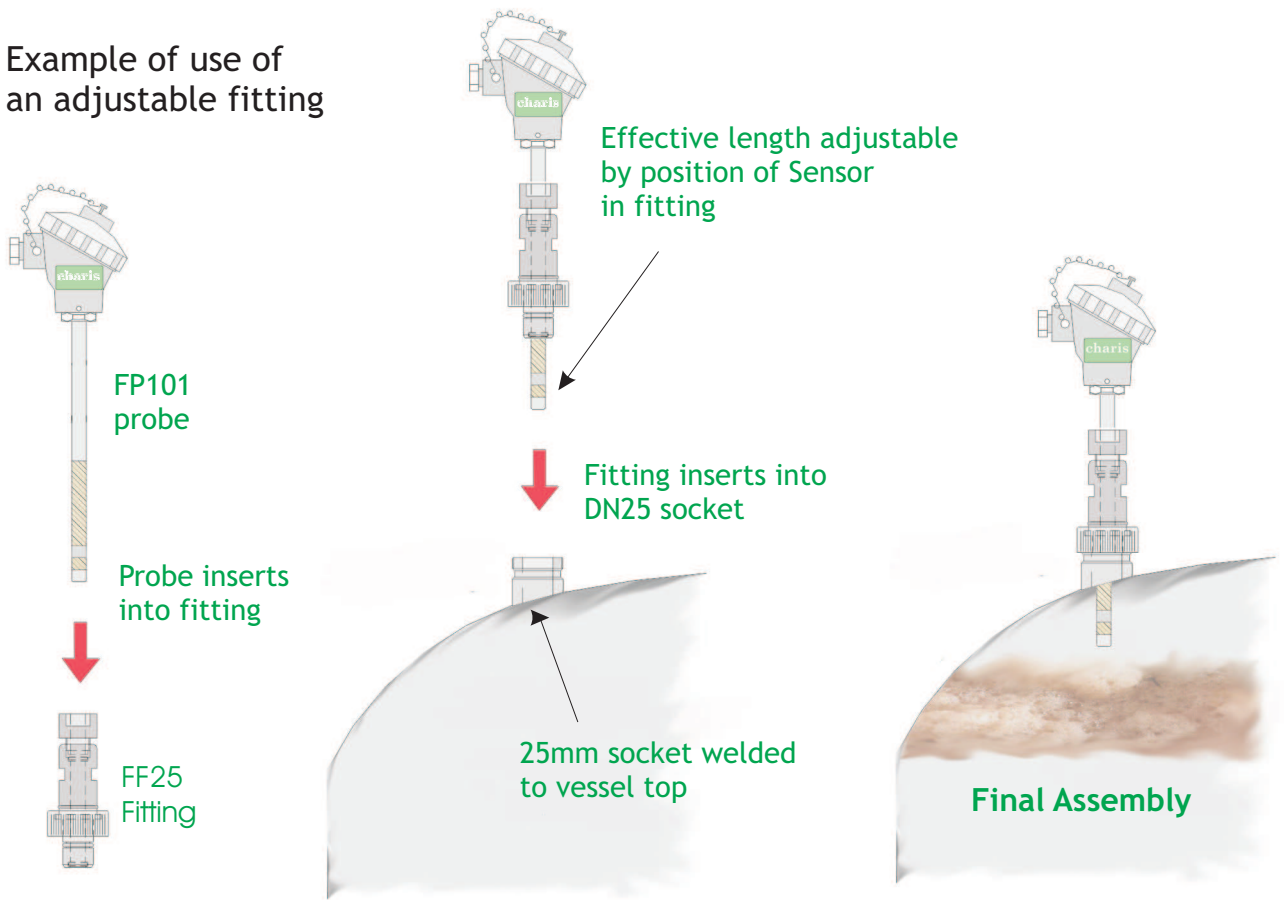
Given the variety of heads and process fittings available to customise our SureSense sensors the part numbers can become a little confusing. To try to simplify things all SureSense sensors follow a common part numbering scheme so hopefully this graphic may help.



