

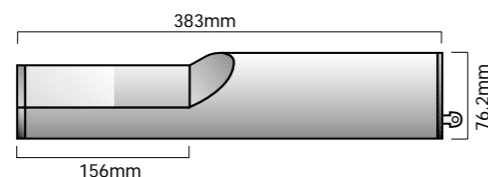
## Ordering

The following products and accessories are available – please ask for further details:

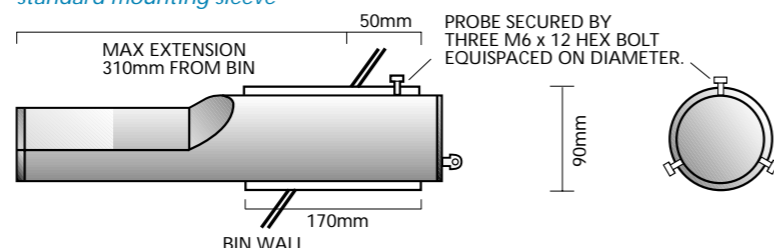
Code Description

HP02T	Hydro-Probe II – standard mode for normal digital or analogue connection
HP02C	Hydro-Probe II – compatible with the Hydro-View interface unit (HV02/HV03)
0071	4 metre, 7 core unterminated connecting cable for HP02T
0069	4 metre, 4 core screened connecting cable with 6 pin Bulgin connector for HP02C
0067	Terminal Box to IP67 with 5 glands and 3 blanking plugs.
0115	Power supply – for up to 2 Probes
0116	Power supply – for up to 4 Probes
0049	RS232/485 adapter – 9 pin type
0049A	RS232/485 adapter – DIN rail mounting
0025	Standard mounting sleeve
0026	Extended mounting sleeve

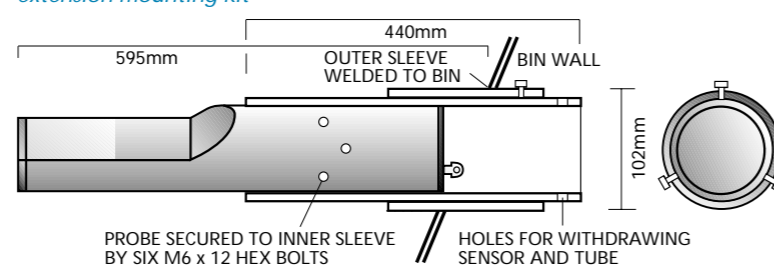
## Fitting options



Hydro-Probe II fitted with standard mounting sleeve



Hydro-Probe II fitted with extension mounting kit



## Technical Specification

### Construction

Body: cast stainless steel (ANC3B 18/8SS)  
Endcap: stainless steel (AISI 316)  
Faceplate: alumina ceramic

### Range of moisture

For bulk materials the sensor will measure up to the point of saturation, typically 0-20% for construction materials.

### Penetration

Approximately 75-100mm dependent on material.

### Power supply

+15Vdc to +30Vdc. 3 watts max.

### Operating temperature

0-60°C. The sensor will not measure moisture in frozen materials.

### Refresh rate

Outputs are updated approximately 25 times per second.

### Extension cables

Type: 5 pairs twisted with overall screen  
Wire size: 7/0.203mm (24awg, 0.22mm<sup>2</sup>)  
Impedance: 92Ω/km  
Capacitance: 98pF/m  
Max length: 90m with 15V supply  
400m with 24V supply

### Analogue output

Configurable 0-20mA or 4-20mA current loop source. For 0-10Vdc output an external 500R load resistor should be connected across the analogue output at the control system.

### Discrete inputs

The batch average start stop or moisture/temperature multiplexing functions can be controlled via the digital inputs. Refer to 'Connecting the Cable' section of the manual for more information.

### Digital Communications

Opto-isolated RS485 2-wire port. Refer to your distributor for read/write access to sensor parameters and values.

### Grounding

The sensor body is connected to the cable shield. Ensure equipotential bonding of all exposed metalwork. In areas of high lightning risk correct and adequate protection should be used.

