
Fwd: Non-Magnetic Oxygen Sensors Fitted to JFD Dive Sets

1 message

Steve Nixon <steve.nixon@vandagraphst.com>

29 October 2020 at 12:37

Reply-To: steve.nixon@vandagraphst.com

To: S.Channing@jfdglobal.com

Dear Sam

Sorry for the delayed response, please see my notes added below.

Steve

----- Forwarded message -----

From: **Sam Channing** <S.Channing@jfdglobal.com>

Date: Wed, 21 Oct 2020 at 14:28

Subject: RE: Non-Magnetic Oxygen Sensors Fitted to JFD Dive Sets

To: steve.nixon@vandagraphst.com <steve.nixon@vandagraphst.com>

Hi Steve,

Thanks for getting back so quickly to me on this.

To answer your questions below:

The other 2 cells we had returned 1x had a PCB fault and 1x had a cable failure. **So, two of the sensor housing modules had developed faults during use?**

In the case of the 7 none had been straight out of the pack. There serial numbers are as detailed below:

SERIAL REC DATE

100119 10/12/18 shipped 06/12/18

100123 10/12/18 shipped 06/12/18

100357 03/01/19 shipped 20/12/18

100389 03/01/19 shipped 20/12/18

100684 28/01/19 shipped 22/01/19

100831 28/01/19 shipped 22/01/19

100832 28/01/19 shipped 22/01/19

Regarding the other seven, what do you mean straight out of the pack? Can you confirm that they had not been in use in a rebreather? If just stored, are the sensors exposed to air?**The sensors are manufactured with a connector attached, which is used during production and QA testing. As instructed by JFD the connector is then removed prior to supply to JFD. The sensors are supplied to JFD in gas barrier bags, in which they can be stored.****My understanding is that upon receipt:**

- 1) JFD will now test the sensors for fit.**
- 2) The sensors are non-mag tested. In the gas barrier bags?**
- 3) Sensors are then stored, in gas barrier bags?**
- 4) Sensor output wires are cut to length and fitted to the JFD 3-way sensor housing module. The modules are then tested?**
- 5) Modules are stored or put into use. Can you please verify how the modules are packed during storage and transportation?**

Separate to these I have been told we have experienced 3 cells that have been straight from the packed and showed the same issue. There serial numbers are as follows:

101494

101646

101489

When you say: "straight from the packed", are you referring to the gas barrier bags or JFD packaging? Were the sensors tested immediately or were they exposed to air and allowed time to recover from storage?

All 3 had been issued from our stores to the shop they had not been sitting in any extremes of temperature and had been in their original packaging.

Would you be able to confirm if the issues we are seeing are nothing out of specification if we returned these cells to you for test?

Can you please return the three sensors to us quoting the returns number: **SRS67631**

101494

101646

101489

Steve

Cheers

Sam

Sam Channing Quality Manager



S.Chan

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From: Main Account <viamedinbox@gmail.com> **On Behalf Of** Steve Nixon

Sent: 20 October 2020 17:36

To: Sam Channing <S.Channing@jfdglobal.com>
Subject: Fwd: Non-Magnetic Oxygen Sensors Fitted to JFD Dive Sets

Dear Sam

A couple of weeks ago Duncan mentioned that you had been experiencing some issues.

Your report is of concern, but over the last ten years we haven't had longevity issues regarding the sensor design. The sensors are past the warranty period, but of course we can have a look at some examples. You say that out of a batch of 7 returned sensors, 5 had failures. What was the conclusion regarding the other two sensors? Do you have the serial numbers of the sensors concerned?

If the sensors have been in use, then of course in a rebreather application it is expected that the sensors could be consumed during normal usage. Once the sensors are in use, many OEMs advocate replacing the sensors as part of PPM programme, for example 12 – 18 months. From your description it sounds like the sensors are current limited which is symptomatic of what would happen during use as the sensors age and are consumed.

Or have the sensors not been used, if this is the case how and where have they been stored?

All specifications are applicable at standard conditions: 1013 mbar, 25°C dry ambient air

Regards

Steve

Steve Nixon

Director - Vandagraph Sensor Technologies Ltd.

Mobile: +44 (0)7850 252267

From: **Sam Channing** <S.Channing@jfdglobal.com>
Date: Tue, 20 Oct 2020 at 10:40
Subject: Non-Magnetic Oxygen Sensors Fitted to JFD Dive Sets
To: info@vandagraph.co.uk <info@vandagraph.co.uk>

FAO

Vandagraph Quality Manager,

Please let me introduce myself I am the Quality Manager for JFD Westhill in Aberdeen and I would like to speak to your Quality Manager about issues we have been experiencing with oxygen cells supplied to JFD from yourselves.

We have been recently getting reports of what seems to be premature failures of the cells of a batch of 7 returned to us 5 had oxygen cell failure. Of which, all were in excess of 18 months old. Two sensors had two cells failed, the remainder had one cell failed.

The symptoms of each cell failure were the same but with varying severities. The higher in the cells output range (ie the higher the partial pressure of oxygen), the more the cells were under-reading – ie for an applied partial pressure of 2.300 Bar, the cells were reading 1.900 Bar, where the allowable tolerance is +/- 0.100 Bar in both our AITP and the part specification.

We are concerned that it may be the start of a longevity problem with the oxygen cells – because there weren't any indications of misuse or damage. In terms of identifying the physical cause as to why this would be the case – hence why we would want to involve Vandagraph as we don't have the expertise to look at anything inside the oxygen cell.

We've compared the results during the investigation to the test results from the point where we populated the sensor with the cells – we've been using our standard production/servicing test procedure as the basis for testing so they are like for like tests.

The cells were all within spec at the point where we populated the oxygen sensor, and in most cells there has been significant degradation from the original test results. The cells were almost certainly in spec at point of supply and there is historical test results to support this.

The specification to the part number of oxygen cell which we receive from Vandagraph states an operation life of "greater than two years in air". The failures we've been seeing are at between 18-21 months so are not conforming to the specification.

The reason we use the proviso 'may be' is that in the three batches from which these cells originate, there are 774 cells total, of which I so far only have 7 confirmed cell failures (0.9%) the status of the remainder is unconfirmed (although there are a lot of noise coming from our customers with regard to this). We have not retrospectively looked at sensor repopulations to see if some of that 774 have already been replaced within the 24 months.

Would it be possible for you to look at the failed cells and see that they have been exposed to some condition that they are not designed to handle, but which is not immediately obvious externally (we can't inspect the cell internally).

I look forward to your reply.

Best Regards

Sam



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