

Instruction Manual

GXS Accessories Manual

Original Instructions



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Associated publications

Publication title

Publication number

Active Strain Gauge Instruction Manual	D357-25-880
Bray Controls Operation And Maintenance Manual Resilient Seated	
Butterfly Valves - 20/21, 22/23, 30/31, 3A,3AH, 31H, 31U, 32/33, 35/36,36H	OM-RSBFV-001 08-2010
Bray Controls Resilient Series Butterfly Valves Technical Manual	TM1050 - 08/06/2010
Bray Resilient Series Butterfly Valves Safety Manual	SM-1002_Resil_2010-09
Bray Series 92/93 Pneumatic Actuator Operation and Maintenance Manual	OM-92_93-001 03-2010
Bray Series 92/93 Pneumatic Actuator Safety Manual	SM-1004_S92-93_2010-06
GXS Dry Pumping Systems Instruction Manual	M588-00-880
NW40 Check Valve Instruction Manual	A507-82-880
NW50 Check Valve Instruction Manual	A507-91-880
Service Manual for Gen 4 Discharge Silencer NW40 Flange, Grey (RAL7035)	DischargeSlcrManualNW40US-0811
Service Manual for Gen 4 Discharge Silencer NW50 Flange, Grey (RAL7035)	DischargeSlcrManualNW50US-0811
Solberg Compact/Big Boy Polyester and Paper Elements Up to 8000 m ³ /h and Housings up to DN300 Flange	-
Solberg Inlet Vacuum Filters - "CSL" Series 4 inch - 6 inch 125/150# Pattern Flange Data Sheet	CSL34-7365
Solberg Inlet Vacuum Filters - "CSL" Series 8 inch - 12 inch 125/150# Pattern Flange Data Sheet	CSL44-7365
Solberg Replacement Filter Elements Maintenance Manual	MMEL-6294
Solberg Small Compact Polyester and Paper Elements Up To 510 M3/H And Housings Up To 3 inch BSPT	-
Solberg Vacuum Filters Maintenance Manual	-
Valvetop® T-Series Valve Controllers Installation, Operation & Maintenance Manual	ES-01856-1 R1

1 Introduction

1.1 Scope and definitions

This manual provides installation, operation and maintenance instructions for the GXS vacuum pump accessories and should be used in conjunction with the GXS Dry Pumping System Instruction Manual - M588-00-880. You must use the GXS vacuum pumping system accessories as specified in this manual.

Read this manual and the GXS Dry Pumping System Instruction Manual - M588-00-880 before you install or use the GXS vacuum pumping system accessories. 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.

CAUTION

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

The units used throughout this manual conform to the SI international system of measurement.

1.2 Flammable / pyrophoric materials



WARNING

You must obey the instructions and take note of any precautions given below to ensure that pumped gases do not enter their flammable ranges.

When flammable or pyrophoric materials are present within the pump there may be additional risks that the user is responsible for assessing and managing as part of the entire process system installation. The severity of the risks and the necessary control measures will depend largely on whether the process system exhaust is in the flammable region, if this is part of normal operation, or if it might only occur under rare conditions. The additional risks arise because all dry pumps must be considered a potential source of ignition due to the heat of compression, or possibly friction. If ignition occurs then the following may happen:

- High pressures could occur within the pump and may not be contained.
- A flame front could travel back up the foreline.
- A flame front could travel downstream from the exhaust of the pump.

Industry best practice suggests that the following measures will reduce the risks of pumping flammable mixtures and pyrophoric materials, but it is the responsibility of the user to carry out a risk assessment and take appropriate measures:

- Do not allow air to enter the equipment.
- Ensure that the system is leak tight.
- Ensure that gases in the pump do not enter the flammable range. This may be achieved by diluting gases in the pump by supplying sufficient inert gas purge. For example, dilution with nitrogen to below one quarter Lower Explosive Limit (LEL) or, if that is not practical, to below 60 % Limiting Oxidant Concentration (LOC).

- The gas module supplied with the pump is not intended to perform a safety function. Users may need to consider adding appropriate measures to monitor the flow of purge gas, for example external sensors. Systems that are fitted with the light duty gas module must not be used on applications pumping flammable or pyrophoric materials.

For further information please refer to Publication Number P400-40-100, Applications Note 'Pumping Flammable Gases' P411-00-090 or contact Edwards.

1.3 Safety and maintenance frequency



WARNING

Obey the safety instructions given below and take the appropriate precautions. If you do not, you can cause injury to people and damage to equipment.



WARNING

Electrical, purge gas and water supplies are all potentially hazardous energy sources. Before carrying out any maintenance the supply of these sources should be locked and tagged out.



WARNING

Personal protective equipment should be checked and used as specified by its supplier. Hazardous chemicals that have been pumped are located within the pumps and piping. Use of suitable protective gloves and clothing along with a respirator is recommended if contact with substances is anticipated. Particular caution should be exercised when working with fluorinated materials which may have been exposed to temperatures greater than 260 °C. Refer to Edwards Material Safety Data Sheets for detailed information.

- Ensure that the maintenance technician is familiar with the safety procedures which relate to the products pumped.
- Allow the pumps to cool to a safe temperature before you fit lifting eye bolts or start maintenance work.
- Vent and purge the dry pumping system before you start any maintenance work.
- Isolate the dry pumping system and other components in the process system from the electrical supply so that they cannot be operated accidentally. Note that the emergency stop switch on the dry pumping system is not an electrical isolator.
- Wait for at least four minutes after you have switched off the electrical supply before you touch any electrical component on the dry pumping system.
- Route and secure cables, hoses and pipelines during maintenance to avoid possible risk of trips or entrapment.

2 Inlet spool



WARNING

These inlet spools are designed for VACUUM use only, do not pressurise.



WARNING

Leak test the system after installation and seal any leaks found to prevent leakage of dangerous substances out of the system and leakage of air into the system.



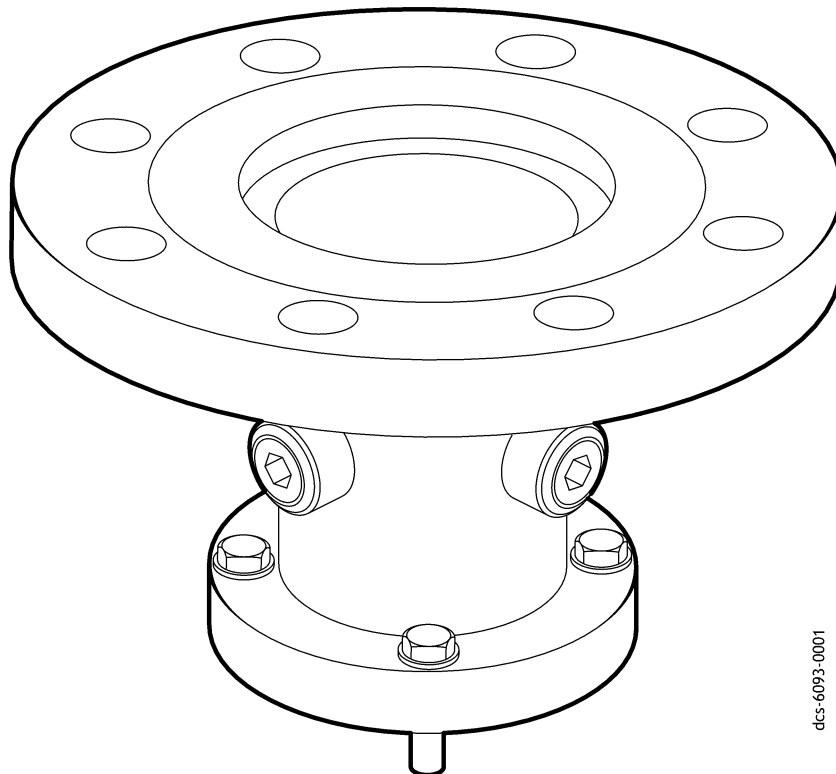
WARNING

Warning - hot surface.

2.1 Description

Refer to [Figure 1](#). Manufactured in both painted carbon steel and stainless steel options (to suit applications) they are provided to facilitate the fitment of additional accessories and can adapt the pump inlet to an ANSI flange profile.

Figure 1 - Inlet spool



dc5-6093-0001

2.2 Physical data

2.2.1 Carbon steel ISO - ANSI inlet spools

Figure 2 - M58808002 carbon steel inlet spool ISO63 - ANSI 4 inch

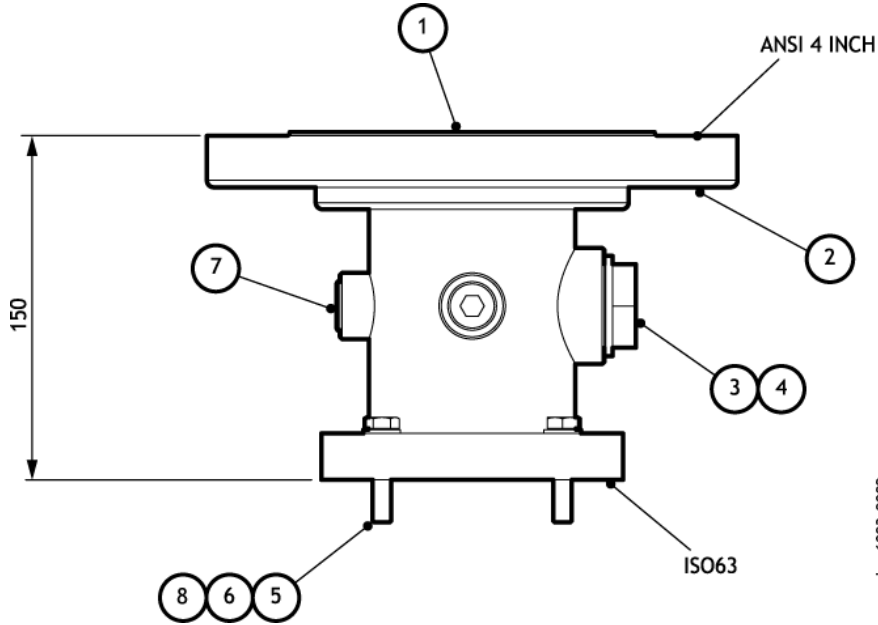


Table 1 - M58808002 carbon steel inlet spool ISO63 - ANSI 4 inch check list

Item	Qty	Description	Check
1	1	Gasket 4 inch ANSI x 2.5 thick	<input type="checkbox"/>
2	1	ISO63 - ANSI 4 inch inlet spool - carbon steel	<input type="checkbox"/>
3	1	1 inch BSP blanking plug	<input type="checkbox"/>
4	1	O-ring 35.15 I/D x 3.0	<input type="checkbox"/>
5	4	M8 x 40 hex head screw - stainless steel	<input type="checkbox"/>
6	4	M8 washer normal - stainless steel	<input type="checkbox"/>
7	3	½ inch BSP taper plug	<input type="checkbox"/>
8	4	M8 washer single coil spring - stainless steel	<input type="checkbox"/>

Figure 3 - M59808002 carbon steel inlet spool ISO100 - ANSI 4 inch

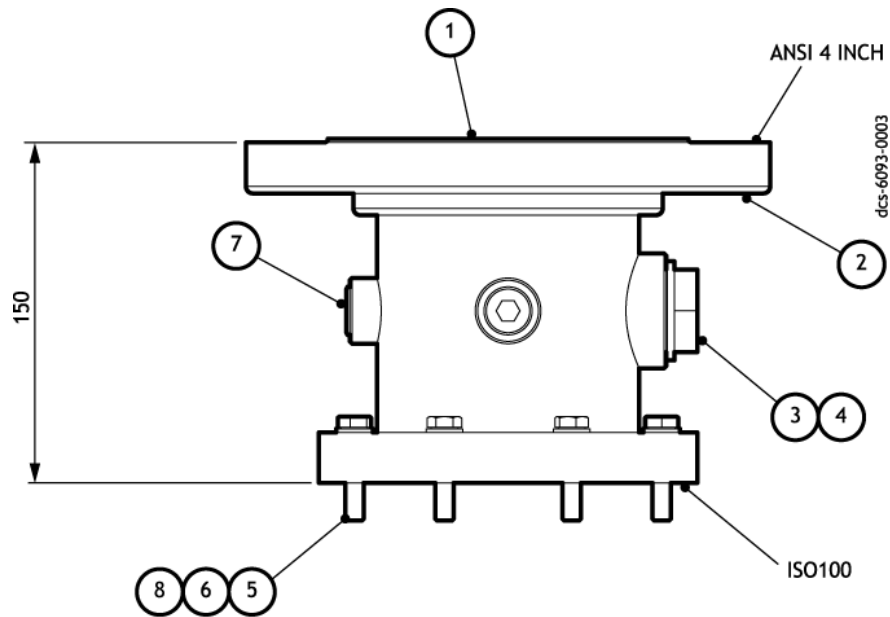


Table 2 - M59808002 carbon steel inlet spool ISO100 - ANSI 4 inch check list

Item	Qty	Description	Check
1	1	Gasket 4 inch ANSI x 2.5 thick	<input type="checkbox"/>
2	1	ISO100 - ANSI 4 inch inlet spool - carbon steel	<input type="checkbox"/>
3	1	1 inch BSP blanking plug	<input type="checkbox"/>
4	1	O-ring 35.15 I/D x 3.0	<input type="checkbox"/>
5	8	M8 x 40 hex head screw - stainless steel	<input type="checkbox"/>
6	8	M8 washer normal - stainless steel	<input type="checkbox"/>
7	3	½ inch BSP taper plug	<input type="checkbox"/>
8	8	M8 washer single coil spring - stainless steel	<input type="checkbox"/>

Figure 4 - M58828002 carbon steel inlet spool ISO100 - ANSI 6 inch

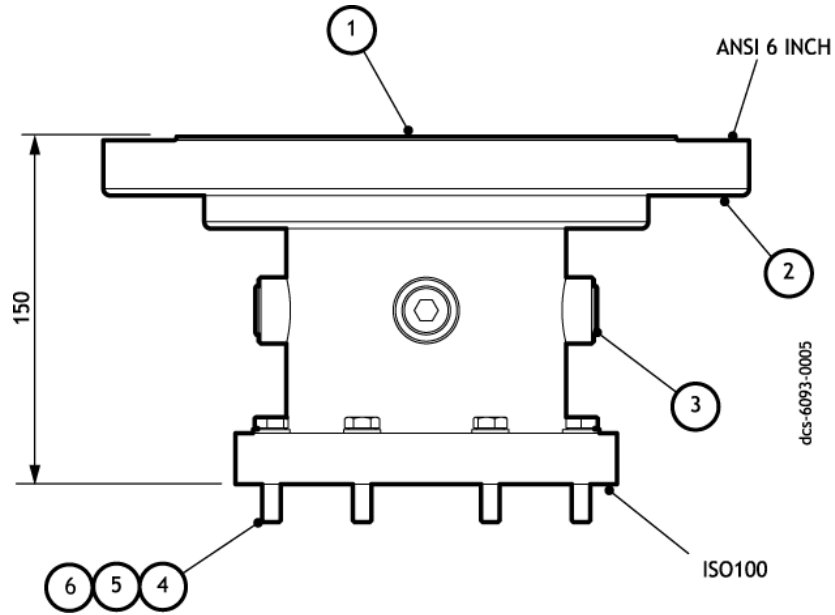


Table 3 - M58828002 carbon steel inlet spool ISO100 - ANSI 6 inch check list

Item	Qty	Description	Check
1	1	Gasket 6 inch ANSI x 2.5 thick	<input type="checkbox"/>
2	1	ISO100 - ANSI 6 inch inlet spool - carbon steel	<input type="checkbox"/>
3	4	1/2 inch BSP taper plug	<input type="checkbox"/>
4	8	M8 x 40 hex head screw - stainless steel	<input type="checkbox"/>
5	8	M8 washer normal - stainless steel	<input type="checkbox"/>
6	8	M8 washer single coil spring - stainless steel	<input type="checkbox"/>

Figure 5 - M58938002 carbon steel inlet spool ISO160 - ANSI 6 inch

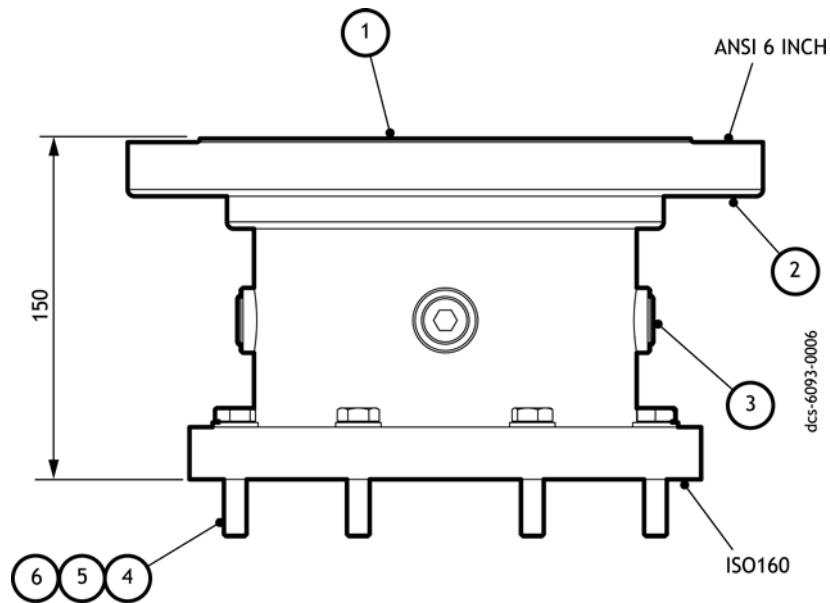


Table 4 - M58938002 carbon steel inlet spool ISO160 - ANSI 6 inch check list

Item	Qty	Description	Check
1	1	Gasket 6 inch ANSI x 2.5 thick	<input type="checkbox"/>
2	1	ISO160 - ANSI 6 inch inlet spool - carbon steel	<input type="checkbox"/>
3	4	½ inch BSP taper plug	<input type="checkbox"/>
4	8	M10 washer normal - stainless steel	<input type="checkbox"/>
5	8	M10 x 45 hex head screw - stainless steel	<input type="checkbox"/>
6	8	M10 washer single coil spring - stainless steel	<input type="checkbox"/>

Figure 6 - M59848002 carbon steel inlet spool ISO160 - ANSI 8 inch

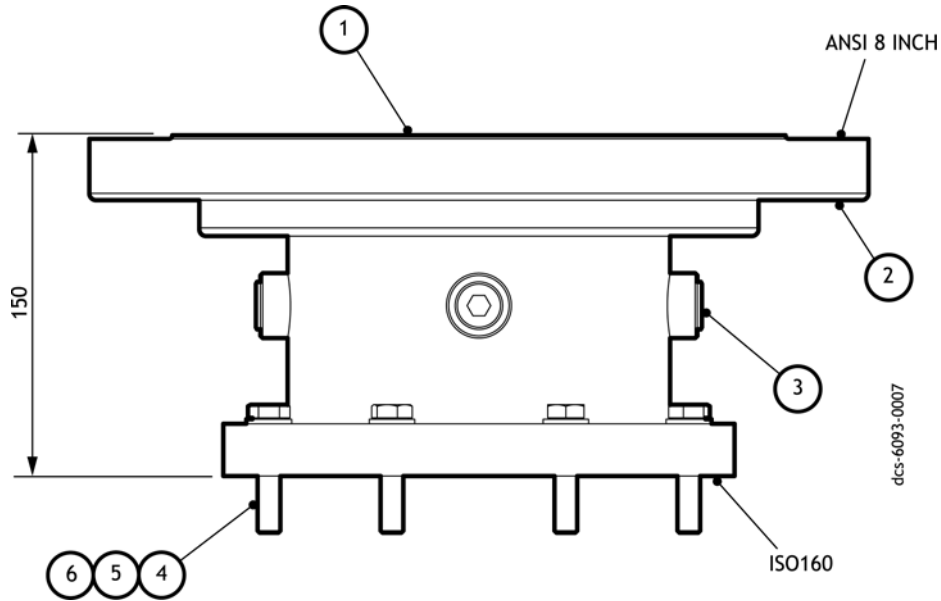


Table 5 - M59848002 carbon steel inlet spool ISO160 - ANSI 8 inch check list

Item	Qty	Description	Check
1	1	Gasket 8 inch ANSI x 2.5 thick	<input type="checkbox"/>
2	1	ISO160 - ANSI 8 inch inlet spool - carbon steel	<input type="checkbox"/>
3	4	½ inch BSP taper plug	<input type="checkbox"/>
4	8	M10 x 45 hex head screw - stainless steel	<input type="checkbox"/>
5	8	M10 washer normal - stainless steel	<input type="checkbox"/>
6	4	M10 washer single coil spring - stainless steel	<input type="checkbox"/>

2.2.2 Carbon steel ISO - ISO inlet spools

Figure 7 - M58808003 carbon steel inlet spool ISO63 - ISO100

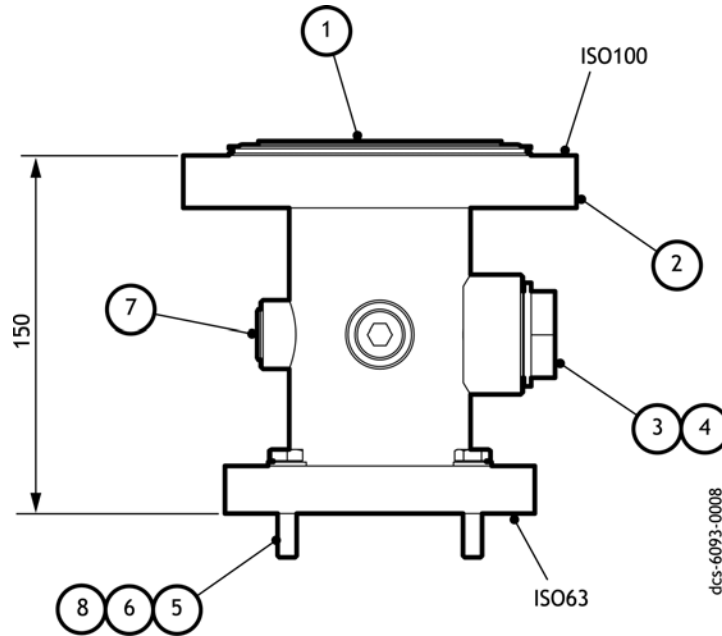


Table 6 - M58808138 carbon steel inlet spool ISO63 - ISO100 check list

Item	Qty	Description	Check
1	1	ISO100 trapped O-ring seal (Viton)	<input type="checkbox"/>
2	1	ISO63 - ISO100 inlet spool - carbon steel	<input type="checkbox"/>
3	1	1 inch BSP blanking plug	<input type="checkbox"/>
4	1	O-ring 35.15 I/D x 3.0	<input type="checkbox"/>
5	4	M8 x 40 hex head screw - stainless steel NT	<input type="checkbox"/>
6	4	M8 washer normal - stainless steel	<input type="checkbox"/>
7	3	½ inch BSPT hollow taper plug	<input type="checkbox"/>
8	4	M8 washer single coil spring - stainless steel	<input type="checkbox"/>

Figure 8 - M59808003 carbon steel inlet spool ISO100 - ISO100

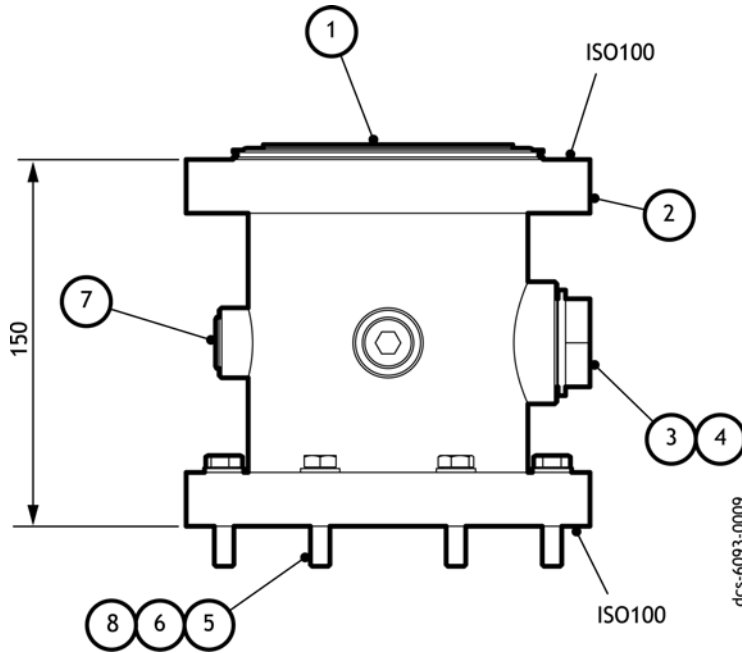


Table 7 - M59808138 carbon steel inlet spool ISO100 - ISO100 check list

Item	Qty	Description	Check
1	1	ISO100 trapped O-ring seal (Viton)	<input type="checkbox"/>
2	1	ISO100 - ISO100 inlet spool - carbon steel	<input type="checkbox"/>
3	1	1 inch BSP blanking plug	<input type="checkbox"/>
4	1	O-ring 35.15 I/D x 3.0	<input type="checkbox"/>
5	4	M8 x 40 hex head screw - stainless steel	<input type="checkbox"/>
6	4	M8 washer normal - stainless steel	<input type="checkbox"/>
7	3	½ inch BSPT hollow taper plug	<input type="checkbox"/>
8	8	M8 washer single coil spring - stainless steel	<input type="checkbox"/>

Figure 9 - M58828003 carbon steel inlet spool ISO100 - ISO160

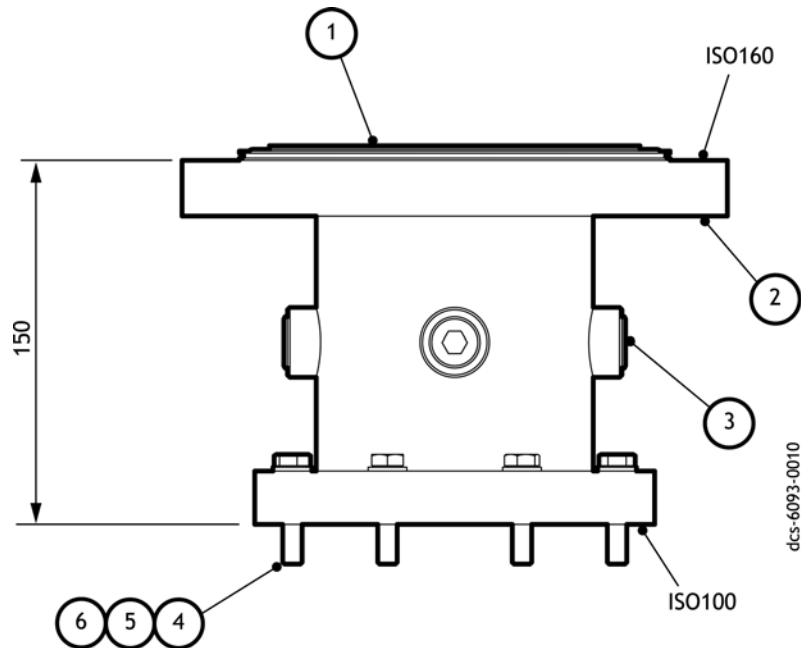


Table 8 - M58828003 carbon steel inlet spool ISO100 - ISO160 check list

Item	Qty	Description	Check
1	1	ISO160 trapped O-ring (Fluoroelastomer)	<input type="checkbox"/>
2	1	ISO100 - ISO160 inlet spool - carbon steel	<input type="checkbox"/>
3	4	½ inch BSP taper plug	<input type="checkbox"/>
4	8	M8 x 40 hex head screw - stainless steel	<input type="checkbox"/>
5	8	M8 washer normal - stainless steel	<input type="checkbox"/>
6	8	M8 washer single coil - stainless steel	<input type="checkbox"/>

Figure 10 - M58938003 carbon steel inlet spool ISO160 - ISO160

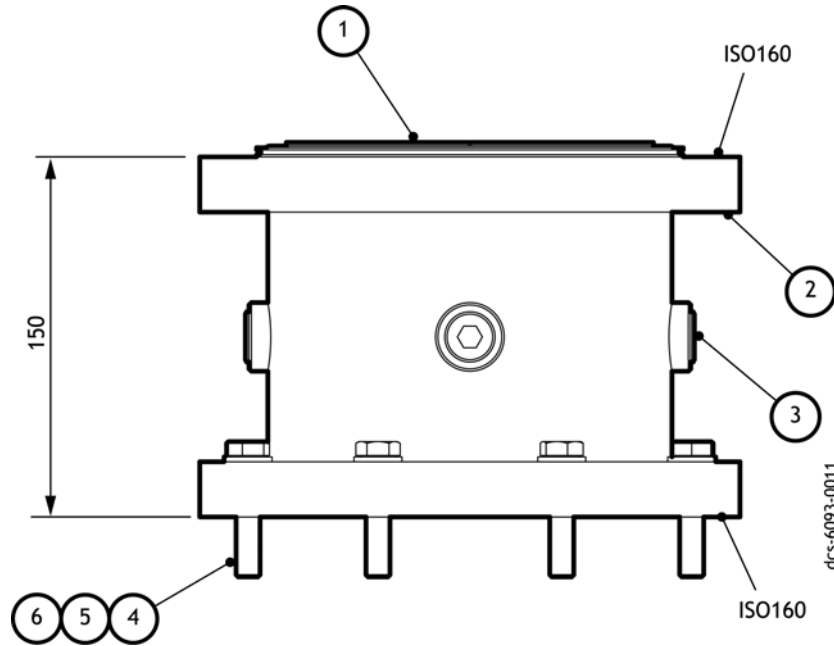


Table 9 - M58938003 carbon steel inlet spool ISO160 - ISO160 check list

Item	Qty	Description	Check
1	1	ISO160 trapped O-ring (Fluoroelastomer)	<input type="checkbox"/>
2	1	ISO160 - ISO160 inlet spool - carbon steel	<input type="checkbox"/>
3	4	½ inch BSP taper plug	<input type="checkbox"/>
4	8	M10 x 45 hex head screw - stainless steel	<input type="checkbox"/>
5	8	M10 washer normal - stainless steel	<input type="checkbox"/>
6	8	M10 washer single coil - stainless steel	<input type="checkbox"/>

Figure 11 - M59848003 carbon steel inlet spool ISO160 - ISO200

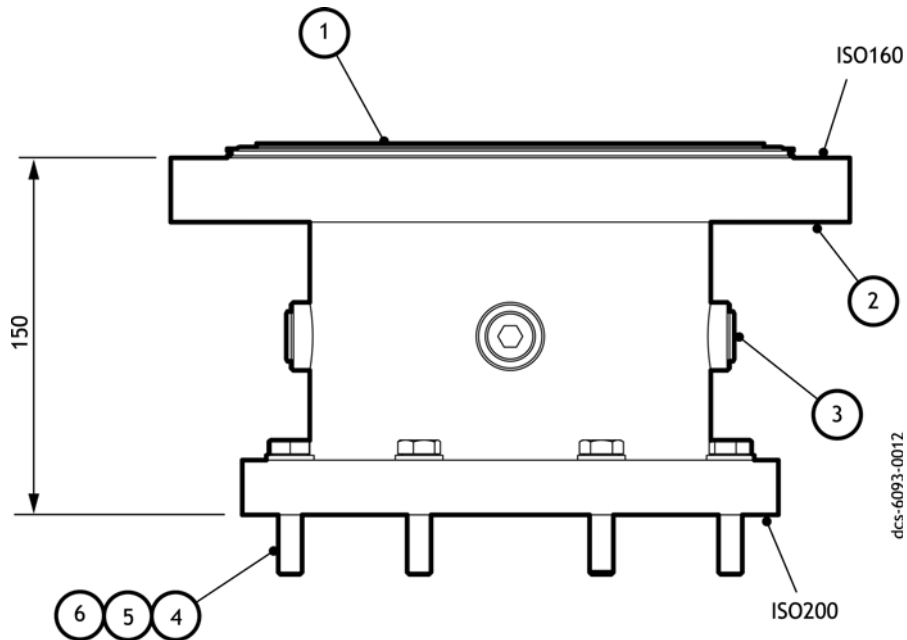


Table 10 - M59848003 carbon steel inlet spool ISO160 - ISO200 check list

Item	Qty	Description	Check
1	1	ISO200 trapped O-ring (Fluoroelastomer)	<input type="checkbox"/>
2	1	ISO160 - ISO200 inlet spool - carbon steel	<input type="checkbox"/>
3	4	½ inch BSP taper plug	<input type="checkbox"/>
4	8	M10 x 45 hex head screw - stainless steel	<input type="checkbox"/>
5	8	M10 washer normal - stainless steel	<input type="checkbox"/>
6	8	M10 washer single coil - stainless steel	<input type="checkbox"/>

Figure 13 - M59808134 stainless steel inlet spool ISO100 - ANSI 4 inch

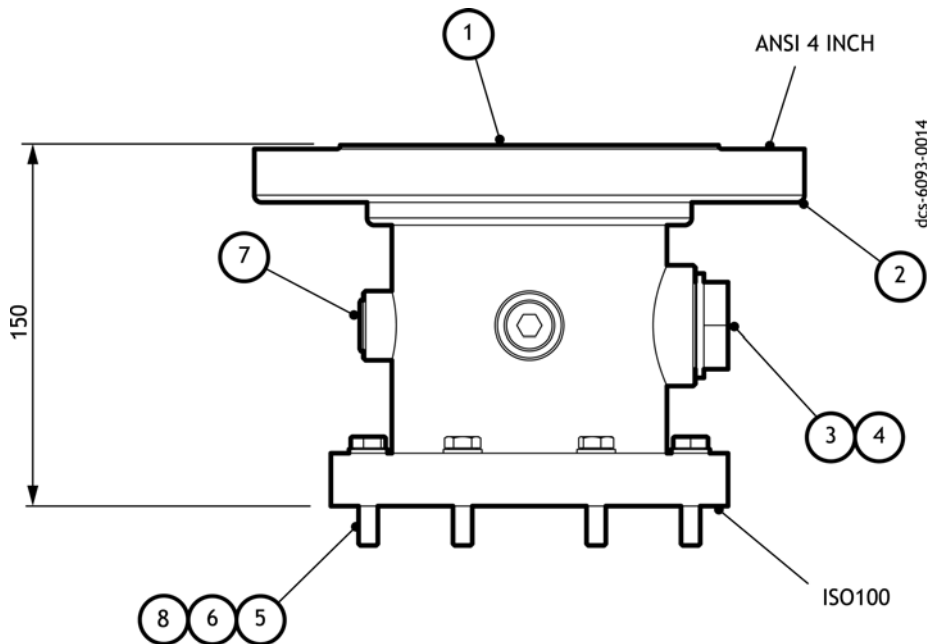


Table 12 - M59808134 stainless steel inlet spool ISO100 - ANSI 4 inch check list

Item	Qty	Description	Check
1	1	Gasket 4 inch ANSI x 2.5 thick	<input type="checkbox"/>
2	1	ISO100 - ANSI 4 inch inlet spool - stainless steel	<input type="checkbox"/>
3	1	1 inch BSP blanking plug	<input type="checkbox"/>
4	1	O-ring 35.15 I/D x 3.0	<input type="checkbox"/>
5	8	M8 x 40 hex head screw - stainless steel	<input type="checkbox"/>
6	8	M8 washer normal - stainless steel	<input type="checkbox"/>
7	3	½ inch BSP taper plug	<input type="checkbox"/>
8	8	M8 washer single coil spring - stainless steel	<input type="checkbox"/>

