

Coal Preparation Plants

Control, Monitor & Optimise



Display, Controllers & Loggers

Interface Level Measurement

Environmental Monitoring

Pressure & Temperature

Ultrasonic Flow Meters

Slurry Concentration

Suspended Solids

Water Quality

Solids Level

Turbidity

Moisture

Dosing

Clarity

For:

Milk of Lime

Solids Handling

Feed to Thickener

Thickener Underflow

Hydrocyclones & Spirals

Blocked Chute Detection

Fine Coal Centrifuge Circuit

Conveyor Protection & Safety

Thickener Bed Level Detection

De-Watering: Centrate & Filtrate

Non-Intrusive Flow Measurement

Open Channel Flow Measurement

Environmental: Licence Compliance

Slurry Concentration

Microwave Concentration Measurement

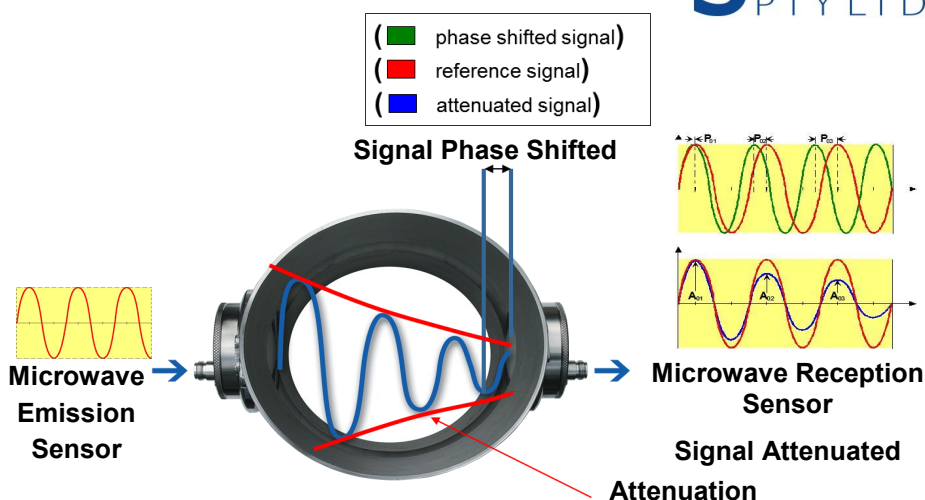
The Microwave Principle

Phase Shift

Decreased speed of propagation after the microwave signal has transmitted the medium.

Attenuation

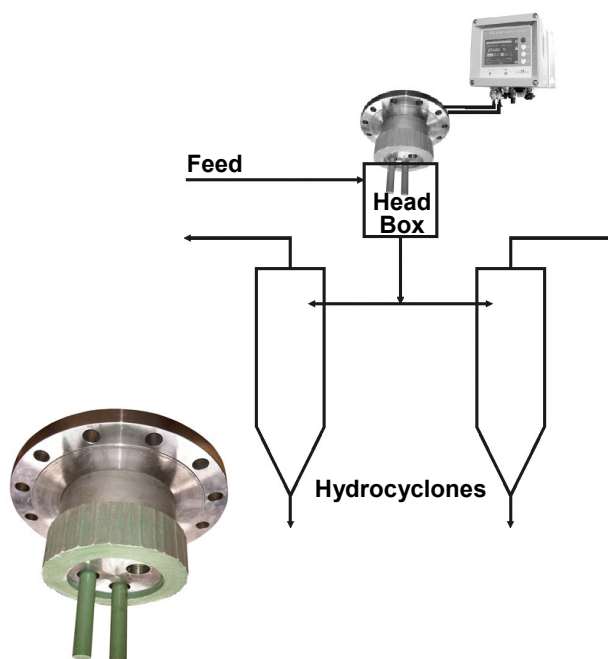
Decreased amplitude after the microwave signal has transmitted the medium



Attenuation & phase shift related to the water content or dry substance

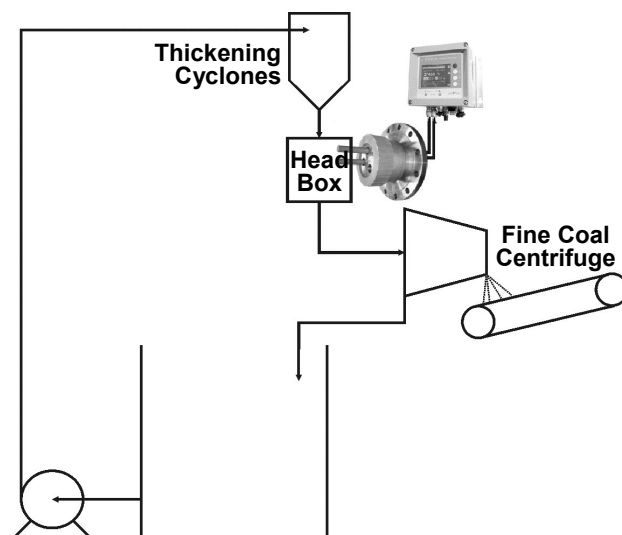
Cyclones & Spirals

- Desliming Cyclones, Thickening Cyclones & Spirals (Reflux Classifiers)
- Installation: Feed Head box, Extended Sensors, Abrasion Resistant Coating
- Use: Control of Valves to change system capacity
- Typical Range: 5-25%
- Benefits: Improved performance
More stable operation



