

ATEX Dust Supplement

Series 9 Gauge with Colour option

Zone 22 Area

Std services cable

Sensor with ATEX Dust kit;
Connector lock, Connector
sealing caps/fixings and
ATEX labelling



Publication Reference : 120/17194-01

Issue A

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Part Number: 120/17194-01

Issue: A

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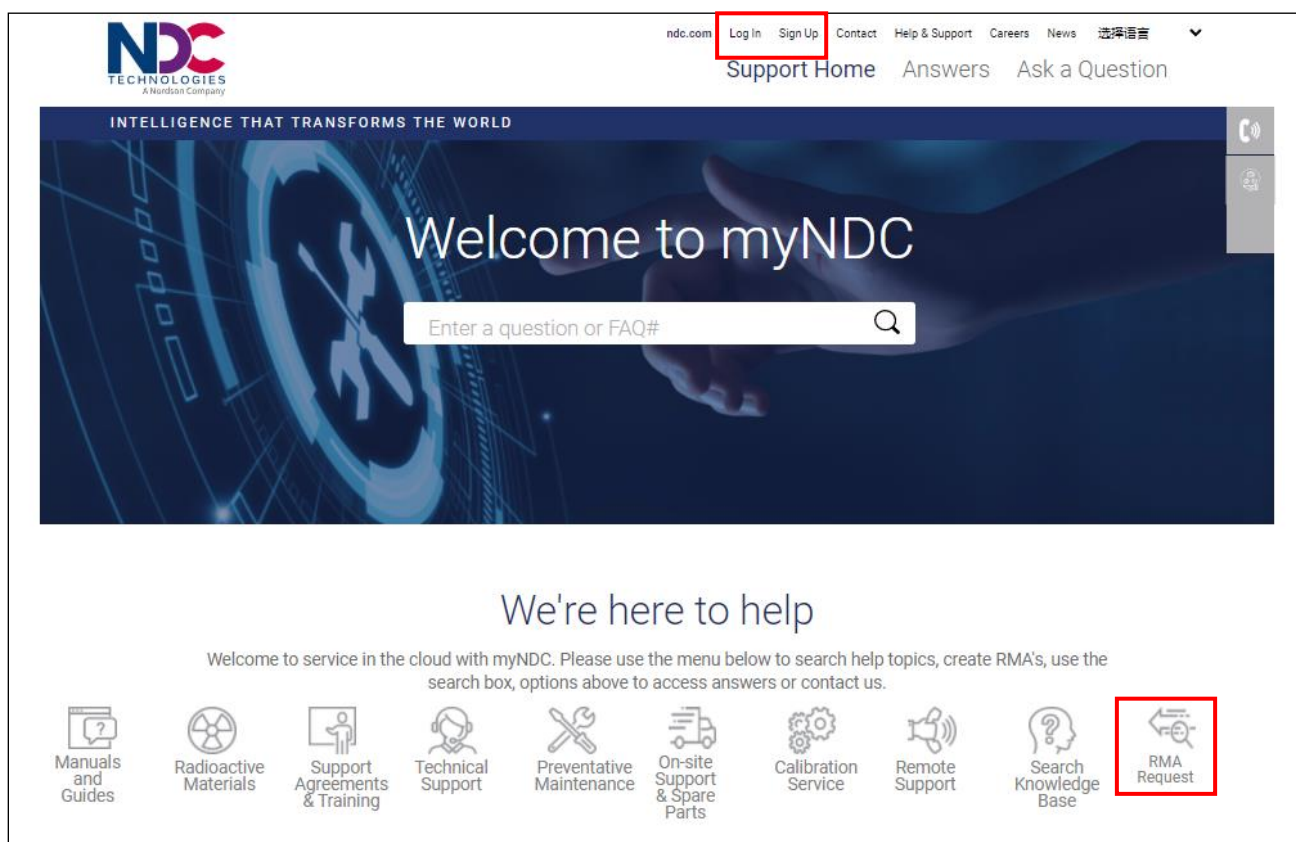
Contact NDC

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.