Figure 14 - M58828134 stainless steel inlet spool ISO100 - ANSI 6 inch

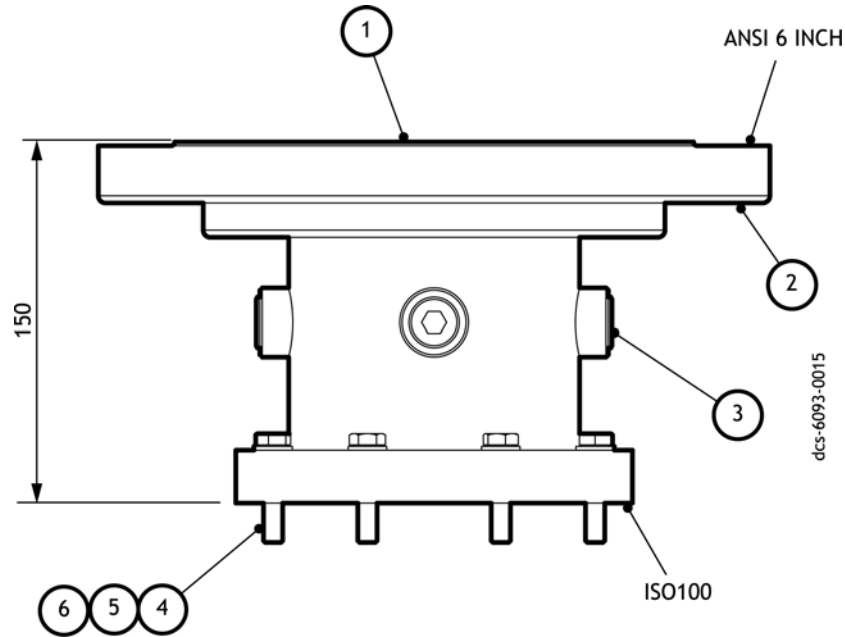


Table 13 - M58828134 stainless steel inlet spool ISO100 - ANSI 6 inch check list

Item	Qty	Description	Check
1	1	Gasket 6 inch ANSI x 2.5 thick	<input type="checkbox"/>
2	1	ISO100 - ANSI 6 inch inlet spool - stainless steel	<input type="checkbox"/>
3	4	½ inch BSP taper plug	<input type="checkbox"/>
4	8	M8 x 40 hex head screw - stainless steel	<input type="checkbox"/>
5	8	M8 washer normal - stainless steel	<input type="checkbox"/>
6	8	M8 washer single coil spring - stainless steel	<input type="checkbox"/>

Figure 15 - M58938134 stainless steel inlet spool ISO160 - ANSI 6 inch

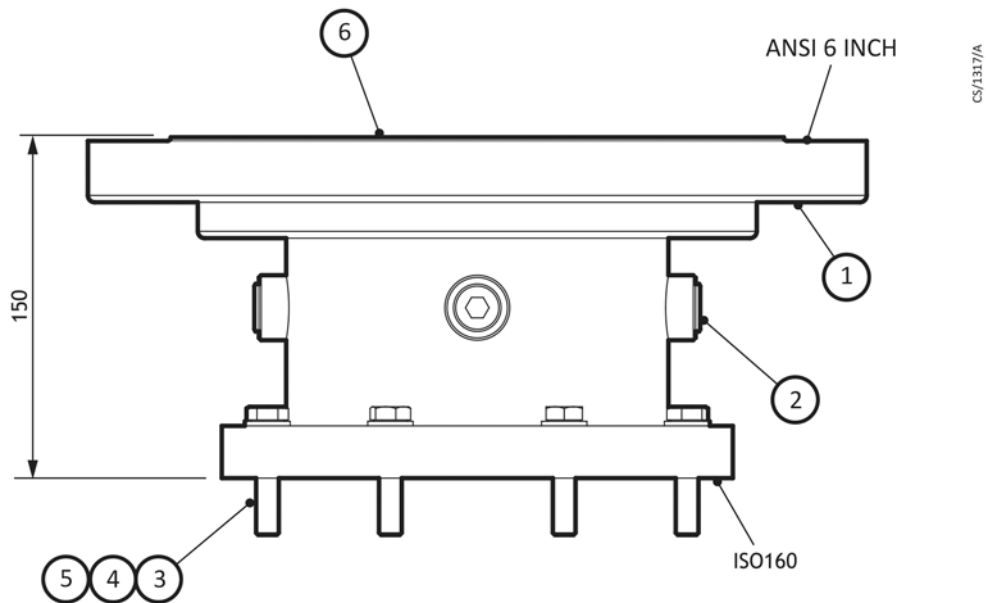


Table 14 - M58938134 stainless steel inlet spool ISO160 - ANSI 6 inch check list

Item	Qty	Description	Check
1	1	ISO160 - ANSI 6 inch inlet spool - stainless steel	<input type="checkbox"/>
2	4	½ inch BSP taper plug	<input type="checkbox"/>
3	8	M10 washer normal - stainless steel	<input type="checkbox"/>
4	8	M10 x 45 hex head screw - stainless steel	<input type="checkbox"/>
5	8	M10 washer single coil spring - stainless steel	<input type="checkbox"/>
6	1	Gasket 6 inch ANSI x 2.5 thick	<input type="checkbox"/>

Figure 16 - M59848134 stainless steel inlet spool ISO160 - ANSI 8 inch

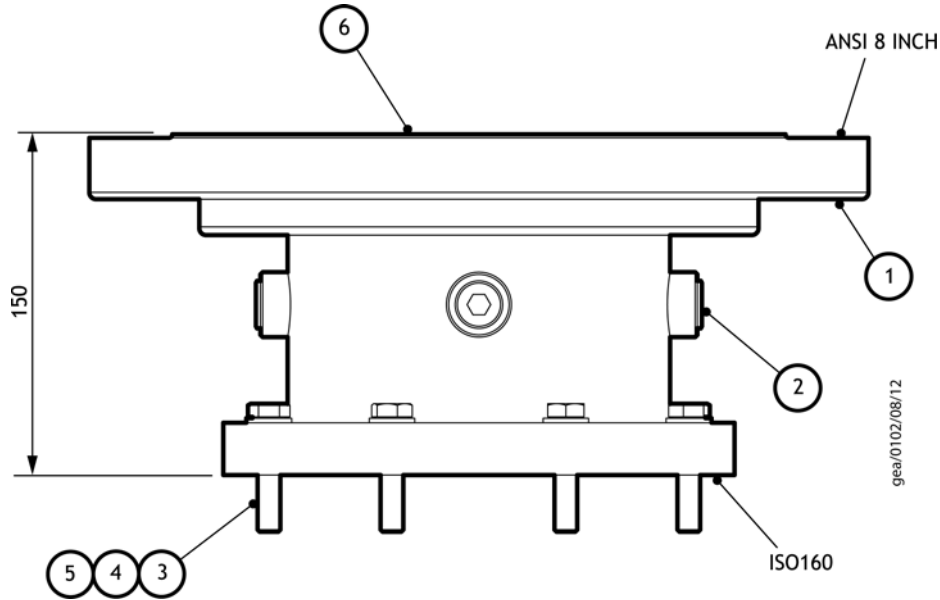


Table 15 - M59848134 stainless steel inlet spool ISO160 - ANSI 8 inch check list

Item	Qty	Description	Check
1	1	ISO160 - ANSI 8 inch inlet spool - stainless steel	<input type="checkbox"/>
2	4	½ inch BSP taper plug	<input type="checkbox"/>
3	8	M10 washer normal - stainless steel	<input type="checkbox"/>
4	8	M10 x 45 hex head screw - stainless steel	<input type="checkbox"/>
5	8	M10 washer single coil spring - stainless steel	<input type="checkbox"/>
6	1	Gasket 8 inch ANSI x 2.5 thick	<input type="checkbox"/>

2.2.4 Stainless steel ISO - ISO inlet spools

Figure 17 - M58808135 stainless steel inlet spool ISO63 - ISO100

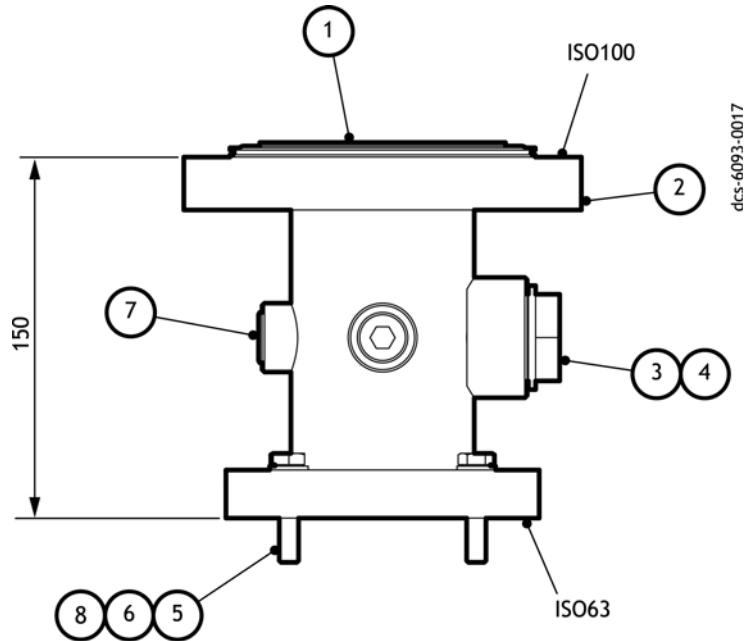


Table 16 - M58808135 stainless steel inlet spool ISO63 - ISO100 check list

Item	Qty	Description	Check
1	1	ISO100 trapped O-ring seal (Viton)	<input type="checkbox"/>
2	1	ISO63 - ISO100 inlet spool - stainless steel	<input type="checkbox"/>
3	1	1 inch BSP blanking plug	<input type="checkbox"/>
4	1	O-ring 35.15 I/D x 3.0	<input type="checkbox"/>
5	4	M8 x 40 hex head screw - stainless steel	<input type="checkbox"/>
6	4	M8 washer normal - stainless steel	<input type="checkbox"/>
7	3	½ inch BSPT hollow taper plug	<input type="checkbox"/>
8	4	M8 washer single coil spring - stainless steel	<input type="checkbox"/>

Figure 18 - M59808135 stainless steel inlet spool ISO100 - ISO100

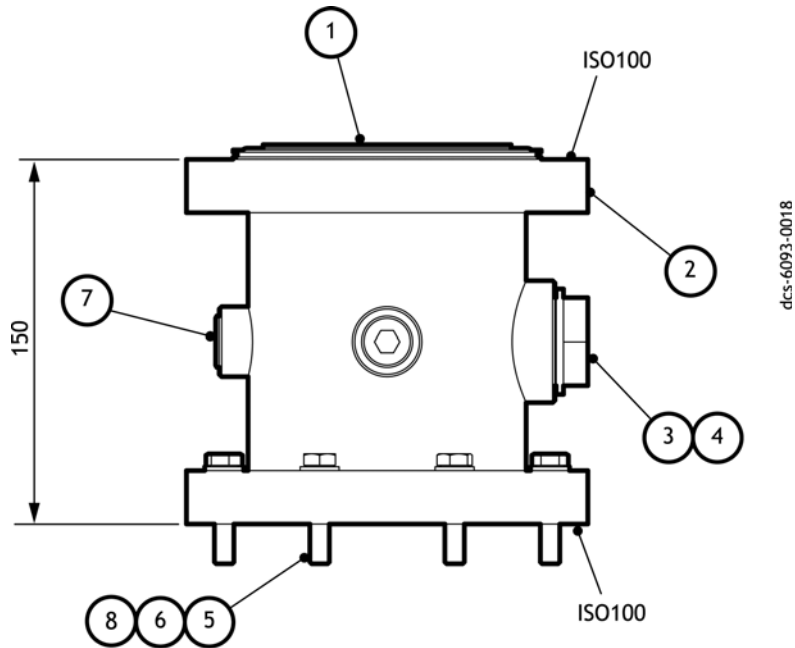


Table 17 - M59808135 stainless steel inlet spool ISO100 - ISO100 check list

Item	Qty	Description	Check
1	1	ISO100 trapped O-ring seal (Viton)	<input type="checkbox"/>
2	1	ISO100 - ISO100 inlet spool - stainless steel	<input type="checkbox"/>
3	1	1 inch BSP blanking plug	<input type="checkbox"/>
4	1	O-ring 35.15 I/D x 3.0	<input type="checkbox"/>
5	4	M8 x 40 hex head screw - stainless steel	<input type="checkbox"/>
6	4	M8 washer normal - stainless steel	<input type="checkbox"/>
7	3	½ inch BSPT hollow taper plug	<input type="checkbox"/>
8	8	M8 washer single coil spring - stainless steel	<input type="checkbox"/>

Figure 19 - Stainless steel inlet spool ISO100 - ISO160

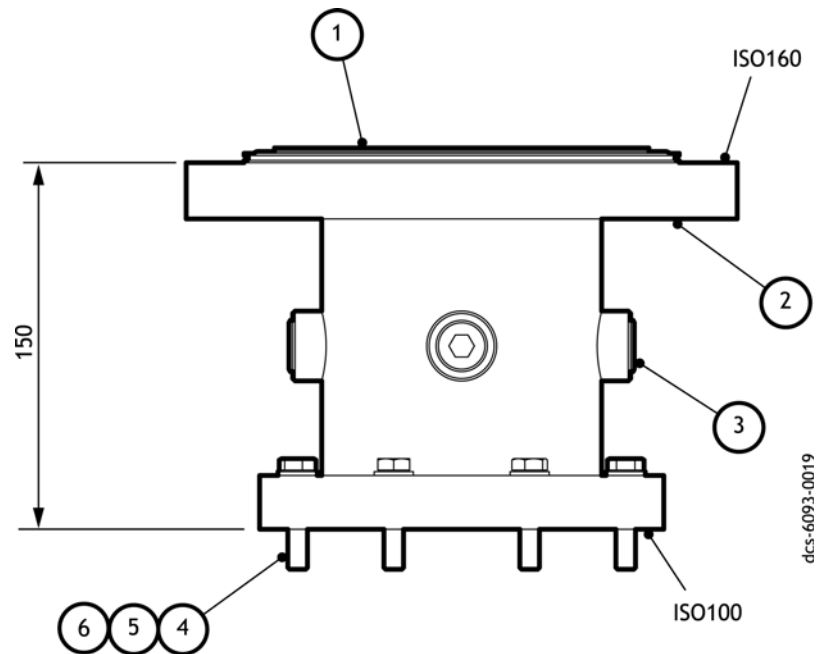


Table 18 - Stainless steel inlet spool ISO100 - ISO160 check list

Item	Qty	Description	Check
1	1	ISO160 trapped O-ring (Fluoroelastomer)	<input type="checkbox"/>
2	1	ISO100 - ISO160 inlet spool - stainless steel	<input type="checkbox"/>
3	4	½ inch BSP taper plug	<input type="checkbox"/>
4	8	M8 x 40 hex head screw - stainless steel	<input type="checkbox"/>
5	8	M8 washer normal - stainless steel	<input type="checkbox"/>
6	8	M8 washer single coil spring - stainless steel	<input type="checkbox"/>

Figure 20 - Stainless steel inlet spool ISO160 - ISO160

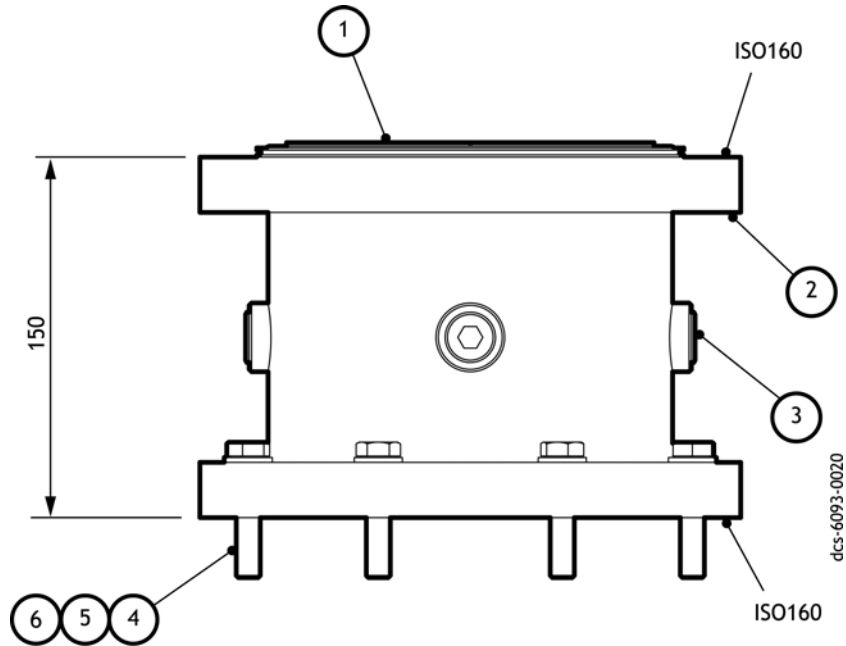
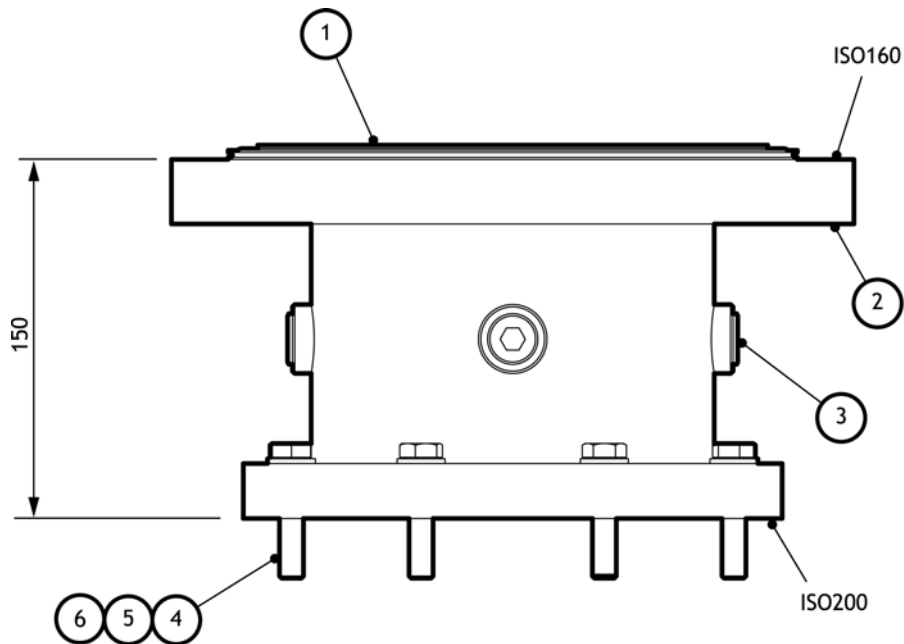


Table 19 - Stainless steel inlet spool ISO160 - ISO160 check list

Item	Qty	Description	Check
1	1	ISO160 trapped O-ring (Fluoroelastomer)	<input type="checkbox"/>
2	1	ISO160 - ISO160 inlet spool - stainless steel	<input type="checkbox"/>
3	4	½ inch BSP taper plug	<input type="checkbox"/>
4	8	M10 x 45 hex head screw - stainless steel	<input type="checkbox"/>
5	8	M10 washer normal - stainless steel	<input type="checkbox"/>
6	8	M10 washer single coil spring - stainless steel	<input type="checkbox"/>

Figure 21 - Stainless steel inlet spool ISO160 - ISO200



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Table 20 - Stainless steel inlet spool ISO160 - ISO200 check list

Item	Qty	Description	Check
1	1	ISO200 trapped O-ring (Fluoroelastomer)	<input type="checkbox"/>
2	1	ISO160 - ISO200 inlet spool - stainless steel	<input type="checkbox"/>
3	4	½ inch BSP taper plug	<input type="checkbox"/>
4	8	M10 x 45 hex head screw - stainless steel	<input type="checkbox"/>
5	8	M10 washer normal - stainless steel	<input type="checkbox"/>
6	8	M10 washer single coil spring - stainless steel	<input type="checkbox"/>

2.3 Technical data

Table 21 - Inlet spool technical data

Description	Part Number	Mass	Materials of Construction	Pump Connection	Foreline Connection	Accessory Ports
ISO to ANSI inlet spool - carbon steel						
Inlet spool ISO63 - ANSI 4 inch - carbon steel	M58808002	10 kg	Painted carbon steel	ISO63	4 inch ANSI	1 x 1 inch BSP female, 3 x ½ inch BSP female
Inlet spool ISO100 - ANSI 4 inch - carbon steel	M59808002	12 kg	Painted carbon steel	ISO100	4 inch ANSI	1 x 1 inch BSP female, 3 x ½ inch BSP female
Inlet spool ISO100 - ANSI 6 inch - carbon steel	M58828002	16 kg	Painted carbon steel	ISO100	6 inch ANSI	4 x ½ inch BSP female
Inlet spool ISO160 - ANSI 6 inch - carbon steel	M58938002	20 kg	Painted carbon steel	ISO160	6 inch ANSI	4 x ½ inch BSP female
Inlet spool ISO160 - ANSI 8 inch - carbon steel	M59848002	25 kg	Painted carbon steel	ISO160	8 inch ANSI	4 x ½ inch BSP female
ISO to ISO inlet spool - carbon steel						
Inlet spool ISO63 - ISO100 - carbon steel	M58808138	9 kg	Painted carbon steel	ISO63	ISO100	1 x 1 inch BSP female, 3 x ½ inch BSP female
Inlet spool ISO100 - ISO100 - carbon steel	M59808138	10 kg	Painted carbon steel	ISO100	ISO100	1 x 1 inch BSP female, 3 x ½ inch BSP female
Inlet spool ISO100 - ISO160 - carbon steel	M58828003	13 kg	Painted carbon steel	ISO100	ISO160	4 x ½ inch BSP female
Inlet spool ISO160 - ISO160 - carbon steel	M58938003	15 kg	Painted carbon steel	ISO160	ISO160	4 x ½ inch BSP female
Inlet spool ISO160 - ISO200 - carbon steel	M59848003	19 kg	Painted carbon steel	ISO160	ISO200	4 x ½ inch BSP female
ISO to ANSI inlet spool - stainless steel						
Inlet spool ISO63 - ANSI 4 inch - stainless steel	M58808134	10 kg	Stainless steel	ISO63	4 inch ANSI	1 x 1 inch BSP female, 3 x ½ inch BSP female
Inlet spool ISO100 - ANSI 4 inch - stainless steel	M59808134	12 kg	Stainless steel	ISO100	4 inch ANSI	1 x 1 inch BSP female, 3 x ½ inch BSP female
Inlet spool ISO100 - ANSI 6 inch - stainless steel	M58828134	16 kg	Stainless steel	ISO100	6 inch ANSI	4 x ½ inch BSP female
Inlet spool ISO160 - ANSI 6 inch - stainless steel	M58938134	20 kg	Stainless steel	ISO160	6 inch ANSI	4 x ½ inch BSP female
Inlet spool ISO160 - ANSI 8 inch - stainless steel	M59848134	25 kg	Stainless steel	ISO160	8 inch ANSI	4 x ½ inch BSP female

Table 21 - Inlet spool technical data (continued)

Description	Part Number	Mass	Materials of Construction	Pump Connection	Foreline Connection	Accessory Ports
ISO to ISO inlet spool - stainless steel						
Inlet spool ISO63 - ISO100 - stainless steel	M58808135	9 kg	Stainless steel	ISO63	ISO100	1 x 1 inch BSP female, 3 x ½ inch BSP female
Inlet spool ISO100 - ISO100 - stainless steel	M59808135	10 kg	Stainless steel	ISO100	ISO100	1 x 1 inch BSP female, 3 x ½ inch BSP female
Inlet spool ISO100 - ISO160 - stainless steel	M58828135	13 kg	Stainless steel	ISO100	ISO160	4 x ½ inch BSP female
Inlet spool ISO160 - ISO160 - stainless steel	M58938135	15 kg	Stainless steel	ISO160	ISO160	4 x ½ inch BSP female
Inlet spool ISO160 - ISO200 - stainless steel	M59848135	19 kg	Stainless steel	ISO160	ISO200	4 x ½ inch BSP female

2.4 Installation

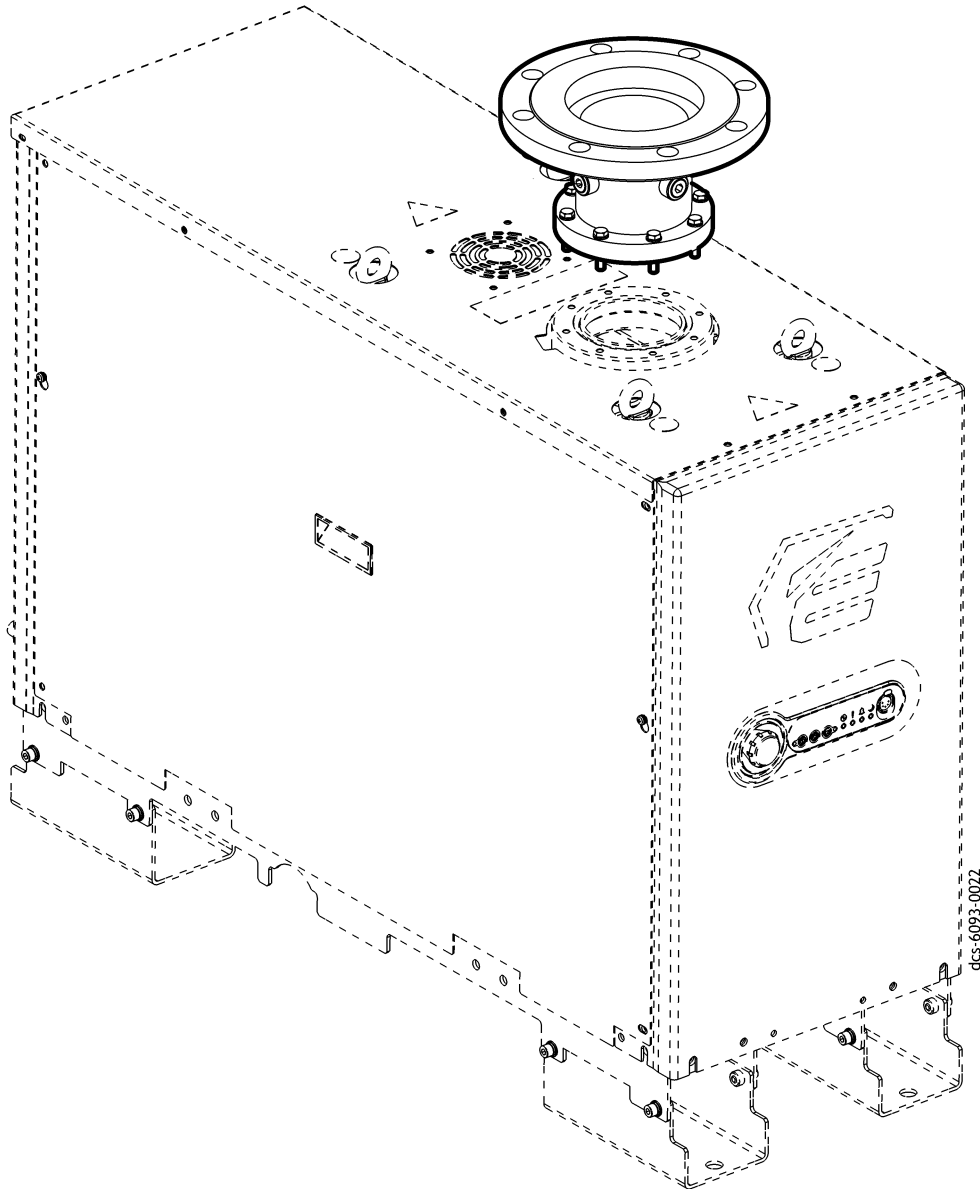
2.4.1 Unpack and inspect

Remove all packing materials and protective covers and visually check the Inlet spool for signs of damage. If the Inlet spool is damaged, notify your supplier and the carrier in writing within three days; state the item number of the Inlet spool together with your order number and your supplier's invoice numbers. Retain all packing materials for inspection. Do not use the Inlet spool if it is damaged.

Check that your package contains the items listed in the [Table 1 to 20](#). If any of these items are missing, notify your supplier in writing within three days.

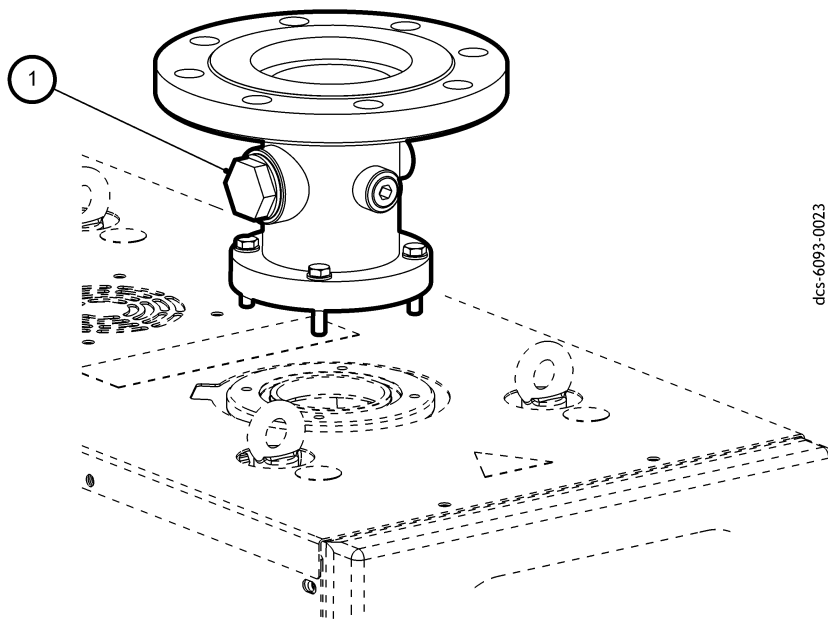
If the inlet spool is not to be used immediately, store as described in [Section 2.8](#).

Figure 22 - Position of inlet spool



Note: Orientation of instrument ports.

Figure 23 - Position of spool with 1 inch instrument port when fitted



1. 1 inch BSP instrument port

2.4.2 Installing an inlet spool to your dry pump

Note: Refer to [Section 3.3](#) of the *GXS Dry Pumping Systems Instruction Manual - M588-00-880* in addition to these instructions.

1. Remove any protective coatings that may have been applied to the spool flanges and remove protective cover from the dry pump. Ensure flange surfaces on spool and dry pump are clean and undamaged.
2. Ensure that the O-ring is correctly installed in the inlet to the dry pump.
3. Ensuring that the bolt holes are lined up, place the inlet spool onto the inlet of your dry pump.
4. Using the supplied hex head screws and washers, securely fix the inlet spool to your dry pump.
5. The hex head screws should be tightened in a diagonal pattern in four passes to the target torque values shown in [Table 22](#).

Table 22 - Flange torque for inlet spool flanges

Flange size	Torque
ISO63	17 Nm for 4 x M8 stainless steel fasteners
ISO100	17 Nm for 8 x M8 stainless steel fasteners
ISO160	34 Nm for 8 x M10 stainless steel fasteners

2.5 Fit customer (ANSI) inlet pipeline to ISO - ANSI inlet spool

1. Ensure that the inlet pipeline has the correct flange and that both mating flange faces are clean and undamaged.
2. Ensure that the ANSI gasket is placed on the raised face of the flange and that the bolt holes are correctly aligned. Do not re-use old gaskets.
3. Using suitable screws, nuts and washers, assemble the inlet pipeline to the inlet spool by bringing the flanges together slowly and keeping the faces parallel.
4. The screws should be tightened in a diagonal pattern in four passes to the target torque values shown in Table 23.

Table 23 - Flange torque for ANSI inlet piping flanges

Flange size	Torque
ANSI 4 inch	150 Nm for 8 x M16 stainless steel fasteners
ANSI 6 inch	290 Nm for 8 x M20 stainless steel fasteners
ANSI 8 inch	290 Nm for 8 x M20 stainless steel fasteners

2.6 Fit customer (ISO) inlet pipeline to ISO - ISO inlet spool

1. Ensure the flange on the inlet pipeline is compatible with the ISO flange on the inlet spool. If the inlet pipeline has a fixed collar flange it can be secured with a rotatable flange or half claw clamps. If the inlet pipeline has a fixed bolted flange then suitable bolts, nuts and washers will be required.
2. Ensure all flange surfaces are clean and undamaged and that the ISO trapped O-ring is correctly installed in the inlet flange of the spool.
3. Position the inlet pipeline flange onto the inlet spool flange ensuring the bolt holes are aligned.
4. Using suitable screws, nuts and washers securely fix the inlet pipeline to the inlet spool.
5. The screws should be tightened in a diagonal pattern in four passes to the target torque values shown in Table 24.

Table 24 - Flange torque for ISO inlet piping flanges

Flange size	Torque
ISO63	17 Nm for 4 x M8 stainless steel fasteners
ISO100	17 Nm for 8 x M8 stainless steel fasteners
ISO160	34 Nm for 8 x M10 stainless steel fasteners

2.7 Fit customer (ISO) inlet pipeline to dry pump

The ISO inlet pipeline can be attached directly to the inlet flange of the pump using the method described in Section 3.3 of the GXS Dry Pumping Systems Instruction Manual - M588-00-880.

2.8 Storage and disposal

2.8.1 Storage

If the inlet spool will not be used immediately:

1. Clean the inlet spool assembly.
2. Protect the sealing faces and place the inlet spool assembly in a sealed polythene bag.
3. Store in a cool dry place.

