

SEMRAD

SURESENSE⁺ FOAM CONTROL SYSTEM

WHY USE FOAM MEASUREMENT TECHNOLOGY?

WHAT CAUSES FOAM?

Foam arises in many industries, and can have a complex set of causes. For example, it can be produced biologically (as in anaerobic digestion or brewing), through the cleansing of wastewater, or as a result of cleaning starchy vegetables. It can be an essential part of the production process, or an unwanted side-effect.

WHY MEASURE AND CONTROL FOAM?

- ◆ **Reduce waste and product loss through over-foam events**
- ◆ **Increase productivity and batch yields**
- ◆ **Reduce volume of anti-foam and de-foamer used**
- ◆ **Minimise clean-up costs and downtime caused by spills**
- ◆ **Reduce costs through waste elimination**
- ◆ **Improve process control and efficiency**
- ◆ **Prevent environmental pollution**
- ◆ **Isolate potential contaminants**
- ◆ **Prevent damage to valuable process equipment**

APPLICATIONS IN MANY INDUSTRIES

- ◆ Pharmaceutical
- ◆ Brewing and beverage
- ◆ Food and dairy
- ◆ Paint
- ◆ Water and wastewater treatment
- ◆ Biotechnology
- ◆ Chemical
- ◆ Anaerobic digestion (AD) and waste

UNIQUE, PURPOSE-DESIGNED TECHNOLOGY

Hycontrol's purpose-designed foam measuring and control systems utilise patented sensing technology and have been proven in a wide range of applications. This technology was developed through research within the petrochemical sector, however, it was soon realised that it could offer benefits to a diverse range of other industries.

By comparison, alternative, less effective solutions use existing level measuring technology that has been 'adapted' to measure foam, which is unreliable, inaccurate and adversely affected by product build-up on the probes. **Hycontrol foam sensors, on the other hand, are designed purely for foam measurement.**

MANUFACTURED TO ISO9001 Q.M.S.



The standard of all Hycontrol products is strictly monitored to conform to all ISO quality requirements.

This ensures we meet the needs of customers as well as statutory and regulatory requirements.



GREATER CONTROL

Foam is inherently unpredictable. It is possible to control, reduce, or remove its production.



REDUCE COSTS

Considerable savings can be achieved by actively controlling and reducing the use of anti-foam.



PREVENT POLLUTION

Reduce risk of excess foaming and overfills, protecting the environment from pollution.



INCREASE YIELDS

Taking control of foam will improve process efficiency, reduce product loss and increase batch yields.

WHAT IS SURESENSE+?

The **SureSense+** (*SureSense Plus*) is an advanced wall-mounted foam controller, which connects to up to three sensors mounted in a single, or multiple, process vessel(s). It allows for the accurate control of aqueous foam by sensing and differentiating between foam and liquid contact. The controller can activate a dosing pump to either keep the foam at a fixed level or to reduce the foam height as required.

Hycontrol's unique **IMA sensing® technology** ensures the system will operate correctly even if the attached sensors become severely fouled. The controller is pre-programmed with a number of useful factory application settings/recipes to aid set-up, and offers both **proportional and delay-and-shot algorithms** for anti-foam dosing when controlling a pump or valve. To discriminate between foam and splashing or other spurious triggers, the controller has an **adjustable response time**. Although the controller can be used for stand-alone control, other control actions such as vacuum valves or gas control can be interfaced. **Thresholds** for both foam and liquid level can be adjusted for very light foams. **ATEX barriers for hazardous areas** are also available.

