Neptune Datasheet
Suspended Solids Analyzer

Neptune is the first purpose built in-situ analyzer for measuring the suspended solids of slurries. Specifically developed for the flotation process in mineral processing, this unique technology gives reliable performance under the most severe service conditions. It incorporates self-cleaning to provide long service life and minimal maintenance.

Principle of Operation

Neptune uses high powered acoustic signals to accurately and repeatedly measure characteristics of the slurry, and provides an analog signal proportional to the changes within these characteristics. At the same time, the high energy action of the Neptune pulse provides acoustic self-cleaning of the sensors to reduce the buildup of scale and coating by the particles in the slurry. It is unaffected by changing environmental conditions within the flotation cell, and is designed to measure suspended solids throughout the measured range.

FloLevel Technologies™

Features

- Simple setup & calibration
- Robust sensor design
- Self-cleaning sensor design
- Colour graphic display
- Enclosure heating/cooling

Primary Application Uses

The **Neptune** suspended solids analyzer has been designed, specifically for the Flotation Cell mineral recovery process. It has been designed to provide a stable signal, proportional to the solids concentration in the Pulp/Slurry under all environmental conditions. The output from this analyzer can be used for feedback to the water addition and other control functions for improved automation capability of the Flotation process.

It can be used in all Rougher, Scavenger, Cleaner and Flash Flotation circuits.
In Flash Flotation Cells, it could be highly valuable as feedback to the Ball Mill, regarding the percentage of particles that present to the Flash Cell as well as providing feedback for water addition, to optimize recovery of the particles of a size that can be floated in the Flash Cell and returned as concentrate.

The Neptune analyzer can provide a full suspended solids profile of the total tank depth, by adding additional array assemblies.

In reagent dosing tanks it can be used to control reagent dosing rate as well as water addition control.

The Neptune suspended solids density analyzer can be used in all applications where an analog output signal is required on solids concentration in a liquid.

Specifications

Power Supply
90-250VAC 50/60Hz

Power Consumption
<5A @ 250VAC

Outputs
1 x 4-20mA @ 24VDC
Maximum Load 500 ohms
Linearity Error +/-0.1%
Modbus RS-485
Serial RS-232
Ethernet TCP/IP
ProfiBus
CANBus: CANopen, UniCAN
Optional features:
Relay outputs,
Additional communication options

Display
3.5” QVGA TFT color LCD
Resolution: 320 x 240 pixels
Touchscreen
5 input keys
Adjustable brightness
NEMA-4X / IP66
Conformal coated circuit boards
Battery backup, 7 year typical
Serial RS-232 / RS-485 comms

