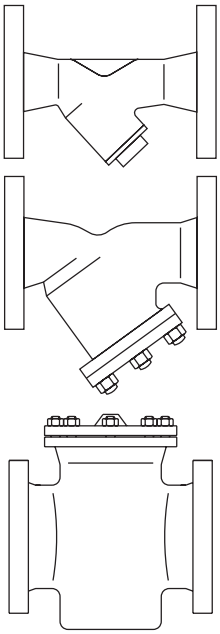
spirax sarco



# Fig 7, 33, 33.1, 34, 34HP, 36, 36HP, 37, 3616 and Fig 3716 Flanged Strainers

Installation and Maintenance Instructions







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# 1. Safety information

**Safe operation of these products can only be guaranteed if they are properly installed, commissioned, used and maintained by qualified personnel (see Section 1.11) in compliance with the operating instructions. General installation and safety instructions for pipeline and plant construction, as well as the proper use of tools and safety equipment must also be complied with.**

## 1.1 Intended use

**Referring to the Installation and Maintenance Instructions, name-plate and Technical Information Sheet, check that the product is suitable for the intended use/application.**

**The products listed below comply with the requirements of the European Pressure Equipment Directive and carry the CE mark when so required.**

**The products fall within the following Pressure Equipment Directive categories:**

| Product | | | Group 1 Gases | Group 2 Gases | Group 1 Liquids | Group 2 Liquids |
|---|---|---|---|---|---|---|
| Fig 7 | PN16 | DN200 | 2 | 2 | 2 | SEP |
| | | DN250 | 3 | 2 | 2 | SEP |
| | ASME 150 | DN200 - DN250 | 3 | 2 | 2 | SEP |
| Fig 33<br>Fig 33.1 | All connections | DN15 - DN25 | SEP | SEP | SEP | SEP |
| | | DN32 - DN50 | 1 | SEP | SEP | SEP |
| | | DN65 - DN125 | 2 | 1 | SEP | SEP |
| | | DN150 - DN200 | 2 | 1 | 2 | SEP |
| Fig 34<br>and<br>Fig 36 | PN16 | DN15 - DN25 | SEP | SEP | SEP | SEP |
| | | DN32 | 2 | SEP | SEP | SEP |
| | | DN40 - DN50 | 2 | 1 | SEP | SEP |
| | | DN65 - DN125 | 2 | 1 | SEP | SEP |
| | | DN150 - DN200 | 2 | 1 | 2 | SEP |
| | | DN250 - DN300 | 3 | 2 | 2 | SEP |
| | | DN350 - DN400 | 3 | 3 | 2 | 1 |
| | PN25 | DN200 | 3 | 2 | 2 | SEP |
| | | DN250 | 3 | 2 | 2 | 1 |
| | | DN300 - DN400 | 3 | 3 | 2 | 1 |
| | PN40 | DN15 - DN25 | SEP | SEP | SEP | SEP |
| | | DN32 | 2 | SEP | SEP | SEP |
| | | DN40 - DN50 | 2 | 1 | SEP | SEP |
| | | DN65 - DN100 | 2 | 1 | 2 | SEP |
| | | DN125 - DN200 | 3 | 2 | 2 | SEP |
| | | DN250 | 3 | 2 | 2 | 1 |
| | | DN300 - DN400 | 3 | 3 | 2 | 1 |

| Product | | | Group 1 Gases | Group 2 Gases | Group 1 Liquids | Group 2 Liquids |
|---|---|---|---|---|---|---|
| Fig 34 and Fig 36 | ASME 150 | DN15 - DN25 | SEP | SEP | SEP | SEP |
| | | DN32 - DN50 | 1 | SEP | SEP | SEP |
| | | DN65 - DN100 | 2 | 1 | SEP | SEP |
| | | DN125 - DN150 | 2 | 1 | 2 | SEP |
| | | DN200 - DN250 | 3 | 2 | 2 | SEP |
| | | DN300 - DN400 | 3 | 3 | 2 | 1 |
| | ASME 300 | DN15 - DN25 | SEP | SEP | SEP | SEP |
| | | DN32 | 2 | SEP | SEP | SEP |
| | | DN40 - DN50 Stainless steel | 2 | 1 | SEP | SEP |
| | | DN40 - DN50 Carbon steel | 2 | 1 | 2 | SEP |
| | | DN65 - DN100 | 2 | 1 | 2 | SEP |
| | | DN125 - DN200 | 3 | 2 | 2 | SEP |
| | | DN250 | 3 | 2 | 2 | 1 |
| | | DN300 - DN400 | 3 | 3 | 2 | 1 |
| | JIS/KS 10 | DN15 - DN25 | SEP | SEP | SEP | SEP |
| | | DN32 - DN65 | 1 | SEP | SEP | SEP |
| | | DN80 - DN125 | 2 | 1 | SEP | SEP |
| | | DN150 - DN250 | 2 | 1 | 2 | SEP |
| | | DN300 - DN350 | 3 | 2 | 2 | SEP |
| | | DN400 | 3 | 3 | 2 | 1 |
| | JIS/KS 20 | DN15 - DN25 | SEP | SEP | SEP | SEP |
| | | DN32 | 2 | SEP | SEP | SEP |
| | | DN40 - DN50 | 2 | 1 | SEP | SEP |
| | | DN65 - DN100 | 2 | 1 | 2 | SEP |
| | | DN125 - DN200 | 3 | 2 | 2 | SEP |
| | | DN250 | 3 | 2 | 2 | 1 |
| | | DN300 - DN400 | 3 | 3 | 2 | 1 |
| Fig 34HP and Fig 36HP | All connections | DN15 - DN25 | SEP | SEP | SEP | SEP |
| | | DN40 - DN100 | 2 | SEP | 2 | SEP |
| | | DN150 - DN200 | 3 | 2 | 2 | SEP |