FEATURES AND BENEFITS

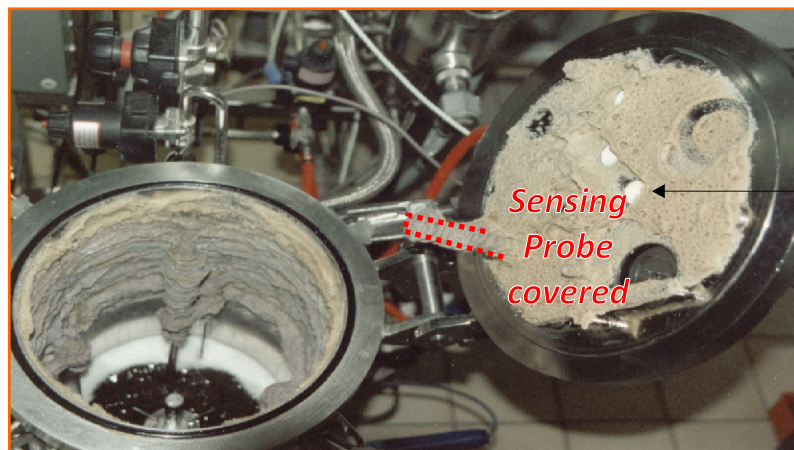
- ◆ Clear display with easy menus for simple programming and use
- ◆ Multiple relay outputs for improved control
- ◆ Connect up to three foam probes to one controller - reduce costs
- ◆ Liquid detection capability to provide greater process control
- ◆ Proportional dosing algorithm reduces unnecessary anti-foam use
- ◆ Record anti-foam use to alert when approaching low level
- ◆ Directly control pumps or valves, or connect to external controller
- ◆ Probes pressure resistant to 10 bar, temperature to 150°C
- ◆ Wide selection of foam probe lengths, connections and materials
- ◆ Immunity to fouling with unique IMA sensing® = total probe reliability



HOW IT WORKS: FOULING IMMUNITY WITH IMA SENSING®

Fouling and product coating of measuring probes is common in many foaming applications. High sensitivity to detect light foam products is an essential requirement, but it is equally important to differentiate between sensor coating and the product rising inside the tank. This is where Hycontrol IMA (Intelligent Multi-Action) sensing® is truly unique, as it will operate with total efficiency even when the probe becomes fouled with residual product.

IMA sensing® technology incorporates a special guard electrode (shown in blue, diagram right), which disrupts the signal produced by the accumulated fouling. This would otherwise have a desensitising effect on the probe. The main foam sensor (in red) is then able to ignore product build-up, regardless of thickness, and to monitor only foam within the process. Even with dense or sticky fouling on the sensor, the probe continues to give accurate and reliable foam control.



A small batch reactor still operating efficiently with the probe totally covered in product build-up

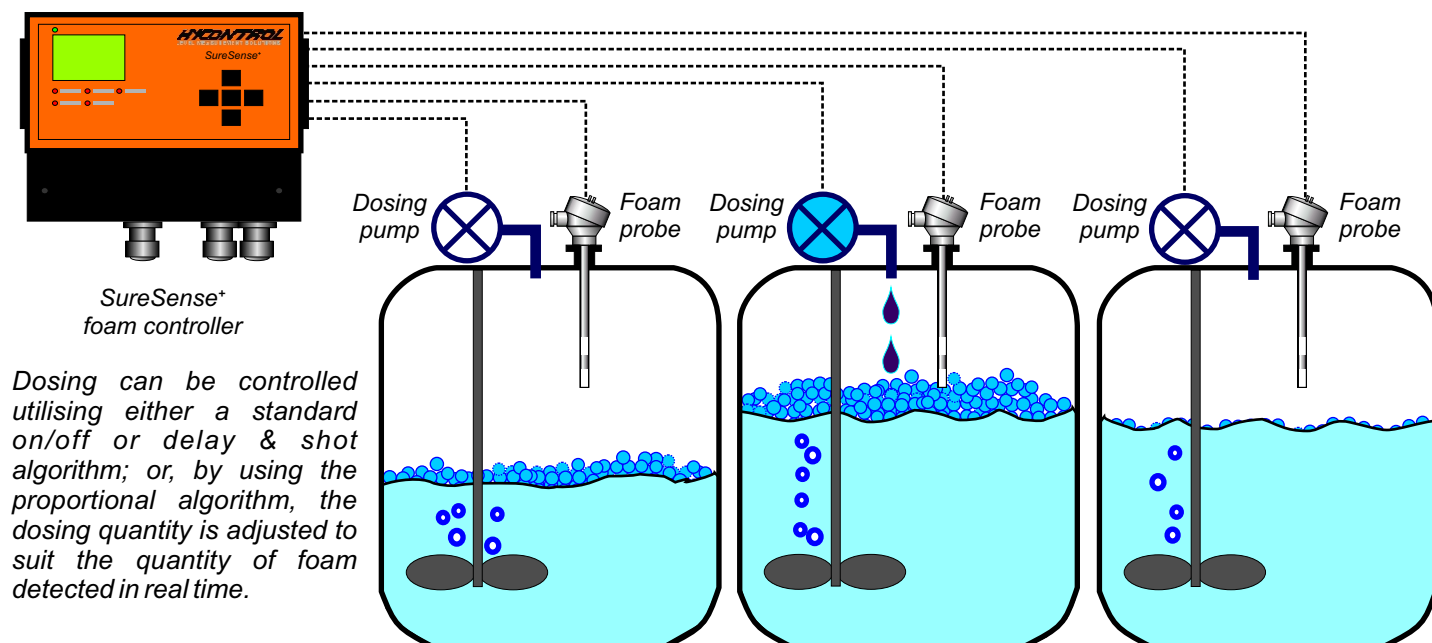
IMA principle displaying the guard probe and the measuring probe