### HP02C

4 core with overall screen  
16/0.2mm (0.5mm<sup>2</sup>)  
40Ω/km  
98pF/m  
110m with Hydro-View



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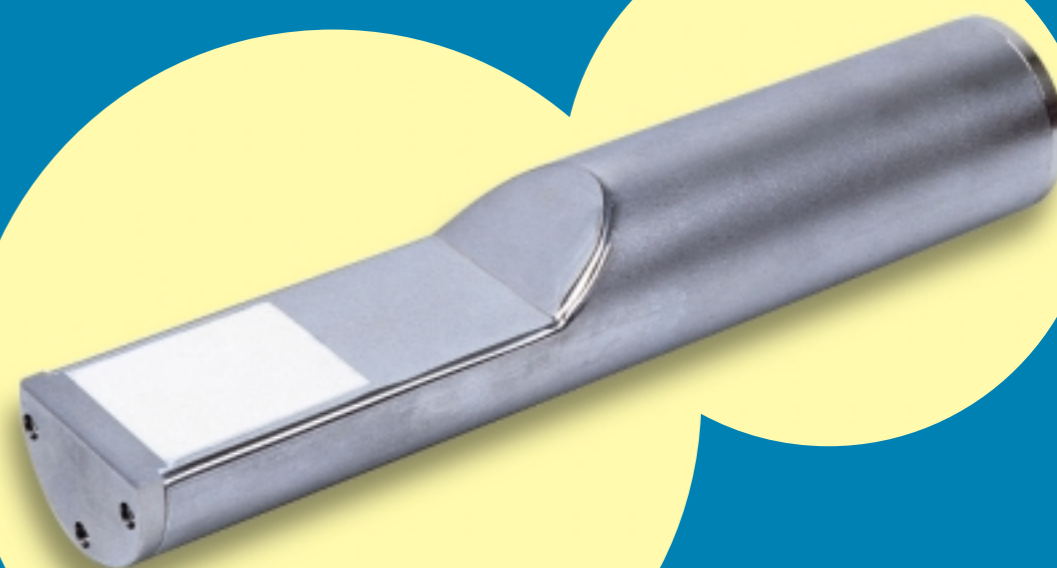
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HP:07:2001

# Hydro-Probe II

## PRODUCT INFORMATION SHEET



*the ultimate intelligent microwave sensor for measurement of moisture in bins*



**Hydronix**



# Hydro-Probe II

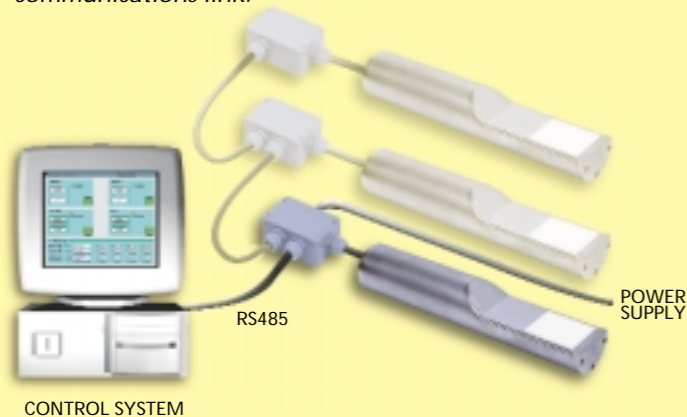
defining the standards of microwave moisture measurement

The Hydro-Probe II is the first microwave sensor to use digital measuring techniques, providing greater accuracy and range of measurement than any other sensor on the market and working with a wider range of materials than ever before.

Physical dimensions remain the same for complete compatibility with the original Hydro-Probe.