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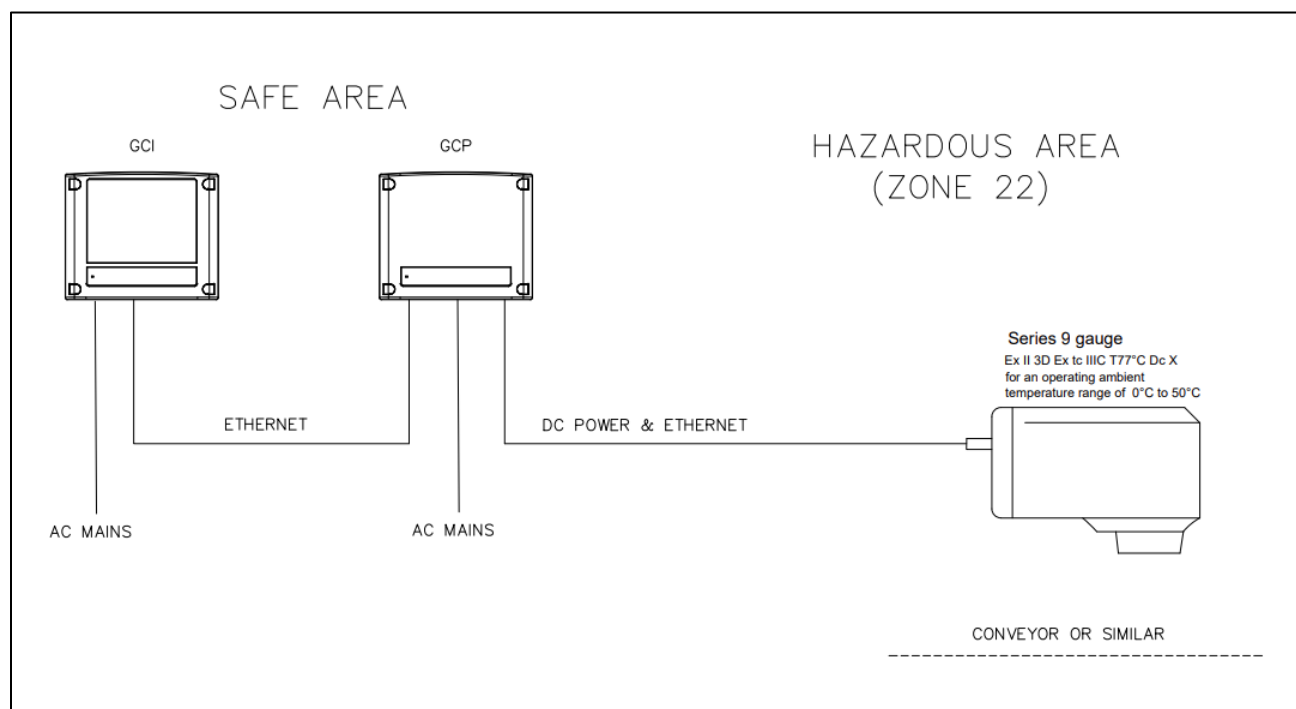
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1 Introduction

The following ATEX supplement is intended to cover the special aspects of the Series 9 Gauge with colour option 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. It is intended as an ATEX guide only 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 that the requirements are met.

The Series 9 gauge with colour option 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.