SURESENSE⁺ WALL-MOUNTED CONTROLLER

CONTROL MULTIPLE TANKS WITH ONE CONTROLLER

SureSense⁺ features a new multi-probe capability, allowing for **fully independent monitoring and dosing control of up to three tanks from a single controller**. This offers multi-tank users a significant cost saving, as well as simplifying programming and creating flexibility for different set-ups.

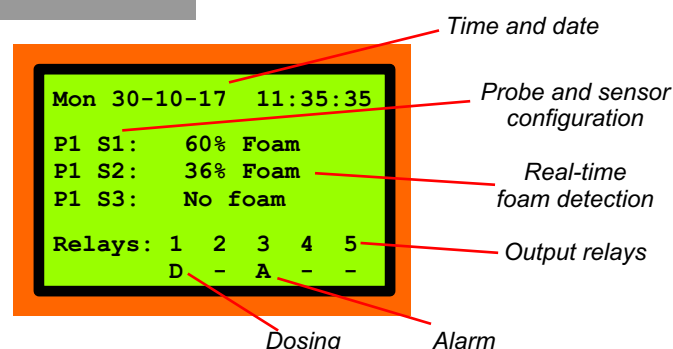


Dosing can be controlled utilising either a standard on/off or delay & shot algorithm; or, by using the proportional algorithm, the dosing quantity is adjusted to suit the quantity of foam detected in real time.

IMPROVED LCD INTERFACE

The SureSense⁺ control unit offers a user interface that is significantly improved over previous versions, with a clear, readable LCD screen and easy-to-use membrane keys.

Programming is conducted through a straightforward menu system, with a selection of information displays depending upon requirements. Foam information can be displayed as a percentage detected or as electrical current resistance. Typical 'recipe' settings for most common industrial applications are available from a pre-set options table.



ELECTRICAL & ENCLOSURE DATA

Power supply Output

12 – 30 vDC 0.5A (250 mA fast-acting TR5 fuse – Littlefuse 37002500430)
Relay 1 – Dosing / Alarm – volt-free change over contacts 250 vAC, 30 vDC 8A
Relays 2 & 3 – Dosing / Alarm – volt-free normally open contact 250 vAC, 30 vDC 5A
Relays 4 & 5 – Alarm – volt-free normally open contact 250 vAC, 30 vDC 5A

Indicators

Analogue 4 – 20 mA current loop
Power indicator – Red: always on
Relay 1 – 5 – Red: On when relay in alarm state

Adjustments

Foam sensitivity 0 – 100% Fouling sensitivity 0 – 100% Liquid sensitivity 0 – 100%
Dosing settings Relay / Alarm settings

Fouling immunity

200:1 foam to fouling

Hysteresis

5% between trigger and reset

IP rating

IP65 wall mounting, polycarbonate

Dimensions

235mm x 185mm x 119mm (L x W x H)

Connections

5 x M20 entry ports
1 x M16

PURPOSE-DESIGNED FOAM SENSORS

Hycontrol's SureSense⁺ sensor probes, when used in conjunction with the SureSense⁺ foam controller unit, provide **efficient and cost-effective foam control** across a wide range of water-based process applications.

Each stainless steel sensor can be customised to suit the requirements of your process. Different heads and process fittings are available, with standard insertion lengths of **up to 3 metres** (for a 20 mm diameter probe). **Probes can be supplied with up to three separate alarm points as required.** This flexibility makes Hycontrol the first choice for the widest range of foam applications.

