

# ATEX Dust Supplement Series 9 OEM Gauge



Publication Reference : 120/16713-01

Issue A

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## **ATEX Dust Supplement – Series 9 OEM Gauge**

Part Number: 120/16713-01

Issue: A

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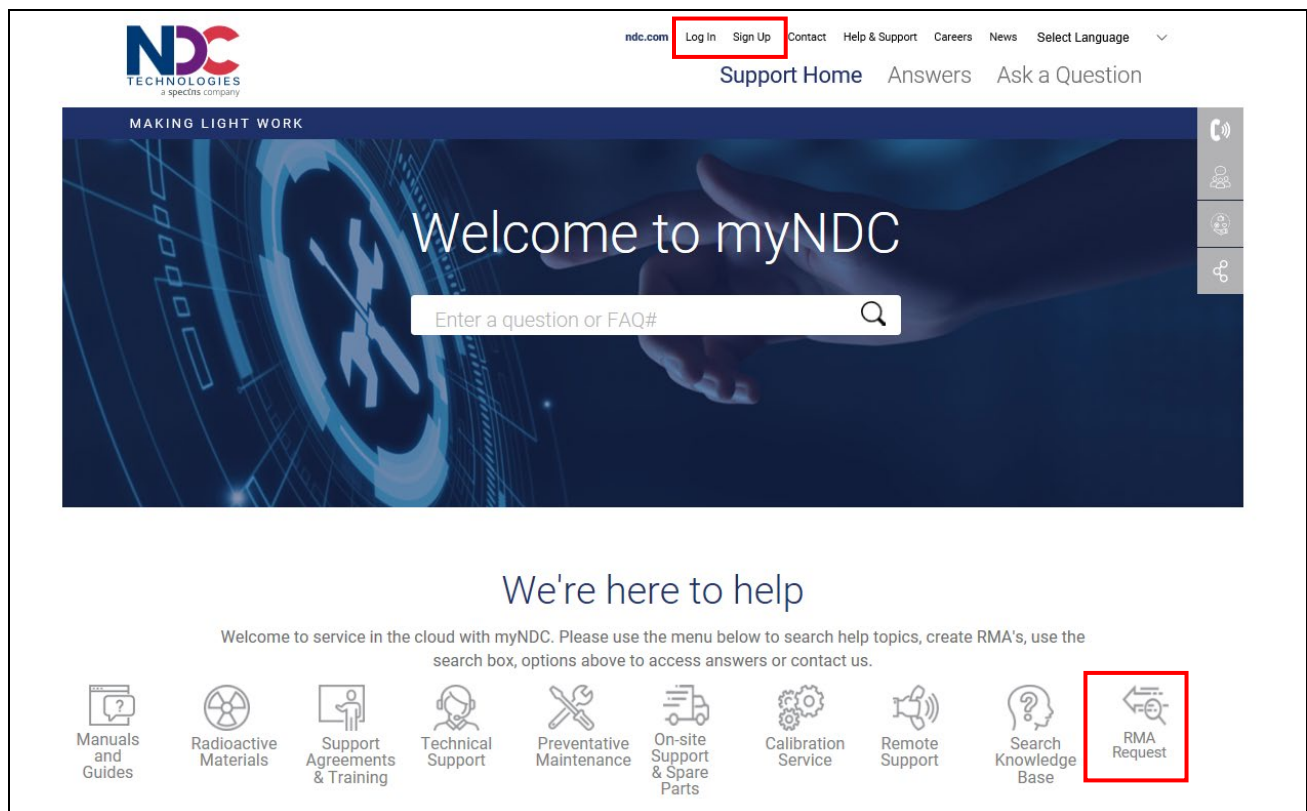
# 1 Contact NDC

## Online Support

You can access the NDC Customer Support portal, myNDC at <https://ndc.custhelp.com>.

myNDC is a cloud-based portal that allows you to get product support by phone, ask a question, provide feedback, submit an RMA request or access information in our on-line knowledge database. You can browse the myNDC site or create a myNDC account.

- To create a myNDC account, click **Log In** or **Sign Up**. After creating the account, you will be immediately logged in. To log in on subsequent visits to myNDC, click **Log In**, enter your user name and password, and then click **LOG IN**.
- To submit an RMA, click on **RMA Request** and follow the on-screen instructions.



# NDC Contact Numbers

Please have your sales order number at hand before contacting NDC.