Fine Coal Centrifuge

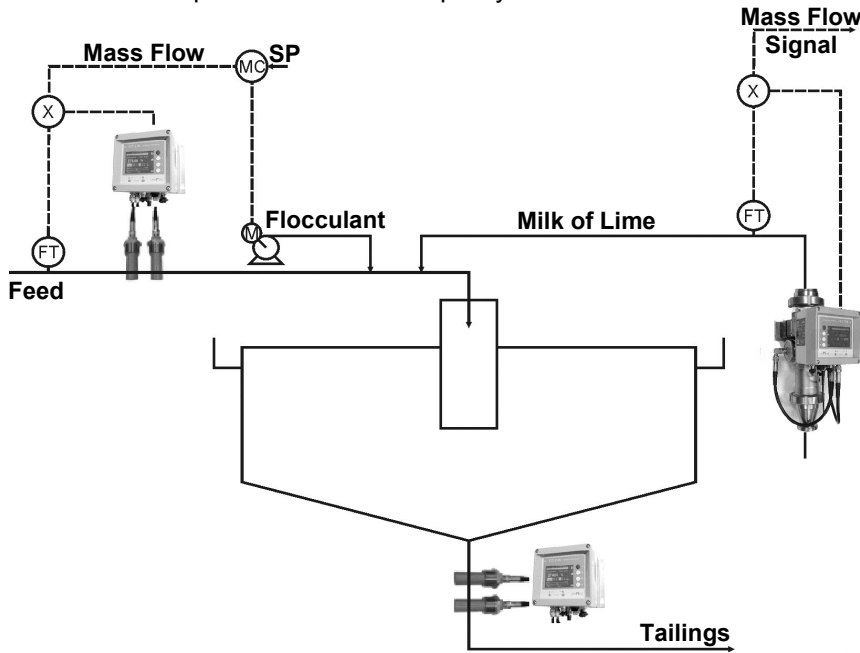
- Installation: Feed Line to Centrifuge, Extended Sensors, Abrasion Resistant Coating
- Use: Control of Valves to change centrifuge capacity
- Typical Range: 40-70%
- Benefits: Increased bowl life
Reduced maintenance costs
More consistent & dryer cake



Slurry Concentration

Feed to Thickener

- Installation: SS Shielded, Insertion Sensors in Feed Line
- Use: Combine with Flow to provide solids load
- Typical Range: 2-10%
- Benefits: Adjustment of Flocc dosing against solids load
To improve Flocc performance & prevent overdosing
Improved water circuit quality



Milk of Lime

- Installation: In-Line with flat sensors or insertion sensor
- Use: Control of Milk of Lime make up/ dilution
- Typical Range: 10-15%
- Benefits: Consistent Milk of Lime concentration to enable more precise pH correction
Control & optimise lime usage



Thickener Underflow

- Installation: In-Line, short insertion sensors with Abrasion Resistant coating
- Use: Control of dewatering capacity & loading
- Typical Range: 20-40%
- Benefits: Improved dewatering efficiency & performance,
Improved management of thickener,
Combine with flow to provide system performance data

Non-Nuclear Measurement for:

- Cyclone Feed
- Spiral Feed
- Thickener Feed
- Thickener Underflow
- Flotation Feed
- Feed to De-Watering

ProMtec (Microwave Technology)

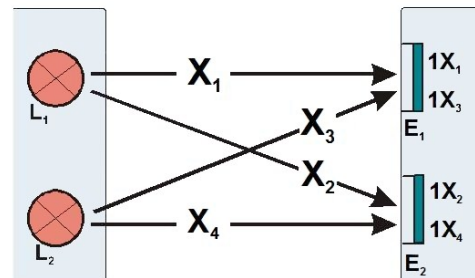
- Microwave measurement
- Connection via coaxial cables (max. 150m)
- Isolated 4-20mA output
- Up to 10 Bar pressure rating



In-Line Turbidity & Suspended Solids Meters With Quadbeam Auto-Compensation Principle

Thickener: Overflow Clarity

- Installation: T30 Sensor, immersion from bridge on thickener with Auto Air Blast cleaning.
- Use: Alarm, performance monitoring.
- Typical Range: 0 - 1000 NTU
- Benefits: Cleaner water circuit, reduced chemical costs, reduced maintenance, improved performance.



De-Watering: Centrifuges & Filters

- Installation: S40, S20/S10 Sensors, in filtrate/centrate pipe.
- Use: Alarm, performance monitoring
- Typical Range: 0 - 0.3%
- Benefits: Cleaner water circuit, reduced chemical costs, reduced maintenance, improved performance.

Environmental: Licence Compliance

- Installation: T30 Sensor with flow in open channel.
- Use: Recording & alarming
- Typical Range: 0 - 50 NTU
- Benefits: Environmental Compliance certificate.