2.8.2 Disposal

Dispose of the inlet spool assembly in accordance with all local and national safety and environmental requirements.

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3 Inlet valve



WARNING

These inlet valves are designed for VACUUM use only, do not pressurise.



WARNING

Complete the mechanical installation before any electrical or pneumatic connections are made.



WARNING

Leak test the system after installation and seal any leaks found to prevent leakage of dangerous substances out of the system and leakage of air into the system.



WARNING

Can cause muscle strain or back injury. Use lifting aids and proper lifting techniques when removing or replacing the inlet valve. Refer to [Section 3.3](#) for weight information.

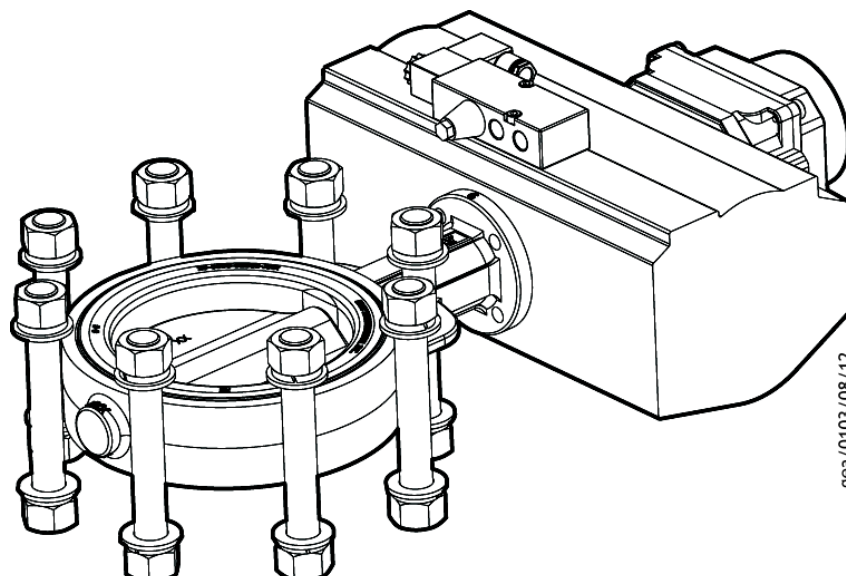
3.1 Description

Refer to [Figure 24](#). The inlet valve is a pneumatically operated butterfly valve which isolates the GXS dry vacuum pumping system from the upstream process.

The valve seat design provides complete isolation of flowing media from the body and stem by a totally encasing design. Inlet valves are pneumatically operated single acting with a spring return and a 24 V d.c operating solenoid. In the event of a power failure, the valve will close automatically.

Note: An ISO - ANSI inlet spool is required to fit an Inlet valve to the GXS dry vacuum pumping system.

Figure 24 - Inlet valve



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3.2 Physical data

Figure 25 - M58808004 inlet isolation valve ANSI 4 inch EPDM

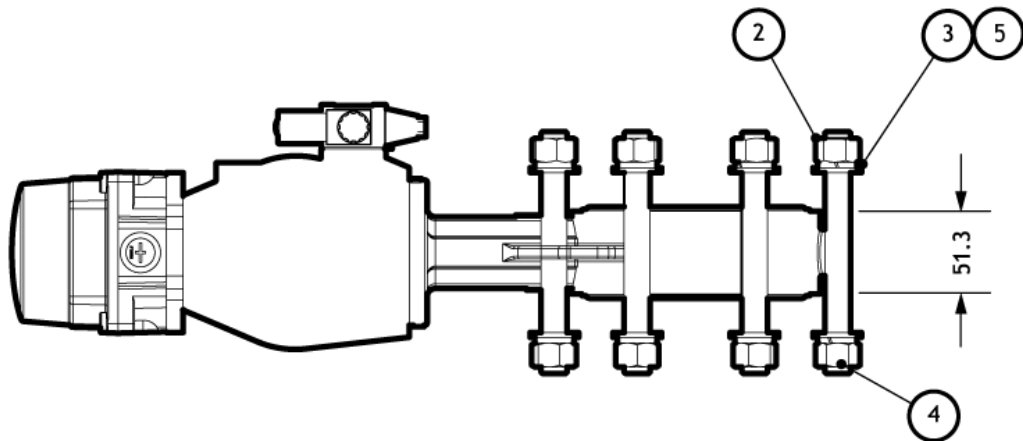
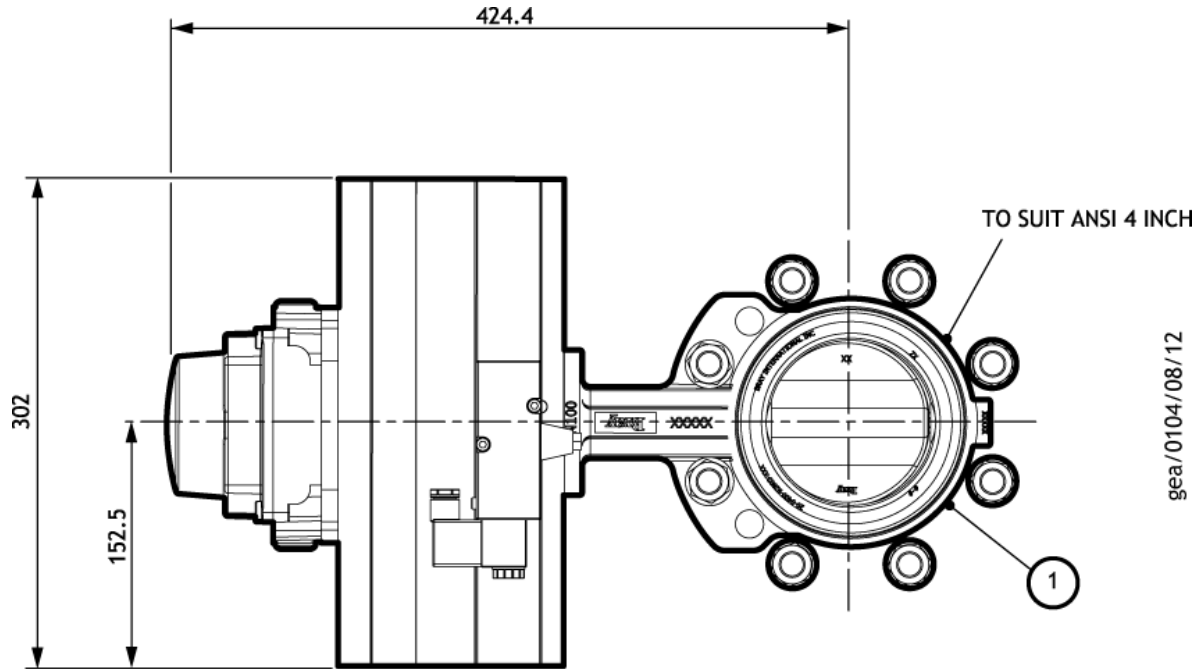


Table 25 - M58808004 inlet isolation valve ANSI 4 inch EPDM check list

Item	Qty	Description	Check
1	1	DN100 Bray inlet valve	<input type="checkbox"/>
2	16	M16 full nut - stainless steel	<input type="checkbox"/>
3	16	M16 washer normal - stainless steel	<input type="checkbox"/>
4	8	Studding M16 x 150 mm - stainless steel	<input type="checkbox"/>
5	16	M16 washer single coil - stainless steel	<input type="checkbox"/>
-	1	Loom - Inlet isolation valve (not shown)	<input type="checkbox"/>

Figure 26 - M58828004 inlet isolation valve ANSI 6 inch EPDM

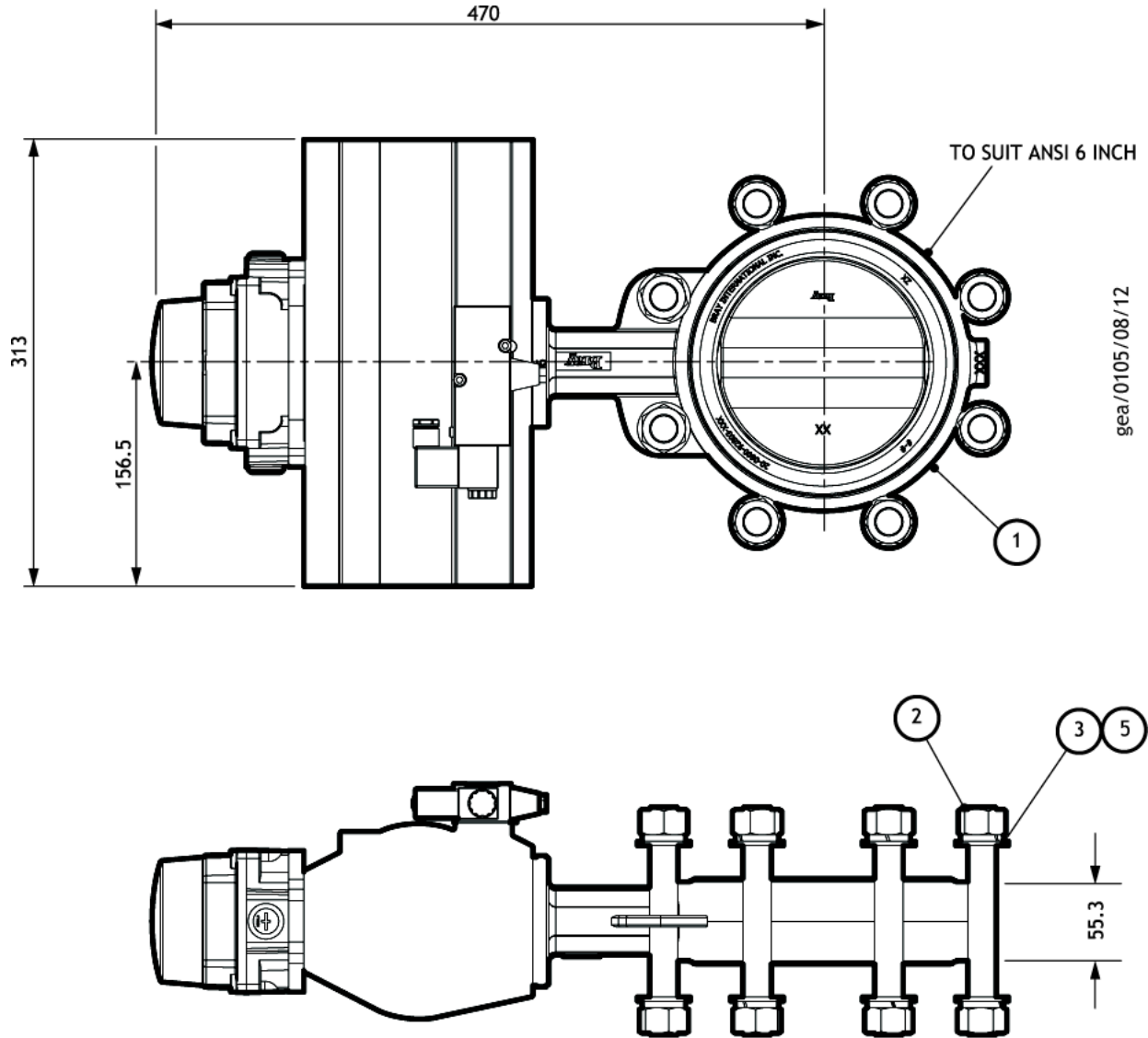
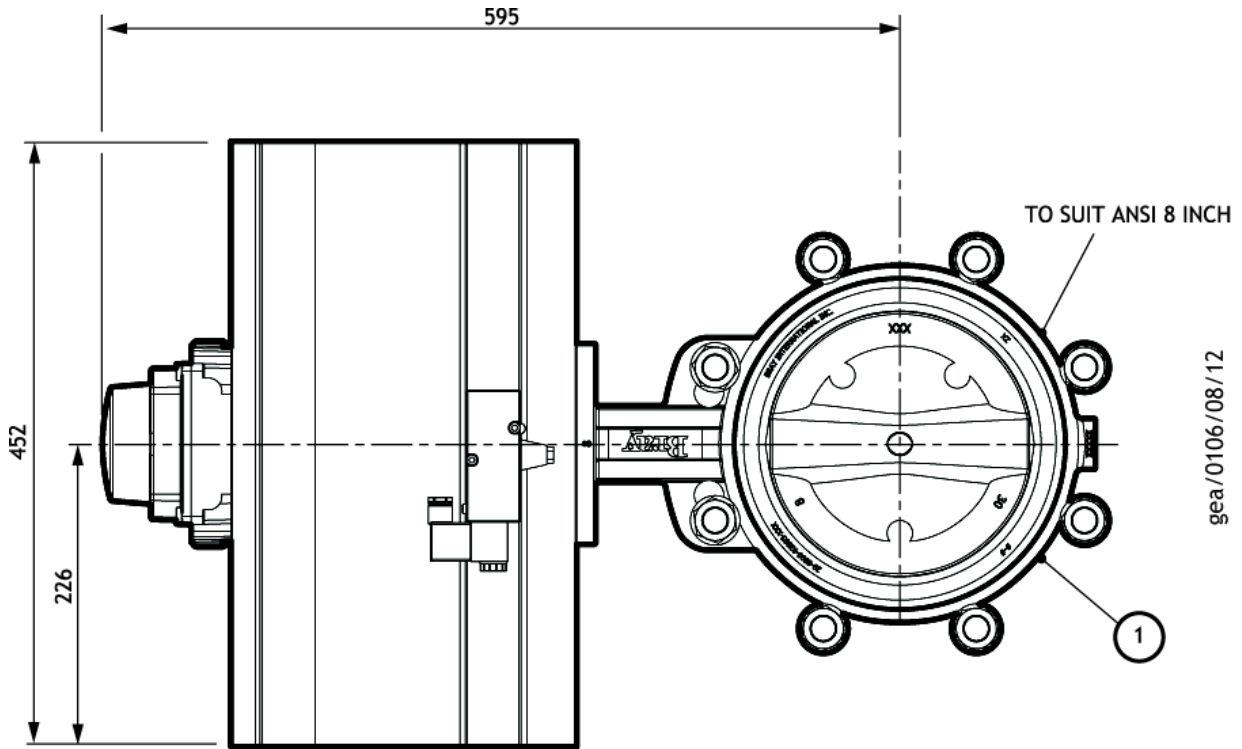


Table 26 - M58828004 inlet isolation valve ANSI 6 inch EPDM check list

Item	Qty	Description	Check
1	1	DN150 Bray inlet valve	<input type="checkbox"/>
2	16	M20 x 140 hex head screw - stainless steel	<input type="checkbox"/>
3	16	M20 washer normal - stainless steel	<input type="checkbox"/>
4	8	Studding M20 x 160 mm - stainless steel	<input type="checkbox"/>
5	16	M20 washer single coil - stainless steel	<input type="checkbox"/>
-	1	Loom - isolation valve (not shown)	<input type="checkbox"/>

Figure 27 - M59848004 inlet isolation valve ANSI 8 inch EPDM



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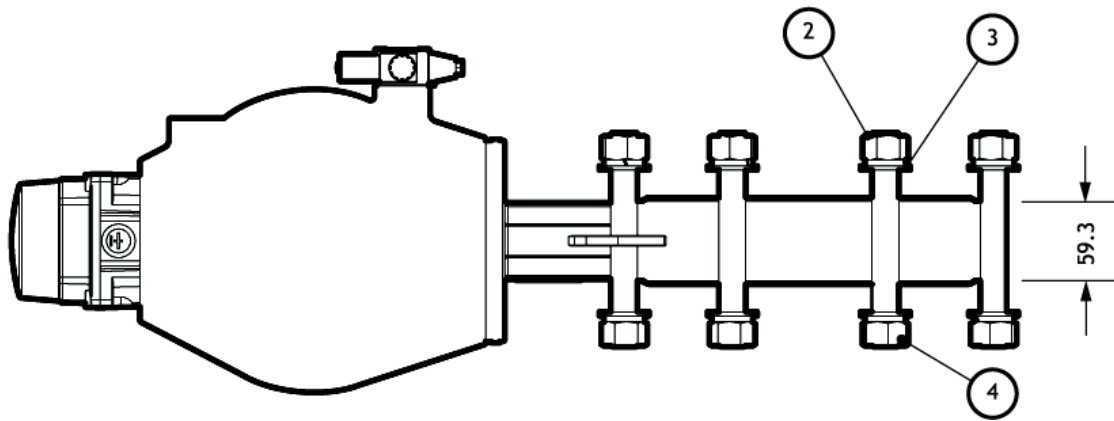


Table 27 - M59848004 inlet isolation valve ANSI 8 inch EPDM check list

Item	Qty	Description	Check
1	1	DN200 Bray inlet valve	<input type="checkbox"/>
2	16	M20 full nut - stainless steel	<input type="checkbox"/>
3	16	M20 washer normal - stainless steel	<input type="checkbox"/>
4	8	Studding M20 x 160 mm - stainless steel	<input type="checkbox"/>
5	16	M20 washer single coil - stainless steel	<input type="checkbox"/>
-	1	Loom - inlet isolation valve (not shown)	<input type="checkbox"/>

3.3 Technical data

3.3.1 Inlet isolation valve ANSI 4 inch EPDM

Table 28 - General

Parameter	Data
Description	Inlet isolation valve ANSI 4 inch EPDM
Part number	M58808004
Mass	23 kg

Table 29 - Butterfly valve

Parameter	Data
Description	100 mm (4 inch) valve with undercut disc and bonded liner suitable for vacuum service
Size	100 mm
Material of Construction	
Body	Cast iron, Epoxy coated - ASTM A126 Class B
Disc	316 stainless steel - ASTM A351 CF8M
Stem	316 stainless steel - ASTM A276 type 316
Seat	EPDM
Maximum design pressure	3.5 bar
Operating temperature range	40 °C to 121 °C
Flange accommodation	Multi drilled locating holes

Table 30 - Pneumatic actuator - spring return

Parameter	Data
Actuation mode	Fail closed
Port connections	¼ inch NPT
Actuator to valve mounting	Standard EN ISO 5211
Maximum operating pressure	10 bar
Operating temperature range	-40 °C to 95 °C

Table 31 - Position indicator

Parameter	Data
Switch type	Single pole double throw
Electrical connection	2 x M20 (PG13 or ½ inch NPT)
Protection rating	IP67 and IP68
Mounting type	VDI/VDE 3845 (NAMUR)
Operating voltage supply	250 V, 10 A
Operating temperature range	-20 °C to 80 °C

Table 32 - Solenoid valve

Parameter	Data
Mains Air connection and exhaust ports	¼ inch BSP
Pressure range	2 to 10 bar
Flow rate	950 l/min
Temperature range (Ta)	-10 °C to +50 °C
Cable entry	PG7 - M16 thread
Voltage	24 V d.c

3.3.2 Inlet isolation valve ANSI 6 inch EPDM

Table 33 - General

Parameter	Data
Description	Inlet isolation valve ANSI 6 inch EPDM
Part number	M58828004
Mass	30 kg

Table 34 - Butterfly valve

Parameter	Data
Description	150 mm (6 inch) valve with undercut disc and bonded liner suitable for vacuum service
Size	150 mm
Material of Construction	
Body	Cast iron, Epoxy coated - ASTM A126 Class B
Disc	316 stainless steel - ASTM A351 CF8M
Stem	316 stainless steel - ASTM A276 type 316
Seat	EPDM
Maximum design pressure	3.5 bar
Operating temperature range	40 °C to 121 °C
Flange accommodation	Multi drilled locating holes

Table 35 - Pneumatic actuator - spring return

Parameter	Data
Actuation mode	Fail closed
Port connections	¼ inch NPT
Actuator to valve mounting	Standard EN ISO 5211
Maximum operating pressure	10 bar
Operating temperature range	-40 °C to 95 °C

Table 36 - Position indicator

Parameter	Data
Switch type	Single pole double throw
Electrical connection	2 x M20 (PG13 or ½ inch NPT)
Protection rating	IP67 and IP68
Mounting type	VDI/VDE 3845 (NAMUR)
Operating voltage supply	250 V, 10 A
Operating temperature range	-20 °C to 80 °C

Table 37 - Solenoid valve

Parameter	Data
Mains air connection and exhaust ports	¼ inch BSP
Pressure range	2 to 10 bar
Flow rate	950 l/min
Temperature range (Ta)	-10 °C to +50 °C
Cable entry	PG7 - M16 thread
Voltage	24 V DC

3.3.3 Inlet isolation valve ANSI 8 inch EPDM

Table 38 - General

Parameter	Data
Description	Inlet isolation valve ANSI 8 inch EPDM
Part number	M59848004
Mass	74 kg

Table 39 - Butterfly valve

Parameter	Data
Description	200 mm (8 inch) valve with undercut disc and bonded liner suitable for vacuum service
Size	200 mm
Material of Construction	
Body	Cast iron, Epoxy coated - ASTM A126 Class B
Disc	316 stainless steel - ASTM A351 CF8M
Stem	316 stainless steel - ASTM A276 type 316
Seat	EPDM
Maximum design pressure	3.5 bar
Operating temperature range	40 °C to 121 °C
Flange accommodation	Multi drilled locating holes

Table 40 - Pneumatic actuator - spring return

Parameter	Data
Actuation mode	Fail closed

Table 40 - Pneumatic actuator - spring return

Parameter	Data
Port connections	¼ inch NPT
Actuator to valve mounting	Standard EN ISO 5211
Maximum operating pressure	10 bar
Operating temperature range	-40 °C to 95 °C

Table 41 - Position indicator

Parameter	Data
Switch type	Single pole double throw
Electrical connection	2 x M20 (PG13 or ½ inch NPT)
Protection rating	IP67 and IP68
Mounting type	VDI/VDE 3845 (NAMUR)
Operating voltage supply	250 V, 10 A
Operating temperature range	-20 °C to 80 °C

Table 42 - Solenoid valve

Parameter	Data
Mains Air connection and exhaust ports	¼ inch BSP
Pressure rate	2 to 10 bar
Flow rate	950 l/min
Temperature range (Ta)	-10 °C to +50 °C
Cable entry	PG7 - M16 thread
Voltage	24 V DC

3.4 Installation

CAUTION

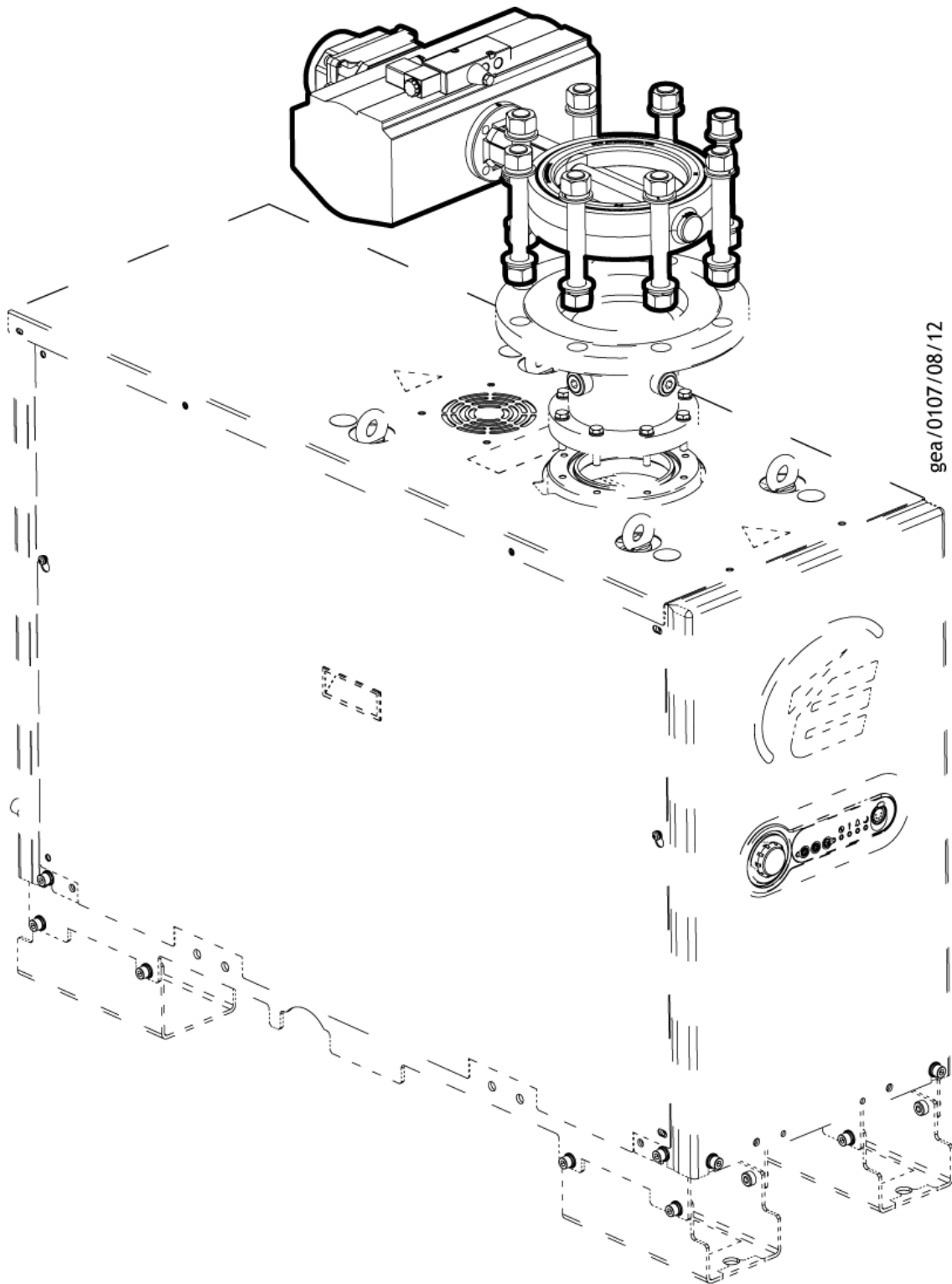
Before installing the inlet valve, the following Original Equipment Manufacturer (OEM) manuals must be read and understood. Failure to observe this caution may cause injury or damage to personnel or equipment.

Note: The information contained within this manual covers the physical installation of the accessory only. It will also be necessary to configure the GXS pump controller to recognise the accessory after it has been installed. Please refer to the GXS product manual for further information.

- Bray Controls Operation and Maintenance Resilient Seated Butterfly Valves Series 30.
- Bray Resilient Seated Butterfly Valves Safety Manual.
- Bray Series 92/93 Pneumatic Actuator Safety Manual.
- Bray Series 92/93 Pneumatic Actuator Operation and Maintenance Manual.
- Valvetop T-Series Valve Controllers Installation, Operation and Maintenance Manual.

For safety reasons, all mechanical installations must be complete before electrical or pneumatic connections are made. [Figure 28](#) shows a typical installation.

Figure 28 - Inlet valve installation and orientation



Note: Figure 28 shows the orientation of the valve in the recommended position. The valve may be installed in other orientations according to specific requirements.

3.4.1 Pneumatic connection

For detailed information and guidance on connection of your actuator, refer to the Bray series 92/93 Pneumatic Actuator Operation and Maintenance Manual.

3.4.2 Electrical connections

3.4.2.1 Installation safety

CAUTION

Be sure to route and secure accessory cables as shown to prevent cables from resting on hot surfaces. Accessory cables may be damaged if they touch the dry pump, booster and spools during pump operation.

The route for the accessory cable around the GXS enclosure has been chosen carefully to ensure that the cable does not rest on hot surfaces or pass over other cables carrying mains voltages. When fitting the accessory cable, carefully follow the instructions given in the sections below. Ensure that cable ties are used as shown to keep the cable in the correct position.

3.4.2.2 Installing the cables inside the GXS enclosure

1. If the GXS system is running, shut it down.
2. Allow the system to cool sufficiently before moving on to step 3, Minimum one hour.
3. Isolate the GXS system from the electrical supply.
4. Refer to [Figure 27](#) and photo L to identify the external position of the inlet valve on the pump.
5. Remove the top cover from the inlet valve position sensor as show, pass the wires through the cable entry position on the sensor and connect the wires as shown in photo M.

Terminal 1 - COMMON (RED)

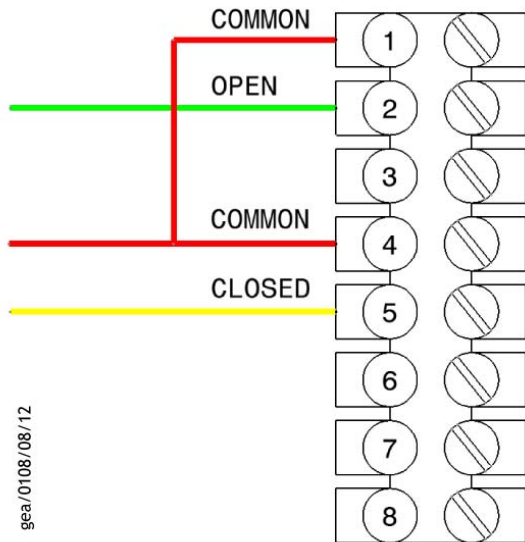
Terminal 2 - OPEN (GREEN)

Terminal 4 - COMMON (RED)

Terminal 5 - CLOSED (YELLOW)

Screw the cable gland into place and tighten until the seal is reached. Replace the top cover.

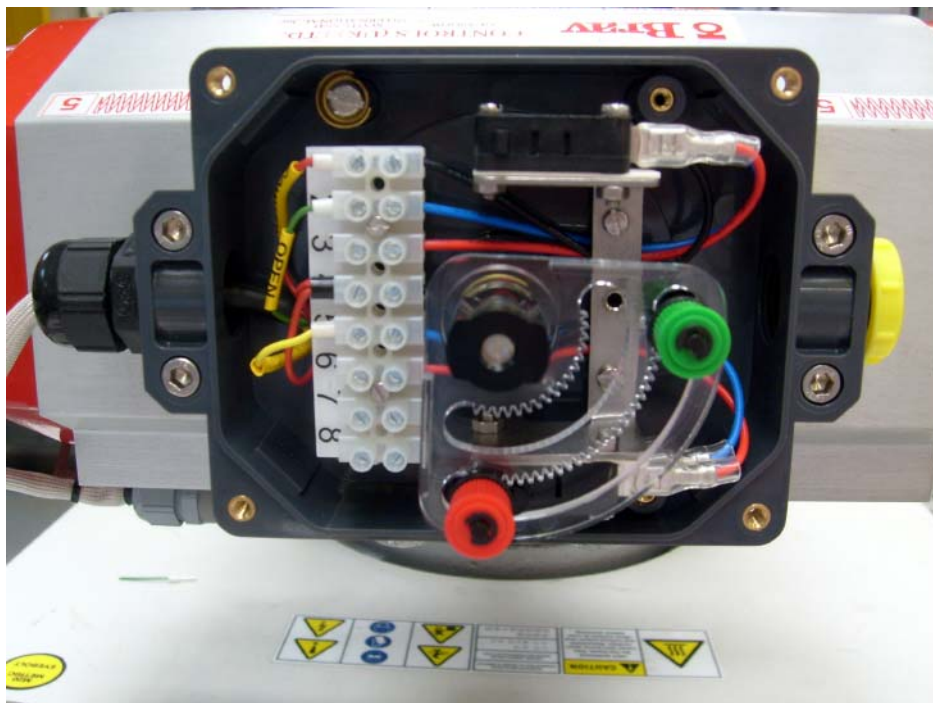
Figure 29 - Inlet valve position



gea/0108/08/12



Figure 30 - Cable connection inlet valve position sensor



gea/0109/08/12

- 6. Connect the other end of the cable to the 15 way socket on the back panel and secure the cables to the pump using the P-clips supplied and the screws used on the pumps panels.

Figure 31 - Clip cable positions



Combination Pump

Pump only



gea/0110/08/12

7. If there is any excess cable, loop it back on itself and secure it firmly with a cable tie. Ensure that it cannot come in contact with the pump surfaces.

Figure 32 - Securing excess cable with a cable tie



3.5 Maintenance

For detailed information and guidance on maintenance of your inlet valve, refer to the Bray Series 92/93 Pneumatic Actuator Operation and Maintenance Manual.

3.6 Storage and disposal

3.6.1 Storage

The inlet valve should be stored with protective covers on both sides of the seat and with the disc at least 10 degrees open. Ideally, the valve should be kept inside a heat-sealed polythene bag to prevent air born contamination and in a temperature range not exceeding 4 °C (40 °F) to 30 °C (85 °F).

3.6.2 Disposal

Dispose of the inlet valve and any components removed from it in accordance with local and national safety and environmental requirements.

Particular care must be taken with the following:

- Fluoroelastomers which may have been subjected to temperatures above 260 °C.
- Components which have been contaminated with dangerous process substances.

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4 Inlet filters



WARNING

Before the inlet filter is fitted to the pump, the pump must be secured as describe in the pump manual.



WARNING

The inlet filter must be removed from the pump before the pump can be moved.



WARNING

These filters are designed for VACUUM use only do not pressurise.



WARNING

Leak test the system after installation and seal any leaks found to prevent leakage of dangerous substances out of the system and leakage of air into the system.



WARNING

Can cause muscle strain or back injury Use lifting aids and proper lifting techniques when removing or replacing the inlet filter. Refer to [Section 4.3](#) for weight information.