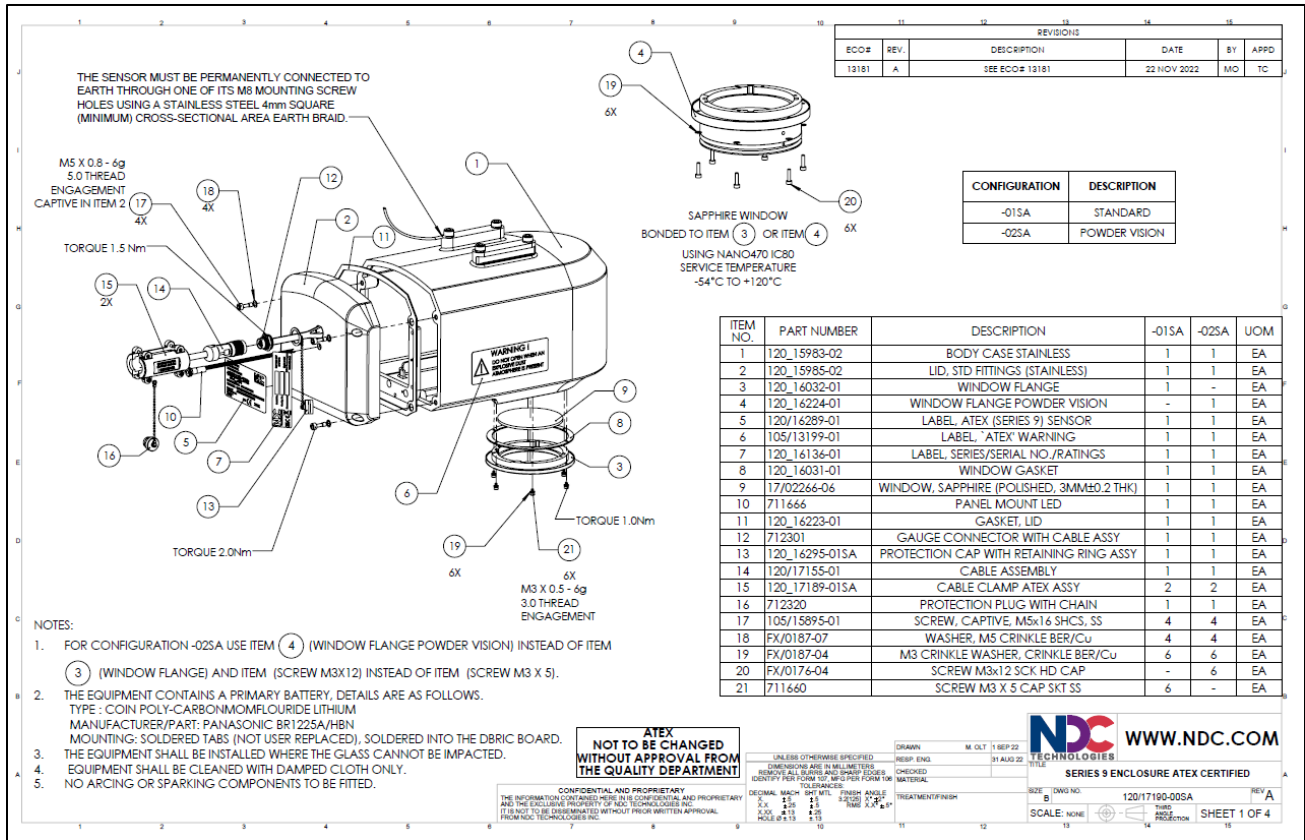
2 | Protection Employed

Note that the ATEX Series 9 Gauge is adapted from the standard with add-ons to make suitable for DUST Hazardous areas and Ex marked accordingly. Please check that the Hazardous area marking is in place before installing and putting into service.

The hazardous area protection employed is for combustible dust and uses protection type “t” which is a rugged dust tight enclosure, comprising the following key features:

- A Stainless-Steel enclosure comprising a body and lid with integral elastomer gasket seal to form a dust tight enclosure to IP6X
- Impact resistant Sapphire window
- Plug/socket connector clamp with warning label “WARNING – DO NOT SEPARATE WHEN ENERGISED”
- Dust tight caps that are fitted when the connectors are left disconnected
- Warning label “WARNING – DO NOT OPEN WHEN EXPLOSIVE ATMOSPHERE IS PRESENT”

These key features can be seen in the Gauge exploded view on the next page, along with the Hazardous Area markings label.



Marking for 3D:



Limitation of use 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.

2.1 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.

2.2 Connector Clamp – Fitting and Removal



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

1. Insert the cable connector socket into the sensor plug and tighten the screw ring lock in a clockwise motion.
2. 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 3 mm Allen key.
3. Ensure that the clamp is securely in place by observing no gap between the two halves.

4. Ensure that 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 Sensor’s GCI/GCP 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.

2.3 Removing the Gauge Lid and Fitting a New Seal

The Sensor’s chassis is held in place using the 4 x M5 captive screws located in the lid (item 11 in the exploded Sensor view) and must all be tightened to a torque of 2.0 Nm to ensure a good seal.