| | Product | | Group 1 Gases | Group 2 Gases | Group 1 Liquids | Group 2 Liquids |
|---|---|---|---|---|---|---|
| Fig 37 | PN16 | DN15 - DN25 | SEP | SEP | SEP | SEP |
| | | DN32 | 2 | SEP | SEP | SEP |
| | | DN40 - DN50 | 2 | 1 | SEP | SEP |
| | | DN65 - DN125 | 2 | 1 | SEP | SEP |
| | | DN150 - DN200 | 2 | 1 | 2 | SEP |
| | PN25 | DN200 | 3 | 2 | 2 | SEP |
| | PN40 | DN15 - DN25 | SEP | SEP | SEP | SEP |
| | | DN32 | 2 | SEP | SEP | SEP |
| | | DN40 - DN50 | 2 | 1 | SEP | SEP |
| | | DN65 - DN100 | 2 | 1 | 2 | SEP |
| | | DN125 - DN150 | 3 | 2 | 2 | SEP |
| | ASME 150 | DN15 - DN25 | SEP | SEP | SEP | SEP |
| | | DN32 - DN50 | 1 | SEP | SEP | SEP |
| | | DN65 - DN100 | 2 | 1 | SEP | SEP |
| | | DN125 - DN200 | 2 | 1 | 2 | SEP |
| | JIS / KS 10 | DN15 - DN25 | SEP | SEP | SEP | SEP |
| | | DN32 - DN65 | 1 | SEP | SEP | SEP |
| | | DN80 - DN125 | 2 | 1 | SEP | SEP |
| | | DN150 - DN200 | 2 | 1 | 2 | SEP |
| | JIS / KS 20 | DN15 - DN25 | SEP | SEP | SEP | SEP |
| | | DN32 | 1 | SEP | SEP | SEP |
| | | DN40 - DN65 | 2 | 1 | SEP | SEP |
| | | DN80 - DN125 | 2 | 1 | 2 | SEP |
| | | DN150 - DN200 | 3 | 2 | 2 | SEP |

| Product | | | Group 1 Gases | Group 2 Gases | Group 1 Liquids | Group 2 Liquids |
|---|---|---|---|---|---|---|
| Fig 3616 | PN16 | DN15 - DN25 | SEP | SEP | SEP | SEP |
| | | DN32 - DN50 | 1 | SEP | SEP | SEP |
| | | DN65 - DN125 | 2 | 1 | SEP | SEP |
| | | DN150 - DN200 | 2 | 1 | 2 | SEP |
| | ASME 150 | DN15 - DN25 | SEP | SEP | SEP | SEP |
| | | DN32 - DN50 | 1 | SEP | SEP | SEP |
| | | DN65 - DN100 | 2 | 1 | SEP | SEP |
| | | DN125 - DN150 | 2 | 1 | 2 | SEP |
| | | DN200 | 3 | 2 | 2 | SEP |
| | JIS/KS 10 | DN15 - DN25 | SEP | SEP | SEP | SEP |
| | | DN32 - DN65 | 1 | SEP | SEP | SEP |
| | | DN80 - DN125 | 2 | 1 | SEP | SEP |
| | | DN150 - DN200 | 2 | 1 | 2 | SEP |
| Fig 3716 | PN16 | DN15 - DN25 | SEP | SEP | SEP | SEP |
| | | DN32 - DN50 | 1 | SEP | SEP | SEP |
| | | DN65 - DN125 | 2 | 1 | SEP | SEP |
| | | DN150 - DN200 | 2 | 1 | 2 | SEP |
| | ASME 150 | DN15 - DN25 | SEP | SEP | SEP | SEP |
| | | DN32 - DN50 | 1 | SEP | SEP | SEP |
| | | DN65 - DN100 | 2 | 1 | SEP | SEP |
| | | DN125 - DN200 | 2 | 1 | 2 | SEP |
| | JIS/KS 10 | DN15 - DN25 | SEP | SEP | SEP | SEP |
| | | DN32 - DN65 | 1 | SEP | SEP | SEP |
| | | DN80 - DN125 | 2 | 1 | SEP | SEP |
| | | DN150 - DN200 | 2 | 1 | 2 | SEP |

i) **These products have been specifically designed for use on steam, air or water /condensate as stated in Groups 1 and 2 of the above mentioned Pressure Equipment Directive. The products' use on other fluids may be possible but, if this is contemplated, Spirax Sarco should be contacted to confirm the suitability of the product for the application being considered.**