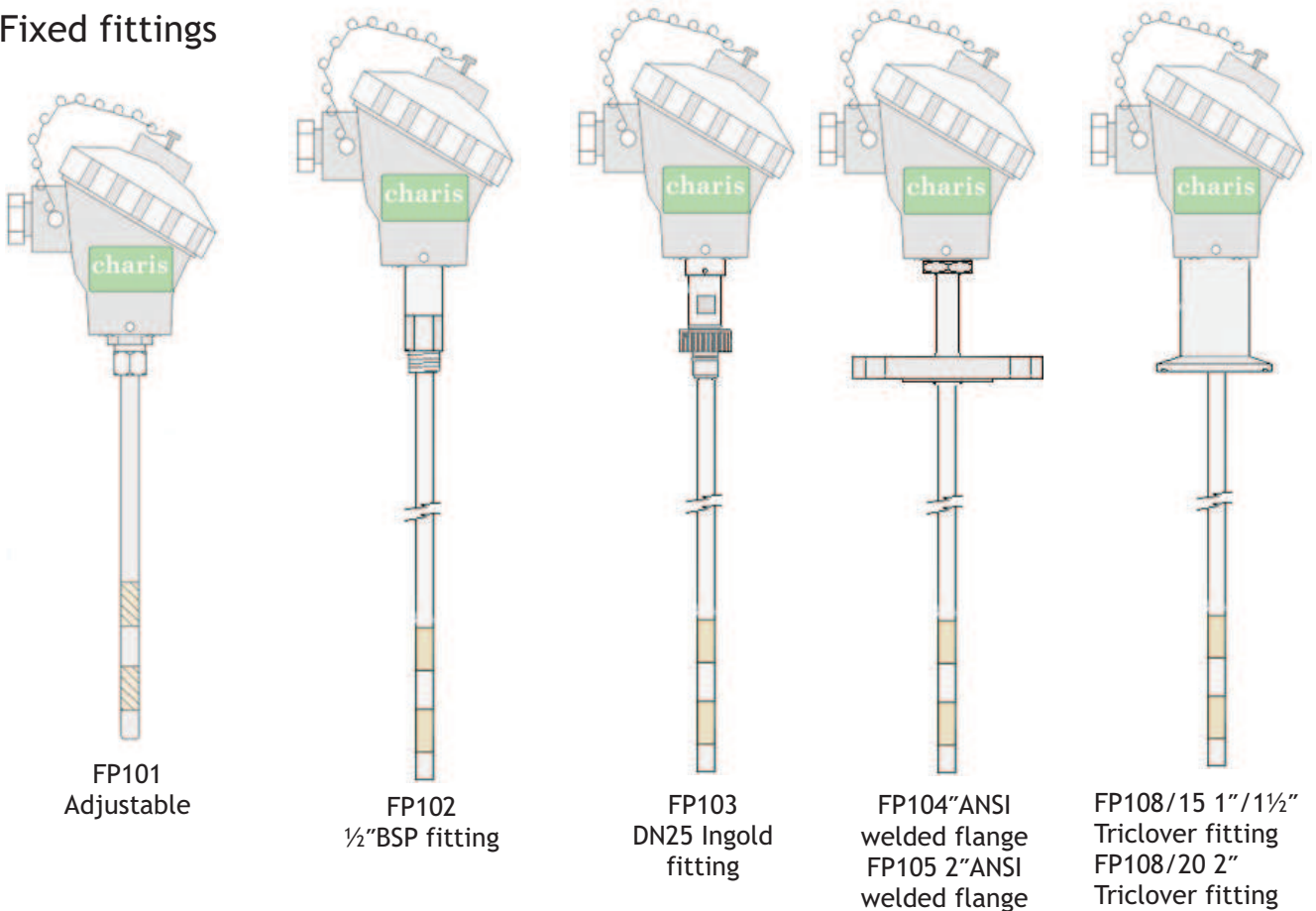
Using the key above, the sensor to the right is a FP103/12/500 - which is a 500mm long sensor with aluminium head and DN25 fitting.