<b>Americas</b>	+1 626 939 3855
<b>Asia Pacific</b>	<p>NDC Asia Pacific Customer Service Toll-free contact numbers:</p> <ul style="list-style-type: none"> <li>• Thailand: 1800 012 048</li> <li>• Indonesia: 00 1803 016 4969</li> <li>• Korea: 00 7981 420 30749</li> <li>• Malaysia: 1800 81 9290</li> <li>• Taiwan: 00 801 128 027</li> <li>• India: 000 800 0402 514</li> </ul> <p>Singapore non toll-free number: +65 6579 2411</p> <p>Email ID: <a href="mailto:osc-apac@ndc.com">osc-apac@ndc.com</a></p>
<b>Japan</b>	+81 (0)3 3255 8157
<b>China</b>	+86 21 61133609
<b>EMEA (Europe, Middle East, Africa)</b>	Germany: 0800 1123194
	Italy: +39 0331 454 207
	<p>All other countries (English speaking): +44 1621 852244</p> <p>Please select option 2 to be connected to the service team</p>

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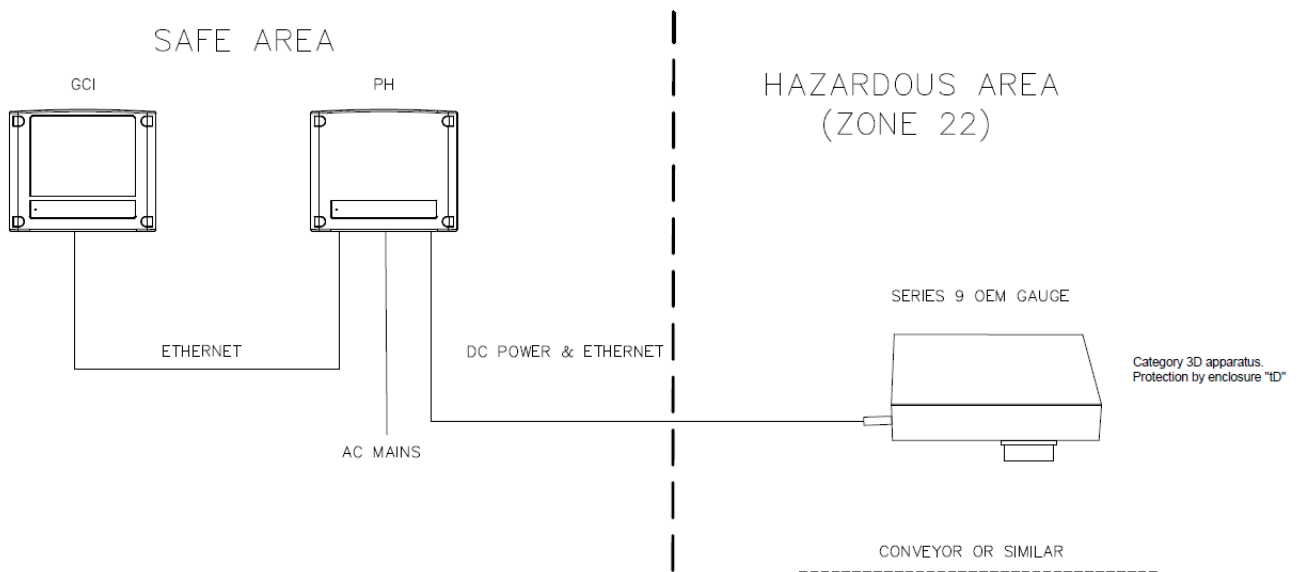
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# 3 Introduction

The following ATEX supplement is intended to cover the special aspects of the Series 9 OEM Gauge that make it safe for use in potentially explosive DUST environments and should be read in conjunction with the main User guide for the equipment. Its intended as a guide and assumes that the user fully understands the safety requirements for the intended Hazardous Area where the equipment is being installed, operated and maintained and takes full responsibility to ensure the requirements are met.

The Series 9 gauge is Self-certified by NDC Technologies through EC Type testing to comply with the following standards; EN60079-0:2018 and EN60079-31:2014 Dust ignition protection by enclosure "t" with the Gauge rated as Cat.3D suitable for dust Zone 22 as per marking.

The Series 9 gauging system layout is shown below in respect to the Hazardous area locations.



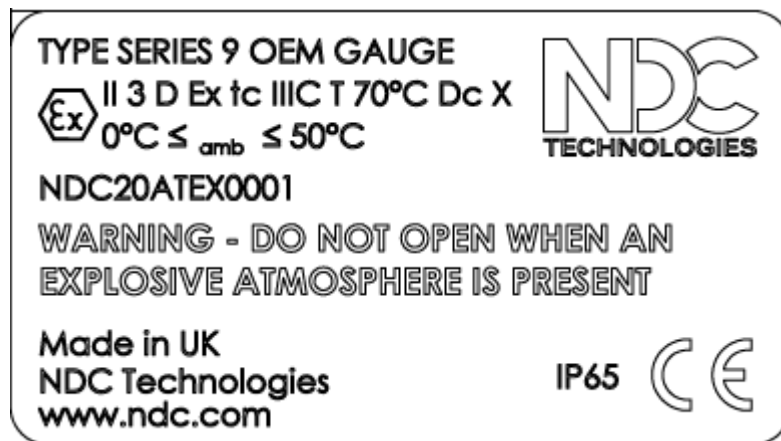
## Limitations warnings (X):

Although the Gauge is fitted with a Sapphire viewing window (ten times tougher than glass), it must be located in an area where there is low risk of impact due to its viewing window.