MXD75 Multi-Channel Electronics

Scattered light measurement

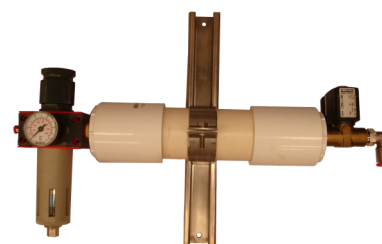
- Digital communication
- Up to 3 sensors on one transmitter
- Simple menu driven interface
- LCD display

T30 Sensors

- Measuring range: 0-50NTU / 0-1000NTU

S Series Sensors

- Measuring range: up to 2% Coal Solids
- Measurement automatically compensates for variation in optical components & sensor fouling to eliminate drift to provide stable measurement.
- The QUADBEAM Sensors use advanced optical technology to provide stable, reliable and robust suspended solids measurements for industrial applications and harsh environments.
- Suitable for immersion into tanks & insertion into pipes. A variety of accessories are available for installation.
- Fully configurable electronics unit with 4-20mA output & 2x relay outputs. Available in 1, 2 or 3 Channel versions.
- Options for automatic in-line cleaning in place.

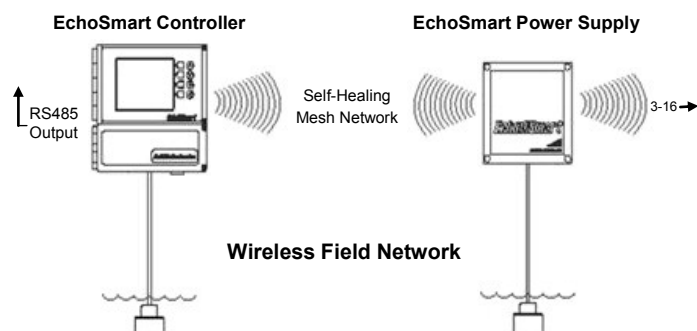
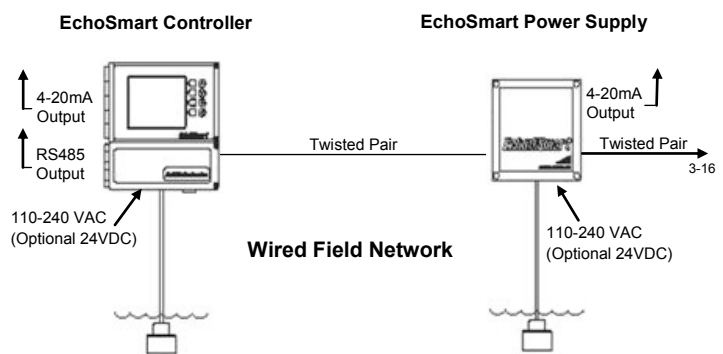
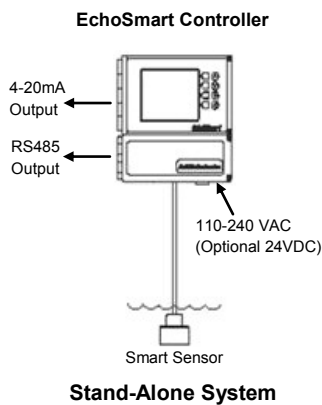
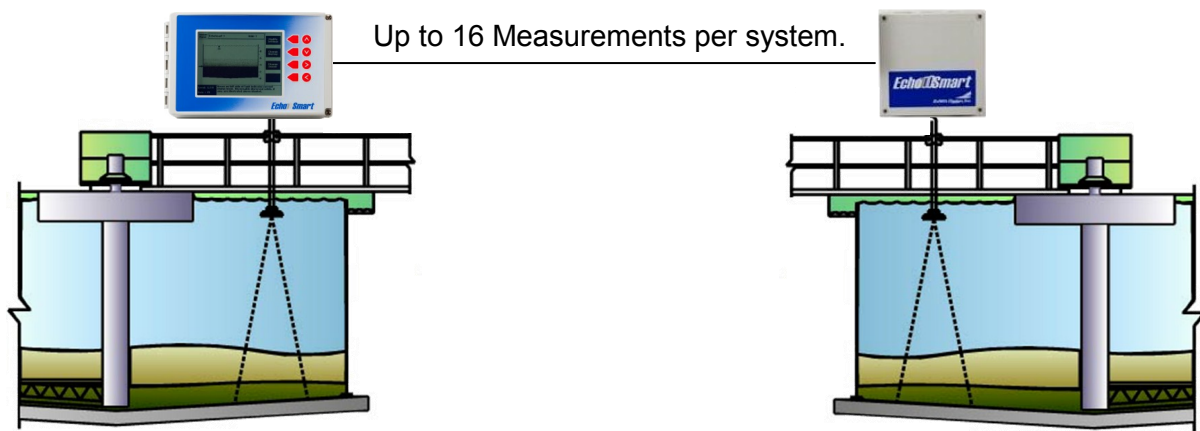


Interface Level Measurement

Thickener Bed Level Detection & Dispersion Layer

- Installation: Bridge Mounted with wiper sensor
- Use: Monitor & Control
- Typical Range: 2 to 4m
- Benefits: Early warning of process upset
 - Improve management of flocculant dosing
 - Prevent rake stalling
 - More consistent underflow solids concentration

Note: De-Aeration required



EchoSmart Specifications:

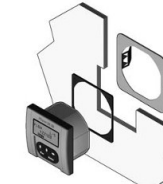
- NEMA 4X enclosure
- Real time measurement
- Up to 16 sensors per system
- Ultrasonic signal (657 kHz)
- Self-cleaning wiper sensor (option)
- Fully integrated Zig Bee Compliant RT
- Wired & Wireless field network (RS-485 & Ethernet options available)

FLS ChemX - pH/ORP & Conductivity Controller

- 240 Vac, or 24 Vdc/ac
- 1 x 4-20mA - Recording
- 2 x Relay or OC, Configurable
- Panel or Wall Mount available, IP 67
- Manual or auto temperature compensation Sensor
 - ❖ Alarm, Control On/Off, Pulse Width Modulation or Frequency
 - ❖ Direct reading of raw probe response for diagnostic purpose & probe condition
 - ❖ Auto calibration routine
 - ❖ Simulating Mode



Wall Mount



Panel Mount

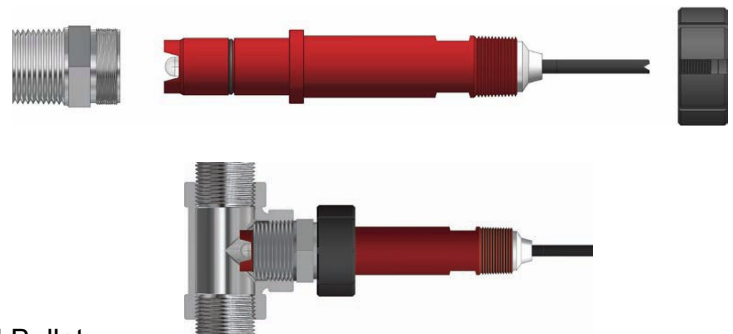


Tip Types



Barben Long Life pH & ORP Sensor

- Patented Axial Ion Path™ reference technology increases electrode lifespan in harsh application
- Quick & easy remove & install for checking & calibration
- Proprietary low-noise, high temperature signal cable
- Longer lasting performance
- Minimal maintenance
- Options for Auto Cleaning In-Line
- Immersion or in-line installation
- Flat Tip simplifies cleaning
- With temperature compensation
- Poison resistant
- pH range: 1-13pH
- Temp range: 0-100°C
- Max. pressure: 150psig (10 bar or 1000kpag)
- For ORP; Platinum, Gold or Silver Cyanide Solid Bullet
- Universal compatible with all manufacturer's analysers
- Sensor insertion depth from 2.6 to 12 inches (measured rib to tip of sensor)



Online Turbidimeter

Model MicroTOL

Designed for filtered water, raw water, waste water final effluent & industrial applications.

- Nephelometry measurement principal.
- Ranges 0 – 100 NTU & 0-1000 NTU.
- Fast response & easy calibration.
- Accurate, reliable & cost effective.
- With ultrasonic cleaning

Simple Calibration



Ultrasonic Cleaning



Dissolved Oxygen

- Maintenance free DO measurement
- Using the revolutionary fluorescence principle
- Long term stability now enables reliable control
- Direct insertion into aeration tank.
- No need for floats or other costly mechanisms.
- Not pressure sensitive, can be inserted at any depth



MicroTPW / TPI – Instruments.

Includes carrying case, one set of calibration standards, indexing rings, 4AAA alkaline batteries operator's manual & measuring cuvettes with light shield caps.

- MicroTPW Portable Turbidimeter (White Light) 0-1,100 NTU
- MicroTPI Portable Turbidimeter (IR) 0-1,100 NTU



Micro100 – Instruments.

Includes a complete set of calibration standards (0.02, 10 & 1000 NTU), two measuring cuvettes with light shield cap & operator's manual.

- Micro 100 WL Laboratory Turbidimeter, 0-1000 NTU, (White Light).
- Micro 100 IR Laboratory Turbidimeter, 0-1000 NTU, (IR Light).



DRT – 15CE – Instruments.

Includes: battery charger, sample cuvette w/light shield cap, 0.2 NTU reference standard, recorder output plug & instruction manual.

- DRT - 15CE Portable Turbidimeter 0-1000 NTU (White Light)

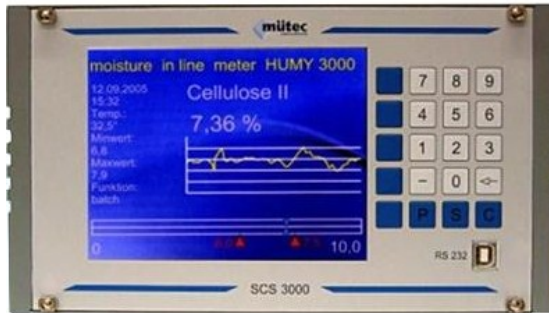


Streaming Current

- Close the automation control loop for coagulation dosing via 4-20mA output
- Draw a post dosed sample
- Monitor the sample charge
- Process the signal in a control device
- Send alarm messages to the operator