CAUTION

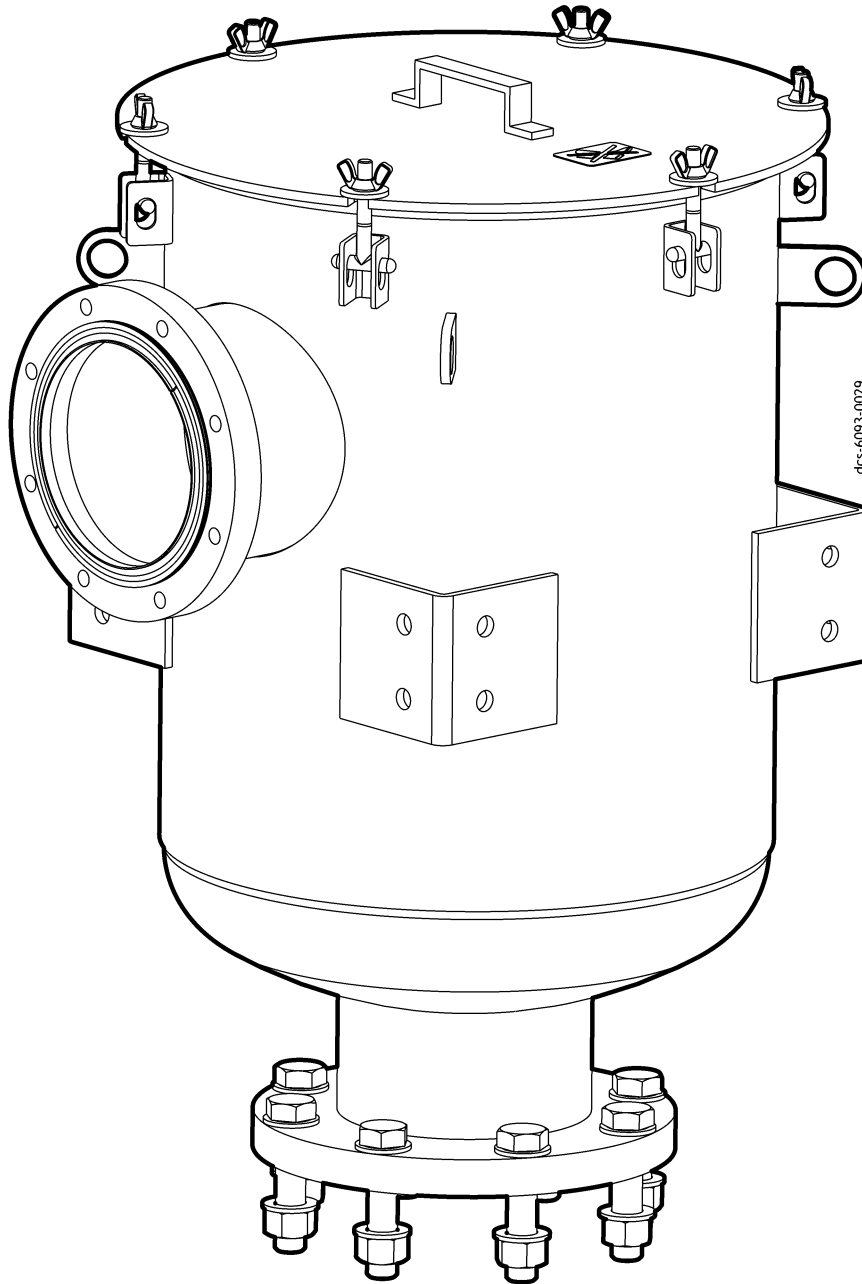
All pipe work that is connected to the inlet filter must be self supporting and must not create any misalignment or stress at the connection point to the inlet filter.

4.1 Description

Refer to [Figure 33](#). Manufactured in both painted carbon steel and stainless steel options (to suit applications), inlet filters entrap process dust by-products, both benign and reactive. Filtration material can be removed, cleaned or replaced when necessary without removing the inlet filter body from the GXS dry vacuum pumping system.

Each filter is supplied with a 5 micron polyester element; an upgrade to a stainless steel S2 wire mesh for reactive dusts is available.

Figure 33 - Inlet filter



4.2 Physical data

4.2.1 Carbon steel inlet filters

Figure 34 - M58808005 carbon steel inlet filter ANSI 4 inch - ISO100

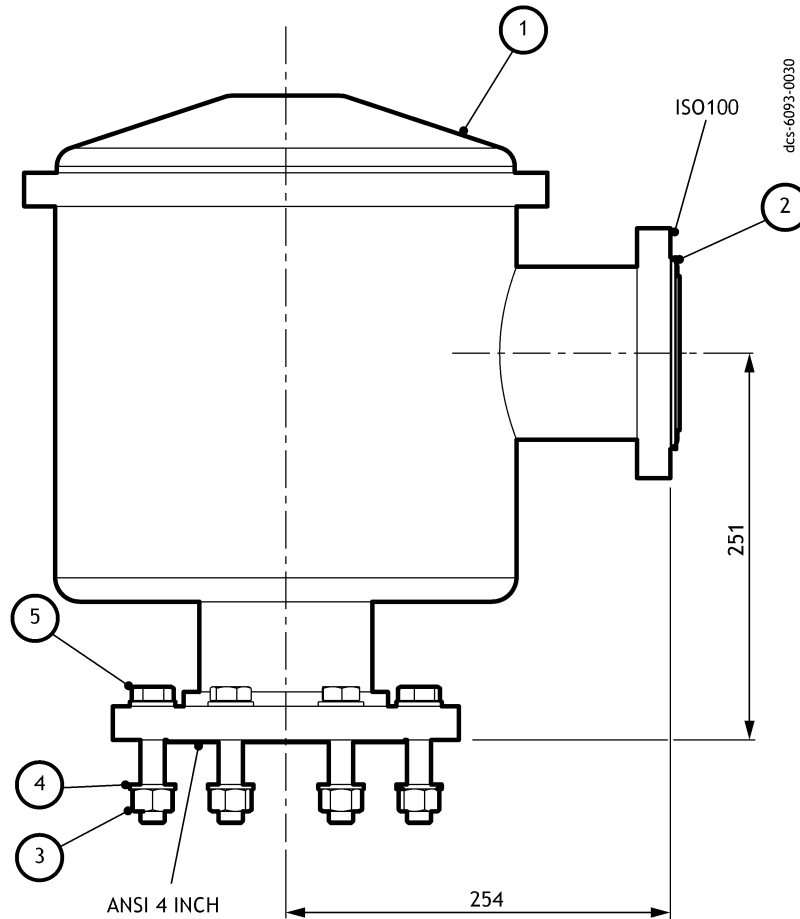
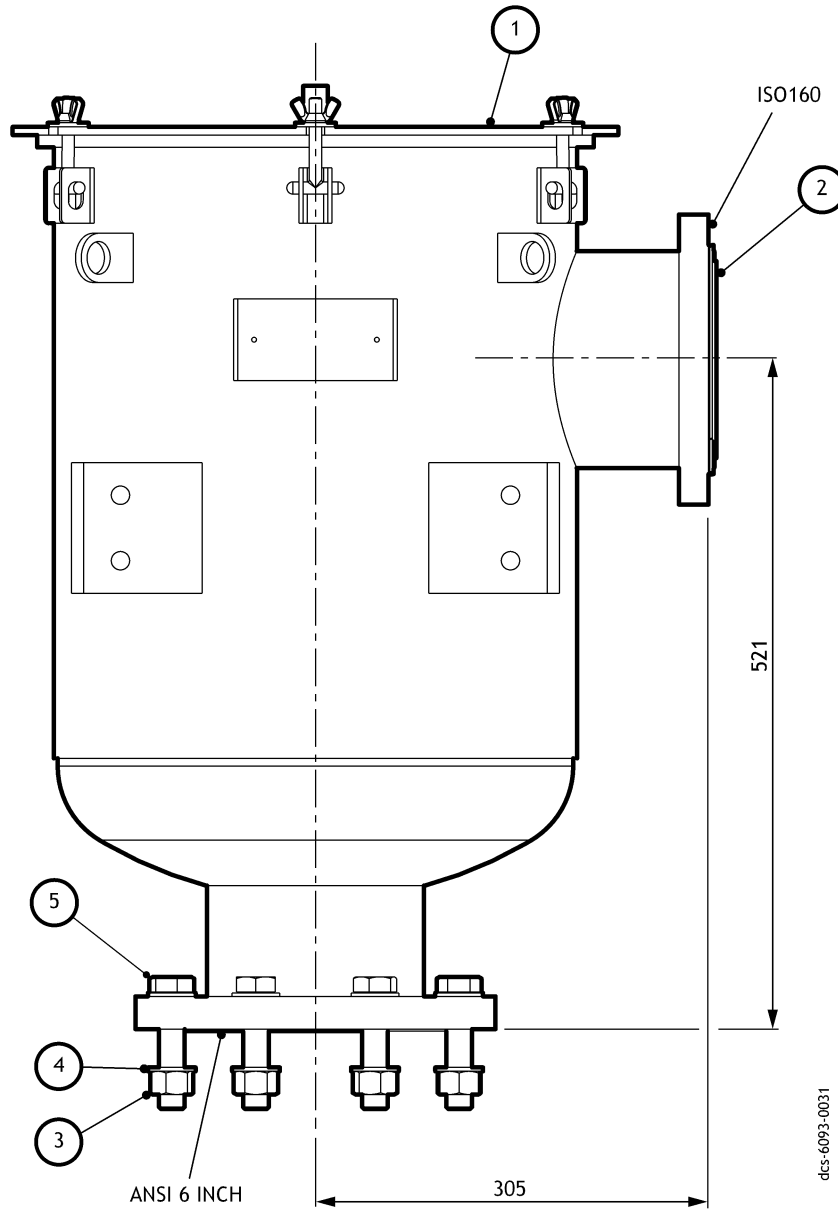


Table 43 - M58808005 carbon steel inlet filter ANSI 4 inch - ISO100 check list

Item	Qty	Description	Check
1	1	ANSI 4 inch - ISO100 inlet filter - carbon steel	<input type="checkbox"/>
2	1	ISO100 trapped O-ring (Fluoroelastomer)	<input type="checkbox"/>
3	8	M8 full nut - stainless steel	<input type="checkbox"/>
4	16	M8 washer normal - stainless steel	<input type="checkbox"/>
5	8	M8 x 60 hex head screw - stainless steel	<input type="checkbox"/>

Figure 35 - M58828005 carbon steel inlet filter ANSI 6 inch - ISO160

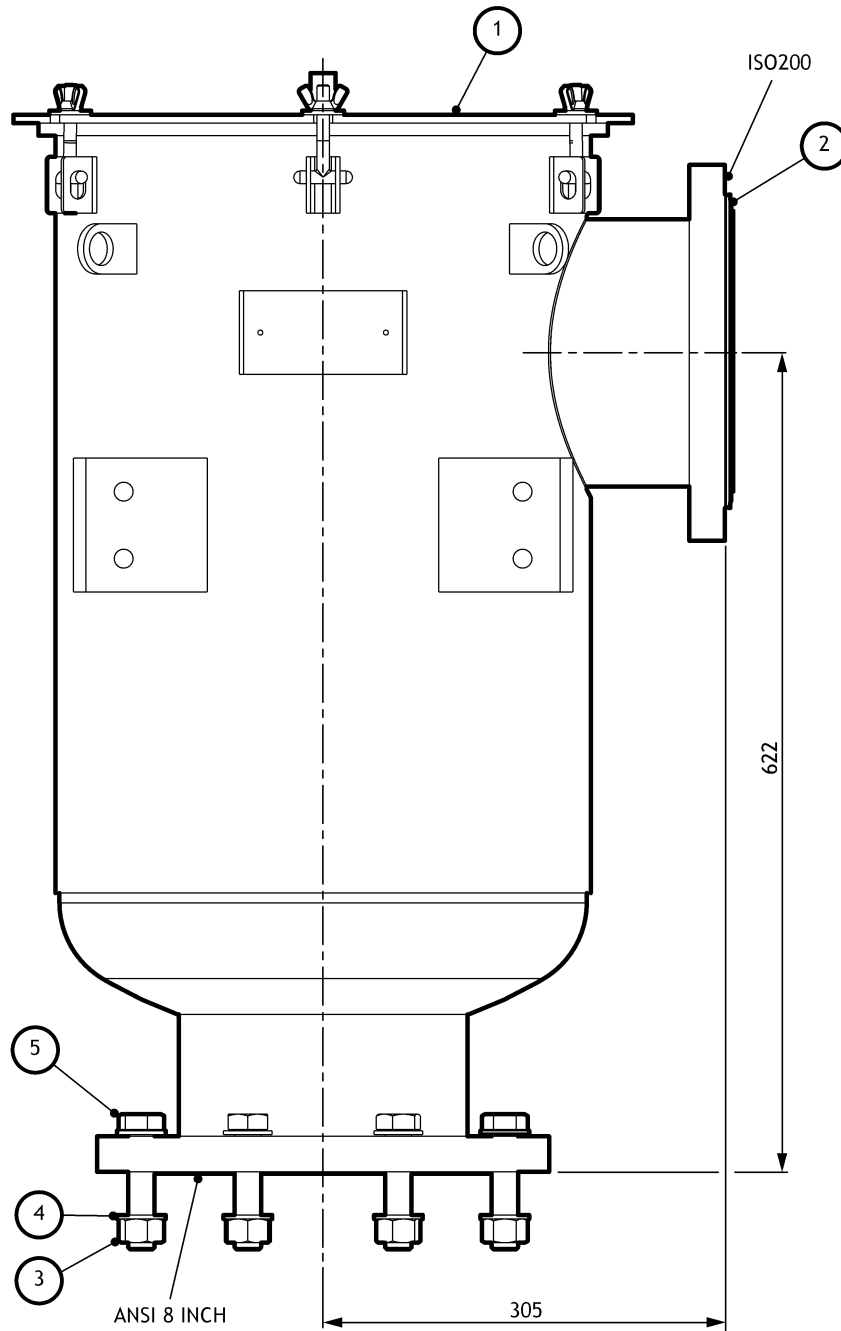


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Table 44 - M58828005 carbon steel inlet filter ANSI 6 inch - ISO160 check list

Item	Qty	Description	Check
1	1	ANSI 6 inch - ISO160 inlet filter - carbon steel	<input type="checkbox"/>
2	1	ISO160 trapped O-ring (Fluoroelastomer)	<input type="checkbox"/>
3	8	M10 full nut - stainless steel	<input type="checkbox"/>
4	16	M10 washer normal - stainless steel	<input type="checkbox"/>
5	8	M10 x 70 hex head screw - stainless steel	<input type="checkbox"/>

Figure 36 - M59848005 carbon steel inlet filter ANSI 8 inch - ISO200



dcs-6093-0032

Table 45 - M59848005 carbon steel inlet filter ANSI 8 inch - ISO200 check list

Item	Qty	Description	Check
1	1	ANSI 8 inch - ISO200 Inlet filter - carbon steel	<input type="checkbox"/>
2	1	ISO200 trapped O-ring (Fluoroelastomer)	<input type="checkbox"/>
3	12	M10 full nut - stainless steel	<input type="checkbox"/>
4	24	M10 washer normal - stainless steel	<input type="checkbox"/>
5	12	M10 x 80 hex head screw - stainless steel	<input type="checkbox"/>

4.2.2 Stainless steel inlet filter

Figure 37 - M58808137 stainless steel inlet filter ANSI 4 inch - ISO100

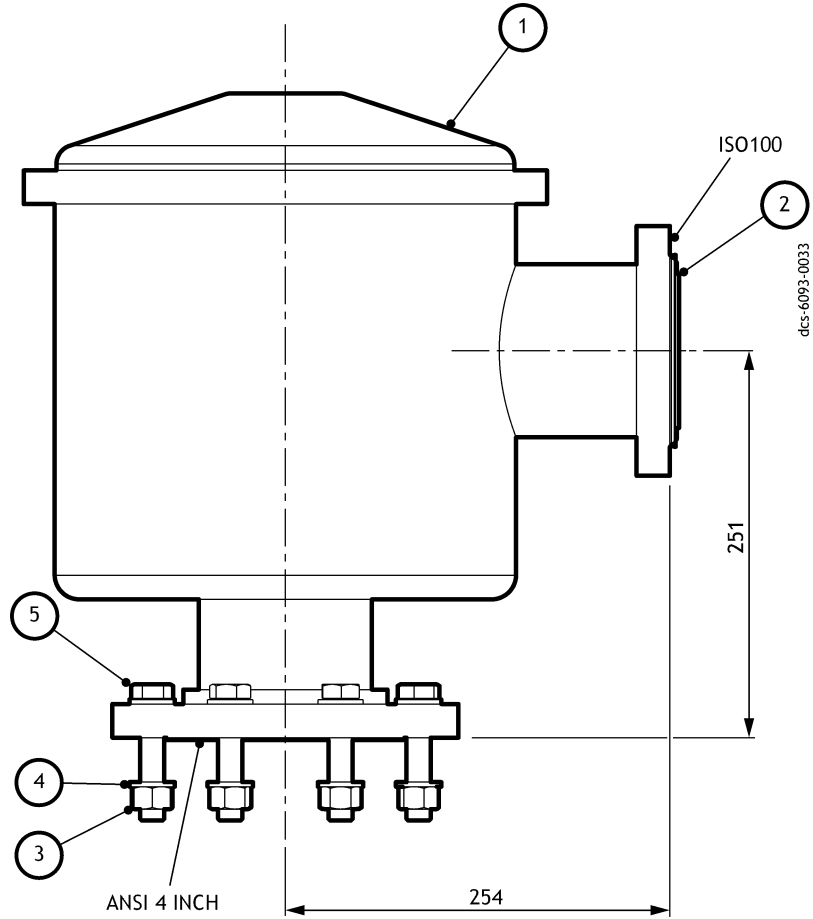


Table 46 - M58808137 stainless steel inlet filter ANSI 4 inch - ISO100 check list

Item	Qty	Description	Check
1	1	ANSI 4 inch - ISO100 inlet filter - stainless steel	<input type="checkbox"/>
2	1	ISO100 trapped O-ring (Fluoroelastomer)	<input type="checkbox"/>
3	8	M8 full nut - stainless steel	<input type="checkbox"/>
4	16	M8 washer normal - stainless steel	<input type="checkbox"/>
5	8	M8 x 60 hex head screw - stainless steel	<input type="checkbox"/>

Figure 38 - M58828137 stainless steel inlet filter ANSI 6 inch - ISO160

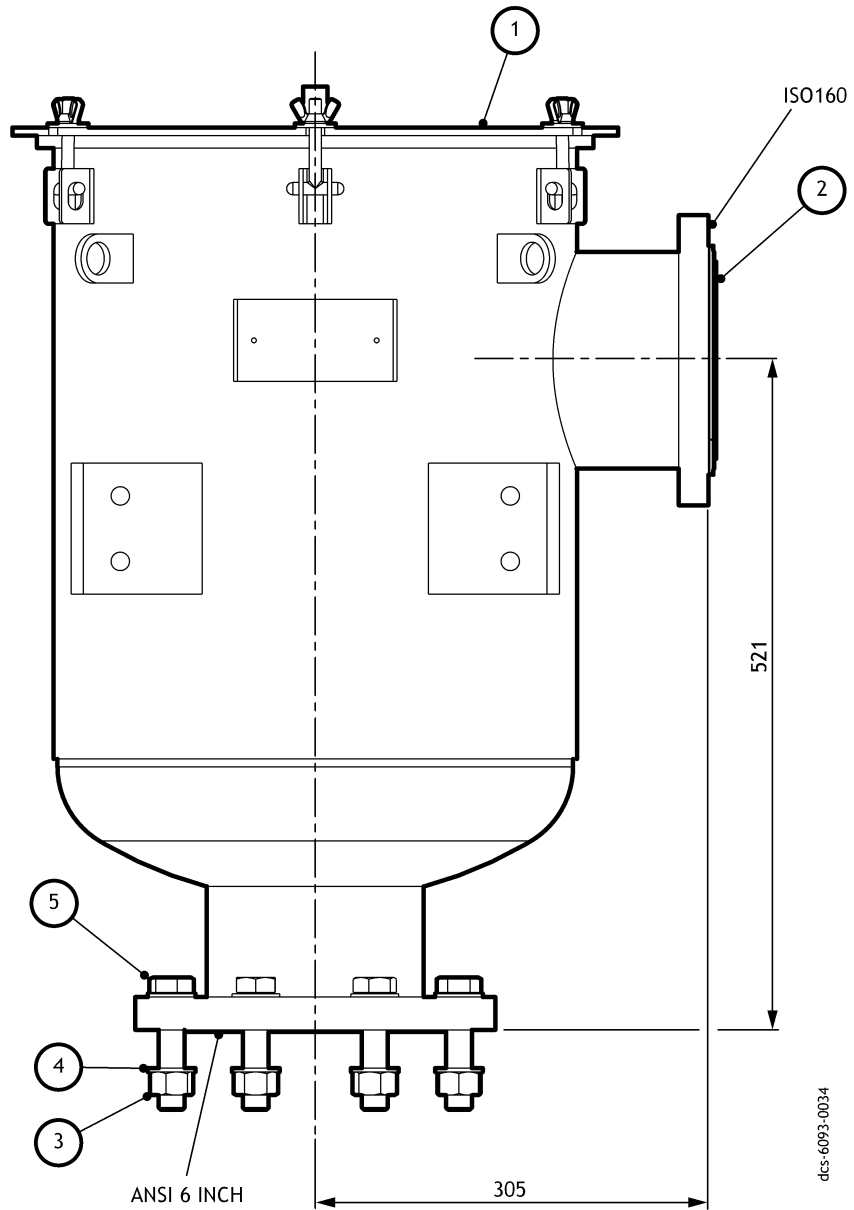
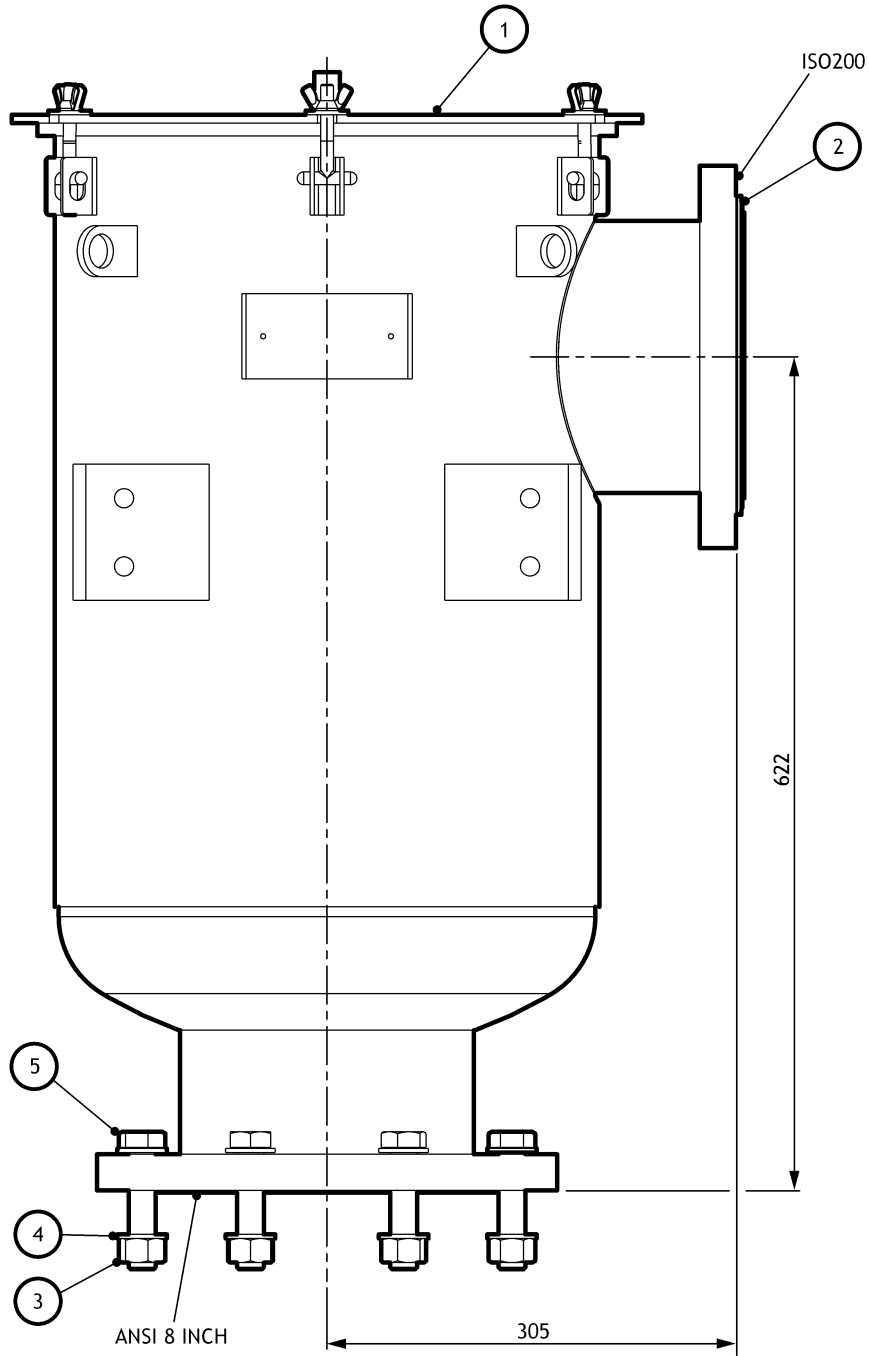


Table 47 - M58828137 stainless steel inlet filter ANSI 6 inch - ISO160 check list

Item	Qty	Description	Check
1	1	ANSI 6 inch - ISO160 inlet filter - stainless steel	<input type="checkbox"/>
2	1	ISO160 trapped O-ring (Fluoroelastomer)	<input type="checkbox"/>
3	8	M10 full nut - stainless steel	<input type="checkbox"/>
4	16	M10 washer normal - stainless steel	<input type="checkbox"/>
5	8	M10 x 70 hex head screw - stainless steel	<input type="checkbox"/>

Figure 39 - M59848137 stainless steel inlet filter ANSI 8 inch - ISO200



dcs-6093-0035

Table 48 - M59848137 Stainless steel inlet filter ANSI 8 inch - ISO200 check list

Item	Qty	Description	Check
1	1	ANSI 8 inch - ISO200 inlet filter - stainless steel	<input type="checkbox"/>
2	1	ISO160 trapped O-ring (Fluoroelastomer)	<input type="checkbox"/>
3	12	M10 full nut - stainless steel	<input type="checkbox"/>
4	24	M10 washer normal - stainless steel	<input type="checkbox"/>
5	12	M10 x 80 hex head screw - stainless steel	<input type="checkbox"/>

4.3 Technical data

Table 49 - Inlet filter technical data

Description	Part Number	Material	Mass	Inlet	Outlet	Element	Element Material	Flow rate m ³ /hr
Carbon steel inlet filter ANSI 4 inch - ISO100	M58808005	Painted carbon steel	22 kg	ISO100	4 inch ANSI	A22304363	Polyester	1274
Carbon steel inlet filter ANSI 6 inch - ISO160	M58828005	Painted carbon steel	55 kg	ISO160	6 inch ANSI	A22304367	Polyester	1868
Carbon steel inlet filter ANSI 8 inch - ISO200	M59848005	Painted carbon steel	72 kg	ISO200	8 inch ANSI	A22304371	Polyester	2548
Stainless steel inlet filter ANSI 4 inch - ISO100	M58808137	Stainless steel	22 kg	ISO100	4 inch ANSI	A22304365	Polyester	1274
Stainless steel inlet filter ANSI 6 inch - ISO160	M58828137	Stainless steel	55 kg	ISO160	6 inch ANSI	A22304369	Polyester	1868
Stainless steel inlet filter ANSI 8 inch - ISO200	M59848137	Stainless steel	72 kg	ISO200	8 inch ANSI	A22304373	Polyester	2548

4.4 Installation

4.4.1 Unpack and inspect

Remove all the packaging materials and check the inlet filter for signs of damage. If the inlet filter is damaged, notify your supplier and the carrier in writing within three days; state the Item number of the inlet filter together with your order number and your supplier's invoice numbers. Do not use the inlet filter if it is damaged.

Check that your package contains the items listed in [Table 43 to 48](#). If any of these items are missing, notify your supplier in writing within three days.

If the inlet filter is not to be used immediately, store as described in [Section 4.6](#).

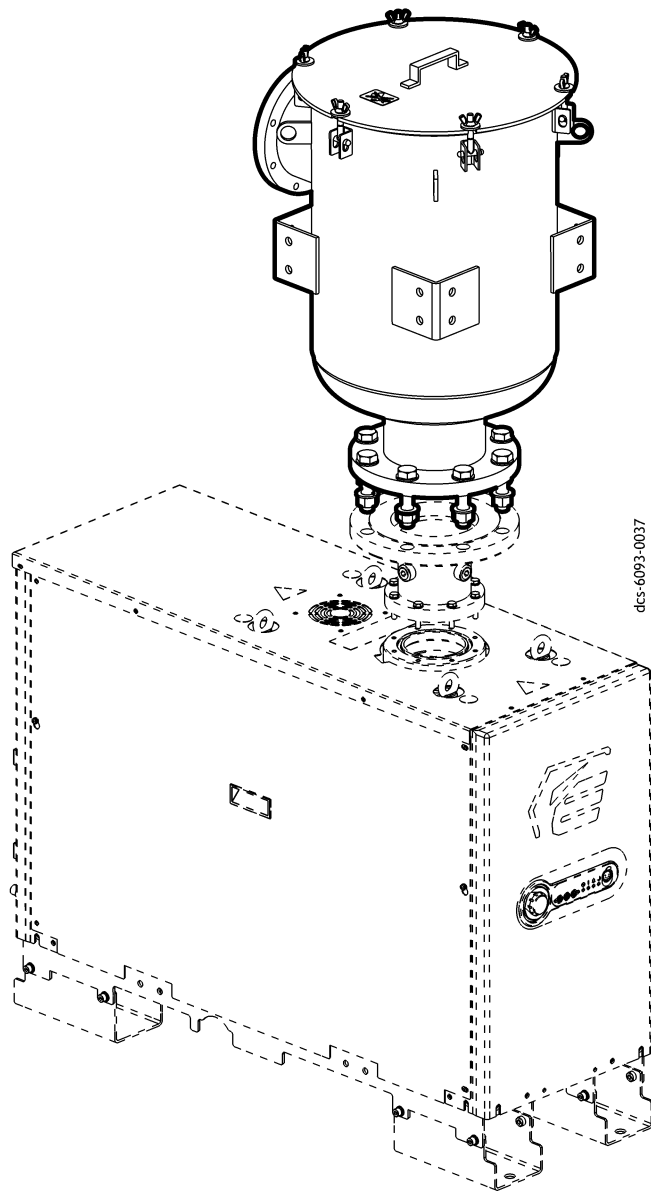
4.4.2 Installation of the inlet filter to the inlet spool

Note: Refer to [Section 2](#) for details on fitting the inlet spool.

Refer to [Figure 40](#).

1. Remove any protective coatings that may have been applied to the filter flanges and ensure the flange faces on the filter and the spool are clean and undamaged.
2. Place the ANSI gasket (supplied with the inlet spool) onto the inlet spool flange raised face.
3. Using appropriate handling equipment, lower the inlet filter onto the inlet spool with the filter inlet flange in the required orientation.
4. Using the fasteners provided with the inlet filter, tighten as described in [Section 2.5](#).

Figure 40 - Installation of the inlet filter to the inlet spool



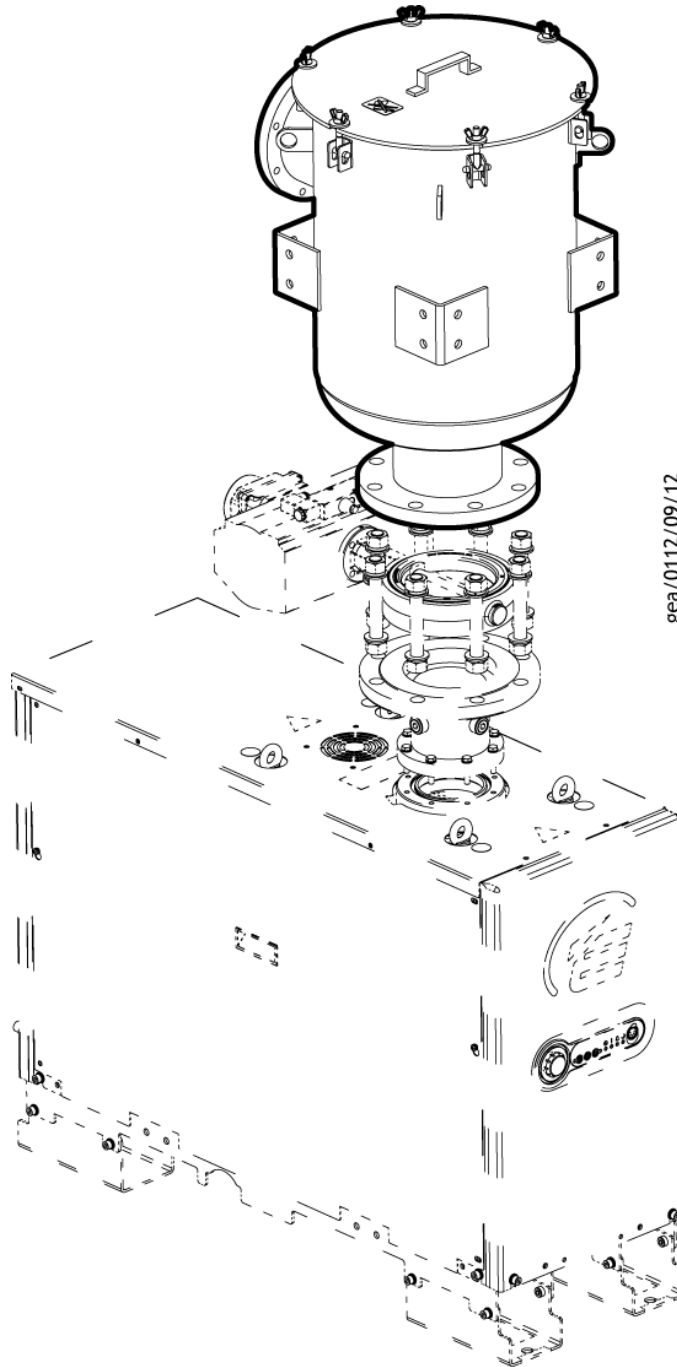
4.4.3 Installation of the inlet filter to inlet spool/ inlet valve assembly

Note: Refer to Section 2 and 3 for details on fitting the inlet spool and inlet valve.

Refer to Figure 41.

Special attention needs to be taken for the installation of the inlet valve due to the sealing system and the removal and refitting of the actuator to aid correct positioning.

Figure 41 - Installation of the inlet filter to inlet spool/ inlet valve assembly



Note: Figure 41 shows the orientation of the valve in the recommended position. The valve may be installed in other orientations according to specific requirements.

4.5 Maintenance

Note: It is recommended that the Solberg Vacuum Filters Maintenance Manual supplied by the OEM is read and adhered to in order to protect the equipment and reduce personal risk.

- Ensure maintenance is carried out by a suitably trained and supervised technician in accordance with local and national safety requirements and that they are familiar with the safety procedures that relate to this filter.
- Check that all the required parts are available and of the correct type before work is started.
- Do not re-use seals and gaskets.
- Where an inlet butterfly valve is present, ensure this is isolated before maintenance work begins on the inlet filter.
- Leak test the system after maintenance work is complete if you have connected or disconnected any vacuum joints. Seal any leaks that are found.

4.6 Storage and disposal

4.6.1 Storage

If the inlet filter will not be used immediately:

1. Refit the protective covers over the inlet and outlet ports.
2. Place the Filter in its protective packaging.
3. Store in a cool dry place.