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

The chassis is removed by first disconnecting the services connector as per Section 2.2 - [Connector Clamp – Fitting and Removal](#) and loosening the 4 x captive screws using a 4 mm Allen key. The chassis can then be carefully slid out of the enclosure.

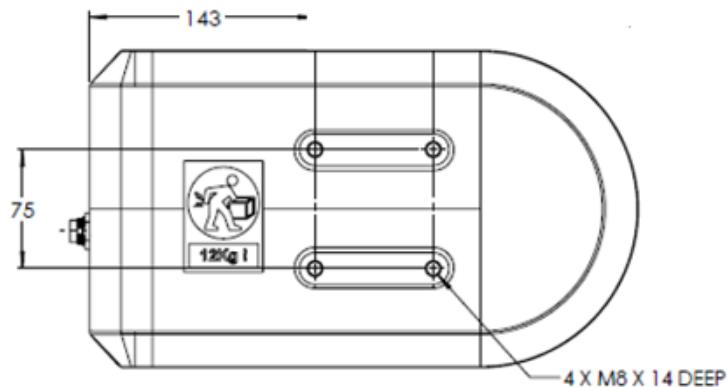
Fitting is the reverse procedure, but first check the seal (item 8) for any damage before fitting and if necessary, replace with a new seal as per the steps below. Tighten all 4 x screws to a torque of 2 Nm using a 4 mm Allen key torque wrench.

1. Remove the old seal by peeling away from the lid flange.
2. Remove any residual adhesive from the lid flange with a solvent (IPA).
3. Take the new seal (part no. 120/16223-01), remove the backing tape and carefully align with the lid flange, ensuring that the mounting bosses are central in the cutouts and the edge is flush before pressing firmly in place.

3 | Electrical

3.1 Earthing the Gauge

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



3.2 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.

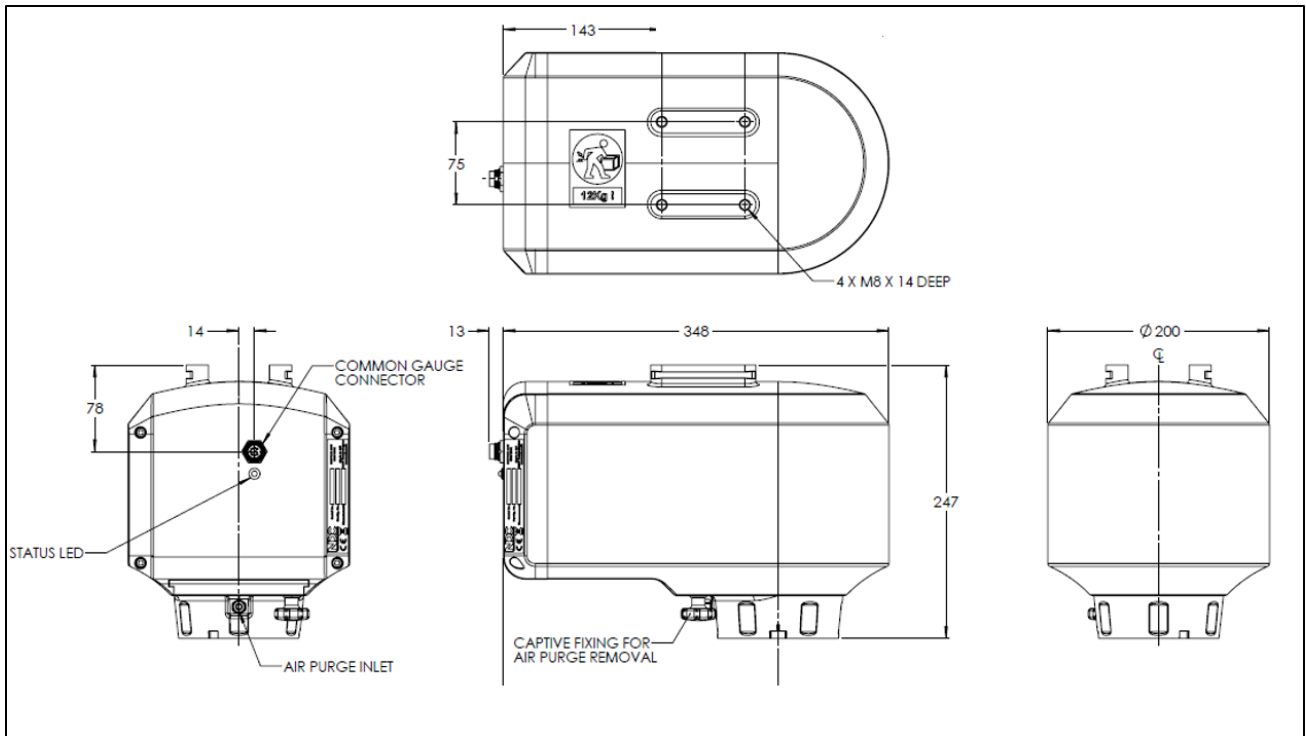
Wire Colour	"ETH2 24v" terminal	Function
Pair 1 White	Tx-	Ethernet Tx-
Pair 1 Orange	Tx+	Ethernet Tx+
Pair 2 White	Rx-	Ethernet Rx-
Pair 2 Green	Rx+	Ethernet Rx+
Pair 3 White	UNFUSED +	Power output +24Vdc
Pair 3 Brown	UNFUSED +	Power output +24Vdc
Pair 4 White	UNFUSED -	Power output 0Vdc return
Pair 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 20 mm A/F torque wrench to 3.5 Nm.