HUMY 3000 Moisture Measuring System



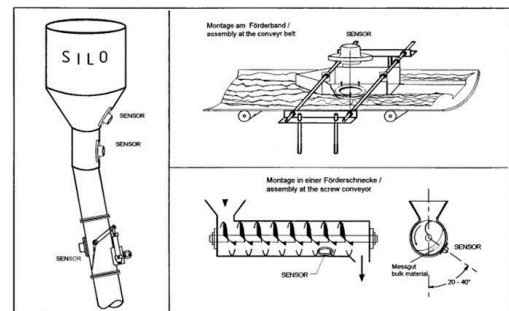
HUMY 3000

Specifications:

- In-line measurements
- Moisture measure range: 0.001%- 50%
- High precision of up to 0.1%
- Digital data transmission (up to 1km)

Features & Benefits:

- Digital sensor
- Up to 24 products
- Temperature compensation
- High resolution and high speed measuring
- Simple & quick installation and calibration
- Safety and long term stability measuring
- Robust maintenance free probe.
- Integrated data logger



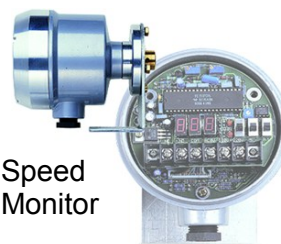
Conveyor Monitoring



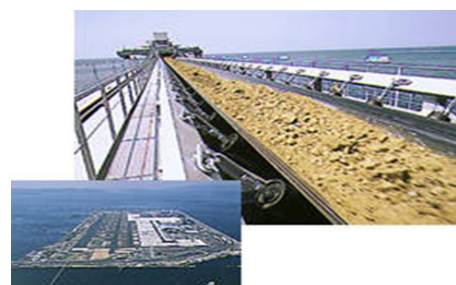
Safety Cable Pull Switch



Mis-Alignment Switch



Speed Monitor



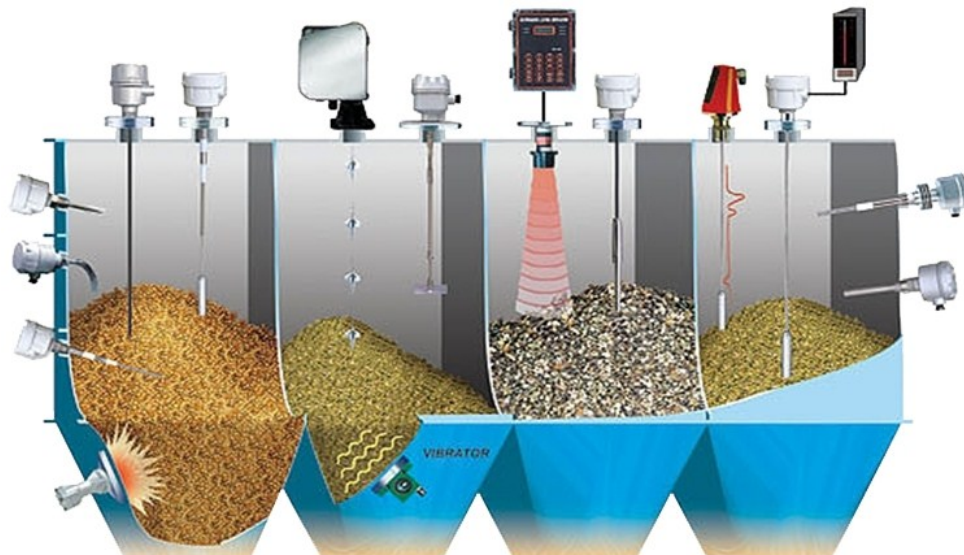
Level - Solids

Switches

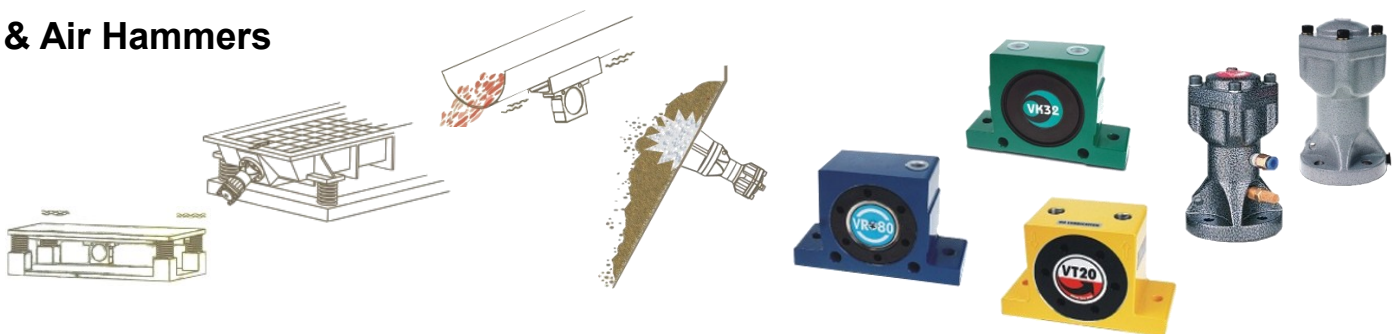
- Rotary Paddle
- Capacitance
- RF Admittance

