



GXS Flow Monitor kit

INSTRUCTION MANUAL

DESCRIPTION	ITEM NUMBER
Flow Monitor 0-60 SLM	A60027043
Flow Monitor 0-200 SLM	A60027044

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We accept no liability for loss of profit, loss of market or any other indirect or consequential loss whatsoever.

Product warranty and limit of liability are dealt with in our standard terms and conditions of sale or negotiated contract under which this document is supplied.

You must use this product as described in this manual. Read the manual before you install, operate, or maintain the product.

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1. Introduction

1.1 Scope and definitions

This manual provides installation, operation and maintenance instructions for the Edwards GXS Dry Pumping System Nitrogen Flow Monitor, abbreviated to Flow Monitor in the remainder of this manual. Use the Flow Monitor as specified in this manual. Use this manual in conjunction with the GXS pump manual.

Read this manual before you install and operate the Flow Monitor. Important safety information is highlighted as WARNING and CAUTION instructions; you must obey these instructions. The use of WARNINGS and CAUTIONS is defined below.



WARNING:

Warnings are given where failure to observe the instruction could result in injury or death to people. The actual symbol shown varies according to the hazard.



CAUTION:

Cautions are given where failure to observe the instruction could result in minor injury or damage to the equipment, associated equipment or process.

The abbreviation slm used in this manual refers to a standard litre per minute, i.e. a flow of one litre per minute under standard conditions of 1 atm pressure at 0° C.

1.2 Product description



WARNING:

This Flow Monitor is designed for use with nitrogen purge gas. As an alternative, Compressed Dry Air (CDA) can be used. It is the user's responsibility to make sure that the selected purge gas is compatible and safe to use.



CAUTION:

Flow Monitor used in the kit is not designed for rapid pressure changes on its input. Inrush can damage the Flow Monitor. Install the slow opening solenoid valve to prevent the Flow Monitor damage.

The Flow Monitor is designed to be externally fitted to the GXS dry pumping system.

When installed, the Flow Monitor enables the user to monitor the flow of nitrogen purge gas to the dry pumping system, and to indicate a no-flow condition.

The Flow Monitor is supplied in two types. 0-60 SLM type is designed for:

- GXS160
- GXS160/1750
- GXS250
- GXS450

- GXS450/2600

0-200 SLM type is designed for:

- GXS450
- GXS450/2600
- GXS450/4200
- GXS750
- GXS750/2600
- GXS750/4200

1.3 Construction

Refer to [Figure: Flow Monitor kit general arrangement on page 10](#).

The Flow Monitor kit has:

- Flow Monitor
- Pipe + adapters
- Bracket
- Screws
- Label

2. Technical data

Table 1 Technical data

Parameter	Data
Mass	0.6 kg
Accuracy at 6.2 bar(g)	60 SLM: $\pm 3.5\%$
	200 SLM: $\pm 2\%$
Ambient operating temperature range	5 to 40 °C
Maximum ambient operating humidity	90% RH (non condensing)
Maximum working pressure	6.9 bar(g) (100 psi(g))

3. Installation

3.1 Safety



WARNING:

Obey the safety instructions and take note of appropriate precautions. Only suitably trained and supervised technicians may install the Flow Monitor.



WARNING:

The Flow Monitor is not intended to perform a safety function, it is not calibrated and must be used for indication only.

- Purge and shut down the dry pumping system and disconnect the nitrogen supply before you start installation.
- Disconnect the dry pumping system and the other components in the process system from the electrical supply so that they cannot be operated accidentally.
- If the dry pump system is on, shut it down and allow it to cool to a safe temperature before you start installation.
- Do not allow debris to get into the Flow Monitor system during installation.
- Leak test the system after installation is complete and seal the leaks to prevent further leakage. Leakage rate must be less than 1×10^{-5} mbar l s⁻¹.
- Make sure that you connect, disconnect and tighten all tube connection components correctly (Refer to [Figure: Connect a tube fitting on page 14](#) and [Figure: Reconnect a tube fitting on page 15](#)).
- Obey all national and local rules and safety regulations when you install the Flow Monitor.