Accuracy
+/- 2.0% of range

Maximum measuring range
0 – 100% solids

Standard Array Sensors
3-Sensor (analyzer only)
Estimated weight: 5kg

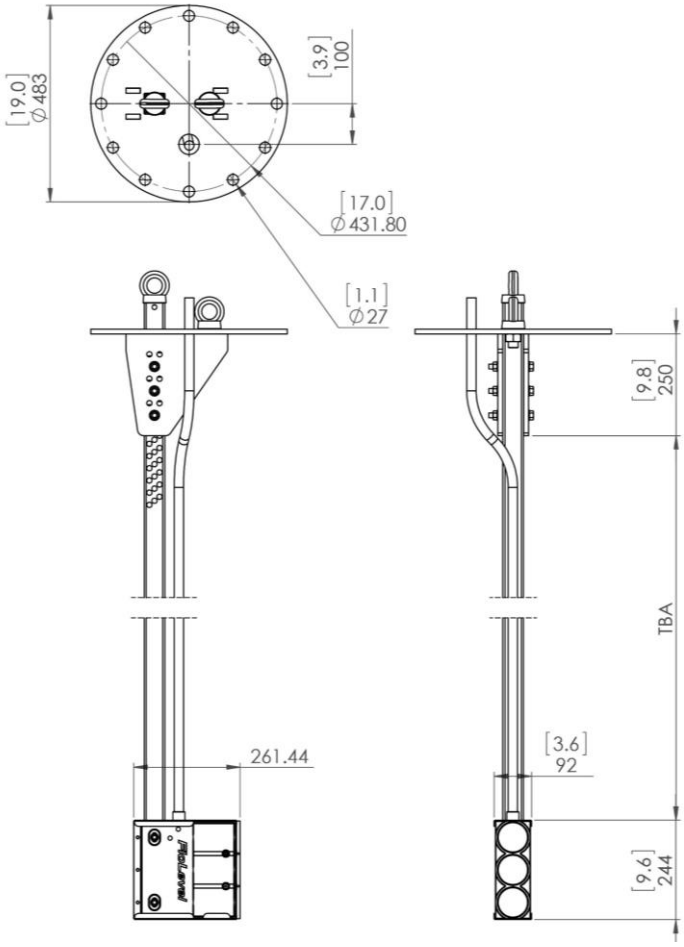
Mounting Assembly
Flange: 12-inch ANSI form
Length: per request
Weight: per request

Materials of Construction
Array Housing: ABS
Sensor face: 316SS
Mounting Frame: 316SS
Enclosure: 316SS
Window: polycarbonate
Hardware: 316SS

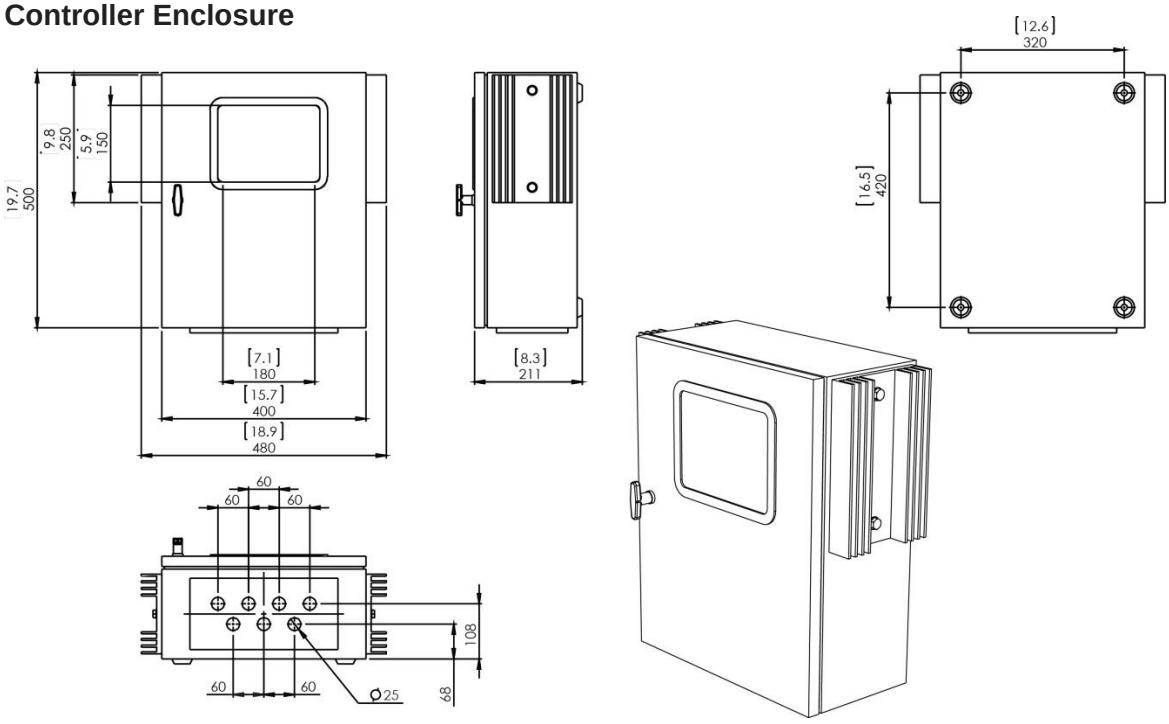
Environmental Limits
Enclosure
NEMA-4X / IP65
-20C (-4F) to 80C (176F)
(Supplied with heating/cooling)
Hazard Class: General Purpose