The sensors are **hygienic and steam sterilisable**, and by utilising Hycontrol's patented IMA Sensing® technology they are able to discriminate between the residual build-up of product along the sensor and the foam created during the process. Thus, the **SureSense⁺ sensors are able to continue to efficiently monitor foam levels regardless of how fouled the sensor may become.**

HOUSING & PROCESS FITTING

The standard head design for the SureSense⁺ sensor is available in aluminium or Stainless Steel. A laboratory sensor fitted with a LEMO connector is also available (please contact Hycontrol to discuss this option).

To meet a wide range of applications, our sensors are available with an equally wide range of process fittings. If the level of foam is always variable then sensors can be made adjustable, or if the optimum level is known then the sensor can be set at a fixed length.

MECHANICAL & ELECTRICAL DATA

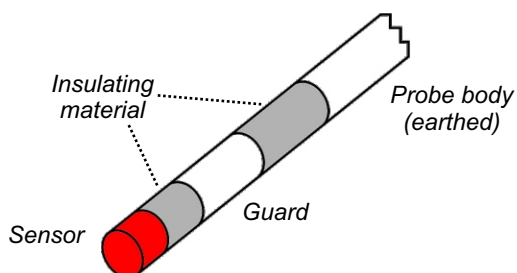
Please refer to order codes chart for full list of options.

| | |
|--------------------|---|
| Termination | Heavy duty die-cast alloy industrial termination lead IP 66 Two-way ceramic block with screw terminals |
| Cable Entry | 20mm ISO Conduit entry |
| Cable | Screened twisted pair cable 0.5mm ² (100 m / 328 ft max. length) |
| Temperature | Max. continuous operating temperature 150°C / 302°F Peak temperature 170°C / 338°F |
| Pressure | 10 bar / 145 psi (higher pressure available to special order) |

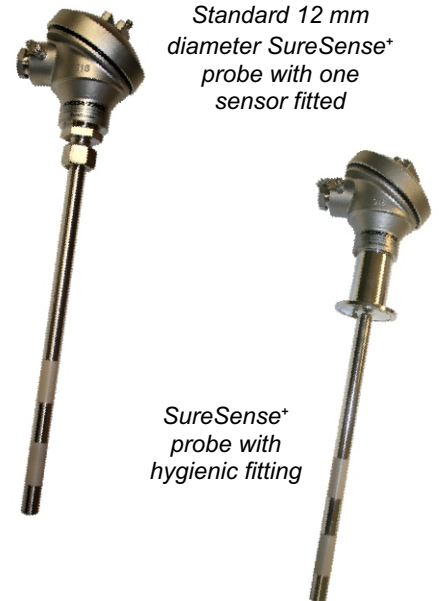
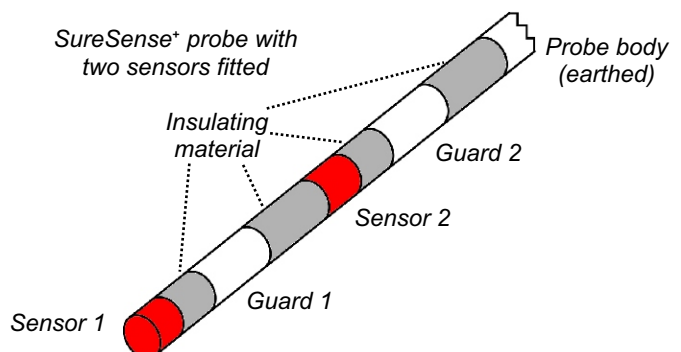
SENSOR PROBE MULTI-POINT OPTIONS

A SureSense⁺ probe consists of between one and three sensors. The probes should be ordered with the controller and are built to the required specification. *Pictured below are examples of different probe sensor set-ups.*