4 | Physical Size and Ratings

Series 9 Sensor	
DC input	24Vdc +10% -20%, 35W
Mounting	Top face through 4 x M8 threaded holes
Digital communications	Ethernet TCP/IP
Environmental sealing	IP67
Maximum surface temperature	tba
Ambient temperature range	0°C to 50°C
Storage temperature range	-30°C to 70°C
Relative Humidity	80% over full temperature range
Weight	12.5 Kg
Pollution degree	Degree 1
Working distance	230 mm ± 100 mm (beam patch 60 mm diameter) 120 mm ± 25 mm (beam patch 10 mm diameter)
Air Purge	Instrument quality compressed air, Ø6.0mm o/d tube, 20L/minute
Dimensions	See outline drawing on next page



All dimensions in mm

5 | Maintenance

5.1 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.

5.2 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.

5.3 Cleaning Gauge Windows

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

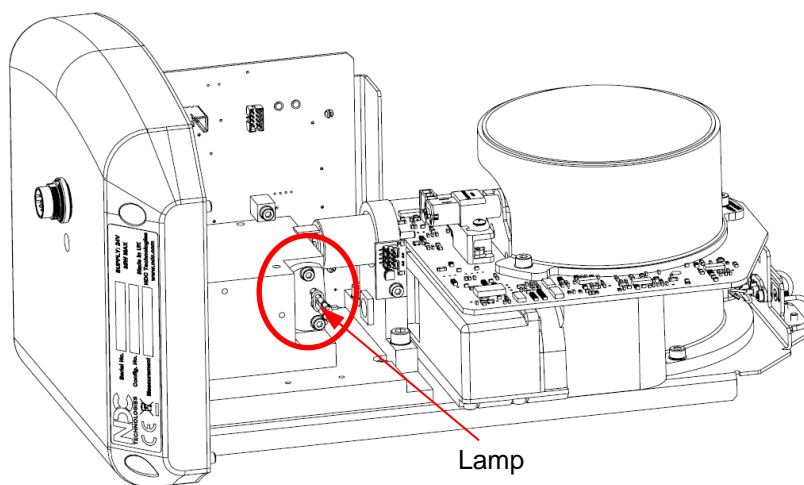
Where necessary, use warm water and a mild detergent. Do not use abrasive cleaners of any kind.

If a solvent is needed to remove contaminants, contact NDC or their agent first.

5.4 Replacing the Gauge Source Lamp Assembly

To replace the Gauge Source Lamp Assembly:

1. Remove power from the gauging system and **ensure that the explosive atmosphere is NOT present.**
2. Remove the connector clamp from the services cable, disconnect from the Sensor and fit the sealing caps to the connectors.
3. Using a 4 mm Allen key, undo the 4 fixing screws within the corners of the sensor lid and carefully slide the chassis out from the enclosure.
4. Place the chassis facing downwards on a flat, clean surface.
5. Locate the lamp, as indicated in the figure below.



