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rbr-global.com

Ping The President - Q&A with Greg Johnson

“Getting the most out of your RBR instrumentation”

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Applications: Mixing

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Applications: Tides, waves & water level

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Applications: Coastal dynamics

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Applications: Ocean Studies

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Applications: Vehicles

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Applications: Water quality

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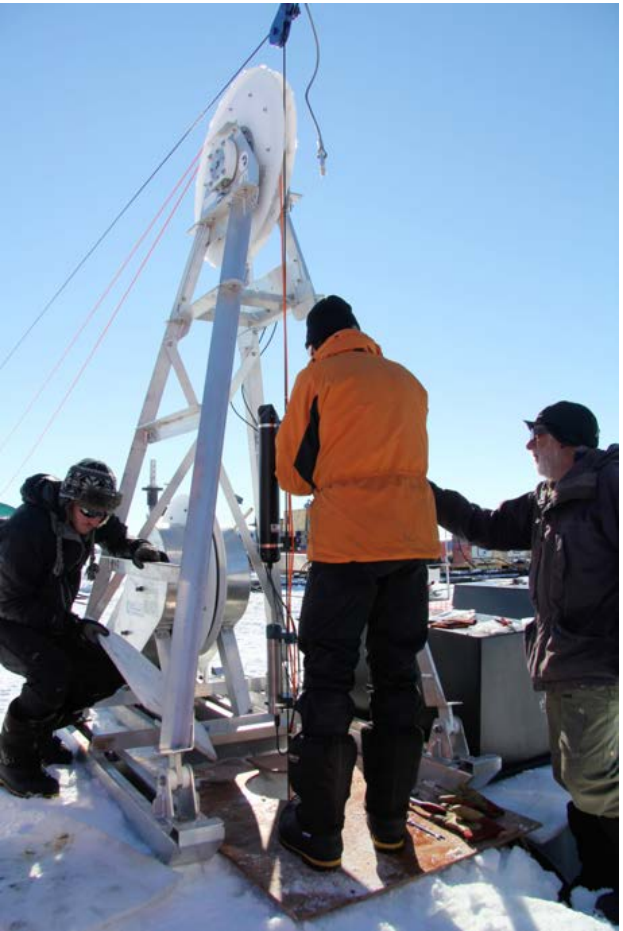
Applications: Real time data



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RBRcervello
RBRduet
RBRsolo
RBRvirtuoso
RBRduo
RBRconc
RBRfermata
RBRfermette
RBRssm
RBRquartz
RBRcoda
RBRmaestro
RBRconcerto
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Water Level / Tides / Waves : Specs

Compact 	Standard 	Quartz 
1 x AA Battery	8 x AA Battery	8 x AA Battery (BPR req. Ext Pwr)
~60M Readings	~240M Readings	~240M Readings
0 to 20 / 50 / 100 / 200 / 500 / 1,000m 0 to 1,000 / 2,000 / 4,000 / 6,000 / 10,000m		Q: 0 to 10 / 20 / 55 / 125 / 190 / 260 / 330m BPR: 0 to 1,350 / 2,000 / 4,000 / 7,000m
-	Twist Activation	Twist Activation (Q only)
-	External Connectivity Available	External Connectivity Available
-	Wi-Fi Available	
±0.05% Accuracy / ±0.001% FS		±0.01% Accuracy / 10ppb @ 1Hz