If the DC Power & Ethernet cable is disconnected from the Gauge, the captive dust tight caps must be fitted over the connectors.



Marking for 3D:



Limitation of use X:

The Gauge is fitted with a Sapphire viewing window (ten times tougher than glass), it must be located in an area where there is low risk of impact due to its viewing window.

If the DC Power & Ethernet cable is disconnected from the Gauge, the captive dust tight caps must be fitted over the connectors.



## 4.1 Battery warning

Note that the Gauge contains a 3v Primary battery as per the details below:

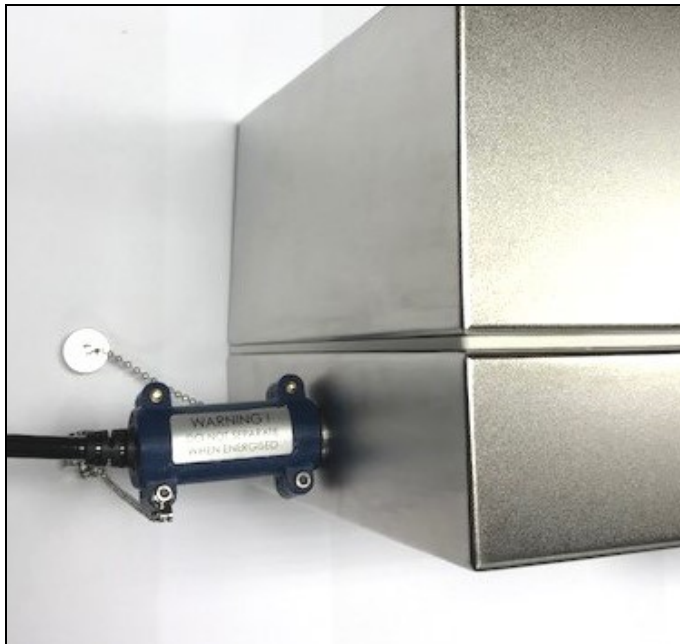
Type: Coin Poly-Carbonmonoflouride Lithium with solder tags

Manufacturer/Part No.: Panasonic BR1225A/HBN

Mounting: Soldered into the DBRIC board.

Do not attempt to replace the battery – please consult NDC.

## 4.2 Connector clamp – fitting and removal



To prevent the Gauge plug/socket from being easily disconnected without a tool, the connector clamp must always be fitted as shown in the photo above as follows:

Insert the cable connector socket into the Gauge plug and tighten the screw ring lock in a clockwise motion. The connector clamp can then be fitted, located on the connector nut and secured in place by tightening the 4 x captive screws with a 3mm Allen key. Ensure the clamp is securely in place by observing no gap between the two halves.

Ensure the warning label “Warning! Do not separate when energised” is in place.

If the connectors are to be separated for any reason, make sure that power is removed and isolated first from the Gauge's GCI/PH before removing the connector clamp and separating, then fit the sealing caps as shown in the second photo by screwing in place until tight which will prevent ingress and a possible short circuit.



## 4.3 Removing the Gauge lid and fitting a new seal

The two halves of the Gauge enclosure are held in place using the 6 x M5 captive screws located in the base section (item 1 in the exploded Gauge view) and must all be tightened to a torque of 2.5Nm to ensure a good seal.

If the enclosure needs to be opened for servicing, do this only when the explosive atmosphere is NOT present.

To remove the enclosure lid, first disconnecting the services connector as per previous section and then loosen the 6 X captive screws using an 4mm Allen Key – remove the lid to reveal the opto-electronics in the box.

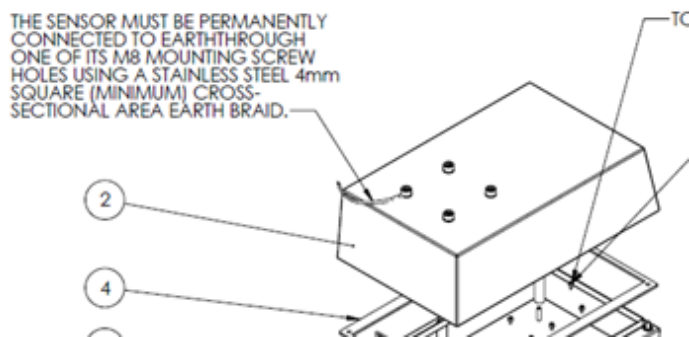
Refitting is the reverse procedure but first check the gasket seal (item 4) for any damage and if necessary replace with a new seal as per the steps below. Fit the screws loose initially to align and then tighten diagonally using 4mm Allen Key torque wrench until all 6 x screws are torqued to 2.5Nm.

1. Remove the old seal by peeling away from the lid flange.
2. Remove any residual adhesive with a solvent (IPA) from the lid flange.
3. Take the new seal (Part No. 120/16348-01), remove the backing tape and carefully align with the lid flange ensuring the mounting bosses are central in the cut outs and the edge is flush before pressing firmly in place.