# Process Fittings

Example of use of an adjustable fitting



## Fixed fittings



# SureSense Range Foam Controllers

## FCW2 Controller

Designed with reliability in mind the FCW2 is an advanced wall mounted foam controller designed to control foam at a fixed level, or to reduce it to a minimum. Our unique IMA Sensing technology ensures the system will operate correctly even if the attached sensor becomes severely fouled.

To discriminate between foam and splashing or other spurious triggers the controller has an adjustable response time. A dosing or shot time can be set for the operation of a pump or valve for antifoam addition. Although the FCW2 can be used for stand alone control other control actions such as vacuum valves or gas control can be interfaced. Volt free contacts can be used for point detection and an analogue output for level indication.



### Electrical Data

Power supply	110v, 240v AC., 50Hz, or 24v DC.
Indicators	Power: illuminates when unit connected to power supply Sense: illuminates when foam is first sensed Activate: illuminates when foam detected continuously for pre-set delay time and stays on until foam collapses
Response Time	1,2,4,8,12,16,20,24,28,32,36,40,44,52,60 seconds (set by dil switches)
Shot Time	1,2,4,8,12,16,20,24,28,32,36,40,44,52,60 seconds (set by dil switches)
Sensitivity	0.35K to 100K ohms impedance (set by dil switches)
Fouling Immunity	Sensitivity to fouling <1% of sensitivity to foam using Charis sensor
Interfaces	'Volt free' c/o contacts rated at 240v AC/30v DC., 2amps. 0-20mA, 4-20mA analogue output

### Enclosure Data

IP Rating	IP65 wall mounting
Dimensions	Height (including glands) 225mm, Width 240mm, Depth 115mm
Connections	Screw terminals. Cable entry via PG11 cable glands (4)

## FCR2 Controller

Basically the FCR2 is a rack mounted version of the FCW2. Designed to fit into a 19" rack the controller is a standard eurocard size and has all the features of the FCW2.

### Electrical Data

Same as for the FCW2

### Enclosure Data

Format	8HP x 3U standard eurocard. Standard 19" rack mounting
Dimensions	pcb: 100x160mm. Overall; 130x190x40mm including panel and handle
Mating connector	Harting 0904 232 6823l



## FTRAN

The FTRAN is an advanced Foam Detector designed to be interfaced with an existing process controller or alarm. It can be wall mounted or fit inside an existing cabinet.

### Electrical Data

Same as for the FCW2 except for there being no shot time facility.

### Enclosure Data

Dimensions	Height 150mm, Width 200mm, Depth 80mm
Connections	Screw terminals



## SureSense Range Foam Control Systems

These 2 self contained controllers feature an integral dosing pump and are designed for use with Charis Technology Sensors.

### FCS2 Benchtop Controller

The FCS2 is a bench standing advanced Foam Controller which, when used in conjunction with a Charis Laboratory Sensor forms a compact foam control system for the control of foam in a laboratory process. It includes an integral pump for the automatic addition of a chemical antifoam agent. A 'delay and shot' algorithm is used to give a very reliable control of the foam with the minimum usage of antifoam.

Two relays can be connected to external equipment. One operates when foam is detected and the other switches on an off with the pump. The response time is variable to discriminate against splashing and other spurious triggers.