4.6.2 Disposal

Dispose of the inlet filter and any components removed from in accordance with local and national safety and environmental requirements.

Particular care must be taken with the following:

1. Fluoroelastomers that may have been subjected to temperatures above 260 °C (refer to [Section 4.2](#)).
2. Components that have been contaminated with dangerous process substances.

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5 Exhaust silencer



WARNING

Before the exhaust silencer is fitted to the pump, the pump must be secured as describe in the pump manual.



WARNING

The exhaust silencer must be removed from the pump before the pump can be moved.



WARNING

This exhaust silencer is designed for ATMOSPHERIC use only; do not pressurise.



WARNING

Leak test the system after installation and seal any leaks found to prevent leakage of dangerous substances out of the system and leakage of air into the system.



WARNING

Can cause muscle strain or back injury. Use lifting aids and proper lifting techniques when removing or replacing. Refer to [Section 5.3](#) for weight information.



WARNING

Hot surface.

CAUTION

The operating procedures detailed in the GXS System Instruction Manual - M588-00-880 must be adhered to, in particular [Section 3](#) and [5](#).

CAUTION

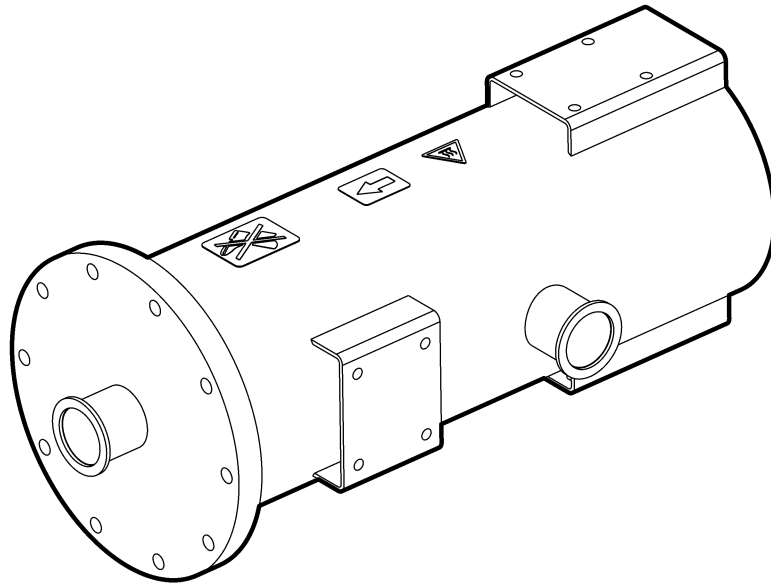
All pipe work that is connected to the exhaust silencer must be self supporting and must not create any misalignment or stress at the connection point to the exhaust silencer.

5.1 Description

There are two types of exhaust silencer that attenuate the noise from the GXS dry vacuum pumping systems.

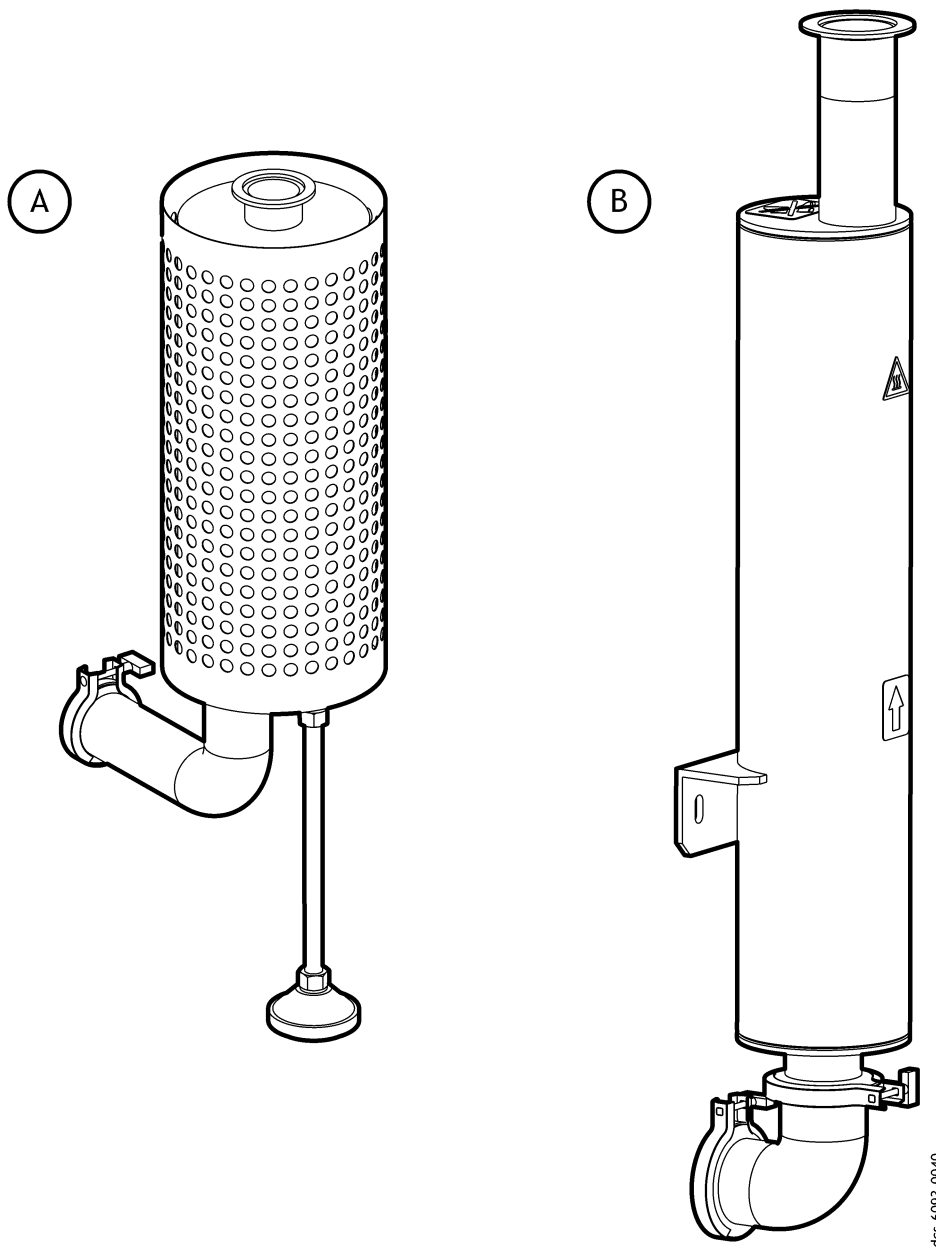
Refer to Figure 42. The first exhaust silencer type is manufactured in both painted carbon steel and stainless steel options (to suit applications) and is designed to hold a volume of liquid or particulates that maybe produced during your process. This exhaust silencer can be drained without disassembly; it is also possible to clean and remove any contaminates with minimal part removal.

Figure 42 - Wet process exhaust silencer



Refer to Figure 43. The second exhaust silencer type is mounted vertically. Manufactured in stainless steel only, this exhaust silencer is designed for clean and dry processes. Easy to disassemble from the GXS pumping system, it is simple to clean and remove any contaminates with minimal parts removal.

Figure 43 - Dry process exhaust silencer



- A. GXS160 and GXS250
- B. GXS450 and GXS750*

* Not suitable for GXS750 on all applications. Please consult an Edwards customer centre for applications advice.

5.2 Physical data

Figure 44 - M58808161 GXS exhaust silencer 100 ctrs assembly - carbon steel

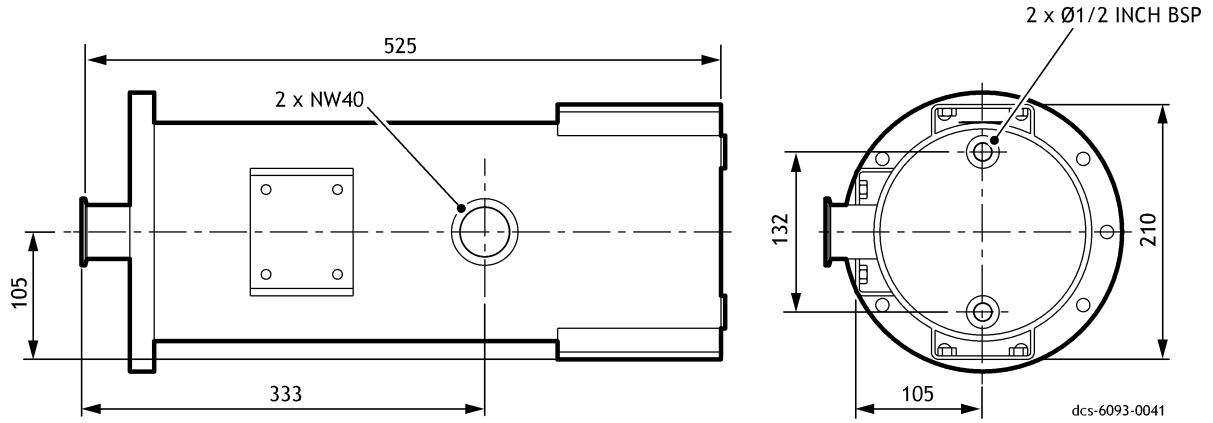


Figure 45 - M58808162 GXS exhaust silencer 100 ctrs assembly - stainless steel

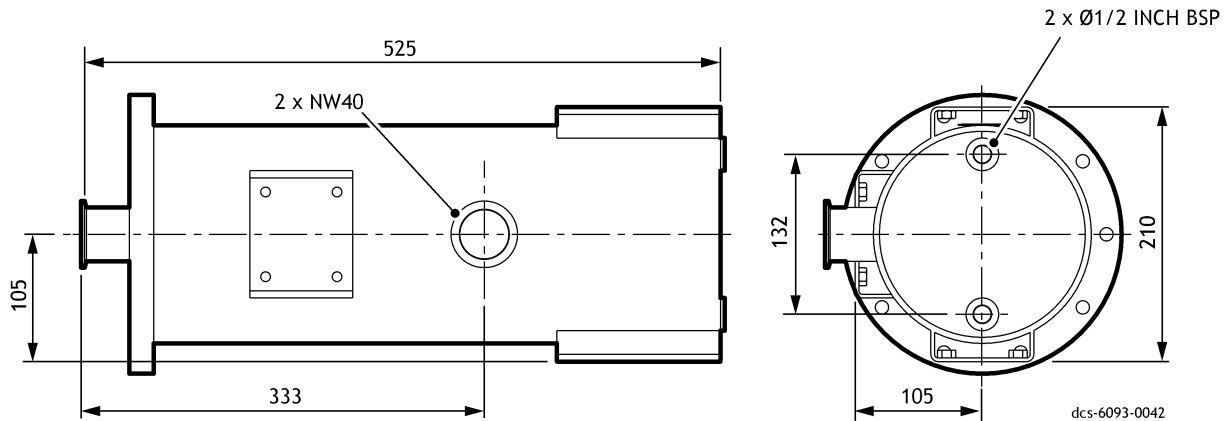


Figure 46 - M59838161 GXS exhaust silencer 150 ctrs assembly - carbon steel

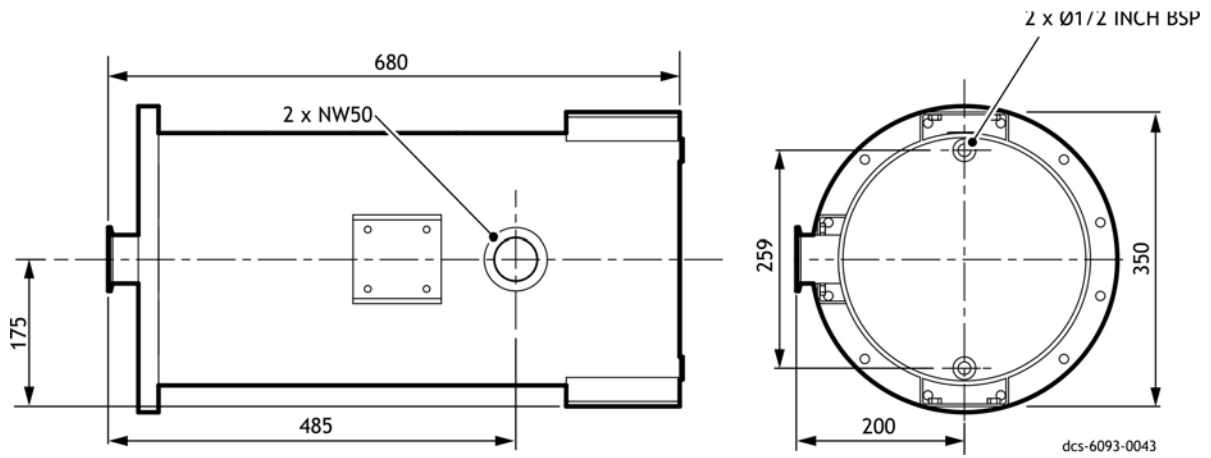
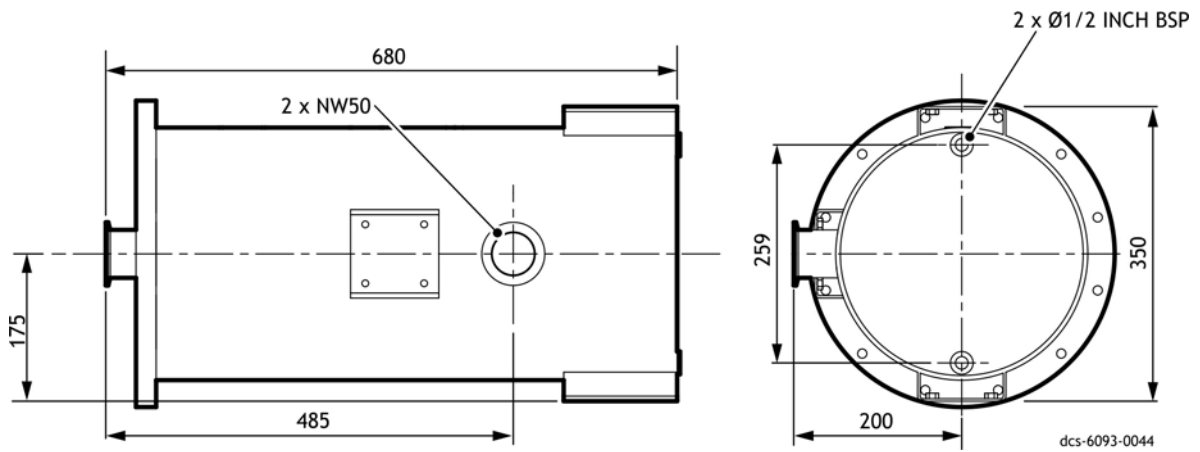


Figure 47 - M59838162 GXS exhaust silencer 150 ctrs assembly - stainless steel



Exhaust silencer

Figure 48 - NKB530000 iF exhaust silencer - stainless steel

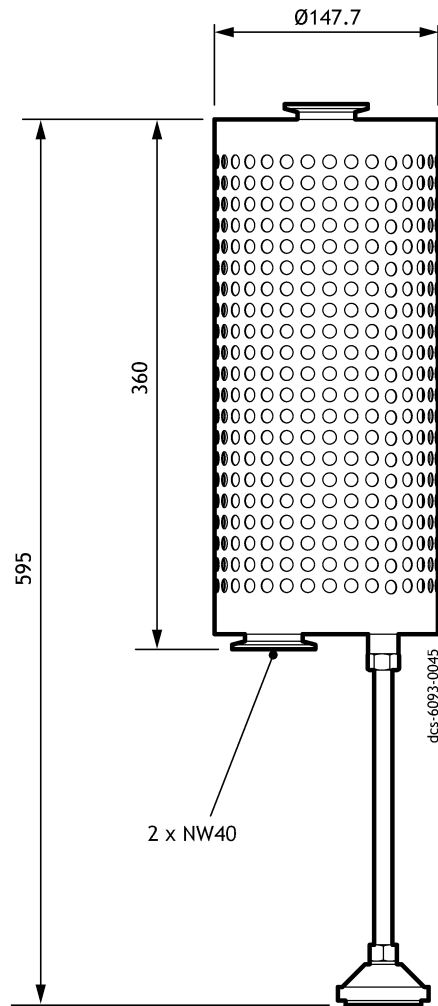
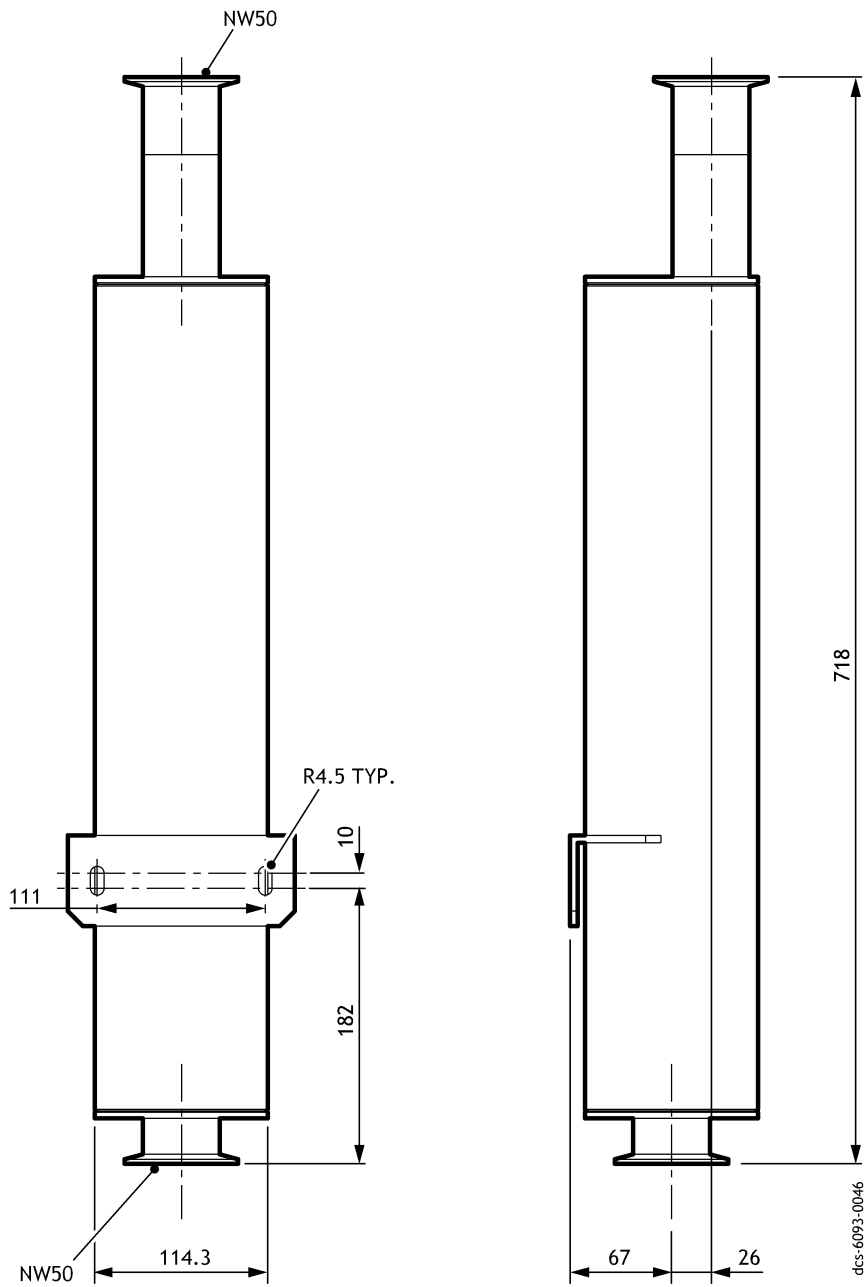


Figure 49 - NR5009000 iF400 exhaust silencer



5.3 Technical data

For technical data relating to the exhaust silencers, refer to [Section 6.3](#).

5.4 Installation

For exhaust silencer installation instructions, please refer to [Section 6](#).

5.5 Operation

The exhaust silencer is a passive device and therefore no operating procedures are required. Follow the points below to ensure you operate your exhaust silencer safely:

- Ensure the exhaust silencer is correctly fitted before you use your GXS dry pump.
- Do not touch the exhaust silencer when it is hot.
- Avoid contact between the exhaust silencer and combustible materials, plastics or electrical cables.
- Check the efficiency of your exhaust silencer regularly. A decrease in pump performance could indicate that the exhaust silencer is becoming blocked with deposits or condensate from your pump exhaust. Remove the silencer and drain it, or clean it as described in [Section 5.6](#).
- Check the inlet and outlet connections weekly to ensure that they are secure.

5.6 Maintenance

5.6.1 Safety information



WARNING

Obey the safety instruction given below and take note of appropriate precautions. If you do not you can cause injury to people and damage equipment.



WARNING

Personal protective equipment should be checked and used as specified by its supplier. If the exhaust silencer has been exposed to hazardous chemicals, the use of suitable protective gloves and clothing along with a respirator is recommended if contact with substances is anticipated.

- Isolate the dry pumping system and other components in the process system from the electrical supply so that they cannot be operated accidentally.
- Allow the exhaust silencer to cool to a safe temperature before starting any maintenance. Do not touch the exhaust silencer when it is hot.
- Take suitable precautions when you maintain the exhaust silencer especially if it has been contaminated with dangerous process materials.
- Replace the exhaust silencer if it becomes damaged or blocked.

5.6.2 Cleaning

The exhaust silencers should be cleaned and maintained in accordance with the procedures detailed in the OEM's Service Manuals as listed in Table 50.

Table 50 - Exhaust silencer OEM service manuals

Item Number	Description	OEM Service Manual
M58808161	GXS exhaust silencer 100 ctrs assembly - carbon steel	DischargeSlcrManualNW40US-0811
M58808162	GXS exhaust silencer 100 ctrs assembly - stainless steel	DischargeSlcrManualNW50US-0811
M59838161	GXS exhaust silencer 150 ctrs assembly - carbon steel	
M59838162	GXS exhaust silencer 150 ctrs assembly - stainless steel	

The exhaust silencers listed below are for clean applications only, and therefore cleaning is not required:

- NKB530000 IF Silencer stainless steel.
- NR5009000 IF400 Silencer.

Note: If cleaning is attempted, be aware that any fluids used could get trapped within the chambers of the silencer, and ejected on start-up of the pumping system.

5.6.3 Leak testing

After maintenance of the exhaust silencer and before the pumping system is used, it is important that the system is leak tested to prevent the possible leakage of hazardous substances.

5.7 Storage and disposal

5.7.1 Storage

If the exhaust silencer will not be used immediately:

1. Drain and clean the exhaust silencer.
2. Protect the flange face and place the exhaust silencer in a sealed polythene bag.
3. Store in a cool dry place.

5.7.2 Disposal

Dispose of the exhaust silencer in accordance with local and national safety and environmental requirements.

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6 Exhaust silencer mounting assembly

6.1 Description

This exhaust silencer is mounted horizontally and either bolted to the side of the pump when a side exiting exhaust is fitted (refer to Figure 50), or free standing at the rear of the pump when a rear exiting exhaust is fitted (refer to Figure 51).

Figure 50 - Side exiting exhaust mounting

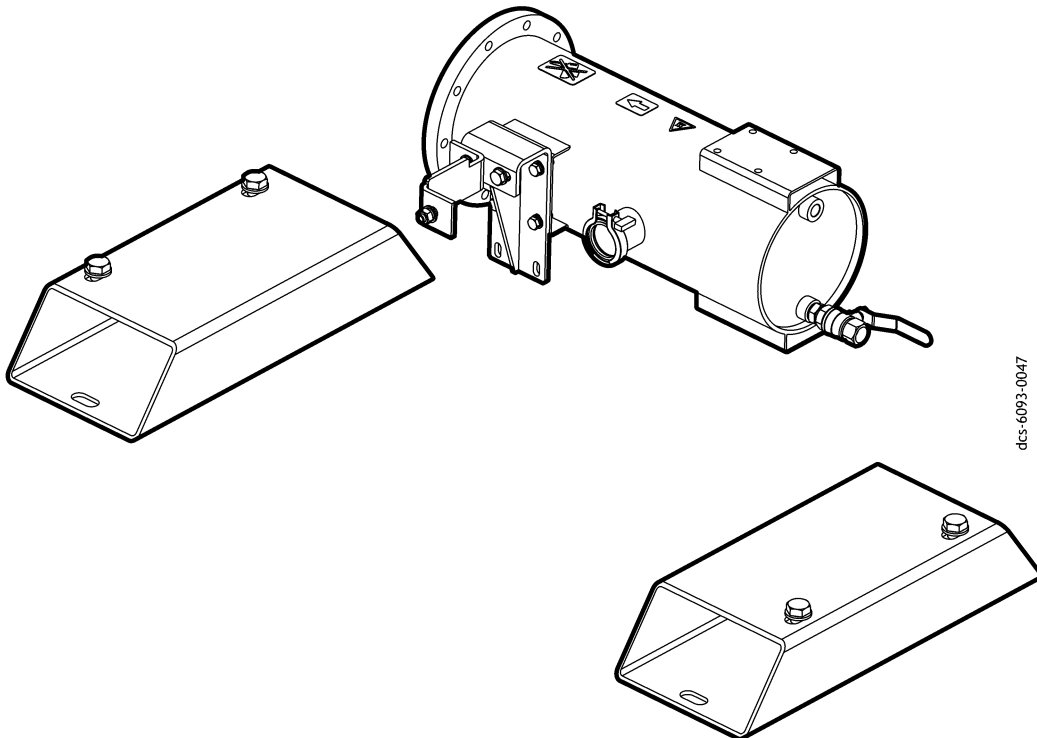
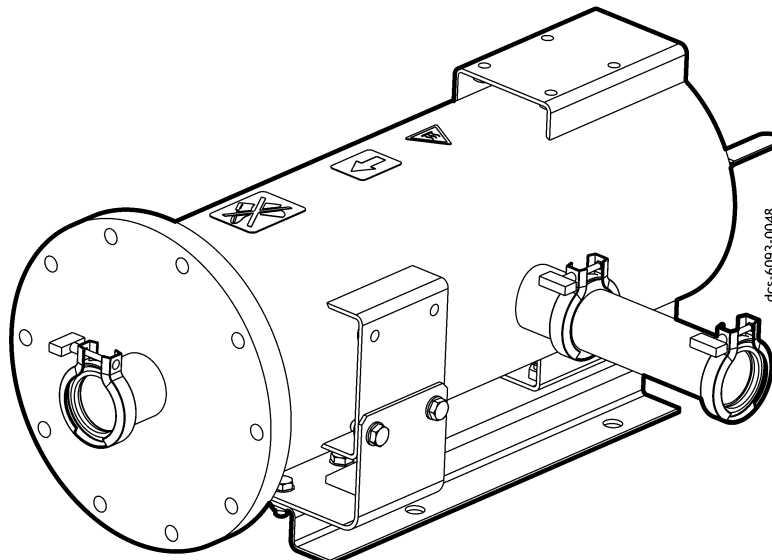
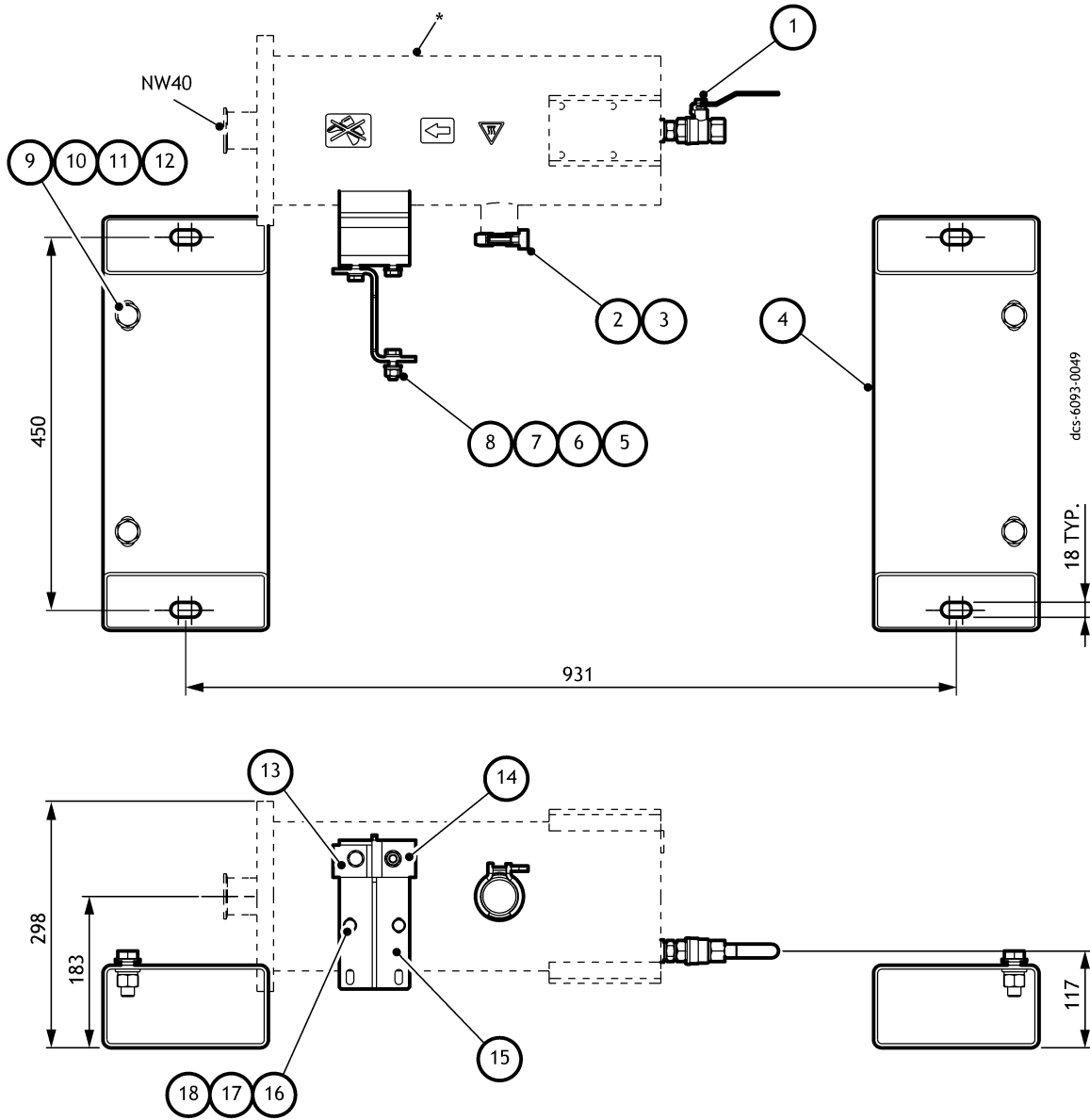


Figure 51 - Rear exiting exhaust mounting



6.2 Physical data

Figure 52 - M58808009 horizontal silencer mount - 100 ctr

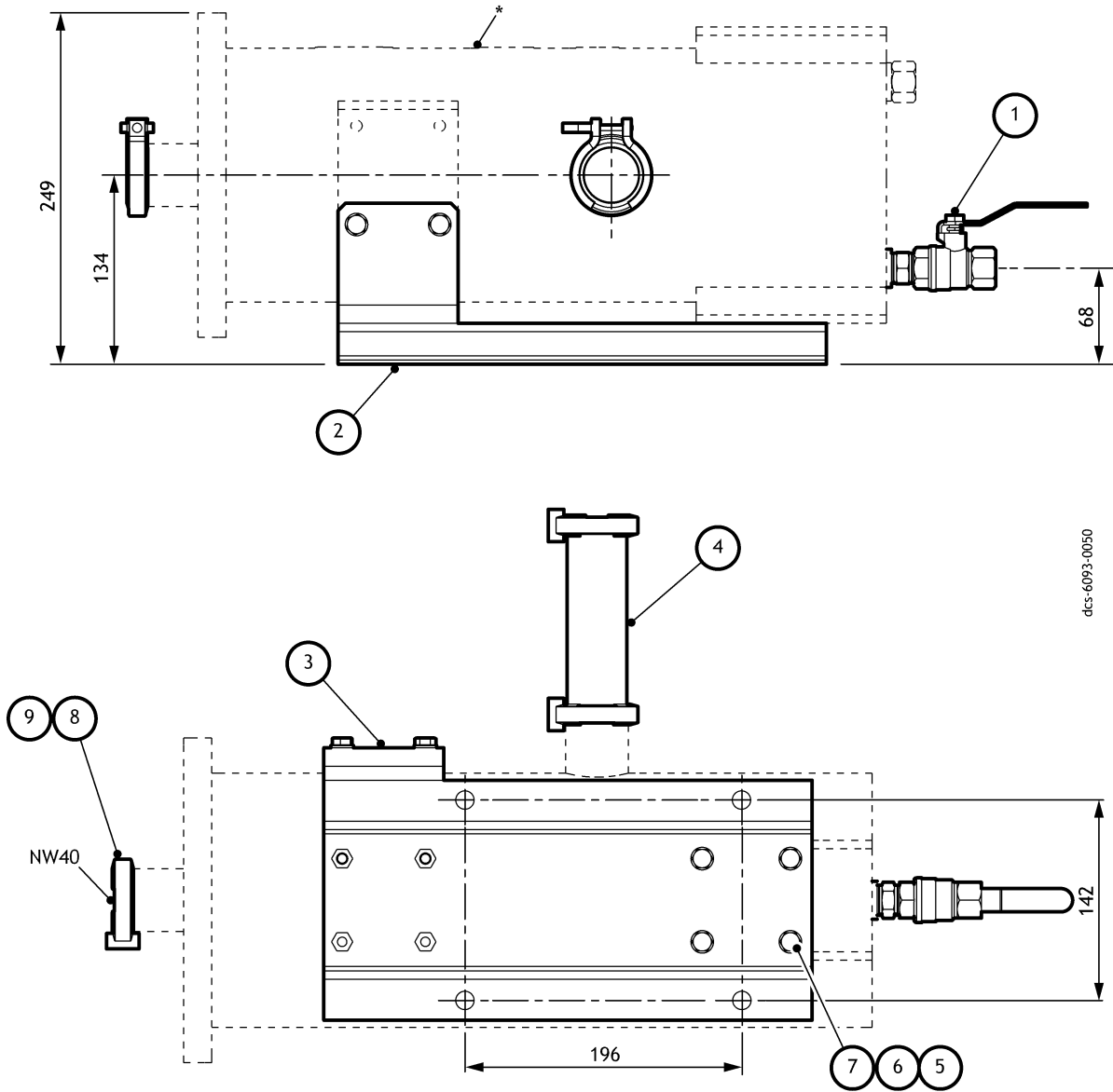


* Silencer supplied separately.