# 5 Electrical

## 5.1 Earthing the Gauge

The Gauge must be permanently connected to earth through one of its M8 mounting screw holes, as shown in the thumbnail sketch below using a 4mm square (minimum) cross-sectional area earth braid with M8 ring terminal and Stainless Steel M8 fixing and star washer to hold in place.



## 5.2 Gauge Services cable connection to the GCI/PH

The Series 9 Gauge is connected to the GCI/PH through the services cable supplied with the Gauge.

The cable must be routed through the gland closest to the “ETH2 24v” screw terminal connector terminations as given in the following table and photo.

Wire Colour	“ETH2 24v” terminal	Function
Pair 1 White	Tx-	Ethernet Tx-
Pair 1 Orange	Tx+	Ethernet Tx+
Pair 2 White	Rx-	Ethernet Rx-
Pair 2 Green	Rx+	Ethernet Rx+
Pair 3 White	UNFUSED +	Power output +24Vdc
Pair 3 Brown	UNFUSED +	Power output +24Vdc
Pair 4 White	UNFUSED -	Power output 0Vdc return
Pair 4 Blue	UNFUSED -	Power output 0Vdc return

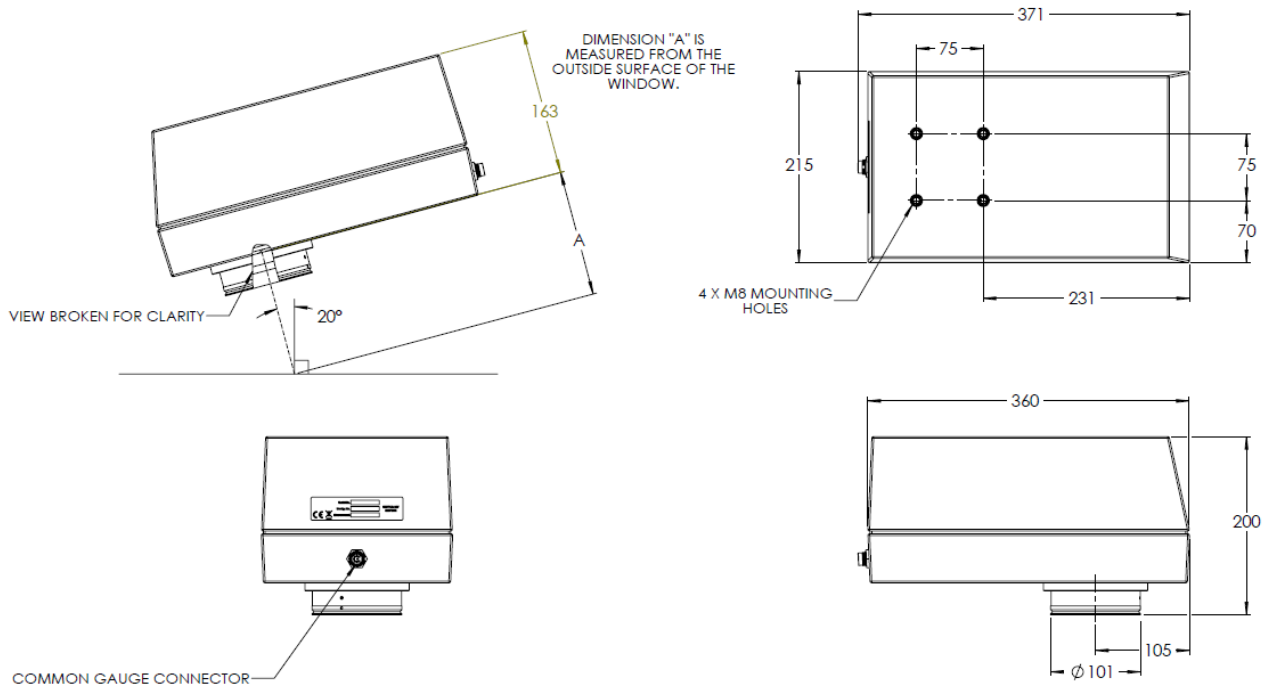


To clamp the cable securely and form a good seal, the gland nut must be tightened with a 20mm A/F torque wrench to 3.5Nm.

# 6 Physical Size and ratings

## Series 9 Gauge

DC input:	24Vdc +10% -20%, 35W
Digital communications:	Ethernet TCP/IP
Mounting:	Top face through 4 x M8 threaded holes
Environmental sealing:	IP65
Maximum surface temperature:	70degC at an ambient of 50deg still air
Ambient temperature range:	0°C to 50°C
Storage temperature range:	-30°C to 70°C
Relative Humidity:	80% over full temperature range
Weight:	8.5Kg
Pollution degree:	Degree 1
Working distance (A):	230 mm +/- 100 mm (beam patch 60 mm diameter)
Air Purge:	Instrument quality compressed air, Ø6.0mm o/d tube, 20L/minute.
Dimensions:	See outline drawing below



# 7 Maintenance

## 7.1 Warnings and cautions

When carrying out any maintenance on the system, observe the following to avoid injury to personnel and damage to the equipment.