3.2 Unpack and inspect

Remove all packing materials and protective covers and inspect the Flow Monitor. If it is damaged, notify your supplier and the carrier in writing within three days; write the item number of the Flow Monitor together with your order number and your supplier's invoice number. Retain all packing materials for inspection. Do not use the Flow Monitor if it is damaged.

If the Flow Monitor is not to be used immediately, refit the protective packaging and store the Flow Monitor in suitable conditions, as described in [Storage on page 12](#).

Check that your package contains the items listed in [Table: Flow Monitor parts list on page 8](#). If any of these items are missing, notify your supplier in writing within three days.

Table 2 Flow Monitor parts list

Quantity	Description	Check
1	Flow Monitor	<input type="checkbox"/>
1	Bracket	<input type="checkbox"/>

Quantity	Description	Check
1	Pipe	<input type="checkbox"/>
2	M5 Screw	<input type="checkbox"/>
1	N ₂ Label	<input type="checkbox"/>

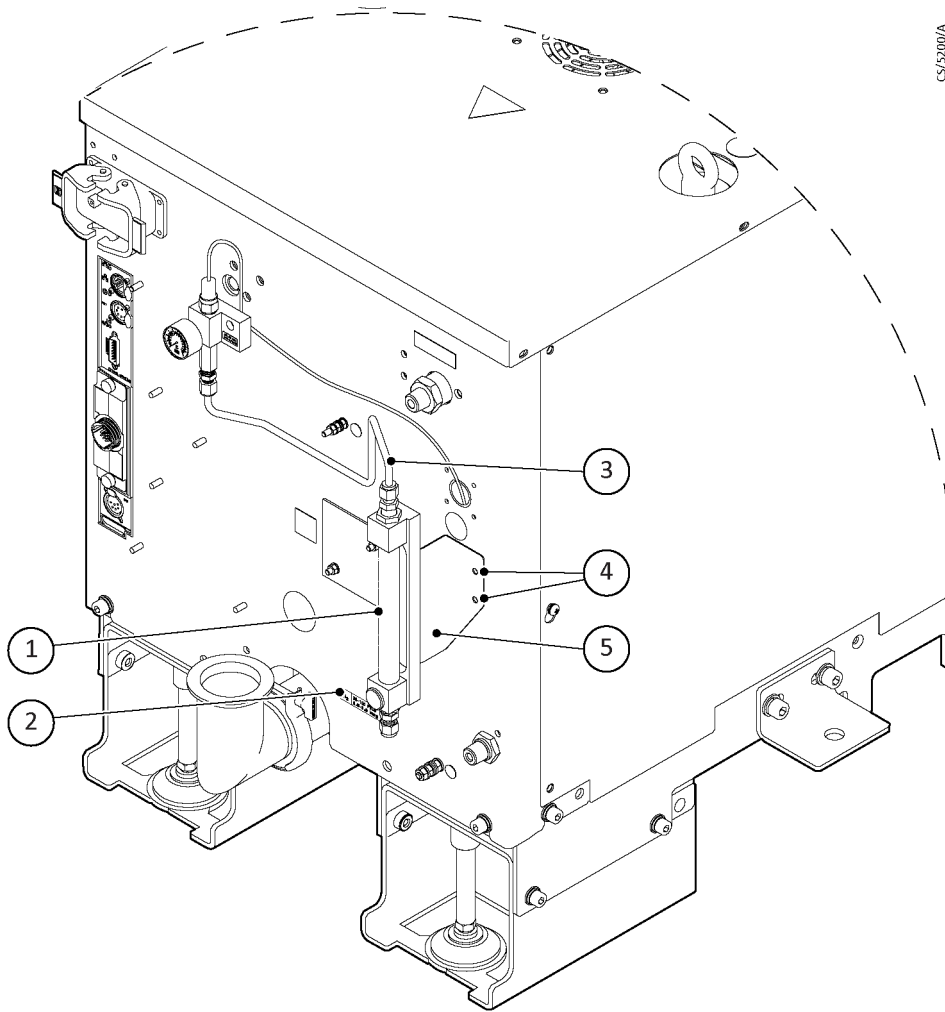
3.3 Install the Flow Monitor

Install the Flow Monitor as shown in [Figure: Flow Monitor kit general arrangement on page 10](#).