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Types - Strain Gauges

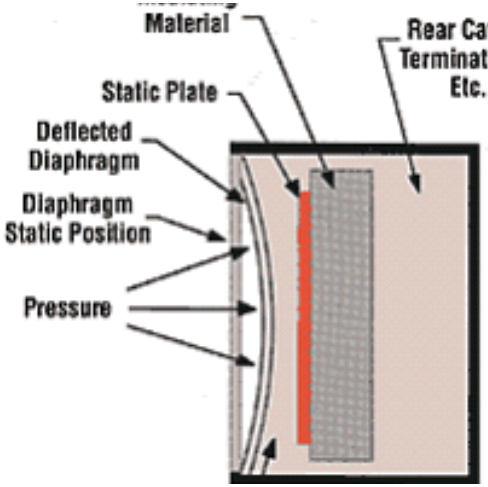
Piezo-resistive

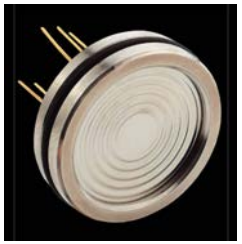
Resistance increases as pressure deform diaphragm

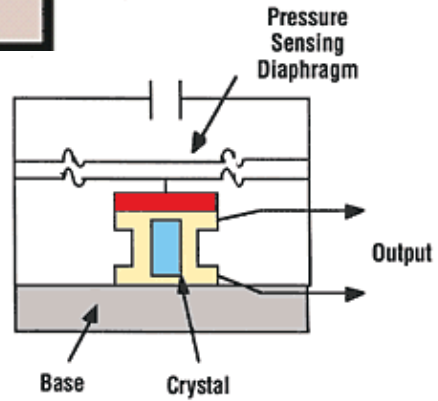
Industry standard

Quick response

Large operating temps







http://www.ni.com/white-paper/3639/en/#toc2R

Types - Resonators

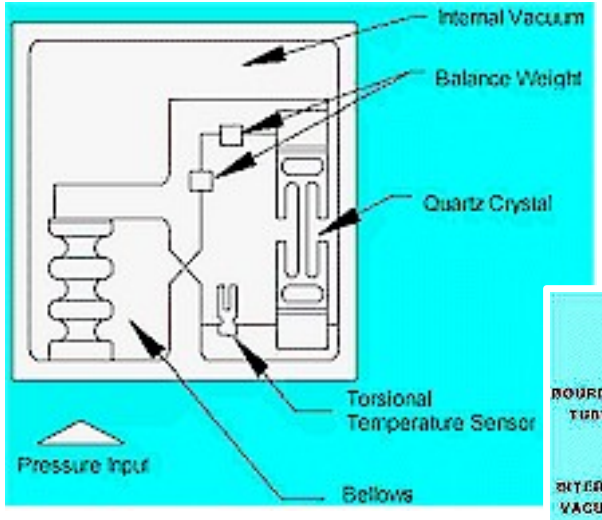
Quartz Crystal Resonator

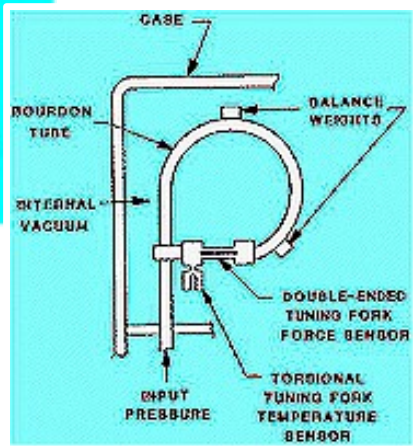
P acts on the bellows to generate a force and torque about the pivot and compressively stress the resonator

Detects changes in resonate freq of crystal

Very stable over time

$$$





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http://www.paroscientific.com/qtechnology.htm