- If the gauge has been operating in very high temperature environment, allow adequate time for it to cool before handling.
- Compressed air can be dangerous. Isolate the Air Purge unit compressed air supply before working on a gauge.
- Do not power up the gauge when the case is open. The filter wheel rotates at very high speed and could cause injury.
- Gauge maintenance must be carried out in a clean room away from the working area of the equipment.
- While the gauge case is open, take care not to touch any optical surfaces.
- When working on any system components, observe standard anti-static precautions.

## 7.2 General cleaning

External surfaces of gauges and other system components should be cleaned periodically with a damp non-abrasive cloth only.

Keep cables and connectors free from contaminants that could cause chemical damage.

Clean gauge windows as described below.

*Caution: If solvents are needed to remove contamination, it is essential to consult the Customer Care Department of NDC or their agent first, giving precise details of the solvent.*

## 7.3 Cleaning gauge windows

Clean the gauge window using a soft lint-free cloth.

Where necessary, use warm water and a mild detergent. Do not use abrasive cleaners of any kind. If a solvent is needed to remove contaminants, contact NDC or their agents first.

## 7.4 Replacing the gauge source lamp assembly

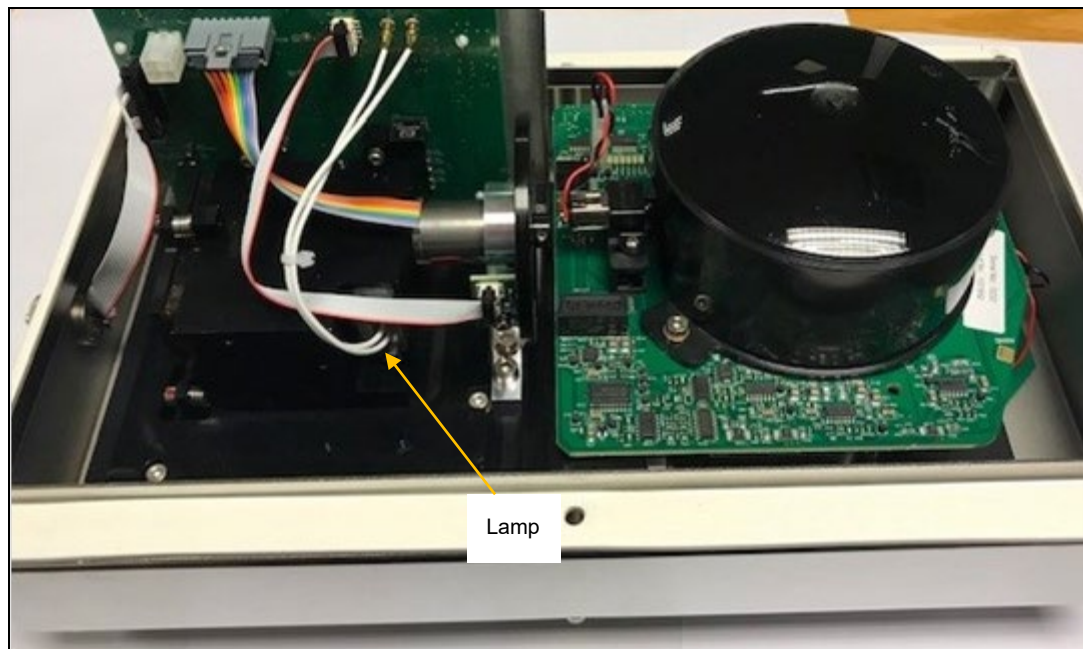
Remove power from the gauging system and ensure the explosive atmosphere is NOT present.

Remove the connector clamp from the services cable, disconnect from the Gauge and fit the sealing caps to the connectors.

Using 4mm Allen key, undo the 6 fixings screws in the base to remove the lid.

Place the base looking downwards on a flat clean surface.

Locate the lamp, as indicated in the picture below.



Unplug the two lamp assembly leads.

Undo the two lamp fixing screws with 2.5mm Allen key and withdraw the lamp assembly from its mount.

Fit the new lamp (part number 120/16107-01SA) and reassemble the Gauge using the reverse of this procedure. Take care not to touch the lamp glass as this may cause lamp failure.

If accidental contact is made, clean the glass with isopropyl alcohol (IPA).

Switch the gauge on and allow 2 hours for it to reach full operating temperature, then auto-reference the gauge.