Table 51 - M58808009 horizontal silencer mount - 100 ctr check list

Item	Qty	Description	Check
1	1	Drain valve assembly	<input type="checkbox"/>
2	1	NW32/40 clamping ring	<input type="checkbox"/>
3	1	NW40 trapped O-ring - Viton 9830 / PTFE	<input type="checkbox"/>
4	2	GXS raised support - 100 ctr	<input type="checkbox"/>
5	3	M10 spring washer - nickel plated mild steel	<input type="checkbox"/>
7	3	M10 full nut - nickel plated mild steel	<input type="checkbox"/>
8	2	M10 x 30 hex head screw - nickel plated mild steel	<input type="checkbox"/>
9	4	M16 spring washer - nickel plated mild steel	<input type="checkbox"/>
10	8	M16 washer normal - nickel plated mild steel	<input type="checkbox"/>
11	4	M16 full nut - nickel plated mild steel	<input type="checkbox"/>
12	4	M16 x 45 hex head screw - nickel plated mild steel	<input type="checkbox"/>
13	1	M10 x 35 hex head screw - nickel plated mild steel	<input type="checkbox"/>
14	1	Silencer brace - 100 ctr	<input type="checkbox"/>
15	1	Silencer mounting - 100 ctr	<input type="checkbox"/>
16	4	M8 x 25 hex head screw - nickel plated mild steel	<input type="checkbox"/>
16	6	M10 washer normal - nickel plated mild steel	<input type="checkbox"/>
17	4	M8 washer normal - nickel plated mild steel	<input type="checkbox"/>
18	4	M8 spring washer - nickel plated mild steel	<input type="checkbox"/>

Figure 53 - M58808151 rear silencer horizontal mount - 100 ctr

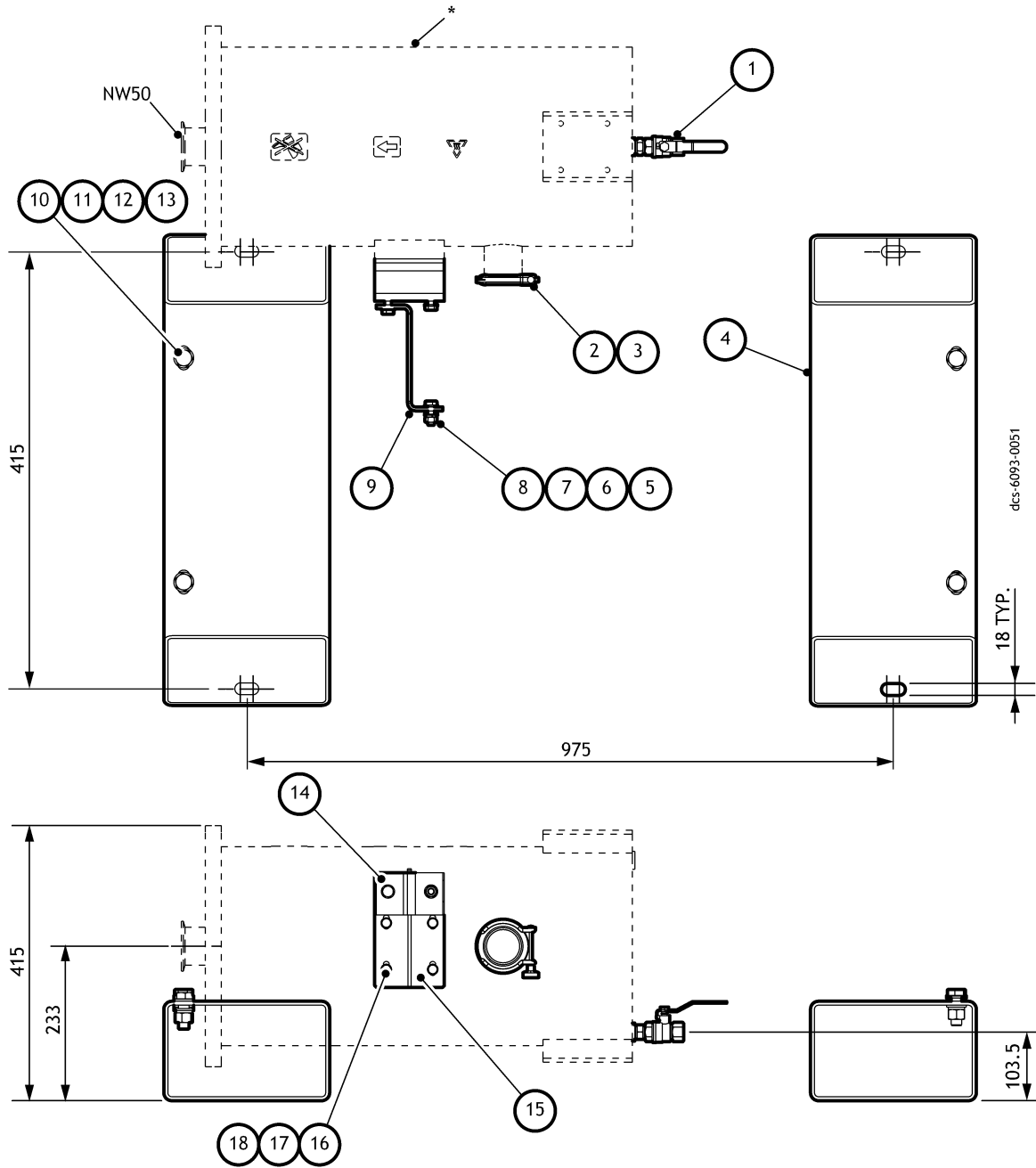


* Silencer supplied separately.

Table 52 - M58808151 rear silencer horizontal mount - 100 ctr check list

Item	QTY	Description	Check
1	1	Drain valve assembly	<input type="checkbox"/>
2	1	Silencer support - horizontal rear 100 ctr	<input type="checkbox"/>
3	1	Silencer support side bracket - horizontal rear 100 ctr	<input type="checkbox"/>
4	1	NW40 full nipple - stainless steel	<input type="checkbox"/>
5	4	M8 spring washer - stainless steel	<input type="checkbox"/>
6	8	M8 washer normal - stainless steel	<input type="checkbox"/>
7	8	M8 x 20 hex head screw - stainless steel	<input type="checkbox"/>
8	3	NW32/40 clamping ring	<input type="checkbox"/>
9	3	NW40 trapped O-ring - Viton 9830 / PTFE	<input type="checkbox"/>

Figure 54 - M59838009 horizontal silencer mount - 150 ctr

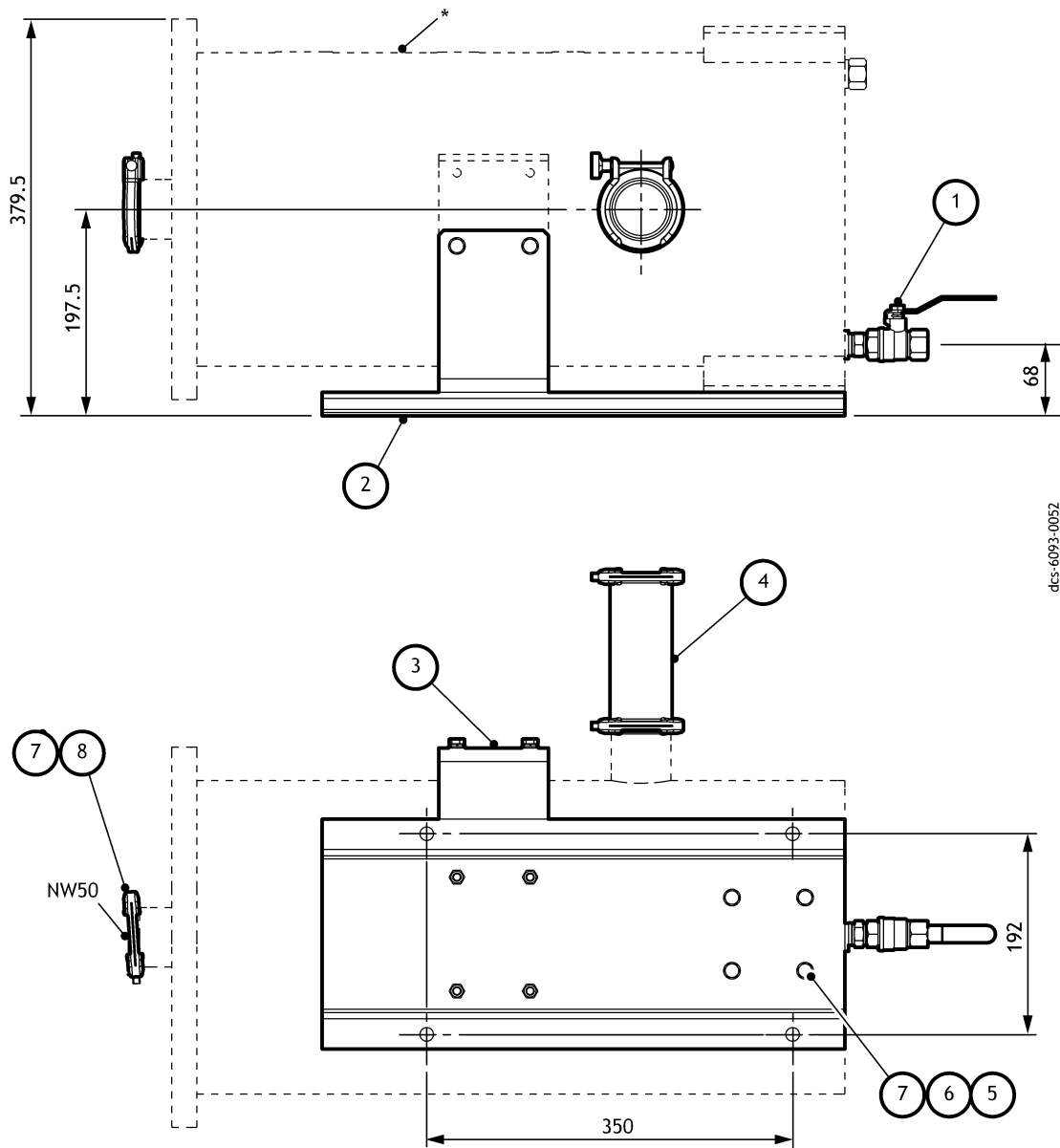


* Silencer supplied separately.

Table 53 - M59838009 horizontal silencer mount - 150 ctr check list

Item	QTY	Description	Check
1	1	Drain valve assembly	<input type="checkbox"/>
2	1	NW50 clamping ring	<input type="checkbox"/>
3	1	NW50 trapped O-ring - Viton / stainless steel	<input type="checkbox"/>
4	2	GXS raised support - 150 ctr	<input type="checkbox"/>
5	3	M10 spring washer - nickel plated mild steel	<input type="checkbox"/>
6	6	M10 washer normal - nickel plated mild steel	<input type="checkbox"/>
7	3	M10 nut full - nickel plated mild steel	<input type="checkbox"/>
8	2	M10 x 30 hex head screw - nickel plated mild steel	<input type="checkbox"/>
9	1	Silencer brace - 150 ctr	<input type="checkbox"/>
10	4	M16 spring washer - nickel plated mild steel	<input type="checkbox"/>
11	8	M16 washer normal - nickel plated mild steel	<input type="checkbox"/>
12	4	M16 full nut - nickel plated mild steel	<input type="checkbox"/>
13	4	M16 x 45 hex head screw - nickel plated mild steel	<input type="checkbox"/>
14	1	M10 x 35 hex head screw - nickel plated mild steel	<input type="checkbox"/>
15	1	Silencer mounting - 150 ctr	<input type="checkbox"/>
16	4	M8 x 25 hex head screw - nickel plated mild steel	<input type="checkbox"/>
17	4	M8 washer normal - nickel plated mild steel	<input type="checkbox"/>
18	4	M8 spring washer - nickel plated mild steel	<input type="checkbox"/>

Figure 55 - M59808151 rear silencer horizontal mount - 150 ctr



* Silencer supplied separately.

Table 54 - M59808151 rear silencer horizontal mount - 150 ctr check list

Item	QTY	Description	Check
1	1	Drain valve assembly	<input type="checkbox"/>
2	1	Silencer support - horizontal rear 150 ctr	<input type="checkbox"/>
3	1	Silencer support side bracket - horizontal rear 150 ctr	<input type="checkbox"/>
4	1	NW50 full nipple - stainless steel	<input type="checkbox"/>
5	7	M8 spring washer - stainless steel	<input type="checkbox"/>
6	8	M8 washer normal - stainless steel	<input type="checkbox"/>
7	8	M8 x 20 hex head screw - stainless steel	<input type="checkbox"/>

Table 54 - M59808151 rear silencer horizontal mount - 150 ctr check list (continued)

Item	QTY	Description	Check
8	3	NW50 clamping ring	<input type="checkbox"/>
9	3	NW50 trapped O-ring - Viton / stainless steel	<input type="checkbox"/>

Figure 56 - M58808069 vertical silencer assembly - 100 ctr

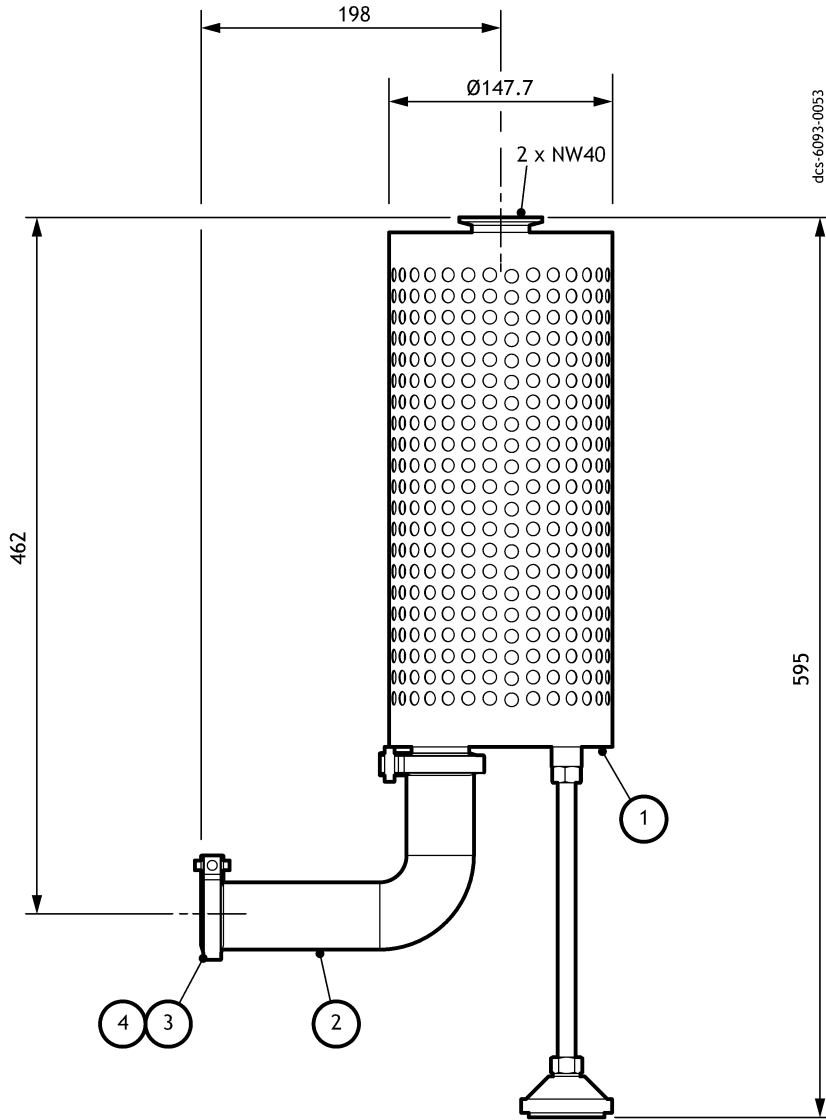


Table 55 - M58808069 vertical silencer assembly - 100 ctr check list

Item	QTY	Description	Check
1	1	iF silencer	<input type="checkbox"/>
2	1	NW40 elbow 149 x 98	<input type="checkbox"/>
3	2	NW40 trapped O-ring - Viton 9830 / PTFE	<input type="checkbox"/>
4	2	NW32/40 clamping ring	<input type="checkbox"/>

Figure 57 - M59838163 vertical silencer assembly - 150 ctr

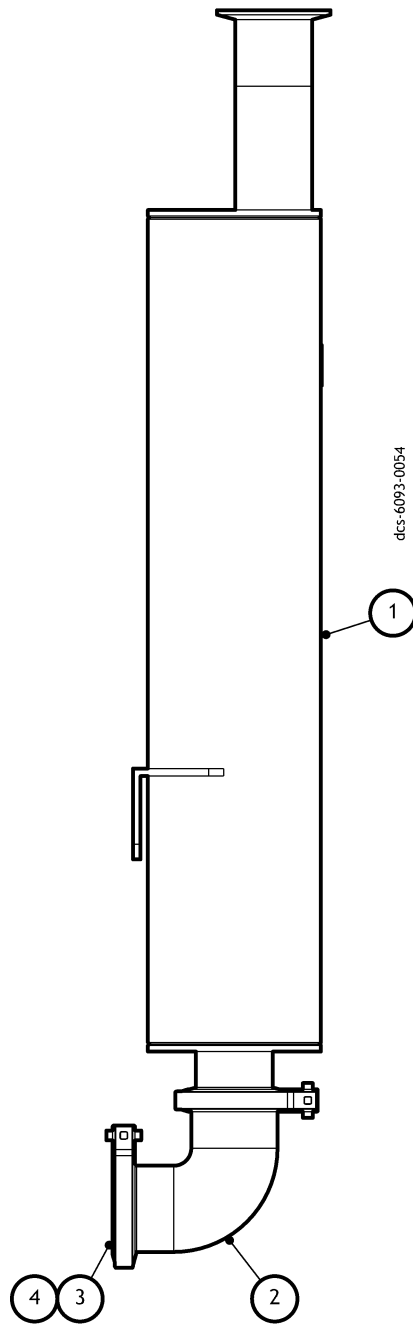


Table 56 - M59838163 vertical silencer assembly - 150 ctr check list

Item	QTY	Description	Check
1	1	iF400 silencer	<input type="checkbox"/>
2	1	NW50 elbow	<input type="checkbox"/>
3	2	NW50 trapped O-ring - Viton 9830 / PTFE	<input type="checkbox"/>
4	2	NW50 clamping ring	<input type="checkbox"/>

Exhaust silencer mounting assembly

6.3 Technical data

Table 57 - Silencer mounting technical data

Description	Part Number	Carbon Steel Silencer	Stainless Steel Silencer	Inlet and outlet	Flow Rate (Roughing) m ³ /hr	Attenuation (at Ultimate Pressure)	Pressure Test To
Horizontal silencer mounting - 100 ctr	M58808009	M58808019	M58808031	NW40	150	> 10 dB typical	10 barG
Rear silencer horizontal mounting - 100 ctr	M58808151	M58808019	M58808031	NW40	150	> 10 dB typical	10 barG
Horizontal silencer mounting - 150 ctr	M59838009	M59808019	M59808031	NW50	420	> 10 dB typical	10 barG
Rear silencer horizontal mounting - 150 ctr	M59808151	M59808019	M59808031	NW50	420	> 10 dB typical	10 barG

6.4 Installation

6.4.1 Unpack and inspect

Remove all the packaging materials and check the silencer mounting components for signs of damage.

If the silencer mounting components are damaged, notify your supplier and the carrier in writing within three days; state the Item number of the silencer mounting together with your order number and your supplier's invoice number. Do not use the silencer mounting if it is damaged.

Check that your package contains the items listed in the [Table 51 to 55](#). If any of these items are missing, notify your supplier in writing within three days.

If the silencer mounting is not to be used immediately, store as described in [Section 6.5](#).

6.4.2 Installation of horizontal silencer mounting assy

CAUTION

When fitting the exhaust silencer, ensure that the arrow on the exhaust Silencer body points in the direction of the gas flow; away from the pump exhaust outlet.

The horizontal silencer is designed to be bolted to the side rail of the pump as shown in [Figure 58](#). The necessary clearance is achieved by the pump being mounted on raised supports. The raised supports should be attached to the pump feet using the fasteners provided. The silencer brace should be bolted in position on the inside of the pump side rail adjacent to the exhaust outlet as shown in [Figure 59](#):

1. Fix the silencer mounting to the outside of the pump side rail using the same fixing holes as the silencer brace (refer to [Figure 58](#) and [Figure 59](#)). This provides a solid base for the mounting of the silencer. Do NOT fully tighten the fasteners. This allows for fine adjustment.
2. Using suitable lifting equipment and techniques, mount the silencer to the bracket as shown in [Figure 58](#). Align the inlet flange on the exhaust silencer with the exhaust outlet flange on the dry pump.
3. Bolt the silencer to the support bracket using the fasteners provided. Do NOT fully tighten the fasteners. This allows for fine adjustment.
4. Fit the trapped O-ring between the two flange connections and carefully draw the flanges together using the clamp provided until secured in position. Attention should be given to the alignment of this connection to ensure an efficient seal.
5. Tighten all bolts to the recommended torque.

Figure 58 - Horizontal silencer mounting

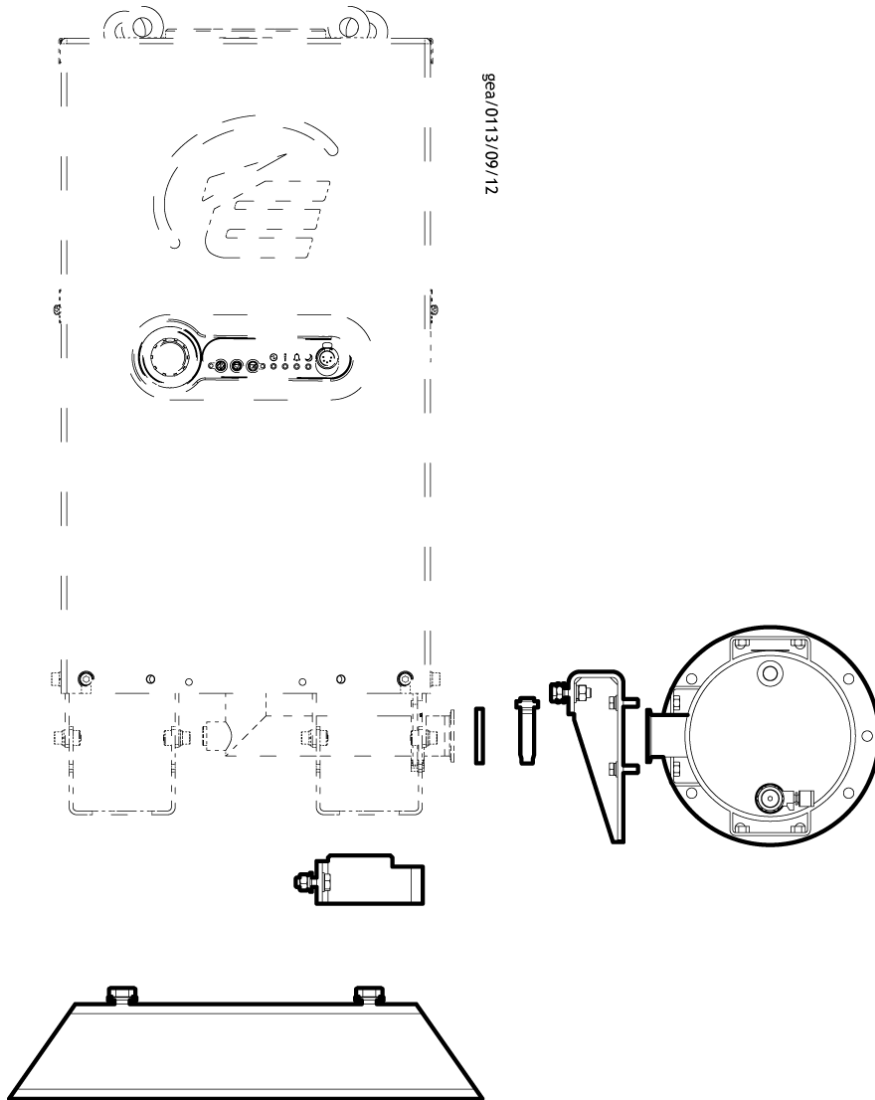
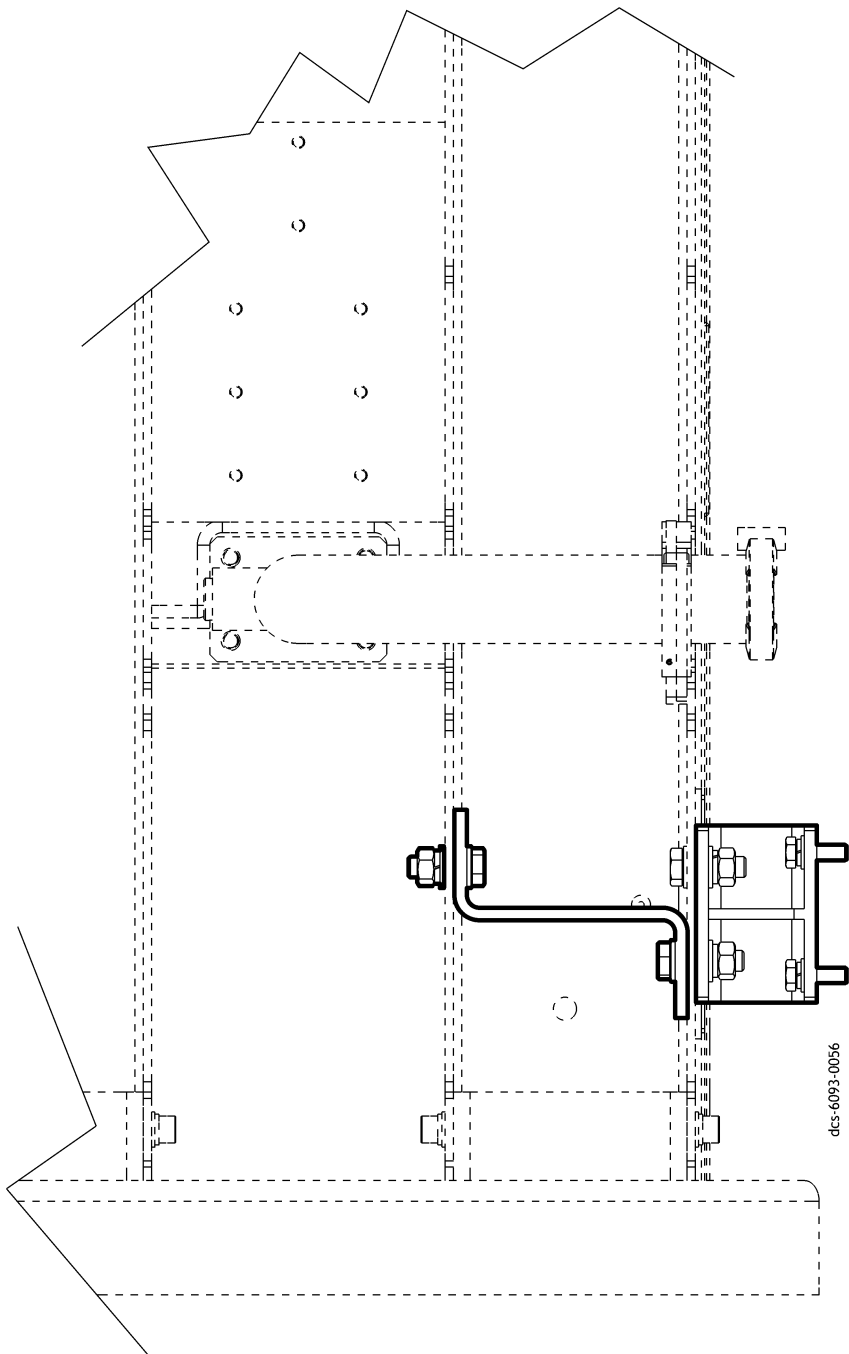


Figure 59 - Silencer brace fitment



Note: Viewed from underneath the pump to show mounting bracket positions for exhaust silencer.

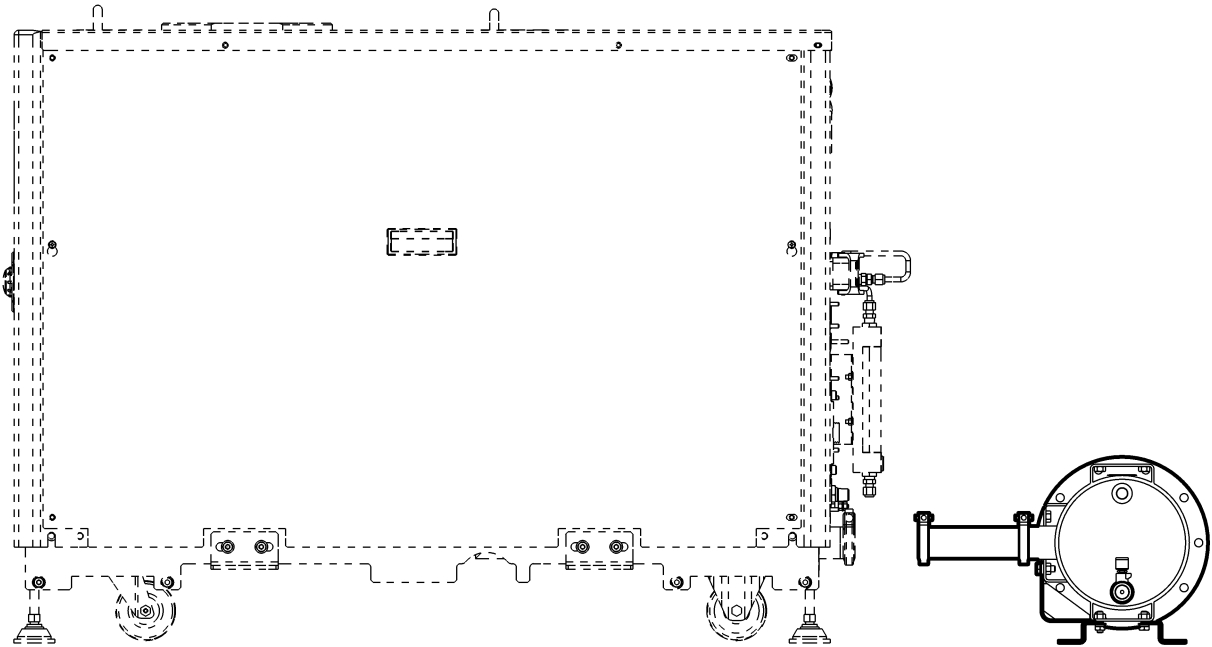
6.4.3 Installation of rear silencer mounting assy

CAUTION

When fitting the exhaust silencer, ensure that the arrow on the exhaust Silencer body points in the direction of the gas flow; away from the pump exhaust outlet.

Refer to Figure 60. The rear silencer is designed to be fixed to the floor at the rear of the dry pump, using suitable fasteners (not supplied). The built-in jacking feet on the pump can be used to align the pump exhaust flange with the exhaust silencer inlet flange. The exhaust silencer is connected using a full nipple, trapped O-rings and clamping rings.

Figure 60 - Installation of the rear silencer



dc5-6093-0057

6.4.4 Installation of vertical silencer assy

CAUTION

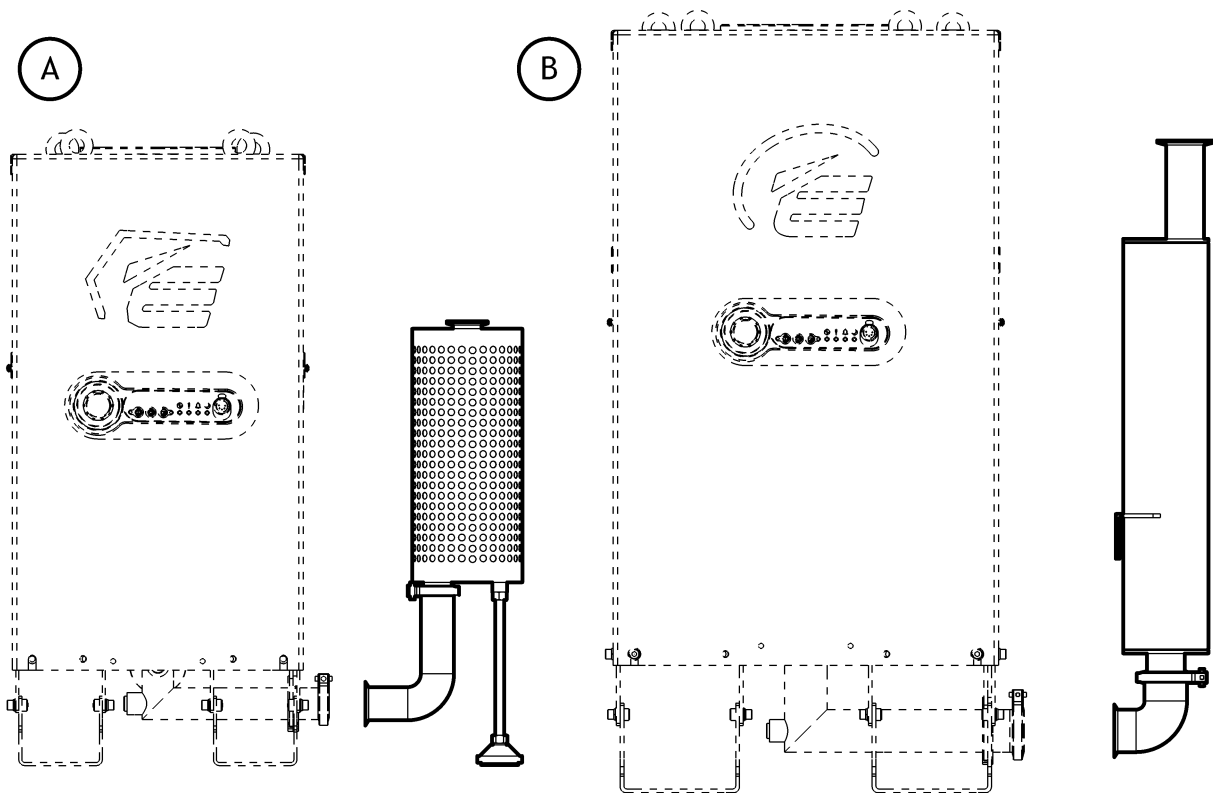
When fitting the exhaust silencer, ensure that the arrow on the exhaust Silencer body points in the direction of the gas flow; away from the pump exhaust outlet.