Measuring pressure

Position in water column

Tides

Waves

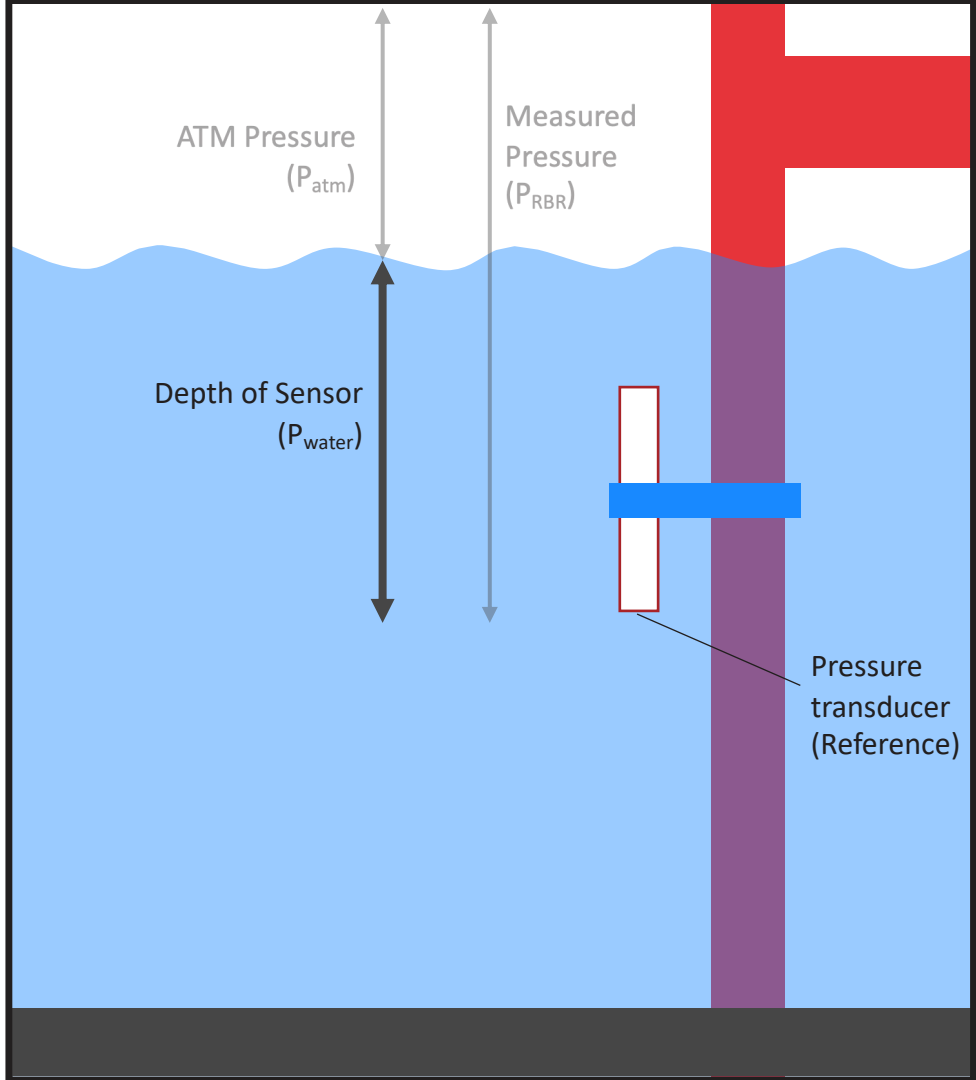
$$P_{RBR} = P_{water} + P_{atm}$$

Wave Tips

Short Periods: Fast sampling & shallow deployment

Long Periods: ~100 cycles the longest period of interest

(20sec waves need 2048sec long burst)



Inside The Logger

Batteries

WHO CHANGES BATTERY	PROS	CONS
NON-REPLACEABLE	Low upfront costs	Disposable instrument Not very green
MANUFACTURER	Consistent endurance ? Forces servicing ?	$$$ Return to factory Downtime Void warranty if DIY
USER (w/ proprietary packs)	Consistent endurance Field serviceable Compact	$$$ Lead times Always need extras
USER (off the shelf)	Cheap (esp in bulk) Easy to source Conducive to emergencies	Variable quality options are available