6. Unplug the two lamp assembly leads.
7. Undo the two lamp fixing screws with a 2.5 mm Allen key and withdraw the lamp assembly from its mount.

8. Fit the new lamp (part no. 120/16107-01SA) and reassemble the sensor using the reverse of this procedure. **Take care not to touch the lamp glass, as this may cause lamp failure.**

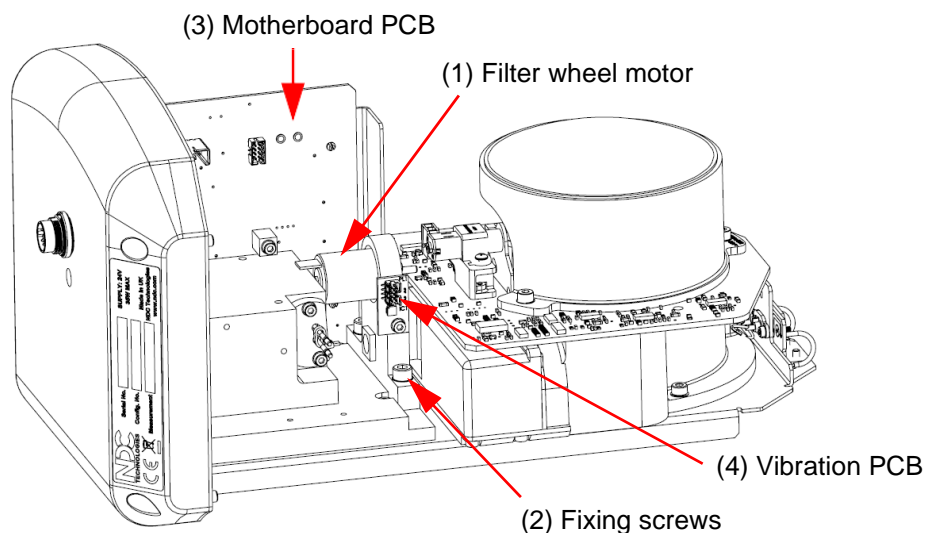
If accidental contact is made, clean the glass with isopropyl alcohol (IPA).

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

5.5 Replacing the Filter Wheel Motor

To replace the filter wheel motor:

1. Remove power from the gauging system and **ensure that the explosive atmosphere is NOT present.**
2. Remove the connector clamp from the services cable, disconnect from the Sensor and fit the sealing caps to the connectors.
3. Using a 4 mm Allen key, undo the 4 fixing screws in the corners of the sensor lid and carefully slide the chassis out from the enclosure.
4. Place the chassis facing downwards on a flat, clean surface.
5. Locate the filter wheel motor (1), as indicated in the figure below.



6. Unplug the filter wheel motor ribbon cable connector from the motherboard PCB (3).
7. Unplug the vibration PCB (4) ribbon cable connector.

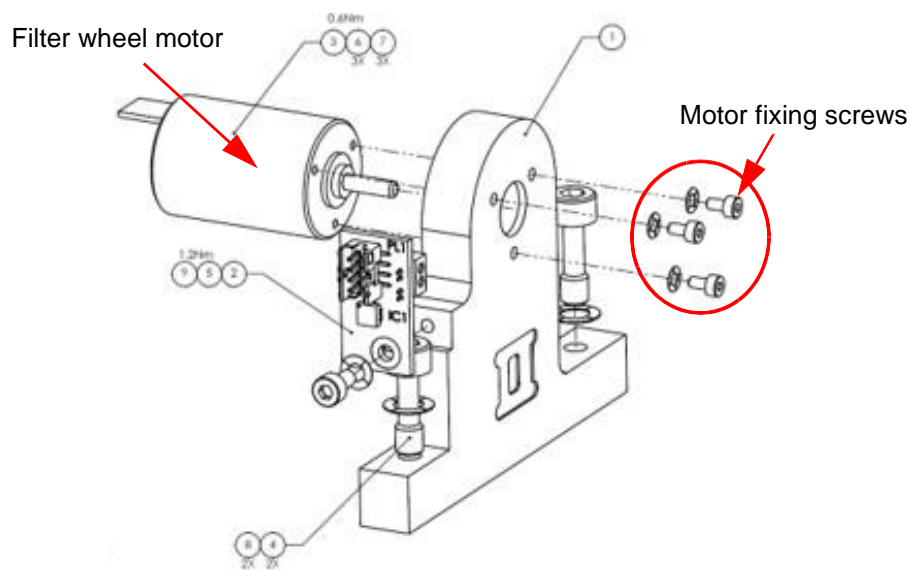
8. Undo the filter wheel motor assembly fixing screws (2) with a 4 mm Allen key.
9. Lift the filter wheel assembly away from the chassis. Do not touch the optical surfaces of the filter wheel.