Transmitters

- Capacitance
- Radar
- Mechanical

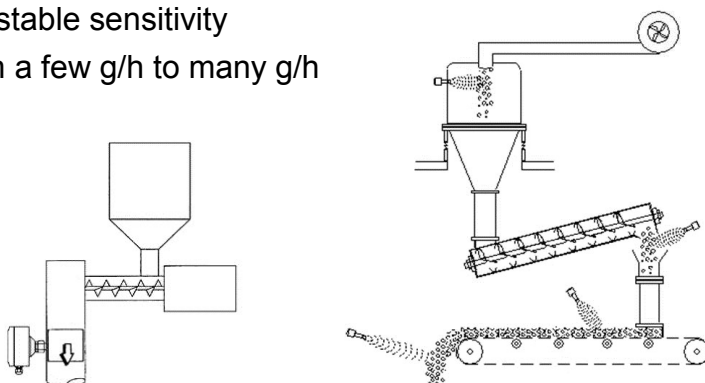


Pneumatic Vibrators & Air Hammers



Blocked Chute Detection

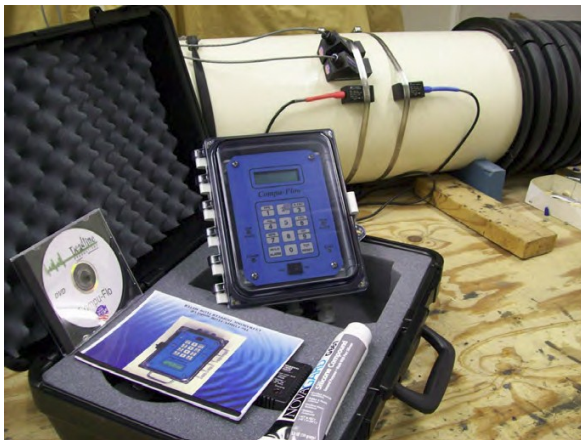
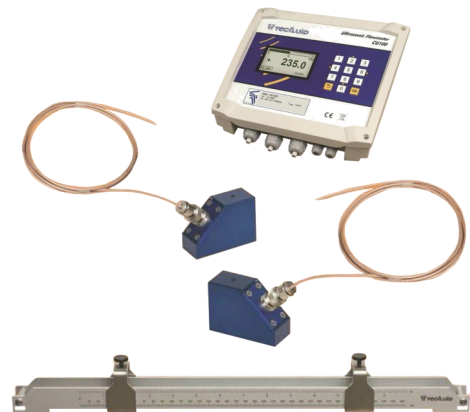
- For pipes, conveyor belts, screw conveyors, silos, etc
- Easy installation by compact forms of construction
- Electrostatic, Microwave, Capacitive
- Adjustable sensitivity
- From a few g/h to many g/h



Ultrasonic Flow Meters

Non-Intrusive Pipe Flow Measurement

- Clamp On Doppler for slurries
- Clamp On Transit Time for clean liquids
- Portable & Permanent Instruments
- Pipe sizes from 80 - 2000mm



Open Channel Flow Measurement

- Bi-directional flow measurement for forward & reverse velocities from 10 mm/S up to 5m/S.
- Powerful, easy to use PC software simplifies flowmeter commissioning
- Sophisticated ultrasound processing ignores spurious signals
- Ultrasound signal quality monitor confirms measurement integrity
- High capacity data logger for permanent records of level, velocity & flow rate.
- Opto-isolated switch outputs for alarms & controls
- Optional 4:20 mA outputs for telemetry & control systems
- Optional modem for dial-up access & internet connectivity





Switch

Measurement Principles

- Thermal Dispersion
- Paddle Wheel
- Sprung Paddle
- Free Paddle
- Variable Area (Rotameter)
- Impeller
- Sprung Float
- Electromagnetic

Brands

- Tecfluid
- FineTek
- FlowLine
- Industrie Technik
- Meister Stromungstechnik
- Intek Rheotherm

Transmitters

Measurement Principles

- Thermal Dispersion
- Paddle Wheel
- Variable Area
- Impeller
- Sprung Float
- Electromagnetic
- Ultrasonic (T/T & Doppler)
- Turbine
- Rotary Piston (PD)

Brands

- Tecfluid
- FineTek
- FlowLine
- Mainstream
- Industrie Technik
- Meister Stromungstechnik

Indication (Gauges)

Measurement Principles

- Paddle Wheel
- Variable Area
- Impeller
- Sprung Float

Brands

- Tecfluid
- Meister Stromungstechnik
- Kytola
- FIP / FLS



Switches

Measurement Principles

- Bellows
- Bourdon Tube
- Diaphragm
- Capillary
- Bi-Metal

Brands

- Regulateurs Georgin
- FineTek
- Industrie Technik

Transmitters

Measurement Principles

- Piezoresistive
- Thermocouple
- RTD (PT100/PT1000)

Brands

- Regulateurs Georgin
- FineTek
- MAC3
- Rhomberg

Gauges

Measurement Principles

- Bellows
- Bourdon Tube
- Diaphragm
- Capillary
- Bi-Metal

Brands

- Regulateurs Georgin
- Rhomberg
- Teltherm

Level - Liquid



Switch

Measurement Principles

Magnetic Float
Side Float
Rotary Paddle
Buoyancy
Capacitance
RF Admittance
Ultrasonic
Cable Float
Vibrating Fork
Conductive
Optical