These exhaust silencers can be rear mounted as shown in Figure 60 and side mounted as shown in Figure 61.

The silencers are connected directly to the pumps exhaust using a trapped O-ring and clamp.

Note: The orientation of the elbow and the support leg lengths differ depending on use. The short leg is used for assembly with side exhaust pumps and the long leg is used for assembly with rear exhaust pumps. This facilitates the use of the support foot (refer to Figure 60 and Figure 61).

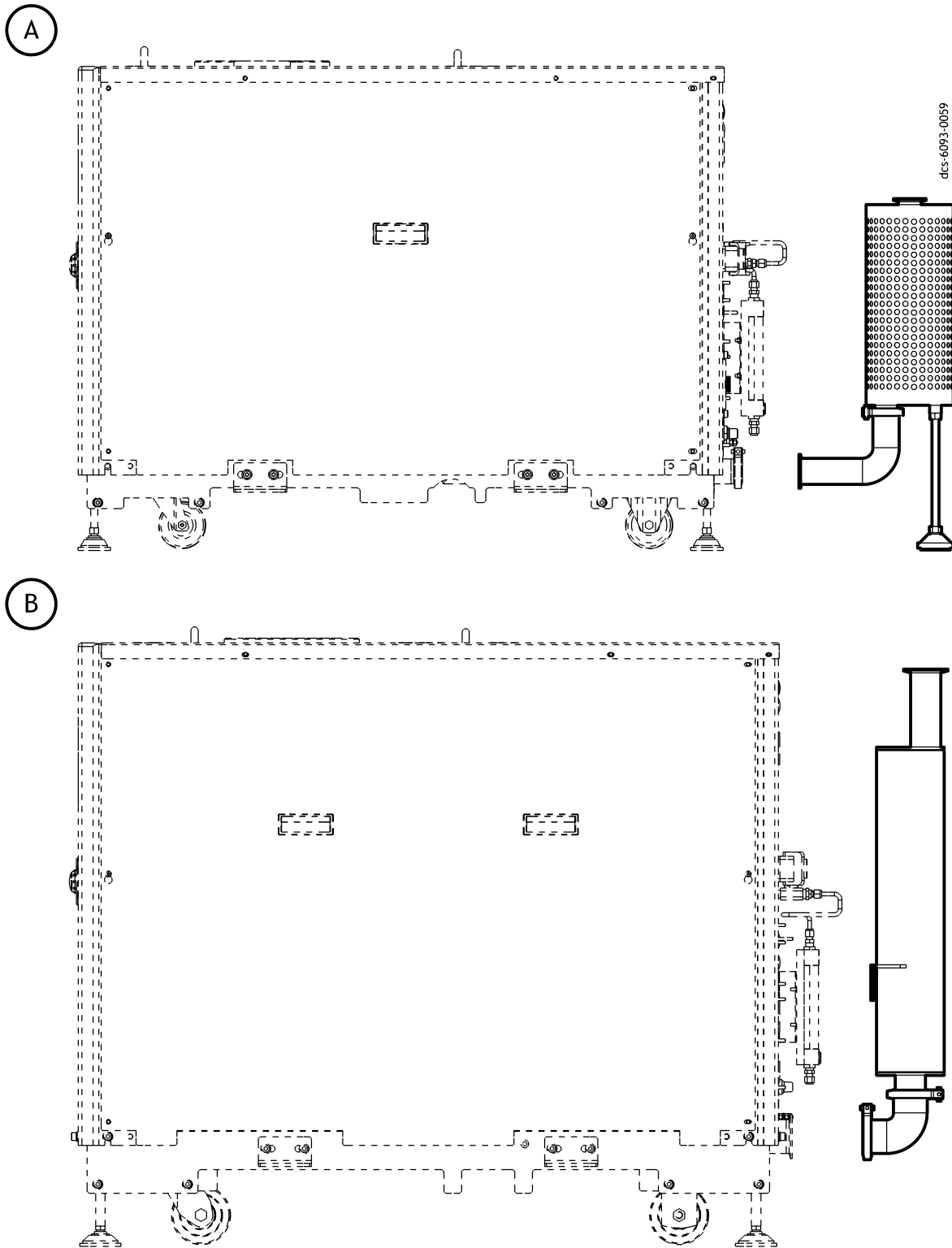
Figure 61 - Installation of the vertical silencer - side mounted



- A. 100 ctr pumps
- B. 150 ctr pumps

8500-6609-0058

Figure 62 - Installation of the vertical silencer - rear mounted



dc5-6093-0059

- A. 100 ctr pumps
- B. 150 ctr pumps

6.5 Storage and disposal

6.5.1 Storage

If the exhaust silencer mounting assembly will not be used immediately:

1. Clean the exhaust silencer mounting assembly.
2. Protect individual items and place in a sealed polythene bag.
3. Store in a cool dry place.

6.5.2 Disposal

Dispose of the exhaust silencer mounting assembly in accordance with all local and national safety and environmental requirements.

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7 Check valve assy

7.1 Description

CAUTION

The check valves must be operated in a vertical position with the gas flow in the direction of the arrow cast to the outside of the check valve.

CAUTION

Before installing the check valve, the following OEM manuals must be read and understood. Failure to observe this caution may cause injury or damage to personnel or equipment.

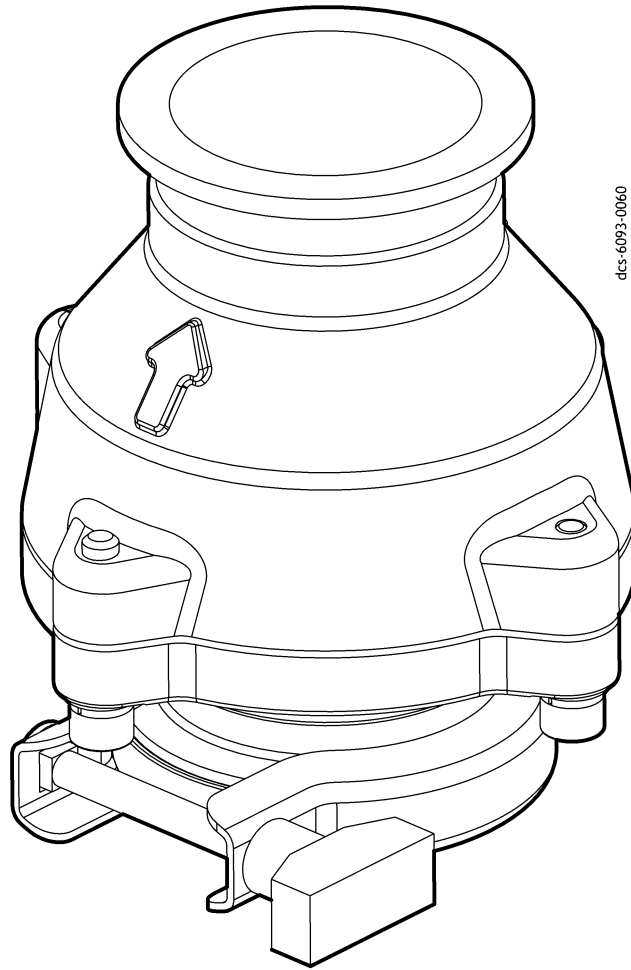
- NW40 Check Valve Instruction Manual - A507-82-880.
- NW50 Check Valve Instruction Manual - A507-91-880.

The check valve is fitted after the exhaust silencer in a vertical position. To fit a check valve to a horizontal silencer, an additional elbow and fixings are required. To allow vertical fitment, the check valve kits listed in [Table 58](#) are recommended.

Table 58 - Check valve kits

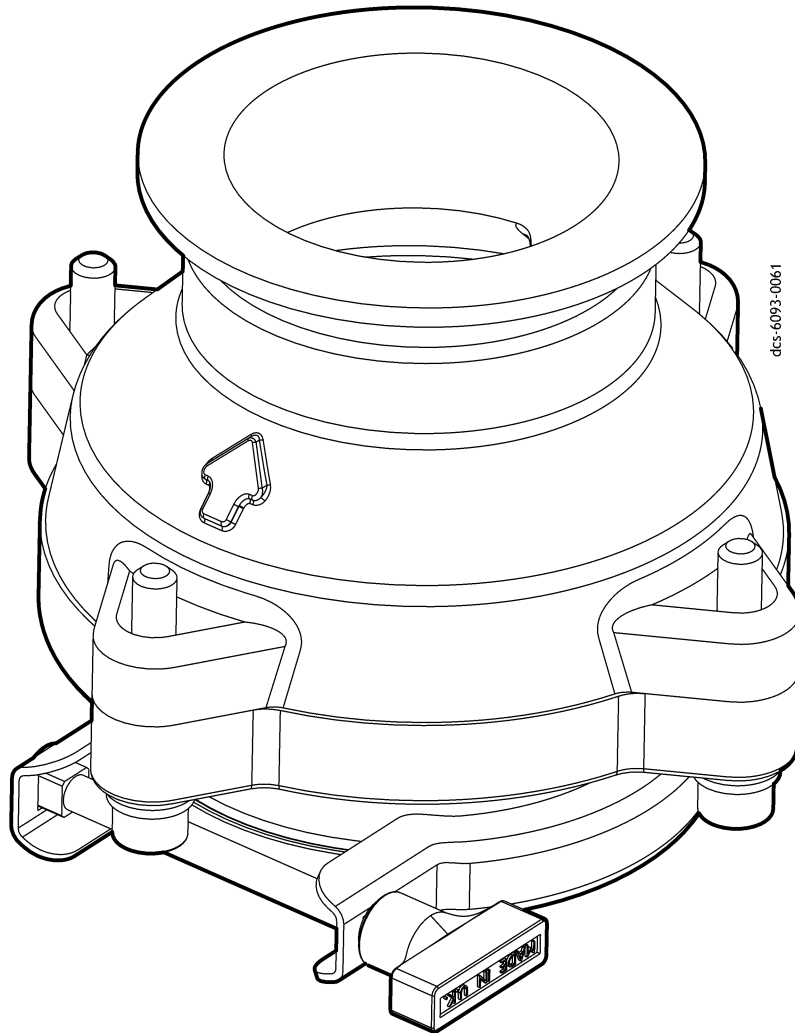
Item Number	Description	Reference
A50782000	iXH check valve kit	Figure 63
A50790000	iXL NW50 check valve kit	Figure 64
M58808012	Check valve - Horizontal silencer - 100 ctr	Figure 65
M59808012	Check valve - Horizontal silencer - 150 ctr	Figure 66

Figure 63 - iXH check valve kit



dcs-6093-0060

Figure 64 - iXL NW50 check valve kit



1910-6093-0061

Figure 65 - Check valve - horizontal silencer - 100 ctr

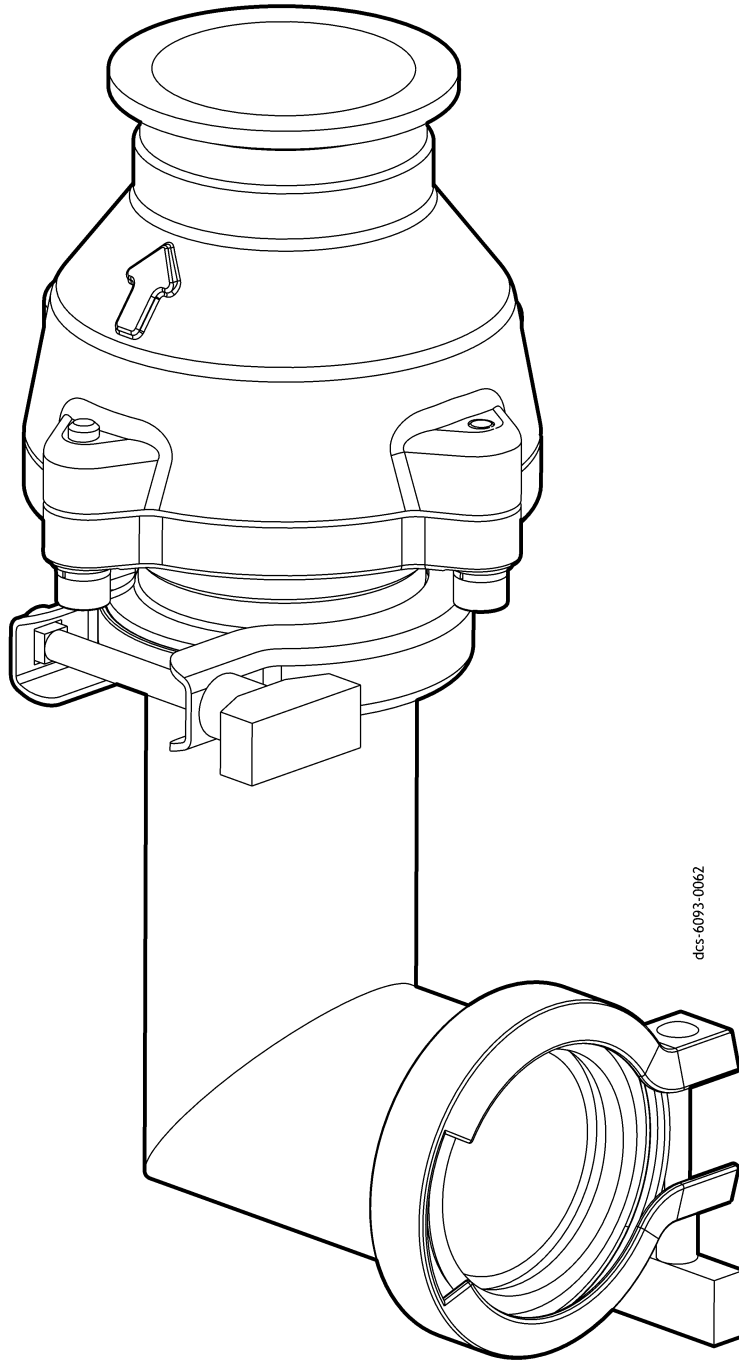
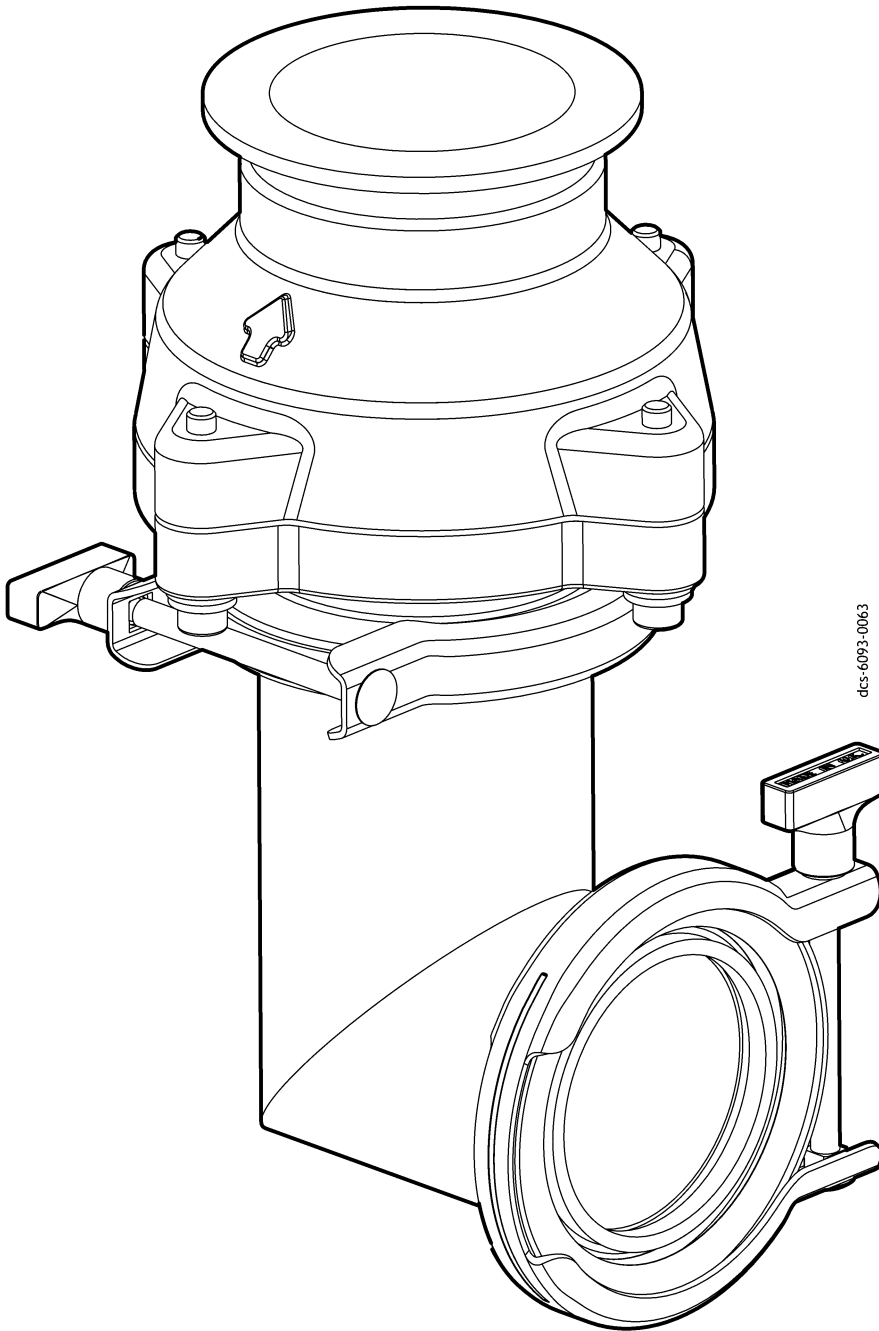


Figure 66 - Check valve - horizontal silencer - 150 ctr



dfs-6093-0063

7.2 Physical data

Figure 67 - M58808012 NW40 check valve assembly for 100 ctr horizontal silencer

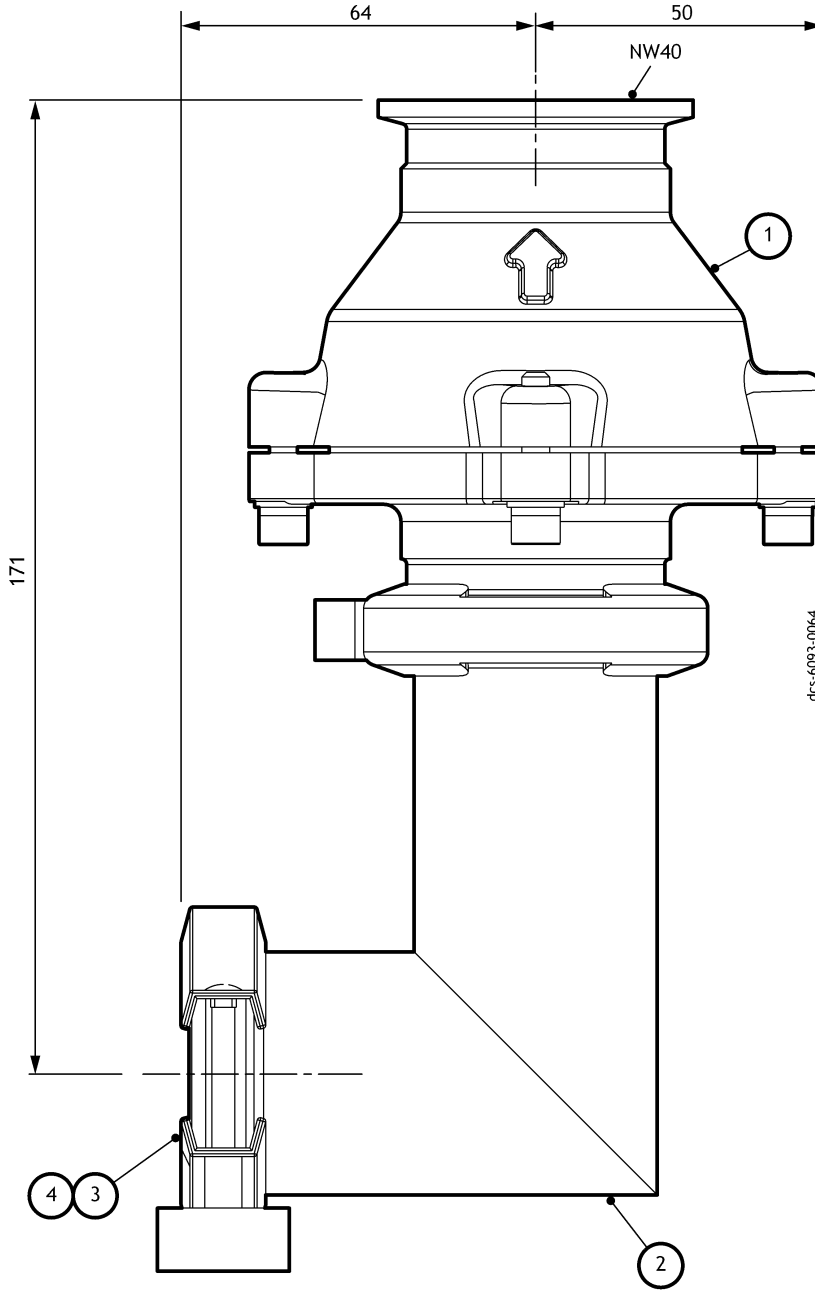


Table 59 - M58808012 NW40 check valve assembly for 100 ctr horizontal silencer

Item	Qty	Description	Check
1	1	iXH exhaust check valve NW40	<input type="checkbox"/>
2	1	Exhaust large elbow - 100 ctr	<input type="checkbox"/>
3	2	NW40 trapped O-ring - Viton 9830 / PTFE	<input type="checkbox"/>
4	2	NW32/40 clamping ring	<input type="checkbox"/>

Figure 68 - M59838012 NW50 check valve assembly for 150 ctr horizontal silencer

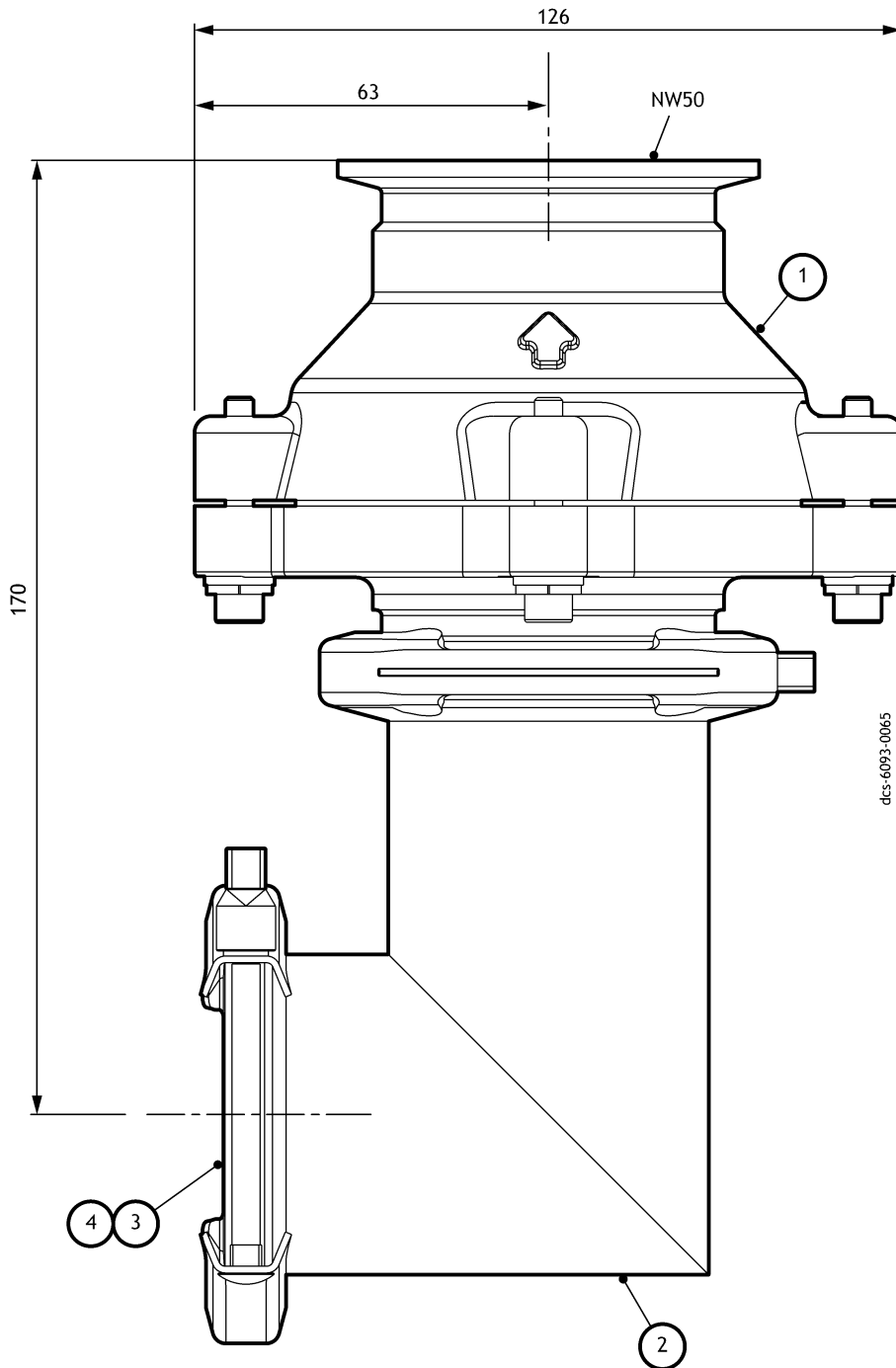


Table 60 - M59838012 NW50 check valve assembly for 150 ctr horizontal silencer

Item	Qty	Description	Check
1	1	iXH exhaust check valve NW50	<input type="checkbox"/>
2	1	Exhaust large elbow - 150 ctr	<input type="checkbox"/>
3	2	NW50 trapped O-ring - Viton 9830 / PTFE	<input type="checkbox"/>
4	2	NW50 clamping ring	<input type="checkbox"/>

7.3 Installation

7.3.1 Unpack and inspect

Remove all the packaging materials and inspect the check valve for signs of damage. If the check valve is damaged, notify your supplier and the carrier in writing within three days; state the Item number of the check valve together with your order number and your supplier's invoice number. Do not use the check valve if it is damaged.

- Check that your package contains the items listed in [Table 59](#) and [60](#). If any of these items are missing, notify your supplier in writing within three days.
- If the check valve is not to be used immediately, store as described in [Section 7](#).

Figure 69 - Vertical silencer

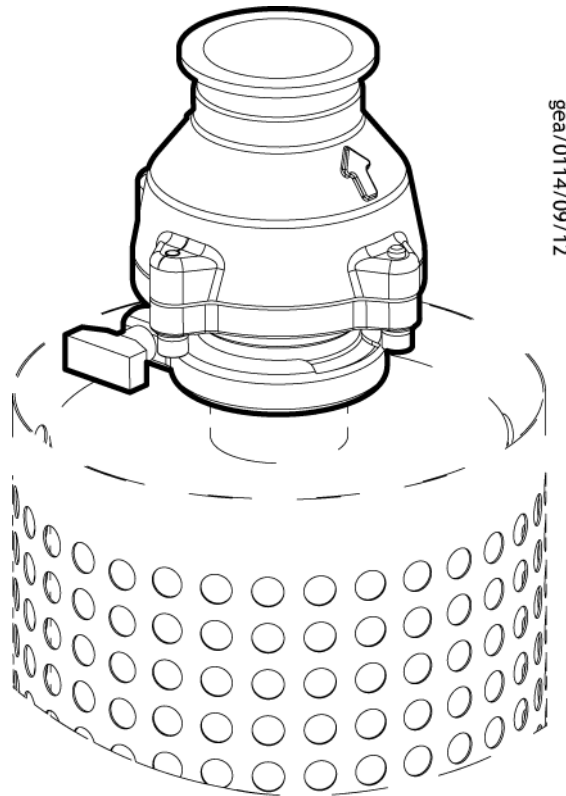
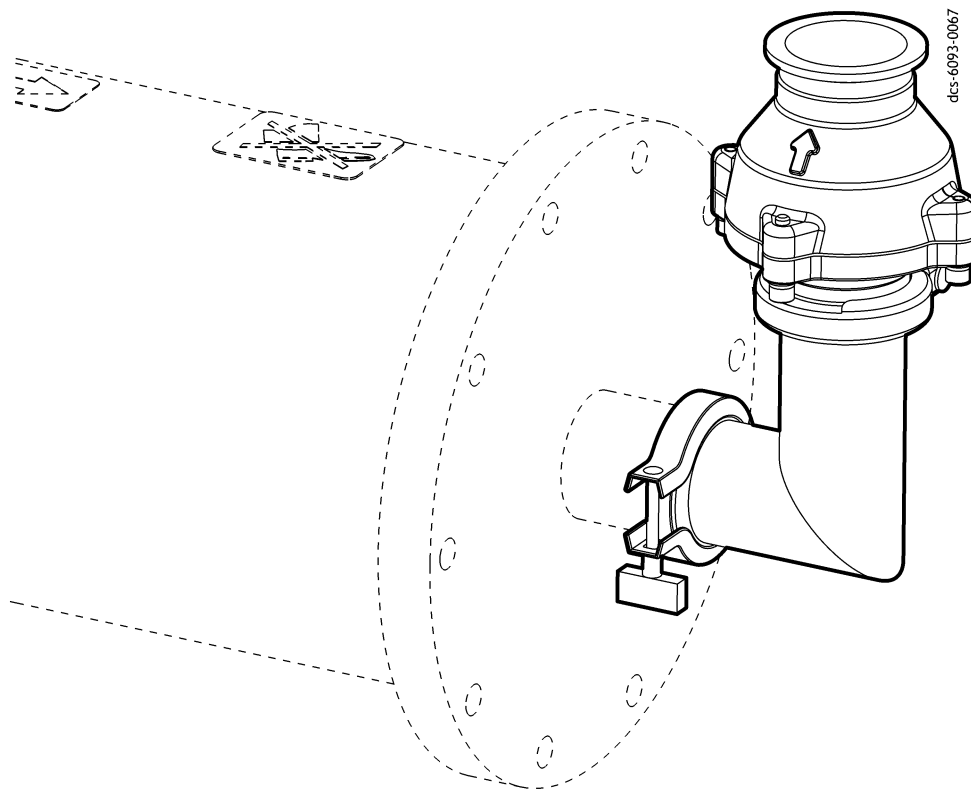


Figure 70 - Horizontal silencer



7.3.2 Installation of a check valve to a silencer

1. Remove the protective caps from the NW flanges from the check valve.
2. Fit the check valve to the outlet flanges of the silencers as shown in [Figure 69](#) and [Figure 70](#).
3. Ensure that the arrow on the check valve body is pointing in the direction of flow away from the Silencer body.

7.4 Storage and disposal

7.4.1 Storage

If the check valve will not be used immediately:

1. Drain and clean the check valve.
2. Protect the flange faces and place the check valve in a sealed polythene bag.
3. Store in a cool dry place.

7.4.2 Disposal

Dispose of the check valve in accordance with all local and national safety and environmental requirements.

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8 Digital pressure measurements

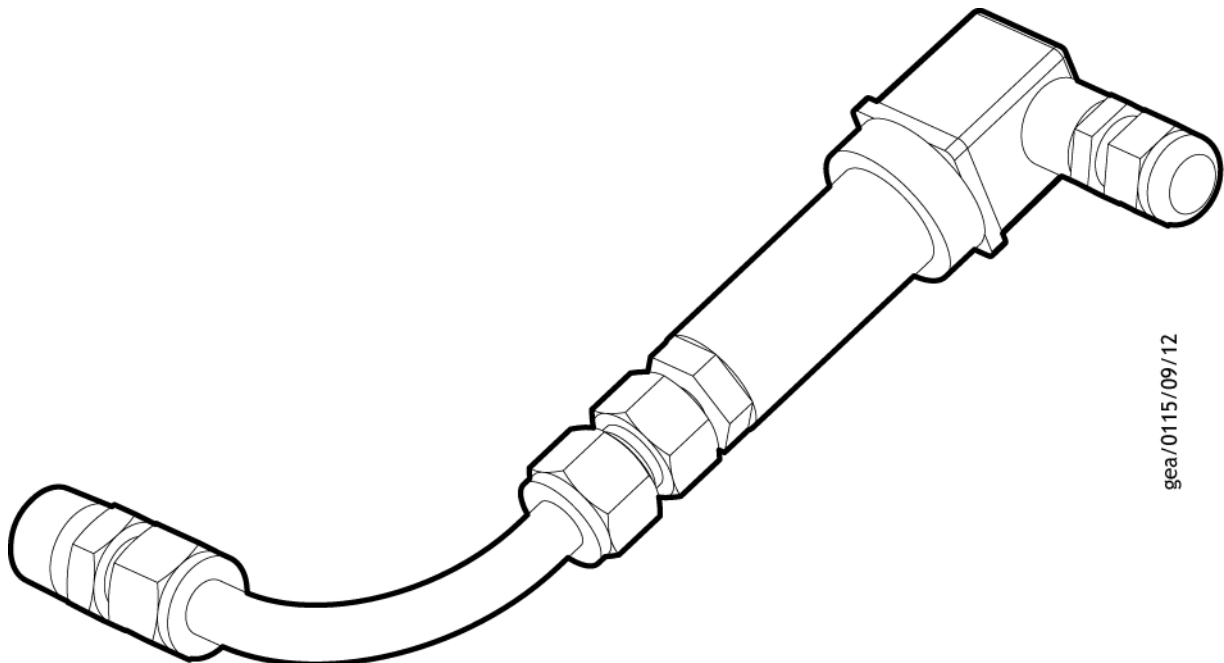
8.1 Description

The pressure transducer assembly is fitted to the externally mounted inlet spool on pumping systems without booster pumps via a $\frac{1}{2}$ inch BSP instrument port. On combination pumps, the pressure transducer assembly is fitted to a $\frac{3}{8}$ inch BSP instrument port on the internally mounted interspool between the pump and the booster.

Refer to [Figure 71](#). The pressure transducer assembly consists of the active strain gauge head connected to a right angled tubular elbow terminated with a $\frac{1}{2}$ inch BSP male connector or a $\frac{3}{8}$ inch BSP male connector as required.

Note: Refer to the *Active Strain Gauge Instruction Manual - D357-25-000* for more information on the Active Strain gauge 1000 - 1/8 NPT.