Sensors
NEMA-4X / IP68
-20C (-4F) to 80C (176F)
Maximum Altitude 6000m
Hazard Class: General Purpose

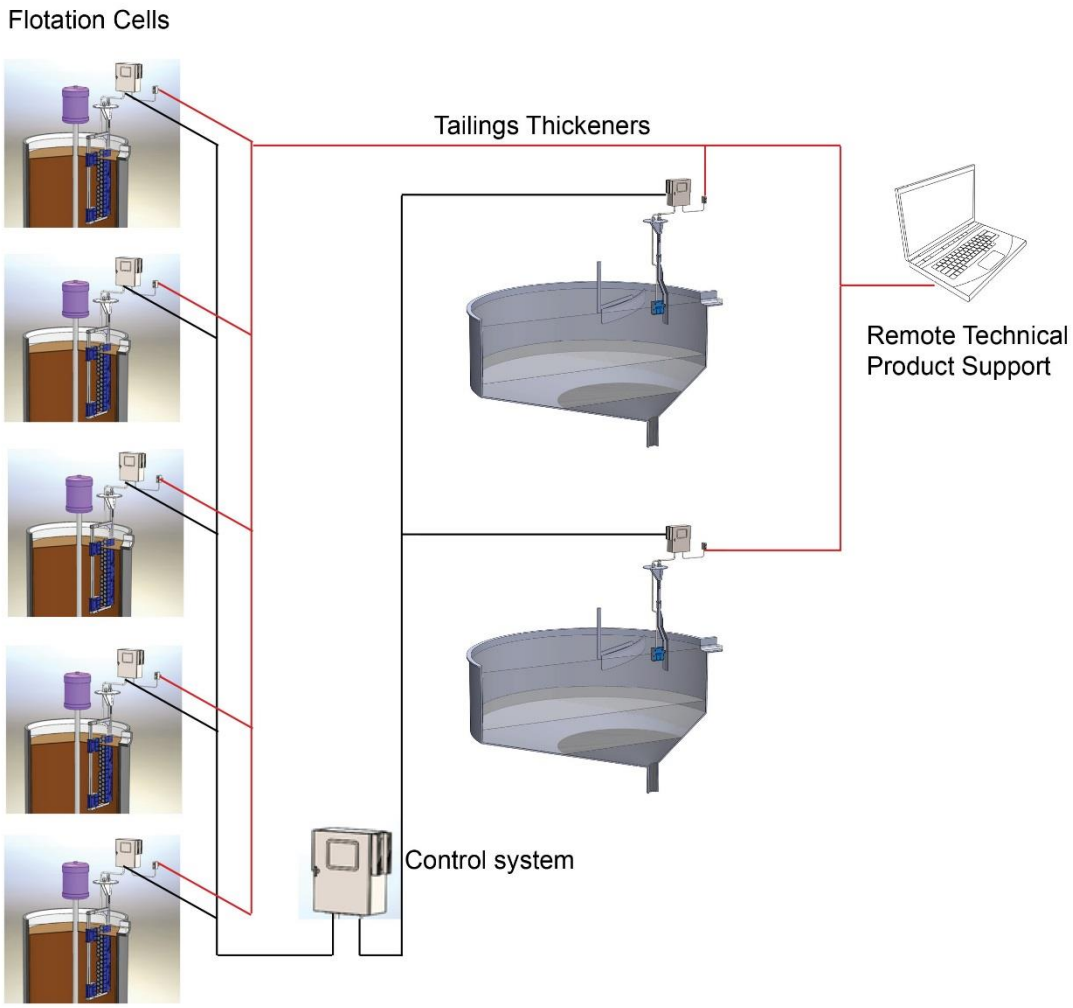
Drawings Analyzer Array



Controller Enclosure



Remote Diagnostics



All FloLevel acoustic systems come with a remote diagnostics support module, which provide remote technical support anywhere in the world from factory trained specialists.