SureSense⁺ single probe construction

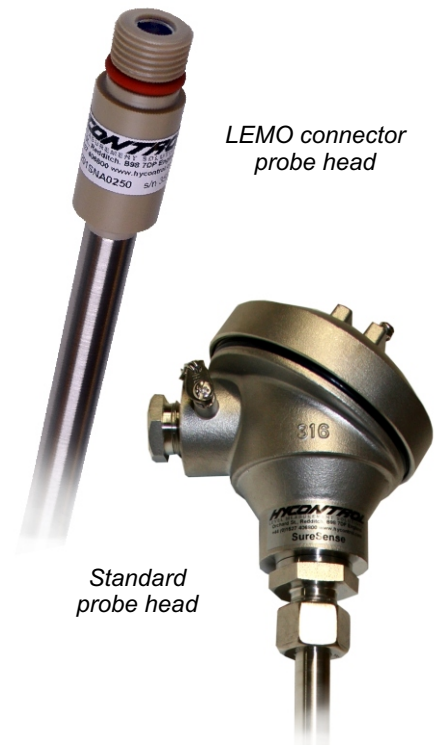


SureSense⁺ probe with two sensors fitted



Standard 12 mm diameter SureSense⁺ probe with one sensor fitted

SureSense⁺ probe with hygienic fitting



LEMO connector probe head

Standard probe head

FOAM SENSOR PROBE ORDER CODES

| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|

| Code | Type |
|------|----------|
| FR | Standard |
| FP6 | ATEX |

| Code | Probe Diameter |
|------|----------------|
| A | 12 mm |
| B | 20 mm |

| Code | Head Type |
|------|-----------|
| 1 | Aluminium |
| 4 | Stainless |

| Code | Process Fitting |
|------|-----------------------------|
| 1 | Adjustable |
| 2 | ½" BSP (12 mm only) |
| 3 | DN25-Ingold Port |
| 7 | 0.5" Triclover (12 mm only) |
| 8 | 1.5" Triclover |
| 9 | 2" Triclover |
| 10 | 19 mm (12 mm only) |
| 12 | ¾" NPT (20 mm only) |
| 15 | ½" NPT (12 mm only) |
| 16 | ¾" BSP (20 mm only) |

| Code | Material |
|------|------------------|
| A | 316L SS |
| C | Alloy C |
| E | Electropolished |
| X | 316 SS with bend |

| Code (cm) | High High Alarm * |
|-----------|-------------------|
| 0 – 100 | 12 mm diameter |
| 0 - 300 | 20 mm diameter |

| Code (cm) | High Alarm * |
|-----------|----------------|
| 0 – 100 | 12 mm diameter |
| 0 - 300 | 20 mm diameter |

| Code Probe Length (cm) | Standard Lengths (cm) ** |
|------------------------|---|
| 018 – 100 | Probe Ø 12 mm 18, 21, 24, 30, 50, 100 |
| 080 – 300 | Probe Ø 20 mm 80, 100, 130, 150, 200, 250, 300 |

| Code | Documentation |
|------|--------------------|
| N | Normal |
| U | USP Class VI |
| Y | Tracking documents |

| Code | Seal Type |
|------|--------------------|
| E | EPDM |
| F | EPDM USP Cl. VI |
| P | Perlast USP Cl. VI |
| S | Silicon |
| V | Viton |

| Code | Measuring Points |
|------|------------------|
| 1 | 1 sensor |
| 2 | 2 sensors |
| 3 | 3 sensors |

* - Please select desired alarm positions (to the nearest 10 mm) from the end tip of the probe (0 mm). Note that this cannot exceed the selected length of the probe.

** - Please consult a Hycontrol representative if a non-standard probe length is required.

FOAM CONTROLLER ORDER CODES

| | | | | | |
|------------|--|--|--|--|--|
| FRC | | | | | |
|------------|--|--|--|--|--|

Note: in ATEX applications, only the probe is ATEX area safe. **The controller must ALWAYS be mounted in the safe area.**

| Code | Probe Configuration |
|------|---|
| 1 | One probe, single sensor (basic unit) |
| 2 | Two probes, single sensor |
| 3 | Three probes, single sensor |
| 4 | One probe, dual sensors |
| 5 | Two probes, one dual sensor & one single sensor |
| 6 | One probe, three sensors |

Hycontrol has been at the forefront of level control and measurement technology for over thirty-five years, providing effective solutions for diverse applications across a wide range of industries ranging from quarrying to food; from nuclear power to chemical; and from animal feed to waste recycling. From our manufacturing base in Redditch, Worcestershire, we have been trusted to oversee thousands of applications across the UK and around the world.