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

10. Note the orientation of the filter wheel, with the bush containing the grub screw towards the end of the motor shaft.
11. 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.

12. Remove the 3 x motor fixing screws using a 1.5 mm Allen key, as shown in the figure below.



13. If the instrument is within the warranty period, return the faulty motor to NDC for replacement. If not, discard the motor.
14. Fit the filter wheel to the new motor (part no.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.

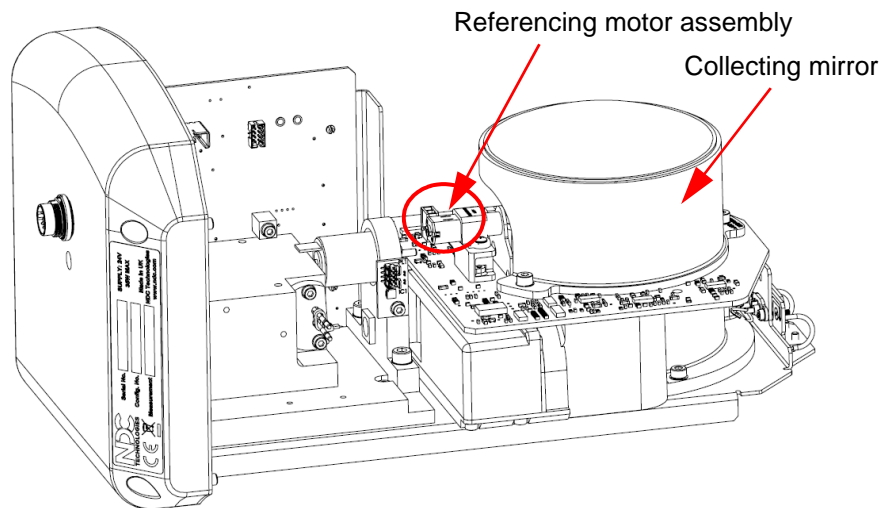
15. Tighten the filter wheel grub screw.

16. Fit the motor assembly and reassemble the Sensor as a reversal of the previous steps.
17. Switch the gauge on and allow 2 hours for it to reach full operating temperature, then auto-reference the gauge.

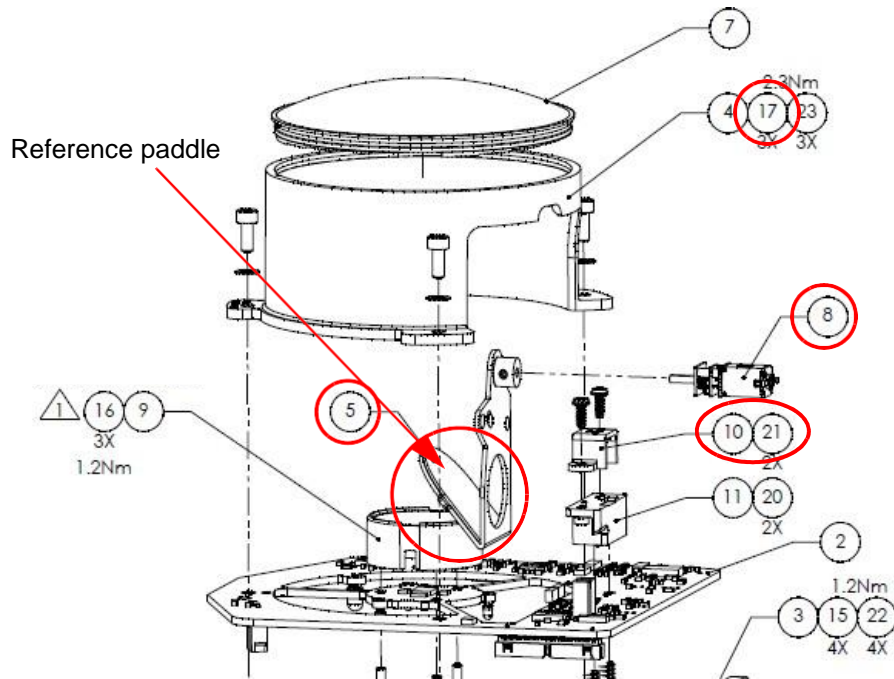
5.6 Replacing the Referencing Motor

To replace the referencing motor:

1. Remove power from the gauging system and **ensure that the explosive atmosphere is NOT present.**
2. Remove the connector clamp from the services cable, disconnect from the Sensor and fit the sealing caps to the connectors.
3. Using a 4 mm Allen key, undo the 4 fixing screws within the corners of the sensor lid and carefully slide the chassis out from the main enclosure.
4. Place the chassis facing downwards on a flat, clean surface.
5. Locate the referencing motor, as indicated in the figure below.



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



7. 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).
8. Remove the reference paddle from the motor shaft by undoing the grub screw and sliding off the shaft.
9. Fit the reference paddle to the new motor, by sliding along the motor shaft until it bottoms out and tightening the grub screw.
10. Reassemble as a reversal of the previous steps.
11. Switch the gauge on and allow 2 hours for it to reach full operating temperature, then auto-reference the gauge.

6 | Servicing, Returns and Recycling

6.1 Servicing and Returning your Equipment

Your instrument was carefully inspected electrically and mechanically prior to shipment. It should be free of surface defects and scratches, and it should be in perfect working order upon receipt. If any indication of damage is found, file a claim with the carrier immediately, prior to using the instrument. If no damage is apparent, proceed by using this manual to install and setup this instrument.

Save the shipping carton and packing material for future storing or shipment of the instrument. If, at some future time, the instrument must be returned to the factory for service, include a full description of the instrument failure and the mode of operation the instrument was in at the time of failure. Also include a contact person to discuss the instrument failure.

When returning equipment for service, it is important to first obtain a Return Material Authorization (RMA) number. The RMA number is needed for proper handling of returned equipment.

- To obtain an RMA, go to <https://ndc.custhelp.com/>.
- To create a myNDC account, click the **Log in or Sign up** button. After creating the account, you will be immediately logged in. To log in on subsequent visits to myNDC, click the **Log in or Sign up** button, enter your username and password, and then click **Log in**.
- To submit an RMA, click on the **RMA Request** link and follow the on-screen instructions.

Ship the instrument in the original carton, or, if the original carton is unavailable, ship in a carton providing sufficient protection. Send the instrument to the Asia, Europe, or USA office, whichever is closest to you or to the office indicated by your sales engineer. Place the RMA number on the outside of the carton and include a purchase order number and any other information specific to your instrument. Field warranty service is available if the customer pays travel expenses by advance purchase order. All service operations should be performed by skilled electronics technicians, who have been trained by NDC Technologies.

6.2 Recycling, Disposal and Sustainability

NDC Technologies provides intelligent measurement and control solutions to help you focus on your unique mission in a more sustainable way. Better for your people. Better for your bottom line. Better for the planet. For this reason, NDC Technologies encourages its customers to recycle and dispose of equipment in a way which is responsible and encourages sustainability.

Please check the following before disposing of your equipment:

- Is the equipment worth repairing? If in doubt, contact NDC Service.
- If you are aware of any hazardous materials in your equipment, ensure qualified personnel take responsibility for its disposal. Some examples of hazardous substances include lead, mercury, cadmium, chromium VI, flame retardants, plasticizers, fluorescent tubes, monitors containing cathode ray tubes and products containing capacitors. NDC is compliant with the European [WEEE](#) and the most current [RoHS](#) Directive.
- Can you re-use or recycle any constituent parts? For example, if the housing/chassis is made of metal, it can be recycled by your local authority. Ensure qualified personnel take responsibility for dismantling the equipment.

If the equipment does need to be disposed of, please dispose of it in a way that does not harm the environment.

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 periods¹:
 - 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

¹ 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.