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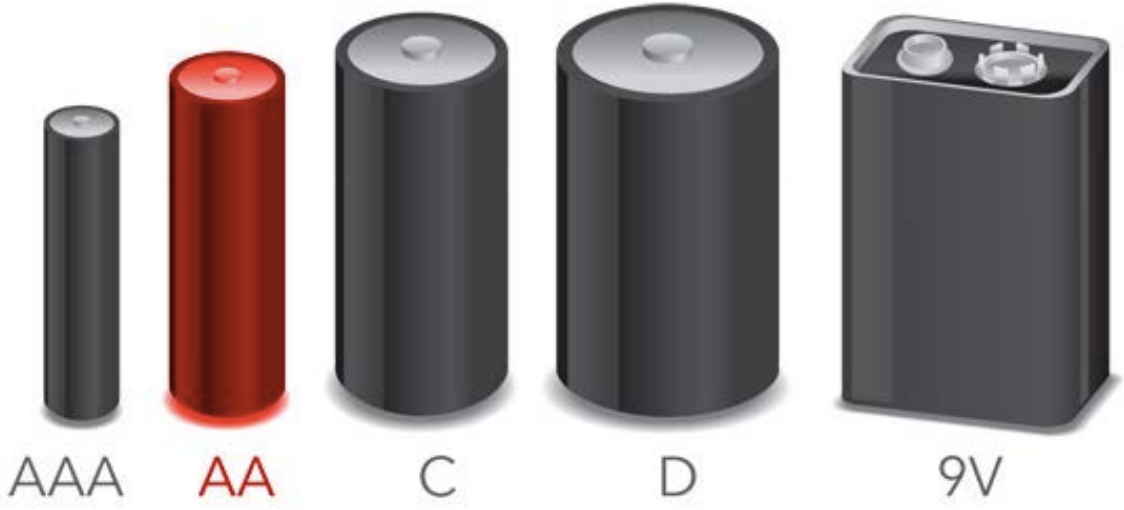
Use name brands

- Follow mfg recommendations
  - Basis for endurance estimates
- Consistent, Stable & Predictable

Rechargeable

- Greener… sure, but...
  - Lower energy density
  - Variable capacity
  - Capacity loss over time/#recharges
- Real world test before deployment
- Best saved for really short/low-power applications



AA Batteries Everywhere

LiSOCl2

LiFe

Zn/MnO2

Li-ion

NiMH

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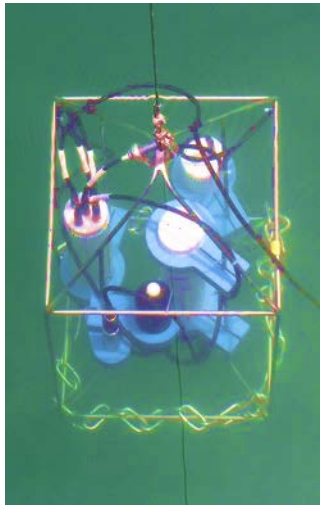
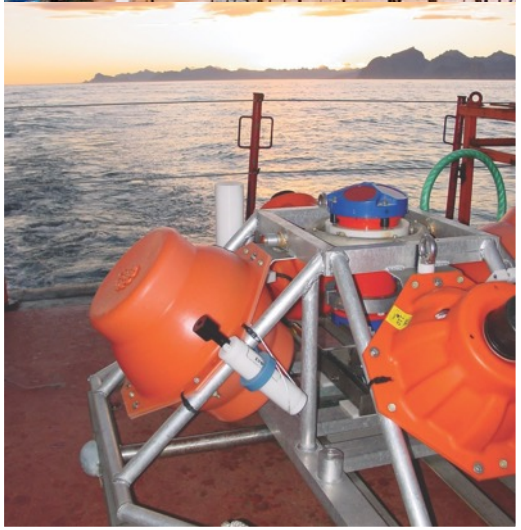
Batteries – How?

Batteries – How?

Now uses size AA

Mounting Loggers





Mounting Sensors Correctly

CTD

PAR

Optical Fluorometer

Dissolved Oxygen

Trans-missometer

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Flat Part?