## 7.5 Replacing the filter wheel motor

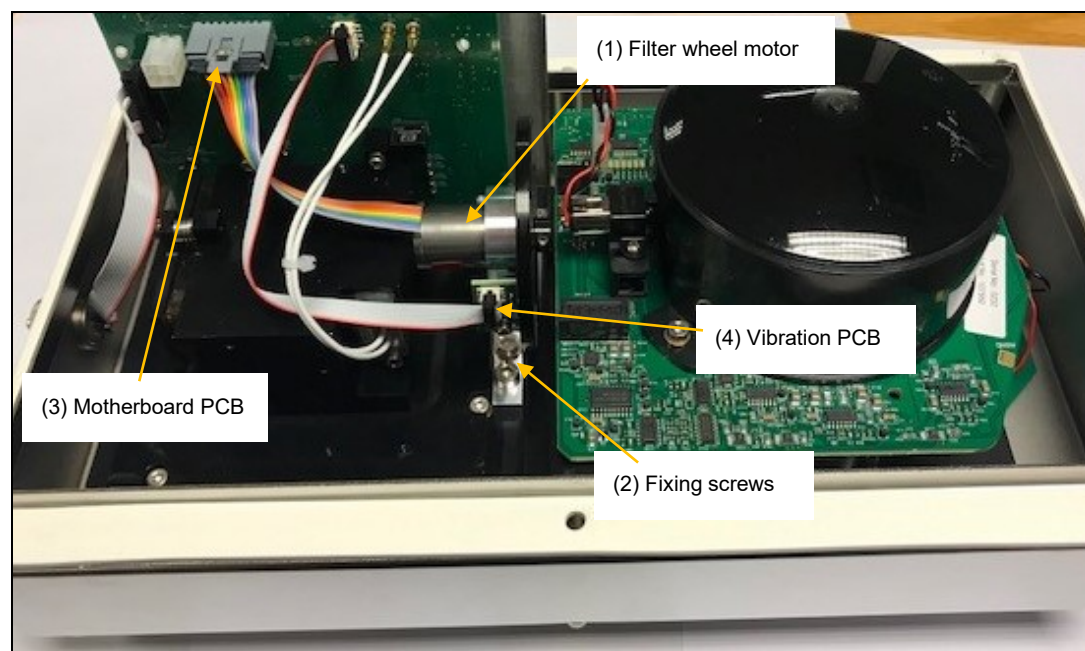
Remove power from the gauging system and ensure the explosive atmosphere is NOT present.

Remove the connector clamp from the services cable, disconnect from the Gauge and fit the sealing caps to the connectors.

Using 4mm Allen key, undo the 6 fixings screws in the base to remove the lid.

Place the base looking downwards on a flat clean surface.

Locate the filter wheel motor (1), as indicated in the picture below.



Unplug the filter wheel motor ribbon cable connector from the motherboard PCB (3).

Unplug the vibration PCB (4) ribbon cable connector.

Undo the filter wheel motor assembly fixings screws (2) with a 4mm Allen key.

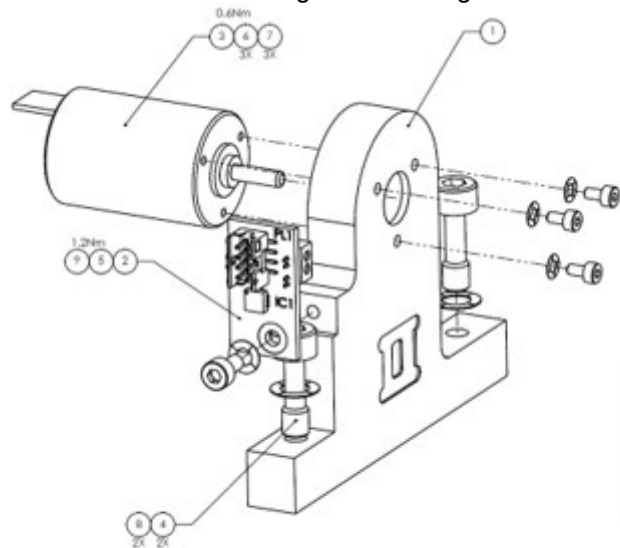
Lift the filter wheel assembly away from the Chassis. Do not touch the optical surfaces of the filter wheel. If accidental contact is made, clean the optical surfaces with isopropyl alcohol (IPA).

Note the orientation of the filter wheel, with the bush containing the grub screw towards the end of the motor shaft.

Loosen the grub screw and carefully withdraw the filter wheel from the motor shaft.

If the filter wheel does not come off easily, do not attempt to pull it off as this may damage the motor bearings. Instead, grip the wheel by its edges and use a small Allen key or similar tool to push the motor spindle out from the wheel.

Remove the 3 x motor fixing screws using 1.5mm Allen key as shown in the picture below.



PART NO.	PART NUMBER	DESCRIPTION	QTY.	UOM
1	120-16282-01	MOTOR MOUNTING BRACKET 16 FILTER	1	EA
2	660799	VIBRATION/SYNC BOARD ASSEMBLY	1	EA
3	ICS MO/0387-06	MOTOR BRUSHLESS (DIA 22mm) (24V)	1	EA
4	105/15895-01	SCREW CAPTIVE M3x16 SHCS SS	2	EA
5	FX/0176-01	SCREW M3x0.5 x 6mm LOI SHCS SS	1	EA
6	FX/13119-03	SCREW M3x2 x 4 SHCS SS	3	EA
7	FX/0167-02	WASHER M3 CRINKLE BRN/Cu	3	EA
8	FX/0167-02	WASHER M3 CRINKLE BRN/Cu	2	EA
9	FX/0167-04	M3 CRINKLE WASHER CRINKLE BRN/Cu	1	EA

If the instrument is within the warranty period, return the faulty motor to NDC Infrared Engineering for replacement. If not discard the motor.