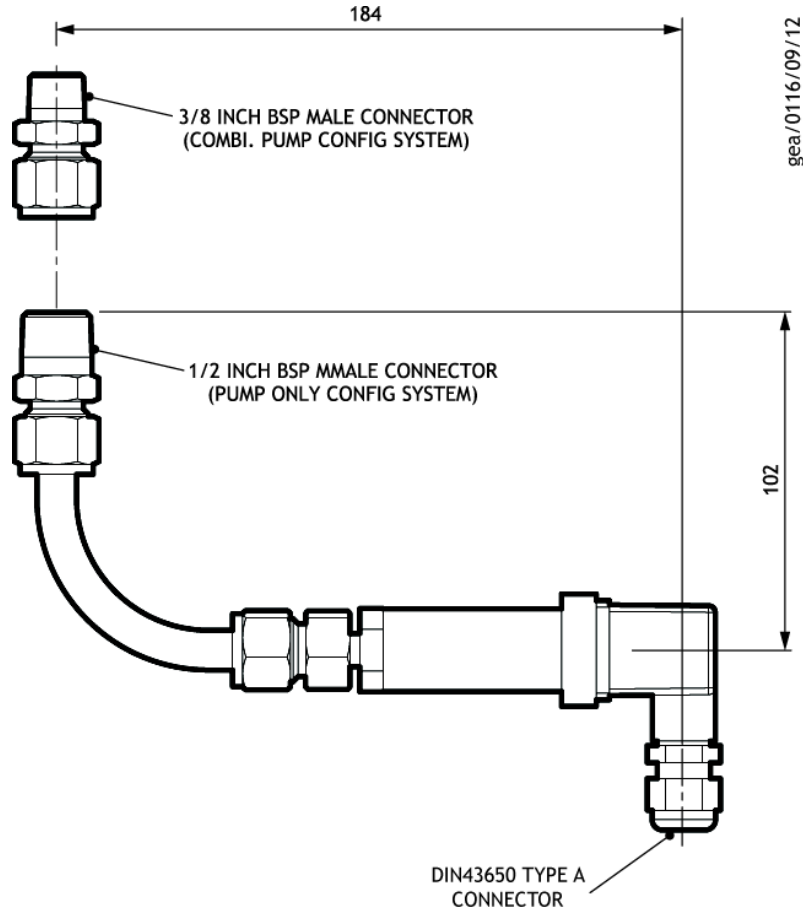
Figure 71 - Pressure transducer assembly



gea/0115/09/12

8.2 Physical data

Figure 72 - Pressure transducer assembly dimensions



8.3 Installation

8.3.1 Unpack and inspect

Note: The information contained within this manual covers the physical installation of the accessory only. It will also be necessary to configure the GXS pump controller to recognise the accessory after it has been installed. Please refer to the GXS product manual for further information.

Remove all the packaging materials and check the pressure transducer assembly for signs of damage. If the pressure transducer assembly is damaged, notify your supplier and the carrier in writing within three days; state the Item number of the pressure transducer assembly together with your order number and your supplier's invoice number. Do not use the pressure transducer assembly if it is damaged.

Check that your package contains the items for the pressure transducer assembly. If any of the items are missing, notify your supplier in writing within three days.

If the pressure transducer assembly is not to be used immediately, store as described in [Section 8.4](#).

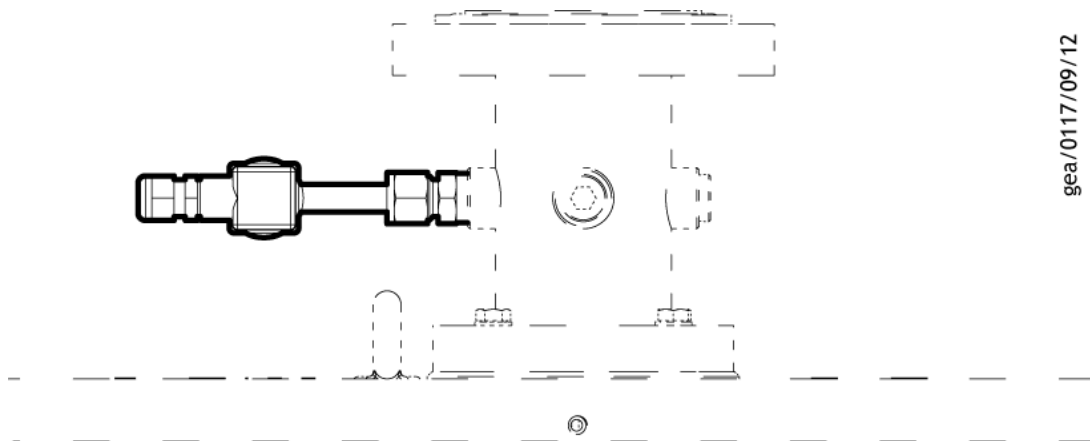
8.3.2 Installation of the pressure transducer assembly to the externally mounted pump inlet spool

Refer to Figure 73.

1. Remove one of the four ½ inch BSP tapered plugs from an instrument port in the inlet spool.
2. Clean and remove all traces of old thread sealant from the instrument port.
3. Check that the pressure transducer assembly has a ½ inch BSP male connector fitted (refer to Figure 72).
4. Apply a thin coat of Loctite 577 thread sealant to the ½ inch BSP tapered thread on the male connector.
5. Refer to Figure 73. Screw the pressure transducer assembly into the instrument port.

Note: The male connector may be loosened to allow the pressure transducer assembly to be rotated to any angle.

Figure 73 - Installation of pressure transducer assembly to external inlet spool



8.3.3 Electrical connection to the on-pump controller

8.3.3.1 Installation safety

CAUTION

Be sure to route and secure accessory cables as shown to prevent cables from resting on hot surfaces. Accessory cables may be damaged if they touch the dry pump, booster and spools during pump operation.

The route for the accessory cable inside the GXS enclosure has been chosen carefully to ensure that the cable does not rest on hot surfaces or pass over other cables carrying mains voltages. When fitting the accessory cable, carefully follow the instructions given in the sections below. Ensure that cable ties are used as shown to keep the cable in the correct position.

8.3.3.2 Installing the cables inside the GXS enclosure

1. If the GXS system is running, shut it down.
2. Allow the system to cool sufficiently before moving on to step 3, Minimum one hour.
3. Isolate the GXS system from the electrical supply.

4. Using a suitable screwdriver, remove both side panels and store them safely nearby.
5. Refer to [Figure 70](#) and photo A to identify the external position of the pressure transducer the pump.
6. Slid the cable anchor mount into position over the edge of the hole in the top panel for the pump inlet. Refer to [Figure 75](#).
7. Connect the cable to the pressure transducer pass the cable through the top panel and secure to the cable anchor mount with a cable tie. Refer to [Figure 74](#).

Figure 74 - External position of pressure transducer



gea/0118/09/12

Figure 75 - Cable anchor in position on top panel



gea/0119/09/12

- Route the cable inside the GXS enclosure as shown in Figure 76. Use cable ties to attach the cable to the water pipes.

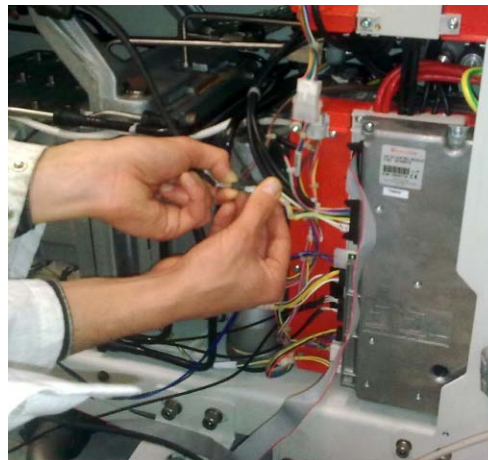
Figure 76 - Correct routing of the accessory cable



gea/0120/09/12

- Connect the other end of the cable into the free socket on the end of a cable that itself goes into the GXS controller as shown in Figure 77.

Figure 77 - Connecting to the control system



gea/0121/09/12

- If there is any excess cable, loop it back on itself and secure it firmly with a cable tie. Ensure that it cannot come into contact with the pump surfaces.

Figure 78 - Securing excess cable with a cable tie



gea/0111/09/12

- Replace the covers of the GXS system.

8.3.4 Installation of the pressure transducer assembly to the internally mounted pump interspool

The pressure transducer assembly is mounted in position for the following combination pumps:

- Refer to [Figure 79](#):
 - GXS160-1750
 - GXS250-2600.
- Refer to [Figure 80](#):
 - GXS450-2600
 - GXS450-4200
 - GXS750-2600
 - GXS750-4200.

Install the pressure transducer assembly as follows:

1. Remove the $\frac{3}{8}$ inch BSP plug from the relevant instrument port in the Interspool.
2. Clean and remove all traces of old thread sealant from the instrument port.
3. Check that the pressure transducer assembly has a $\frac{1}{2}$ inch BSP male connector fitted (refer to [Figure 72](#)).
4. Apply a thin coat of Loctite 577 thread sealant to the $\frac{3}{8}$ inch BSP tapered thread on the male connector.
5. Refer to [Figure 79](#) and [Figure 80](#) Screw the pressure transducer into the instrument port.

Figure 79 - Pressure transducer assembly installation position - GXS160/250

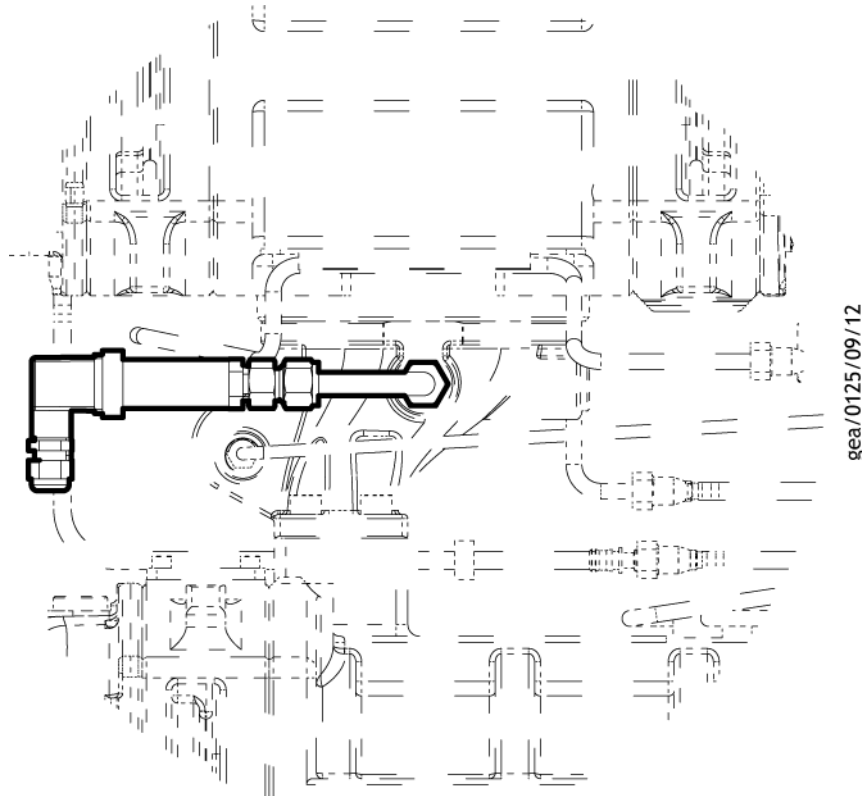
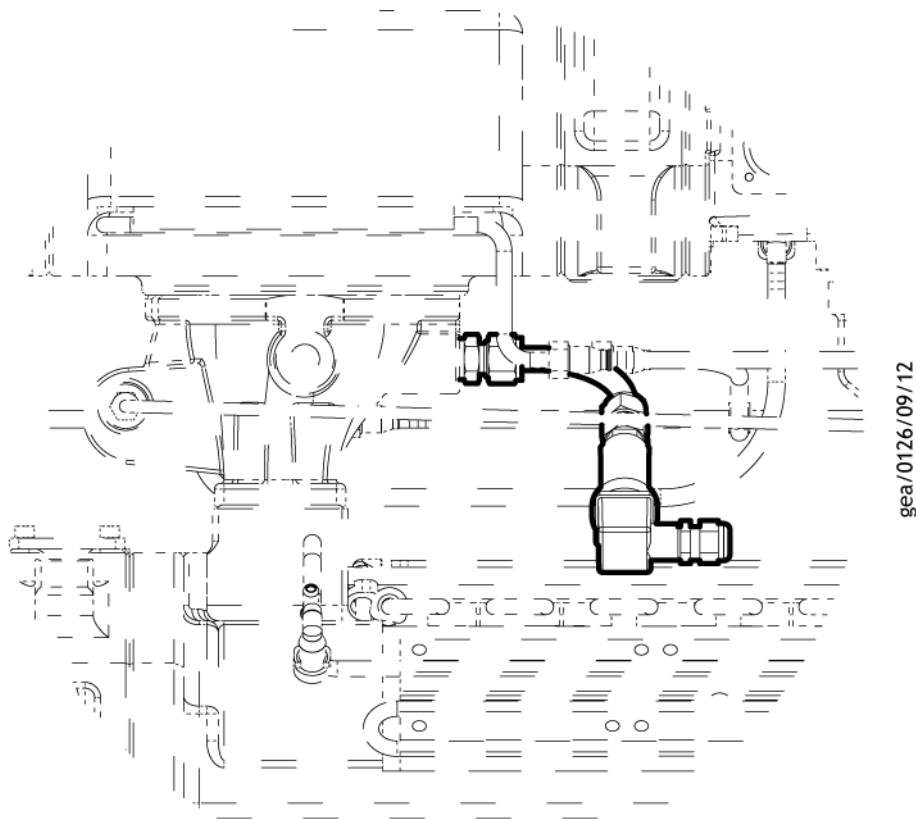


Figure 80 - Pressure transducer assembly installation position - GXS450/750



8.3.5 Electrical connection to the on-pump controller

8.3.5.1 Installation safety

CAUTION

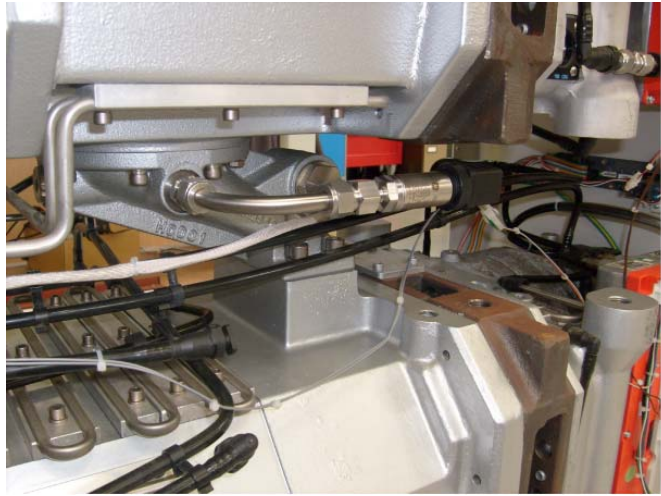
Be sure to route and secure accessory cables as shown to prevent cables from resting on hot surfaces. Accessory cables may be damaged if they touch the dry pump, booster and spools during pump operation.

The route for the accessory cable inside the GXS enclosure has been chosen carefully to ensure that the cable does not rest on hot surfaces or pass over other cables carrying mains voltages. When fitting the accessory cable, carefully follow the instructions given in the sections below. Ensure that cable ties are used as shown to keep the cable in the correct position.

8.3.5.2 Installing the cables inside the GXS enclosure

1. If the GXS system is running, shut it down.
2. Allow the system to cool sufficiently before moving on to step 3, Minimum one hour.
3. Isolate the GXS system from the electrical supply.
4. Using a suitable screw driver, remove both side panels and store them safely nearby.
5. Refer to Figures 79, 80 and 81 to identify the internal position of the pressure transducer within the pump.
6. Connect the cable to the pressure transducer as shown in Figure 81.

Figure 81 - Internal position of pressure transducer



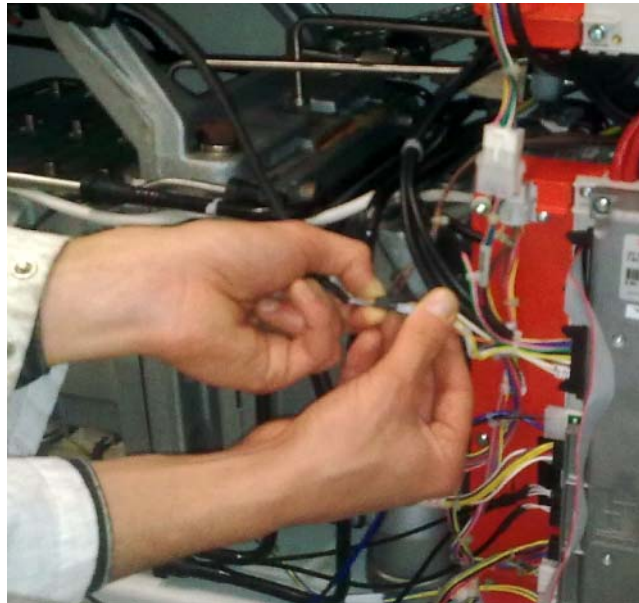
7. Route the cable inside the GXS enclosure as shown in Figure 82. Use the cable ties to attach the cable to the water pipes.

Figure 82 - Correct routing of the accessory cable



8. Connect the other end of the cable into the free socket on the end of a cable that itself goes into the GXS controller as shown in Figure 83.

Figure 83 - Connecting to the control system



9. If there is any excess cable, loop it back on itself and secure it firmly with a cable tie. Ensure that it cannot come into contact with the pump surfaces.

Figure 84 - Securing of excess cable with a cable tie



10. Replace the covers of the GXS system.

8.4 Storage and disposal

8.4.1 Storage

If the pressure transducer assembly will not be used immediately:

1. Drain and clean the pressure transducer assembly.
2. Protect the thread and micro Din connector and place the pressure transducer assembly in a sealed polythene bag.
3. Store in a cool dry place.

8.4.2 Disposal

Dispose of the pressure transducer assembly in accordance with all local and national safety and environmental requirements.

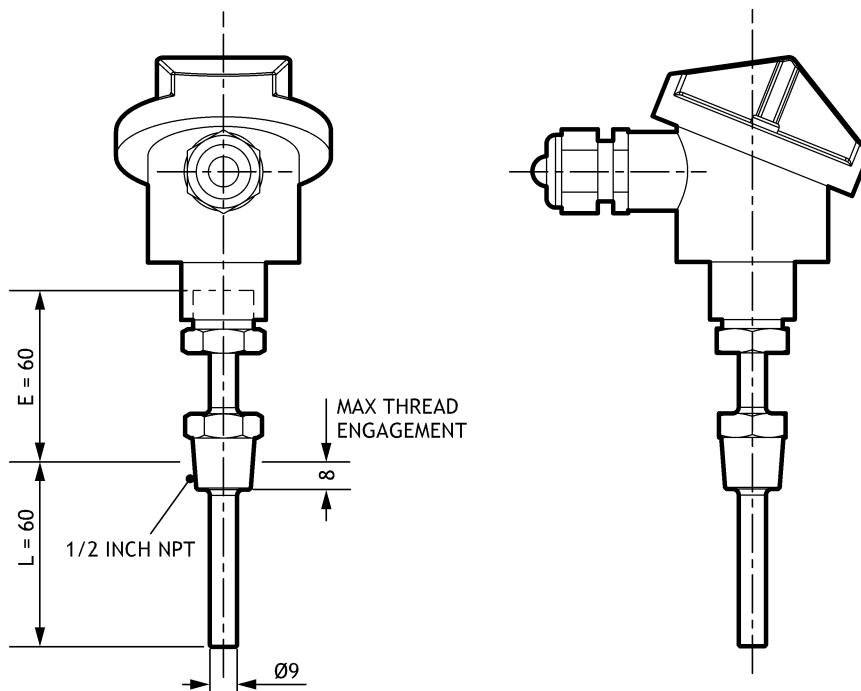
9 Temperature transmitter

9.1 Description

The temperature transmitter is a type PT100 Resistance Temperature Dector (RTD) that uses predictable resistance to measure temperature response. The temperature transmitter is used to temperature measurement and control.

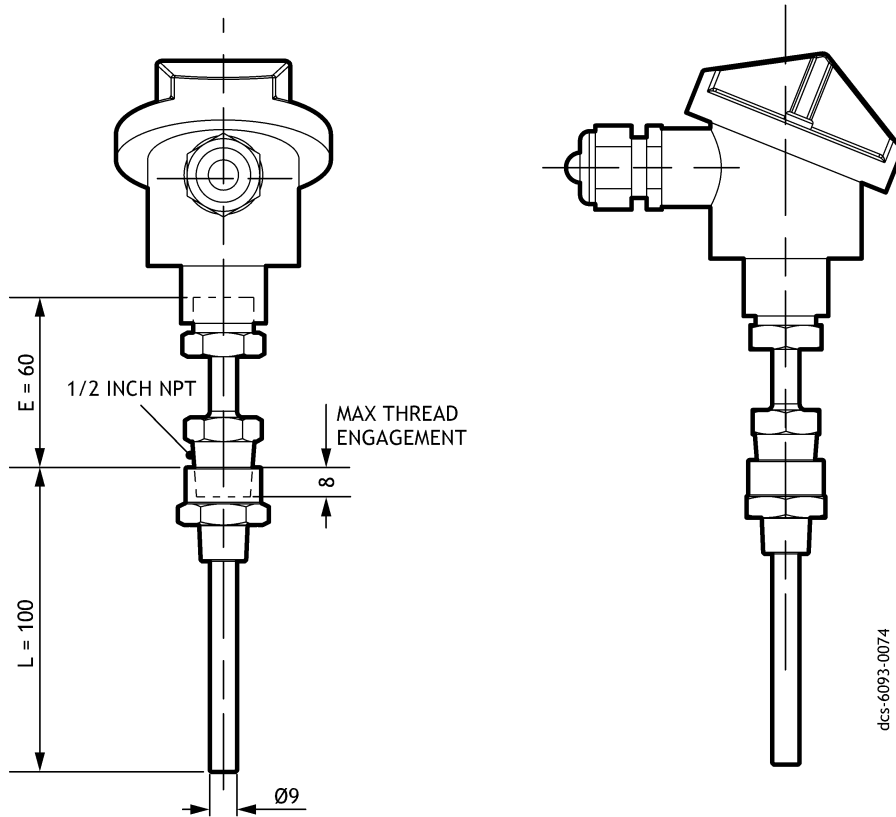
9.2 Physical data

Figure 85 - Temperature transmitter assembly - GXS pump only (probe length 60 mm)



dcs-6093-0073

Figure 86 - Temperature transmitter assembly - GX5 combination (probe length 100 mm)



dcs-6093-0074

9.3 Technical data

Table 61 - Thermometer / thermowell

Parameter	Data
Material	316L stainless steel
RTD class	Std RTD 1 x PT100
Accuracy	+/- 1.3 % as stated in DIN 1EC751

Table 62 - Transmitter

Parameter	Data
Mounting	Head mounted transmitter
Sensor	PT100 - 200 °C to 850 °C
Measurement range	0 °C to 200 °C
Model	Standard model

Table 63 - Other

Parameter	Data
Control voltage	Nominal 24 V
Signal output	4 mA to 20 mA
Cable entry	PG16
Design pressure	1 barg/FV (mechanical integrity 10 barg)
Operating temperature	-20 °C to +200 °C

9.4 Installation

9.4.1 Unpack and inspect

Note: The information contained within this manual covers the physical installation of the accessory only. It will also be necessary to configure the GXS pump controller to recognise the accessory after it has been installed. Please refer to the GXS product manual for further information.

Remove all the packaging materials and check the temperature transmitter for signs of damage. If the temperature transmitter is damaged, notify your supplier and the carrier in writing within three days; state the Item number of the temperature transmitter together with your order number and your supplier's invoice number. Do not use the temperature transmitter if it is damaged.

Check that your package contains the correct items. If any of the items are missing, notify your supplier in writing within three days.

If the temperature transmitter is not to be used immediately, store as described in [Section 9.5](#).

9.4.2 Installation of the temperature transmitter

9.4.2.1 To the pump inlet spool

Install the temperature transmitter assembly as follows:

1. Remove the ½ inch BSP tapered plug from the relevant instrument port in the inlet spool.
2. Clean and remove all traces of old thread sealant from the instrument port.
3. Check that the temperature transducer assembly has a ½ inch BSP male connector fitted.
4. Apply a thin coat of Loctite 577 thread sealant to the ½ inch BSP tapered thread on the male connector.
5. Refer to [Figure 86](#) and [Figure 87](#). Screw the temperature transducer into the instrument port.

Note: The body of the temperature transmitter may be rotated to any position before the fitting is fully tightened.

Figure 87 - Installation of the temperature transmitter to the pump inlet spool



9.4.2.2 To the spool between the pump and booster

Install the temperature transmitter assembly as follows:

1. Remove the 3/8 inch BSP plug from the relevant instrument port in the spool.
2. Ensure the 3/8 inch BSP instrument port is clean.
3. Check that the temperature transducer assembly has a 3/8 inch BSP male connector fitted.
4. Apply a thin coat of Loctite 577 thread sealant to the 3/8 inch BSP tapered thread on the male connector.
5. Refer to [Figure 86](#) and [Figure 88](#). Screw the temperature transducer into the instrument port.

Note: The body of the temperature transmitter may be rotated to any position before the fitting is fully tightened.

Figure 88 - Installation of the temperature transmitter to the spool between the pump and booster



9.4.3 Electrical connection to the on-pump controller

9.4.3.1 Installation safety

CAUTION

Be sure to route and secure accessory cables as shown to prevent cables from resting on hot surfaces. Accessory cables may be damaged if they touch the dry pump, booster and spools during pump operation.

The route for the accessory cable inside the GXS enclosure has been chosen carefully to ensure that the cable does not rest on hot surfaces or pass over other cables carrying mains voltages. When fitting the accessory cable, carefully follow the instructions given in the sections below. Ensure that cable ties are used as shown to keep the cable in the correct position.

9.4.3.2 Installing the cables inside the GXS enclosure

1. If the GXS system is running, shut it down.
2. Allow the system to cool sufficiently before moving on to step 3, Minimum one hour.
3. Isolate the GXS system from the electrical supply.
4. Using a suitable screwdriver, remove both side panels and store them safely nearby.
5. Refer to [Figure 73](#) and [Figure 90](#) to identify the external position of the temperature transmitter to the pump.
6. Slid the cable anchor mount into position over the edge of the hole in the top panel for the pump inlet. Refer to [Figure 91](#).
7. Remove the top cover from the temperature transmitter as show, pass the wires through the cable entry position on the transmitter and connect the wires as shown. Screw the cable gland into place and tighten until the seal is reached. Replace the top cover and pass the cable through the top panel and secure to the cable anchor mount with a cable tie as shown in [Figure 90](#).

Figure 89 - Cable connection within the temperature transmitter



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Figure 90 - External position of temperature transmitter



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Figure 91 - Cable anchor in position on top panel



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- 8. Route the cable inside the GXS enclosure as shown in Figure 92. Use cable ties to attach the cable to the water pipes.

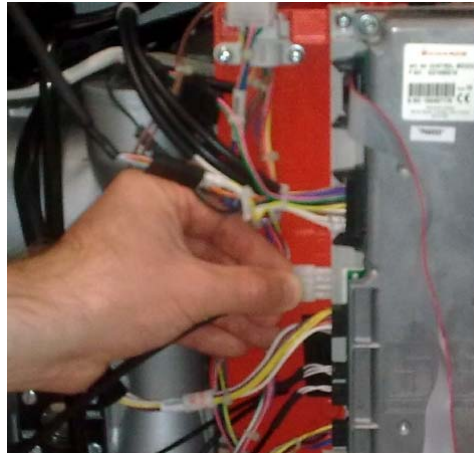
Figure 92 - Correct routing of the accessory cable



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9. Connect the cable directly into the free socket on the GXS controller as shown in Figure 93.

Figure 93 - Connecting to the control system



10. If there is any excess cable, loop it back on itself and secure it firmly with a cable tie. Ensure that it cannot come in contact with the pump surfaces.

Figure 94 - Securing excess cable with a cable tie



11. Replace the covers of the GXS system.

9.5 Storage and disposal

9.5.1 Storage

If the temperature transducer will not be used immediately:

1. Clean the temperature transmitter.
2. Protect the thread and sensing probe and place the temperature transmitter in a sealed polythene bag.
3. Store in a cool dry

9.5.2 Disposal

Dispose of the temperature transmitter in accordance with all local and national safety and environmental requirements.

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10 Pressure gauge assembly

CAUTION

This gauge is for test purposes only and must be left in the closed position during normal use to avoid damage to the gauge.

10.1 Description

The pressure gauge assembly is a 100 mm diameter liquid filled gauge with safety blow out disc and bayonet lock and bezel window with laminated safety glass. The pressure gauge assembly is fitted with a ball valve to isolate the gauge from fluctuations in vacuum when a reading is not required. This also increases longevity of the gauge.

10.2 Physical data

Figure 95 - Pressure gauge assembly

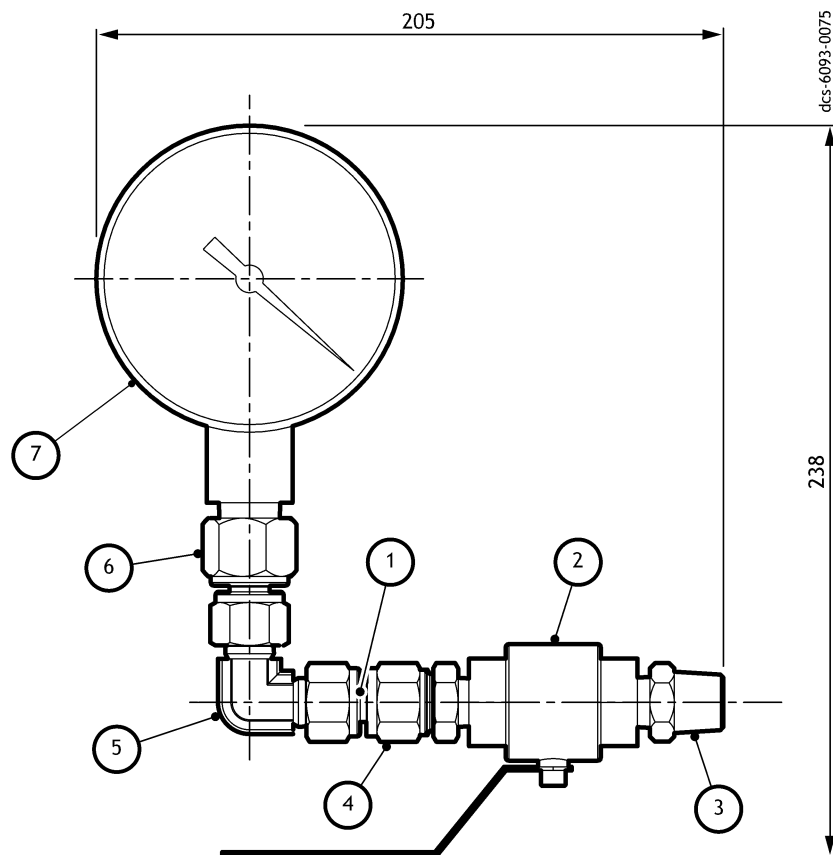


Table 64 - Pressure gauge assembly check list

Item	Qty	Description	Check
1	1	Port connector	<input type="checkbox"/>
2	1	Ball valve	<input type="checkbox"/>
3	1	1/2 inch BSPT hexagonal reducing nipple	<input type="checkbox"/>

Table 64 - Pressure gauge assembly check list

Item	Qty	Description	Check
4	1	Male connector	<input type="checkbox"/>
5	1	Union elbow	<input type="checkbox"/>
6	1	Female adapter	<input type="checkbox"/>
7	1	Pressure gauge	<input type="checkbox"/>

10.3 Technical data

Table 65 - Technical data

Parameter	Data
Accuracy	± 1.0 % fsd @ 20 °C
Movement	Anti-clockwise
Code number	233.50.100
Scale	1000 - 0 absolute
Case	Stainless steel
Material	Stainless steel 316 Ti Bourdon tube and connector block

10.4 Installation

10.4.1 Unpack and inspect

Remove all the packaging materials and check the pressure gauge assembly. If the pressure gauge assembly is damaged, notify your supplier and the carrier in writing within three days; state the item number of the pressure gauge assembly together with your order number and your supplier's invoice number. Do not use the pressure gauge assembly if it is damaged.

Check that your package contains the correct items for the pressure gauge assembly listed in Table 64. If any of the items are missing, notify your supplier in writing within three days.

If the pressure gauge assembly is not to be used immediately, store as described in Section 10.

10.4.2 Installation of the pressure gauge assembly to the pump inlet spool

Install the pressure gauge assembly as follows:

1. Remove the ½ inch BSP tapered plug from the relevant instrument port in the inlet spool.
2. Clean and remove all traces of old thread sealant from the instrument port.
3. Remove the gauge head from the rest of the assembly by unscrewing the nut on the elbow - refer to Figure 95, item 5.
4. Apply a thin coat of Loctite 577 thread sealant to the ½ inch BSP tapered thread on the male connector.
5. Screw the body of the assembly into an instrument port on the inlet spool, refit the gauge head and test for leaks.

Note: The pressure gauge and ball valve may be rotated to any position before the fitting is fully tightened.

10.5 Storage and disposal

10.5.1 Storage

If the pressure gauge assembly will not be used immediately:

1. Clean the pressure gauge assembly.
2. Protect the thread and gauge face and place in a sealed polythene bag.
3. Store in a cool dry.

10.5.2 Disposal

Dispose of the pressure gauge assembly in accordance with all local and national safety and environmental requirements.

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11 Service spares and accessories

11.1 Spares and accessories

Edwards products, spares and accessories are available from Edwards companies in Belgium,

Brazil, Canada, France, Germany, Hong Kong, Italy, Japan, Korea, Singapore, Switzerland, United Kingdom, USA and a world-wide network of distributors. The majority of these centres employ Service Engineers who have undergone comprehensive training courses.

Order spare parts and accessories from your nearest Edwards Ltd Company or distributor. When ordering please state for each part required:

- Model and Item Number of your equipment
- Serial Number (if any)
- Item Number and description of part.

11.2 Service

Edwards products are supported by a world-wide network of Edwards Service Centres. Each Service Centre offers a wide range of options including: equipment decontamination; service exchange, repair; rebuild and testing to factory specifications. Equipment which has been serviced or rebuilt is returned with a full warranty.

Your local Service Centre can also provide Edwards engineers to support on-site maintenance service or repair of your equipment.

For more information about service options, contact your nearest centre or other Edwards Ltd company.

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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 Edwards.

Note: *If we do not receive a completed HS2 form, we will not accept the return of the equipment.*