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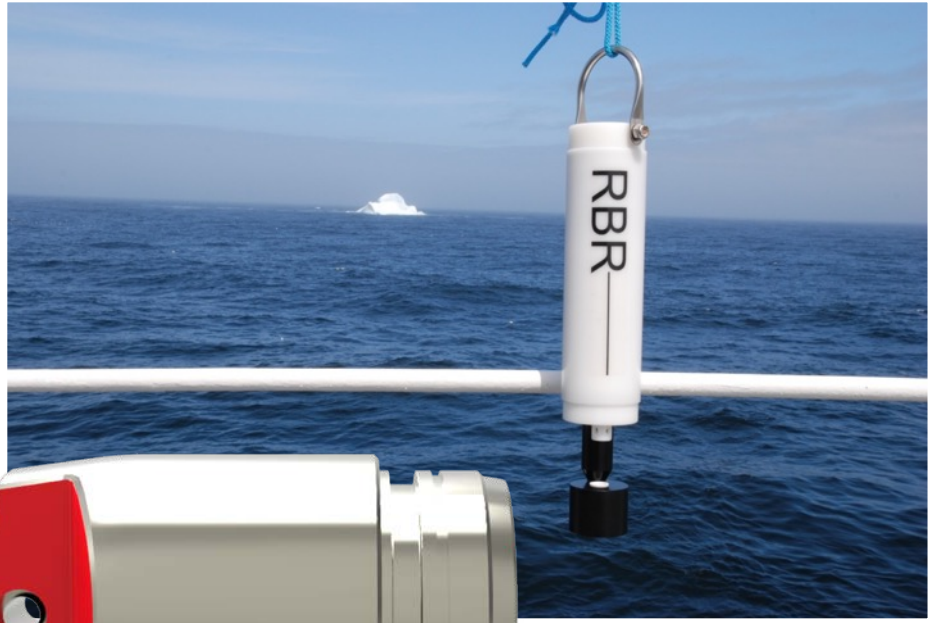
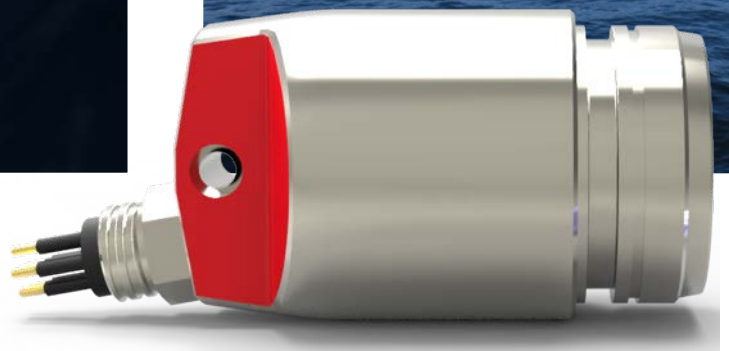
What's the hole for?





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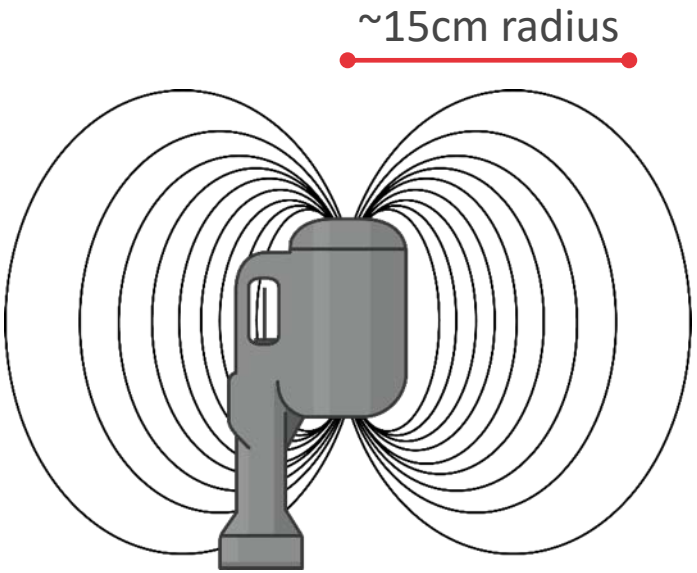
What’s the hole for?