Fit the filter wheel to the new motor (MO/0387-06).

If the wheel is a tight fit, do not attempt to push it on while holding the motor. Place the back end of the motor shaft against a hard surface and then push the filter wheel on as far as it will go.

Tighten the filter wheel grub screw.

Fit the motor assembly and reassemble the Gauge as a reversal of the previous steps.

Switch the gauge on and allow 2 hours for it to reach full operating temperature, then auto-reference the gauge.

## 7.6 Replacing the referencing motor

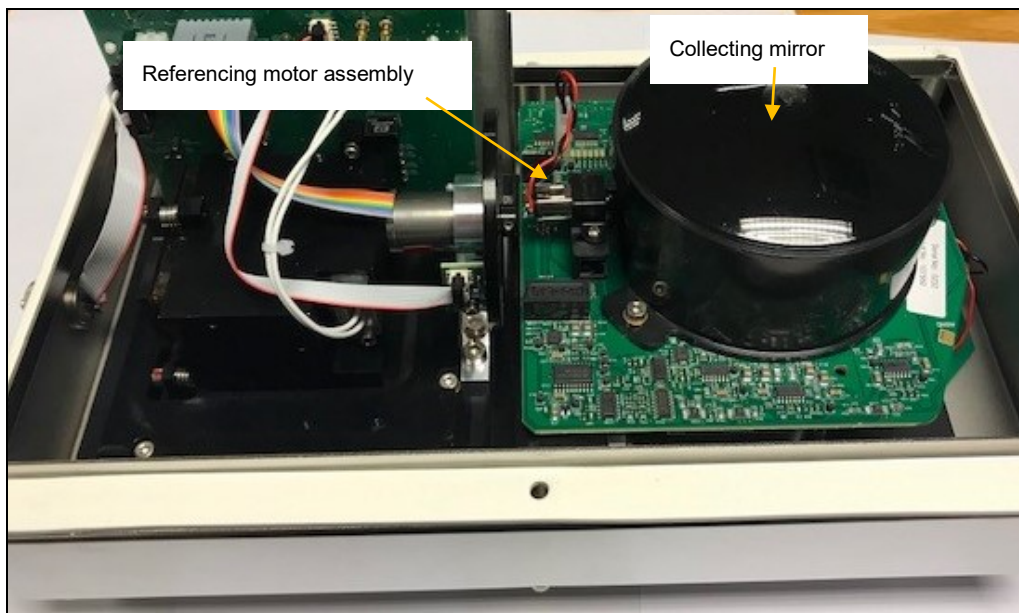
Remove power from the gauging system and ensure the explosive atmosphere is NOT present.

Remove the connector clamp from the services cable, disconnect from the Gauge and fit the sealing caps to the connectors.

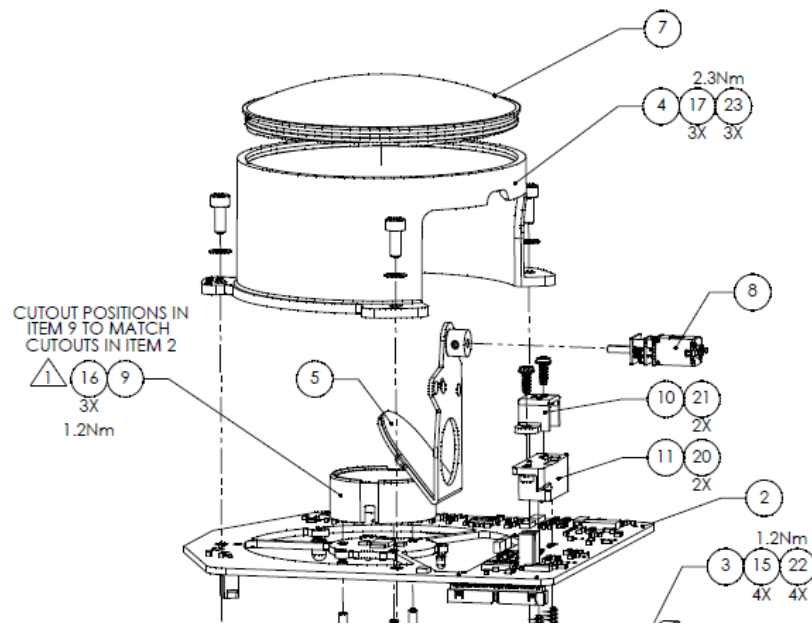
Using 4mm Allen key, undo the 6 fixings screws in the base to remove the lid.

Place the base looking downwards on a flat clean surface.

Locate the referencing motor, as indicated in the picture below.