Before you start installation:

- Make sure that the electrical power supply to the system is switched off.
- Refer to [Appendix A1 - Tube fittings on page 14](#) for assembly of all compression type fittings.
- Refer to [Figure: Flow Monitor kit general arrangement on page 10](#) for the Flow Monitor assembly components.
- Leak check the installation. Leakage rate must be less than 1×10^{-5} mbar l s⁻¹

Figure 1 Flow Monitor kit general arrangement



Item no.	Description	Quantity
1	Flow monitor	1
2	N ₂ Label	1
3	Flow monitor to Purge manifold pipe	1
4	M5 Screws	2
5	Bracket	1

4. Maintenance

4.1 General

Follow the procedure during the maintenance of the dry pumping system:

- Make sure that the Flow Monitor is clean and is not damaged.
- Make sure that the bracket is correctly installed to the pump rear bulkhead at the Flow Monitor body. If necessary, tighten the screws and nuts of the the bracket.
- Make sure that the nitrogen fittings are tight.
- Make sure that the nitrogen pipes and fittings are not damaged or corroded.

5. Storage

If the Flow Monitor is not used immediately, refit any protective packaging and store in cool, dry conditions until required. When required for use, install the kit as described in [Install the Flow Monitor on page 9](#).

6. Disposal

Dispose of the Flow Monitor and any components in accordance with all local and national safety and environmental requirements.

7. Appendix A1 - Tube fittings

7.1 Correct use of tube fittings

 **Note:**

It is recommended to use an additional spanner when you remove or fit the tube connector, to make sure that the fitting does not move.

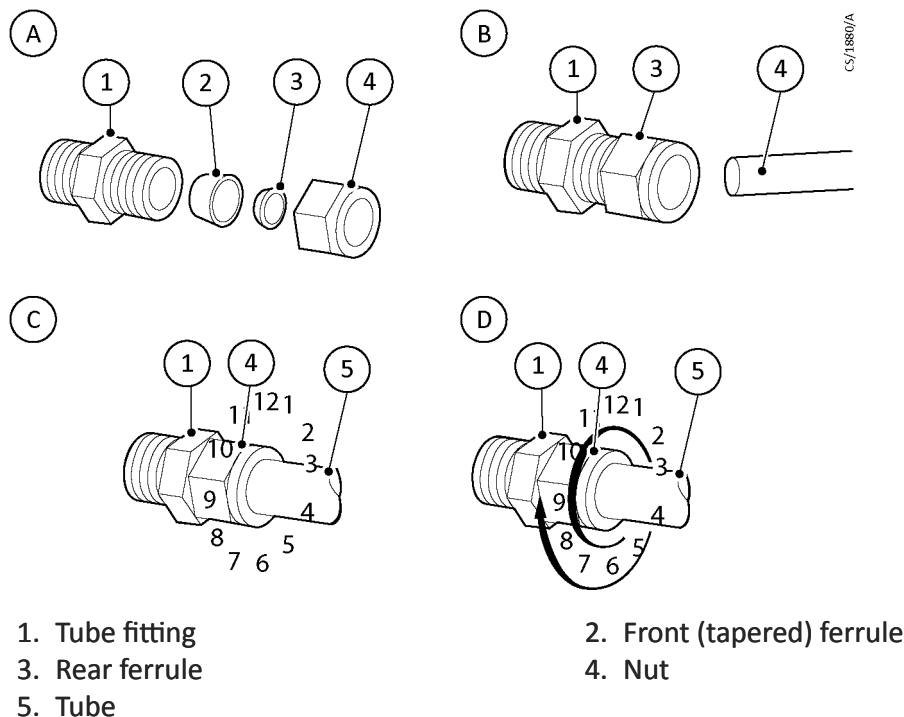
You must know how to correctly fit and tighten tube fittings in order to prevent gas leaks.