Brands

Tecfluid
FineTek
FlowLine
MAC3

Transmitters

Measurement Principles

Magnetic Float
Guided & Non-Guided Radar
Magnetostrictive
Buoyancy
Capacitance
Ultrasonic
Hydrostatic (Pressure)

Brands

Tecfluid
FineTek
FlowLine
MAC3

Gauges

Measurement Principles

By-Pass Gauges
Sight Glasses (PVC)
Buoyancy

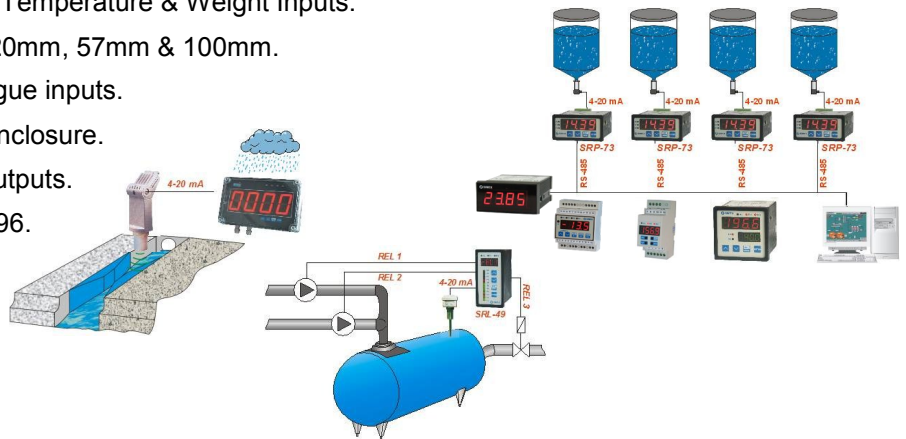
Brands

Emteq
Tecfluid
FineTek

Display, Controllers & Loggers

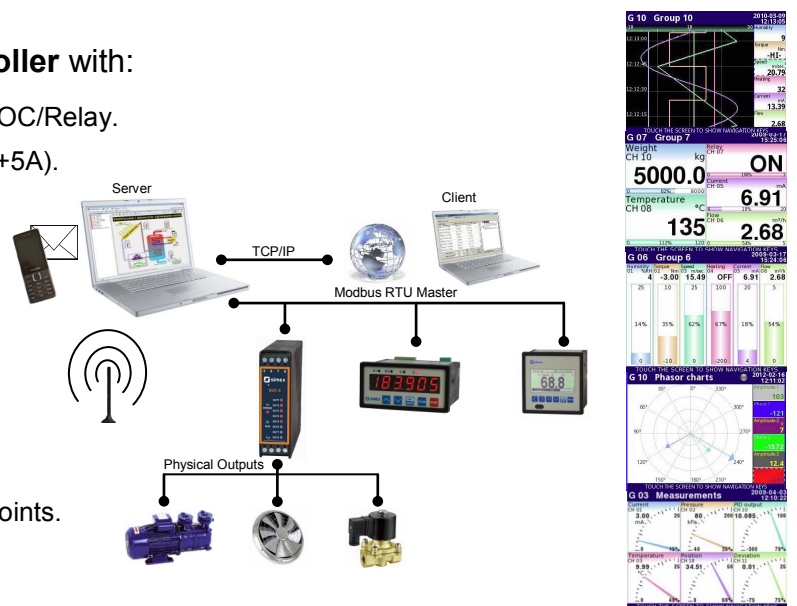
Single Channel Displays & Controllers

- Current (0/4-20mA), Pulse, Frequency, Temperature & Weight Inputs.
- Small & Large Displays: 9mm, 13mm, 20mm, 57mm & 100mm.
- Rate, Total or Both from pulse or analogue inputs.
- Panel, DIN Rail & Wall Mount (IP-65) Enclosure.
- Display Only or with Alarm & Control Outputs.
- Panel Sizes: 72x36, 96x48, 72x72, 96x96.
- Modus (RS-485) Masters & Slaves.
- Batch Controllers & Counters
- Bar Graph Display
- Clocks, Timers & Time Controllers.



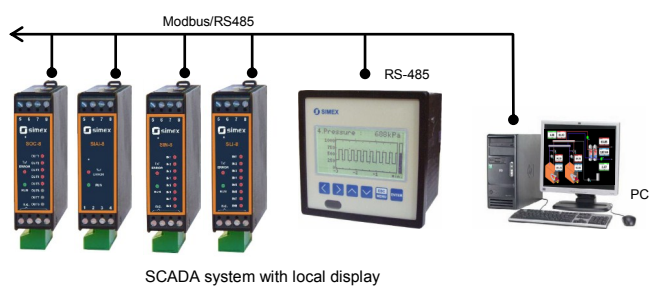
Multichannel Display, Recorder & Controller with:

- Inputs: Current (0/4-20mA), V, mV, TC, RTD, R, OC/Relay.
- Outputs: Current (0/4-20mA), V, SSR, Relay (1A+5A).
- Touchscreen Colour Display
- Ethernet Options.
- Modbus RTU (Master & Slave).
- USB Host (memory stick).
- Remote Access Options.
- Option for data logging.
- Control Modes: PID, PWM, On/Off & Frequency, Batch, Feedforward/Feedback, Remote Set Points.