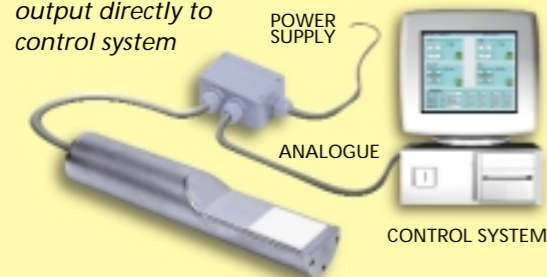
## Digital Connection

Upto 16 Hydro-Probe II sensors may be daisy-chained to connect directly to a control system via the serial communications link.



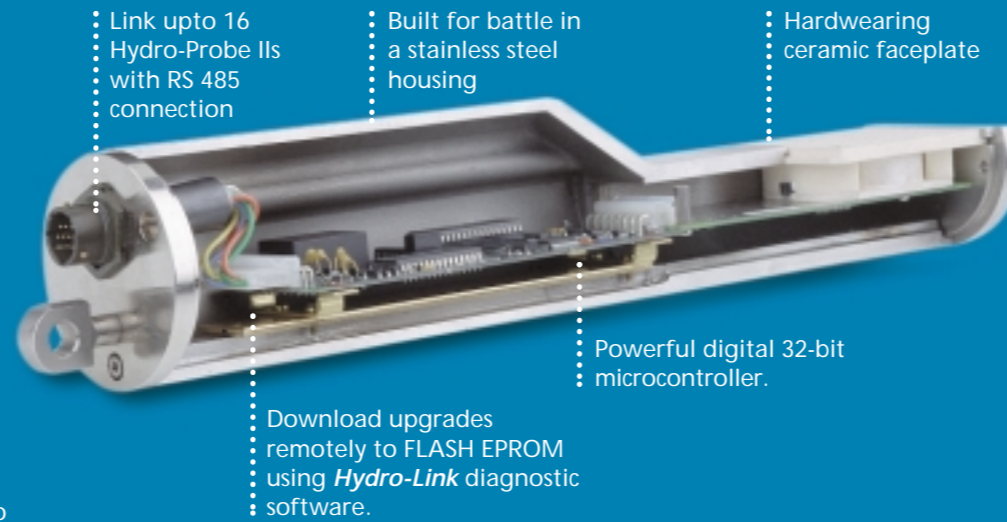
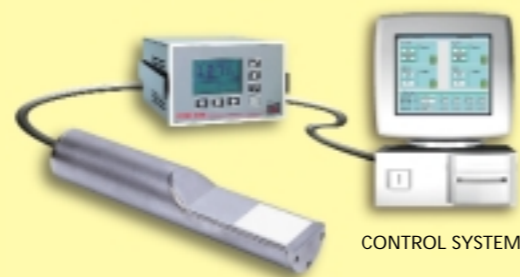
## Analogue Connection

Using linear analogue output directly to control system



## Hydro-View Connection

Provides compatibility with the original Hydro-Probe for replacement, or connection to Hydro-View.



## Measuring in the flow

The Hydro-Probe II is designed to measure continuously in the flow of material during batching. Reading at 25 times per second the sensor detects rapid changes in moisture, providing a linear digital or analogue output.

## Batch averaging

The 'averaging' mode continuously provides the 'average' reading of moisture from the start of reading to any time selected – normally the closing of the hopper door.

Averaging, bin empty alarms and signal processing performed internally by sensor.

## Calibration

One point technique enables sensor to be readily calibrated on site. Further calibration points may be taken to ensure highest possible accuracy. The sensor may be internally calibrated using Hydro-Link software, or the sensors output may be calibrated within the control system or using the Hydro-View.

## Matching characteristics

Identical output characteristics for all sensors means it is now possible to swap out sensors without recalibration. A simple air and bucket of water test may be performed to ensure sensor is performing correctly.

## Simple power requirements

The Hydro-Probe II may be powered from wide range dc supply. Multiple sensors may be driven from a single power source.