Applications that include flotation cells, reagent dosing tanks, mining thickeners that operate 24/7 can be supported remotely through all time zones.

Condition	Problem	Corrective Action
Suspended Solids in the ideal range	None – properly operating for maximum particle liberation	None, validation that proper particle suspension is achieved
Suspended Solids too high	At the same feed rate as above, there are more solids present than can be collected by the air bubbles at the same aeration rate. Particles may not attach to bubbles and be lost to tails, reducing collection efficiency. In carbon circuits this will lead to diminished mass transfer to the carbon.	For flotation cells - Increase aeration rate, monitor froth conditions for proper operating conditions. For flotation & flash reagent tanks - Dilute the feed by increasing water addition/chemical dosing, verify suspended solids are in the correct range. For carbon circuits - Decrease carbon addition or increase liquor feed.
Suspended solids too low	At the same feed rate, there are insufficient particles present for collection. Froth may begin to lose density as mineral collection is reduced. This reduces recovery and grade, also excessive water and chemical consumption. In carbon circuits this will result in a loss of leaching residence time and increase reagent addition rates.	For flotation cells - Reduce aeration rates, monitor froth conditions to maintain proper operating conditions. For flotation & flash reagent tanks - Reduce water addition/chemical dose, verify suspended solids are in the correct range. For carbon circuits - Increase carbon addition or reduce liquor feed.

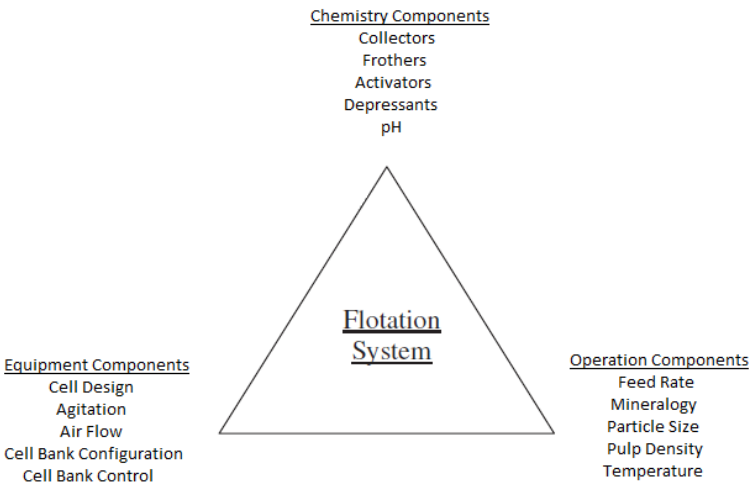


Figure 1: The flotation system includes many interrelated components, and changes in one area will produce compensating effects in other areas (Klimpel, 1995)

Part Numbers

Product	Control Range = CR	Flange Position Dist = FP	Range	Array Transducer Housing Material	Power Supply	Outputs	Cable Length	Flange Type for Mounting Bracket
		Above control range					Interface Array to Controller	
FLN	300mm = 1 600mm = 2 Other = 3	1000mm = 1 2000mm = 2 Custom (m) = X	0-100% = 1	ABS = 1	90-265Vac 50/60Hz @10A	1x4-20Ma= 1	15m = 15 Other (m) = X	12” ANSI = 1

Patent Pending

FloLevel Technologies Pty Ltd
Factory 50, 41-49 Norcal Road
Nunawading 3131 VIC
Australia
Phone: +61 (0)3 9872 3096
info@flo-level.com.au www.flo-level.com

FloLevel Technologies™