Proximity Effect

- ~15cm radius from the C-cell
- ~80% measurement inside ceramic; ~20% measurement outside
- Calibrated to fixed volume of water in sensing area
- Proximity effect is equally related to conductive and non-conductive materials



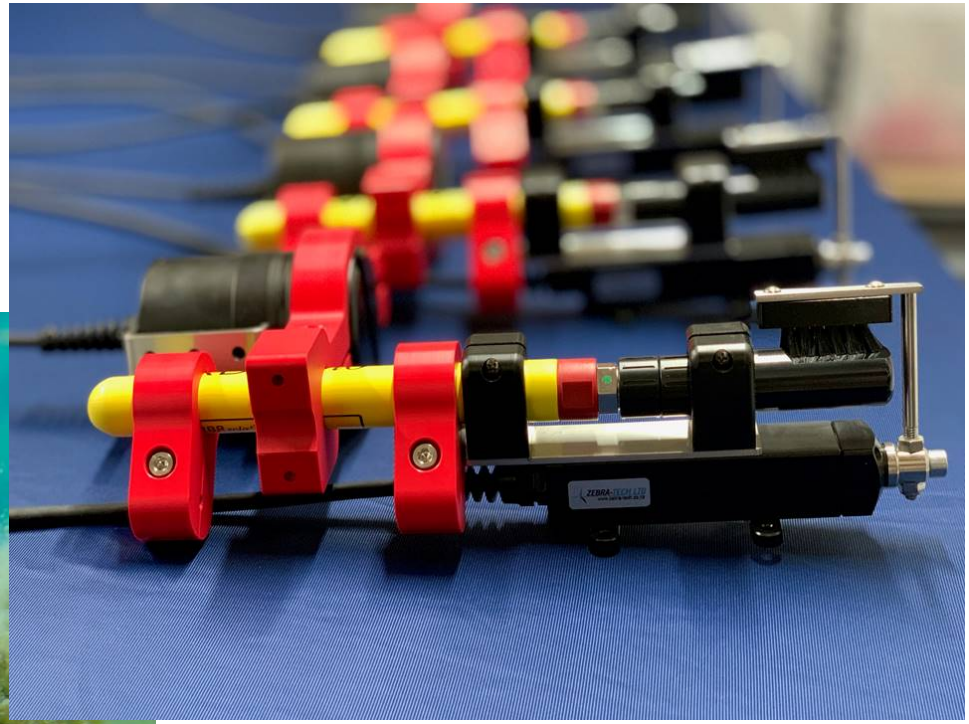
Proximity Effects

75mm clamp

150mm clamp

Long	0.000 05 PSU difference
Short	0.002 49 PSU difference
Spec	0.003 00 PSU

Applications: Sensors



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Practical Maintenance

Most maintenance related to consumables

- Batteries
- Desiccant
- O-rings
- Connectors & Cables

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Desiccant

Who, what, where, when, why, and how?

You! Don’t rely on mfg’s

Drying agent

It absorbs water!! Don’t put it on the electronics!

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Desiccant – When?

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Desiccant – When?