7.1.1 Connect a tube fitting

To fit a tube connector. Refer to [Figure: Connect a tube fitting on page 14](#)

- Turn and remove the nut (4) from the tube connector (1). Make sure that the front (tapered) ferrule (2) and the rear ferrule (3) are correctly orientated with reference to A, then loosely refit the nut (4) to the (1).
- Insert the tube (5) through the nut (4) and into the tube fitting (1). Make sure that the tube rests firmly on the shoulder inside the fitting, and that the nut (4) is finger tight. Tighten the nut (4) until you cannot rotate the tube (5). If the tube cannot be turned because of the way it is installed, tighten the nut by 1/8 th of a turn.
- Display the nut (4) at the six o'clock position.
- Hold the body of the connector steady, then turn the nut (4) by 1¼ turns (to the nine o'clock position) to fully tighten the connection.

Figure 2 Connect a tube fitting

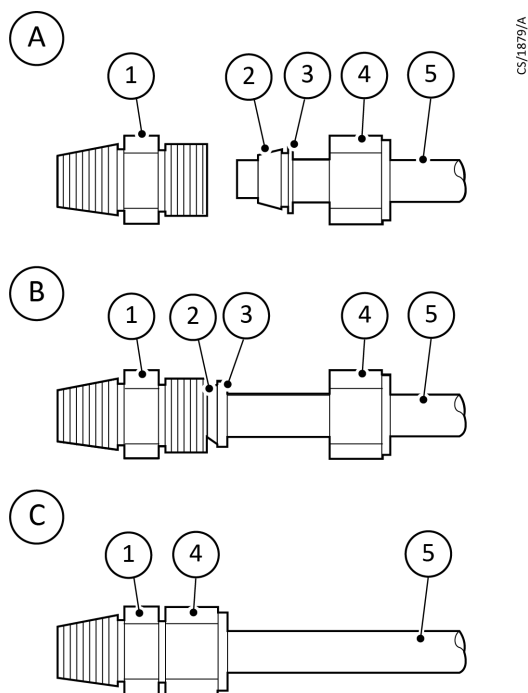


7.1.2 Reconnect a tube fitting

You can achieve an accurate seal against leakage, even if you disconnect the tube connector several times and re-connect again.

1. Refer to [Figure: Reconnect a tube fitting on page 15](#)
 - A. Shows the tube connector after disconnection.
 - B. Insert the tube (5) with the swaged ferrules (2, 3) into the tube fitting (1), until the front ferrule (2) is fully in the body of the fitting.
 - C. Tighten the nut (4) by hand.
2. Use a wrench or spanner to turn the nut (4) to its original position (you will feel an increase in resistance when the nut is in its original position), then tighten the nut slightly.

Figure 3 Reconnect a tube fitting



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- | | |
|-----------------|----------------------------|
| 1. Tube fitting | 2. Front (tapered) ferrule |
| 3. Rear ferrule | 4. Nut |
| 5. Tube | |

8. Return the equipment or components for service

Before you send your equipment to us for service or for any other reason, you must send us a completed Declaration of Contamination of Vacuum Equipment and Components – Form HS2. The HS2 form tells us if any substances found in the equipment are hazardous, which is important for the safety of our employees and all other people involved in the service of your equipment. The hazard information also lets us select the correct procedures to service your equipment.

We provide instructions for completing the form in the Declaration of Contamination of Vacuum equipment and Components – Procedure HS1.

If you are returning a vacuum pump, note the following:

- If a pump is configured to suit the application, make a record of the configuration before returning the pump. All replacement pumps will be supplied with default factory settings.
- Do not return a pump with accessories fitted. Remove all accessories and retain them for future use.
- The instruction in the returns procedure to drain all fluids does not apply to the lubricant in pump oil reservoirs.

Download the latest documents from www.edwardsvacuum.com/HSForms/, follow the procedure in HS1, fill in the electronic HS2 form, print it, sign it, and return the signed copy to us.



NOTICE:

If we do not receive a completed HS2 form, your equipment cannot be serviced.

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