At Hycontrol, we pride ourselves on providing a 'complete solution' service to our UK customers. We provide a turnkey solution for level equipment requirements, with the experience and skill to design, manufacture, install and maintain bespoke measurement and control systems that are crafted to suit the particular needs of each individual customer.

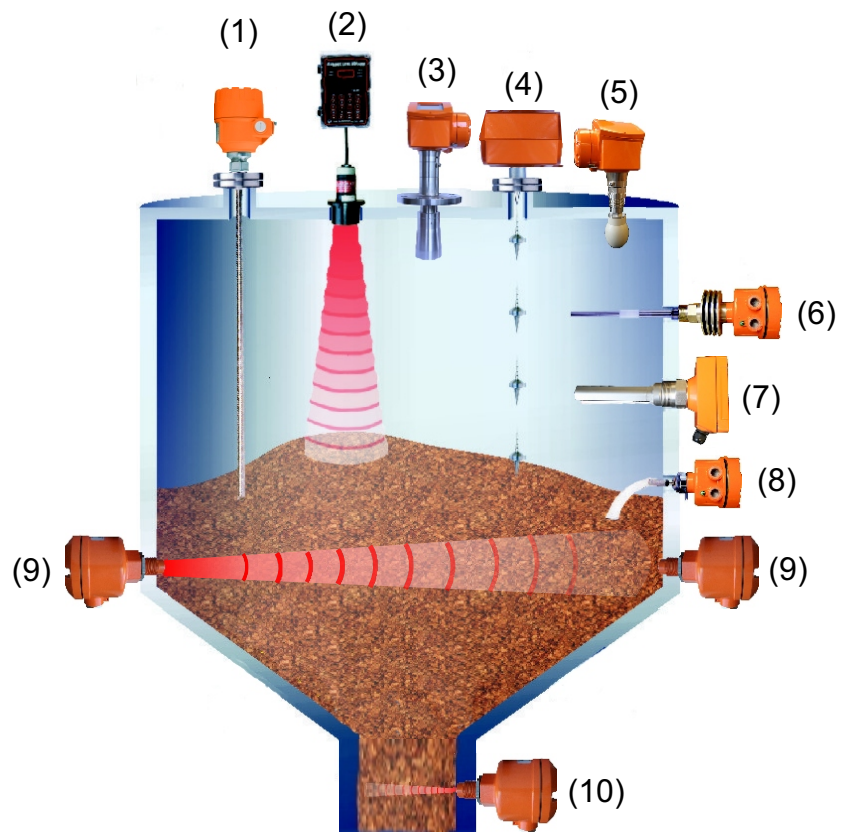
We understand the consequences of inaccurate or unreliable level systems, and therefore each Hycontrol installation is tailored precisely to match your application. Our goal is simple: to provide the best-engineered solution - *without compromise*.

With one of the widest ranges of level measurement technologies on the market including award-winning silo pressure safety systems and a patented range of foam detection and control equipment, backed up by a team of highly experienced engineers and technicians, Hycontrol is a leading force in the manufacture and supply of advanced level solutions.



Product Range For Solids:

- (1) TDR Radar for Solids
- (2) 2-Wire Ultrasonic Transmitter
- (3) FMCW 2-Wire Radar (Horn)
- (4) Continuous Servo Level Indicator
- (5) FMCW 2-Wire Radar (Drop)
- (6) Capacitance Level Switch
- (7) Vibrating Probe Level Switch
- (8) Rotating Paddle Level switch
- (9) Microwave Level Switch
- (10) Doppler Flow Switch



Product Range For Liquids:

- (1) Bypass Level Indicator with Radar
- (2) TDR Radar for Liquids
- (3) 2-Wire Ultrasonic Transmitter
- (4) FMCW 2-Wire Radar (Horn)
- (5) Magnetic Float Switches
- (6) FMCW 2-Wire Radar (Corrosion-Proof)
- (7) Capacitance Level Switch
- (8) RF Admittance Level Switch
- (9) Side Mounting 316 SS Float Switch
- (10) Tuning Fork Level Switch
- (11) Tuning Fork Level Switch
- (12) Ultrasonic Through Wall
- (13) Mini Magnetic Float Level Switch