#### Electrical Data

Power supply	220-250v AC., 50Hz
Pump	Watson Marlow 102 pump head, 12rpm, Flow 0.2-19ml/min.
Indicators	Power: illuminates when unit connected to power supply Sense: illuminates when foam is first sensed Activate: illuminates when foam detected continuously for pre-set delay time and stays on until foam collapses
Response Time	1,2,4,8,12,16,20,24,28,32,36,40,44,52,60 seconds (set by dil switches)
Shot Time	1,2,4,8,12,16,20,24,28,32,36,40,44,52,60 seconds (set by dil switches)
Sensitivity	Adjusted by means of a 4 pole switch. 35K to 100K ohms impedance
Fouling Immunity	Sensitivity to fouling <1% of sensitivity to foam using Charis sensor
Interfaces	'Volt free' c/o contacts rated at 240v AC/30v DC., 2amps. Relay 1 operates with pump. Relay 2 operates with active indicator.



#### Enclosure Data

Type	28HP x 3U 19" caseframe
Dimensions	Width 186mm, Depth 262mm, Height 147mm
Connections	Power: IEC, Sensor: Lemo, Interface: screw terminals - all mounted in rear panel.

### FCS200 Control System

Designed for industrial applications the FCS200 is an intelligent Foam Control System with integral diaphragm pump. The FCS200 features high reliability and can be operated for long periods without attention.

A Charis foam sensor can be placed in a suitable position to detect foam when it occurs. An internal dosing system operates the pump automatically in a 'shot and delay' mode to minimise antifoam usage. In addition the pump speed can be adjusted to suit the requirements of the process and may be switched off or run in manual mode if required.

#### Electrical Data

Power Supply	110, 230v AC., 50/60Hz (specify when ordering)
Indicators	Power: illuminates when unit connected to power supply Sense: illuminates when foam is first sensed Activate: illuminates when pump is actuated automatically
Pump	Alldos DMI5 diaphragm
Flow Rate	0 to 5lt/hour at 5 bars back pressure
Sensitivity	35K to 100K ohms impedance
Fouling Immunity	Sensitivity to fouling <1% of sensitivity to foam using Charis sensor



#### Enclosure Data

IP Rating	IP65
Mounting	Wall mounting with brackets
Dimensions	Height 400mm, Width 300mm, Depth 200mm (enclosure)
Connections	Screw terminals. Cable entry via Pg135 cable glands x 4.

In some applications it may be necessary to measure foam and give some indication of the level of process liquid as well. It might be that you have a large biodigester with a continual throughput of wastewater. What happens if the exit pipe or filter from the vessel blocks and the wastewater level rises above the foam sensor level? Firstly the sensor assumes the rising wastewater to be foam and starts adding antifoam on a continual basis, thus adding to the problem.

To overcome this and other problems where a process involves changing liquid levels, Charis Technology have developed the Foam and Level Control System with software to control foam in the normal way, but also to detect too high a level of liquid and send a control signal to set an alarm or activate part of your process control system. This could take the form of isolating the antifoam pump, or closing the input valve to the biodigester until such times as the blockage or other problem is cleared. This system uses the standard range of SureSense sensors.

However, the SureSense Foam and Level Control will not measure liquid and foam together - for that you would need to look at our 'MultiSense' range.

## FLCW2 Controller

Designed with reliability in mind the FLCW2 is an advanced wall mounted foam and level controller designed to control foam at a fixed level or reduce it to a minimum, and give a positive indication if the liquid level in the vessel rises too high. Applications include Biotechnology, Food and Chemical Manufacture and Effluent treatment. The FLCW2 can discriminate between foam and liquid at the sensor by means of the change in density.

To discriminate between foam and splashing or other spurious triggers the controller has an adjustable response time. A dosing or shot time can be set for the operation of a pump or valve for antifoam addition. Separate Liquid and Foam switches (volt-free contacts) can be used for point detection and an analogue o/p for level indication. When foam is detected the foam output switches, but when the liquid is detected the foam output is reset and the liquid output switches.