Power Supplies & Signal Conditioners

- Modbus I/O Modules, Slaves for Input & Outputs.
- 12/24 Vdc Power Supplies, DIN Rail.
- Transmitters: DIN Rail & Puck.
Temperature, Load Cells, mV, V.
- 4-20mA Signal Isolators.
- Semi - SCADA Software.
- Convertors: USB/RS485 & USB/RS232



Ex Barriers

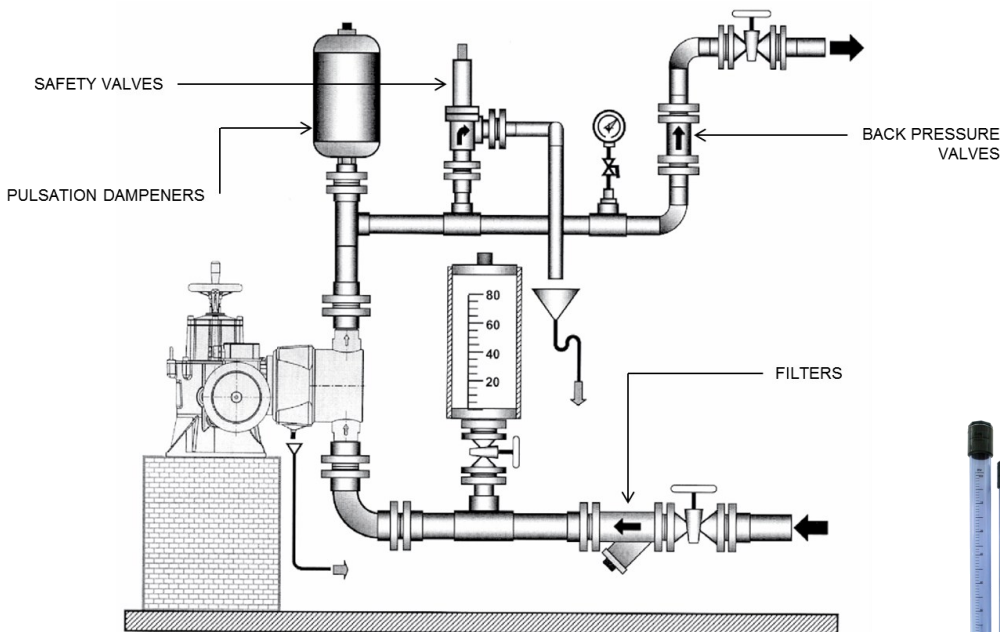
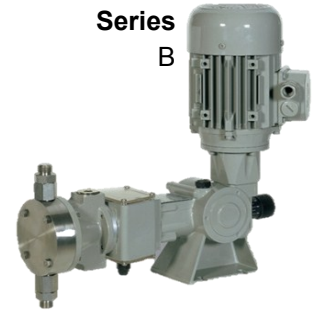
- Rail Mount
- Back Plane Mount
- Galvanic Isolators
- Zener Barriers
- IECEX Certified
- SIL2 Capability
- HART Compatible



Piston and Positive Displacement Pumps

Options & Accessories

- Hydraulic or Mechanical Diaphragm
- Piston
- Polyethylene tanks
- Safety relief valve & back pressure valves
- Injection Valves & Foot Valves
- Hydropneumatic accumulators
- Calibration pot
- Dosing rate: up to 3800 l/hr
- Viscosities up to...3000CP



About PCS

For more than twenty years Process Control Services (PCS) have provided Measurement & Dosing equipment to an extensive range of industries, varying in size, throughout Australasia.

Continuous growth over the past twenty years driven predominately through word of mouth referrals has led to PCS achieving an outstanding market profile. With offices in Sydney, Brisbane and Melbourne combined with a network of over twenty regional sales outlets PCS is able to deliver top quality international brands at very competitive prices, backed by an outstanding level of customer service throughout Australia and New Zealand.

Process Control Services (PCS) are renowned for their industry expertise together with their extensive choice and range of equipment. Their highly trained engineers are able to offer extraordinary levels of expert service and advice through combining their extensive product knowledge with industry experience that extends in many cases beyond the life of the company.

We supply Flow, Level, Pressure, Temperature and Specialty Measurement Equipment and Chemical Dosing Equipment for monitoring, control & optimisation of industrial processes.

If you have a problem, call us, we have the solution.....

Contacts:	E-Mail:
Quotes, Orders & Product Data	sales@pcspl.com.au
Service	service@pcspl.com.au
Accounts	admin@pcspl.com.au
Technical	
QLD & NSW: Michael Dickens	michael.dickens@pcspl.com.au
VIC & TAS: Gavin Peiris	gpeiris@pcspl.com.au
NZ: Kevin Hamilton-Reen	kevin@pcspl.com.au
National: John Lane	jlane@pcspl.com.au
Head Office & Warehouse: 4 / 198-222 Young St, Waterloo, NSW, 2017	