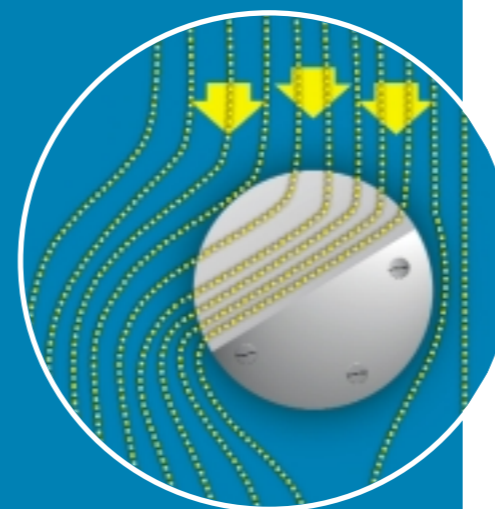
## Temperature measurement

Temperature output is available to provide read-out of material temperature.

## Inclination of measurement face

Another unique feature is the 'angling' of the sensor face plate to the flow of the material thereby ensuring consistent compaction and flow characteristics over the sensor face irrespective of whether the bin is full or almost empty.

The normal angle for sand is 30° but may be easily adjusted to suit the flow characteristics of any material.

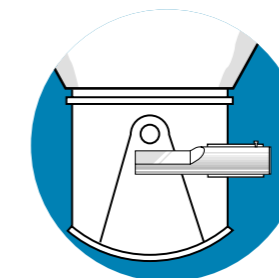


## Flexible positioning

The Hydro-Probe II sensor is designed to give the greatest possible flexibility for mounting.

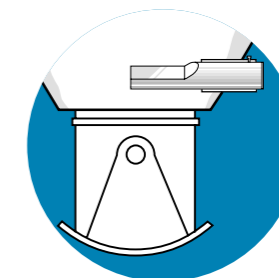
The following points should be considered when positioning the sensor:

- The measurement field penetrates most dense materials (eg sand) by approximately 100mm. The sensor should always face into material with a minimum depth of 120mm to avoid reflection problems.
- The sensor should be positioned as close to the bottom of the bin as possible to ensure it does not miss any significant quantity of wet material resulting from drainage between batching.
- The sensor should be positioned in the flowing material, and not close to the side of the bin as it will cause an obstruction to the flow.
- When using aggregates with particles larger than 12mm the use of a deflector bar is recommended.



Scheme 1

Preferred position. Hydro-Probe II fitted in neck of bin using standard mounting sleeve.



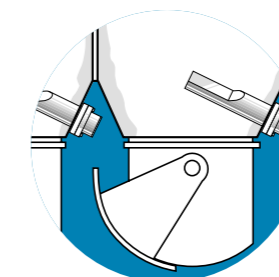
Scheme 2

Hydro-Probe II mounted in bin using standard mounting sleeve if neck of bin is too small.



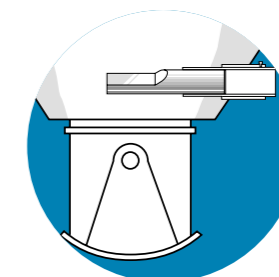
Scheme 3

Hydro-Probe II may be inclined down at approx 45° to minimise obstruction to the flow, when neck of bin is small.



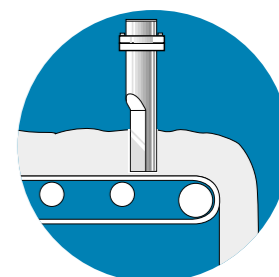
Scheme 4

With multiple bins accessibility is difficult and it may be easier to fit the Hydro-Probe II on the incline.



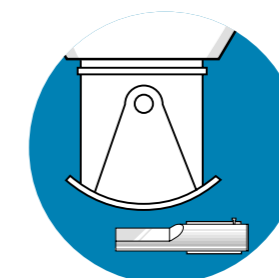
Scheme 5

The extended mounting sleeve will be required with wide bins to ensure Hydro-Probe II face is in the flowing material.



Scheme 6

Hydro-Probe II with conveyors or belt feeders. Minimum depth of material 120mm.



Scheme 7

Where space is very restricted, the Hydro-Probe II may be positioned below the bin to avoid flow obstruction

## Vibratory feeders

Hydro-Probe II may also be used with bins with vibratory feeders. Details available on request.