### Electrical Data

Power supply	110v, 240v AC., 50Hz, or 24v DC.
Indicators	Power: illuminates when unit connected to power supply Sense: illuminates when foam is first sensed Activate: illuminates when foam detected continuously for pre-set delay time and stays on until foam collapses
Response Time	1,2,4,8,12,16,20,24,28,32,36,40,44,52,60 seconds (set by dil switches)
Shot Time	1,2,4,8,12,16,20,24,28,32,36,40,44,52,60 seconds (set by dil switches)
Sensitivity	0.35K to 100K ohms impedance (set by dil switches)
Fouling Immunity	Sensitivity to fouling <1% of sensitivity to foam using Charis sensor
Output Liquid	'Volt free' c/o contacts rated at 240 volts ac / 30 volts dc, 2amps
Output Foam	'Volt free' c/o contacts rated at 240 volts ac / 30 volts dc, 2amps
Combined Output	0-20mA, 420mA analogue

### Enclosure Data

IP Rating	IP65 wall mounting
Dimensions	Height (including glands) 225mm, Width 240mm, Depth 115mm
Connections	Screw terminals. Cable entry via PG11 cable glands (4)

## FLCR2 Controller

Basically the FLCR2 is a rack mounted version of the FLCW2. Designed to fit into a 19" rack the controller is a standard eurocard size and has all the features of the FCW2.

### Electrical Data

Same as for the FLCW2

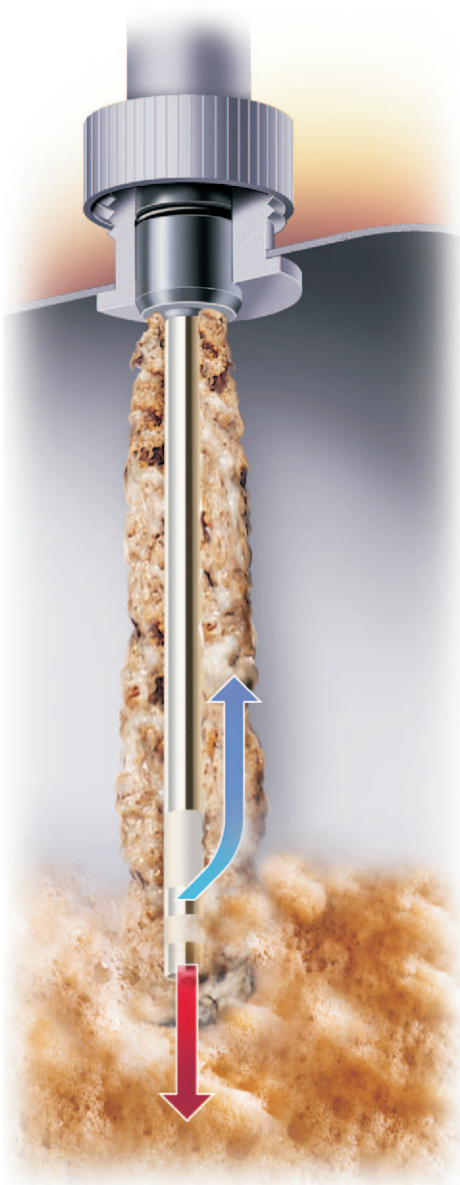
### Enclosure Data

Format	8HP x 3U standard eurocard. Standard 19" rack mounting
Dimensions	pcb: 100x160mm. Overall; 130x190x40mm including panel and handle
Mating connector	Harting 0904 232 6823l





## At last, a foam control system that really works - even when fouled!



If you think all foam sensors cease to operate efficiently when they become fouled with residual product then Charis have the answer.

Only Charis Technology Foam Control Systems have unique Intelligent Multi Action Sensing Technology (IMA Sensing® technology) to beat even the heaviest fouling.

A special 'guard electrode' (blue arrow) disrupts the desensitising effect of the accumulated fouling thus allowing the main foam sensing electrode (red arrow) to ignore the fouling and monitor only the active foam within the process.

So no matter how dense or sticky the fouling on the sensor may become the Charis Foam Control System continues to function giving accurate and reliable foam control.

For a practical demonstration of IMA Sensing® technology at work visit our website at [www.charis.uk.com](http://www.charis.uk.com).



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