Remove the collecting mirror by removing the 3 x M4 screws (item 17 below) with a 3mm Allen key and carefully lift away and store carefully.



Carefully unplug the motor lead and remove the two pozi drive screws securing the reference motor clamp (8, 10, 21) and lift away the motor and reference paddle (5).

Remove the reference paddle from the motor shaft by undoing the grub screw and sliding off the shaft.

Fit the reference paddle to the new motor, by sliding along the motor shaft until it bottoms out and tightening the grub screw.

Reassembly as a reversal of the previous steps.

Switch the gauge on and allow 2 hours for it to reach full operating temperature, then auto-reference the gauge.

## 8 Warranty

1. All sales of NDC Technologies products are subject to the contractual terms and conditions of the Order pursuant to which they were sold to Buyer, including Warranty terms. The following terms are a general summary of the contractual Warranty terms, NOT a revision or alternative to the contractual terms, and are presented as merely a point of reference for your information. The contractual Warranty is the complete and exclusive statement of all NDC Technologies warranties to Buyer. In the event the following terms are in conflict with any of the contractual Warranty terms, the contractual Warranty terms shall be deemed to control.

**The warranty terms contained herein are expressly in lieu of any and all other warranties, expressed or implied, including any warranty of merchantability or fitness for a particular purpose. In no event shall NDC Technologies be liable for any incidental, consequential or special damages, including but not limited to, any loss of business, income or profits, expenses incurred for time when the system is not in operation, and any labor costs relating to or arising out of the performance, functioning or use of the system.**

**Purchaser assumes the risk for use of this product and agrees to indemnify and hold NDC Technologies harmless for any and all damage to person or to property resulting therefrom.**

**NDC Technologies grants no license under any patent rights except the right, under only such patents as may be owned or acquired by NDC Technologies, to use the product sold hereby for the purpose for which it is sold. NDC Technologies does not warrant that the product or its use does not infringe any patent owned by persons other than NDC Technologies.**

2. NDC Technologies guarantees all products to be free from defects in material and workmanship for the following periods<sup>1</sup>:
  - Product and peripherals – 2 years from shipment
  - Source lamp – 5 years from shipment
  - Filter wheel motor – 5 years from shipment
  - Spare parts – 1 year from shipment
  - Replacement lamps and motors supplied under warranty – 1 year or up to the original 5 year warranty from shipment of the sensor, whichever is longer

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<sup>1</sup> Refer to the contractual terms and conditions of the Order for usage of the warranty.

During this period, NDC Technologies will repair or at its option replace, free of all charges for parts and labor, any NDC Technologies parts determined by it to have been broken or damaged due to causes other than improper application, abuse or negligence. NDC Technologies' obligation to repair or replace shall not extend to expendable parts which are subject to normal operating wear.

Nothing in this paragraph 2 will require NDC Technologies to make repairs or replacements where:

- A. The product has been repaired, other than by an authorized NDC Technologies dealer or an NDC Technologies employee, or altered in any way without the prior written consent of NDC Technologies; or
  - B. The product has not been properly maintained in accordance with any operating and maintenance manual supplied therewith; or
  - C. The product has been damaged as a result of fire, flood, war, insurrection, civil commotion, acts of God or any other cause beyond the control of NDC Technologies or Buyer.
- 3. NDC Technologies' liability shall be limited to the obligations set forth in Paragraph 2. These shall be the Buyer's sole and exclusive remedies, whether in contract, tort or otherwise, provided, however, that in lieu thereof, NDC Technologies at its option may replace the entire product on an exchange basis or refund the purchase price against the return of the defective product.
  - 4. NDC Technologies will not be responsible for failure to provide service or parts due to shortage of materials, labor or transportation strikes or delays, or any causes beyond NDC Technologies' control.
  - 5. Unless otherwise specified by NDC Technologies, all warranty repairs will be made at NDC Technologies' facility. The customer shall be responsible for all expenses of packing, freight and insurance in connection with the shipment of products to NDC Technologies for repair. NDC Technologies will pay the cost of returning the equipment to customer.

**If it is mutually determined by the buyer and NDC Technologies that the examination, replacement or repair takes place at the buyer's facility, then the buyer will be responsible for NDC Technologies' travel and living expenses incurred in traveling to and from the buyer's facility, and during the time of the visit, as well as the cost of field labor and replacement parts unless the parts being repaired or replaced are determined to have been defective, in which event the cost of said repaired or replacement parts shall be borne by NDC Technologies. These travel and living expenses will be billed to the buyer at actual cost to NDC Technologies.**

- 6. No person, including any NDC Technologies distributor, agent or representative, is authorized to assume any liability on behalf or in the name of NDC Technologies, and NDC Technologies shall not be bound to any understandings, representations, or agreements with respect to warranties except as set forth in this policy.
- 7. NDC Technologies requests immediate notification of any claims arising from damage in transit in order to determine if carrier responsibility exists. If damaged equipment arrives, save the shipping container for inspection by the carrier and telephone NDC Technologies as soon as possible.