Reuseable → dry in oven or microwave

New → Used → Bad → Very Bad

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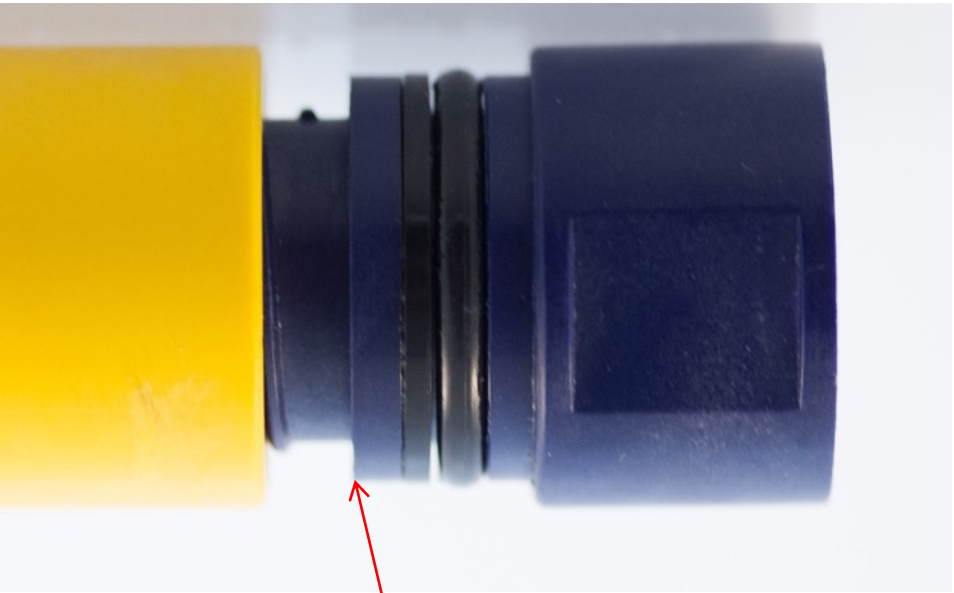
Who, what, when, where, why, and how?

You again

At least on the part that you open.

Mfg servicing includes ALL o-ring changes.

O-Rings – Where?



O-ring releases BEFORE threads

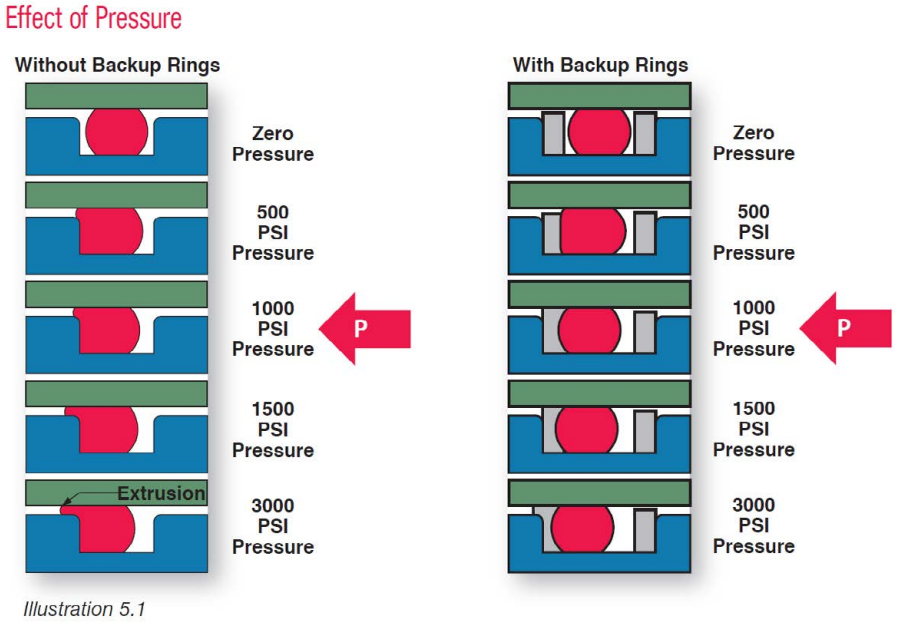


Illustration 5.1

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EVERY TIME THE LOGGER IS OPENED

Inspect

Clean hands (gloves?)

Lint free wipes

O-ring (silicone) grease

Physical Inspection

Smooth Glossy Finish

Cleaning

Vinegar?

Abrasives

Scour pads, brushes, sandpaper, swabs

Sometimes ok, sometimes destructive

Know how the sensor works

Thank You

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