ii) **Check material suitability, pressure and temperature and their maximum and minimum values. If the maximum operating limits of the product are lower than those of the system in which it is being fitted, or if malfunction of the product could result in a dangerous overpressure or overtemperature occurrence, ensure a safety device is included in the system to prevent such over-limit situations.**

iii) **Determine the correct installation situation and direction of fluid flow.**

iv) **Spirax Sarco products are not intended to withstand external stresses that may be induced by any system to which they are fitted. It is the responsibility of the installer to consider these stresses and take adequate precautions to minimise them.**

v) **Remove protection covers from all connections and protective film from all name-plates, where appropriate, before installation on steam or other high temperature applications.**

## 1.2 Access

**Ensure safe access and if necessary a safe working platform (suitably guarded) before attempting to work on the product. Arrange suitable lifting gear if required.**

## 1.3 Lighting

**Ensure adequate lighting, particularly where detailed or intricate work is required.**

## 1.4 Hazardous liquids or gases in the pipeline

**Consider what is in the pipeline or what may have been in the pipeline at some previous time. Consider: flammable materials, substances hazardous to health, extremes of temperature.**

## 1.5 Hazardous environment around the product

**Consider: explosion risk areas, lack of oxygen (e.g. tanks, pits), dangerous gases, extremes of temperature, hot surfaces, fire hazard (e.g. during welding), excessive noise, moving machinery.**

## 1.6 The system

**Consider the effect on the complete system of the work proposed. Will any proposed action (e.g. closing isolation valves, electrical isolation) put any other part of the system or any personnel at risk?**
**Dangers might include isolation of vents or protective devices or the rendering ineffective of controls or alarms. Ensure isolation valves are turned on and off in a gradual way to avoid system shocks.**

## 1.7 Pressure systems

**Ensure that any pressure is isolated and safely vented to atmospheric pressure. Consider double isolation (double block and bleed) and the locking or labelling of closed valves. Do not assume that the system has depressurised even when the pressure gauge indicates zero.**

## 1.8 Temperature

**Allow time for temperature to normalise after isolation to avoid danger of burns.**

## 1.9 Tools and consumables

**Before starting work ensure that you have suitable tools and/or consumables available. Use only genuine Spirax Sarco replacement parts.**

## 1.10 Protective clothing

**Consider whether you and/or others in the vicinity require any protective clothing to protect against the hazards of, for example, chemicals, high/low temperature, radiation, noise, falling objects, and dangers to eyes and face.**

## 1.11 Permits to work

**All work must be carried out or be supervised by a suitably competent person.**
**Installation and operating personnel should be trained in the correct use of the product according to the Installation and Maintenance Instructions.**
**Where a formal 'permit to work' system is in force it must be complied with. Where there is no such system, it is recommended that a responsible person should know what work is going on and, where necessary, arrange to have an assistant whose primary responsibility is safety.**
**Post 'warning notices' if necessary.**

## 1.12 Handling

**Manual handling of large and/or heavy products may present a risk of injury. Lifting, pushing, pulling, carrying or supporting a load by bodily force can cause injury particularly to the back. You are advised to assess the risks taking into account the task, the individual, the load and the working environment and use the appropriate handling method depending on the circumstances of the work being done.**

## 1.13 Residual hazards

**In normal use the external surface of the product may be very hot. If used at the maximum permitted operating conditions the surface temperature of some products may reach temperatures of 300 °C (572 °F).**
**Many products are not self-draining. Take due care when dismantling or removing the product from an installation (refer to 'Maintenance instructions').**

## 1.14 Freezing

**Provision must be made to protect products which are not self-draining against frost damage in environments where they may be exposed to temperatures below freezing point.**

## 1.15 Disposal

**Unless otherwise stated in the Installation and Maintenance Instructions, this product is recyclable and no ecological hazard is anticipated with its disposal providing due care is taken.**

## 1.16 Returning products

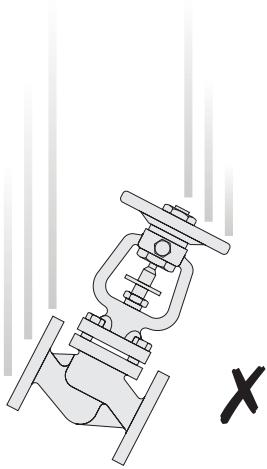
**Customers and stockists are reminded that under EC Health, Safety and Environment Law, when returning products to Spirax Sarco they must provide information on any hazards and the precautions to be taken due to contamination residues or mechanical damage which may present a health, safety or environmental risk. This information must be provided in writing including Health and Safety data sheets relating to any substances identified as hazardous or potentially hazardous.**

## 1.17 Working safely with cast iron products on steam

**Cast iron products are commonly found on steam and condensate systems. If installed correctly using good steam engineering practices, it is perfectly safe. However, because of its mechanical properties, it is less forgiving compared to other materials such as SG iron or carbon steel. The following are the good engineering practices required to prevent waterhammer and ensure safe working conditions on a steam system.**

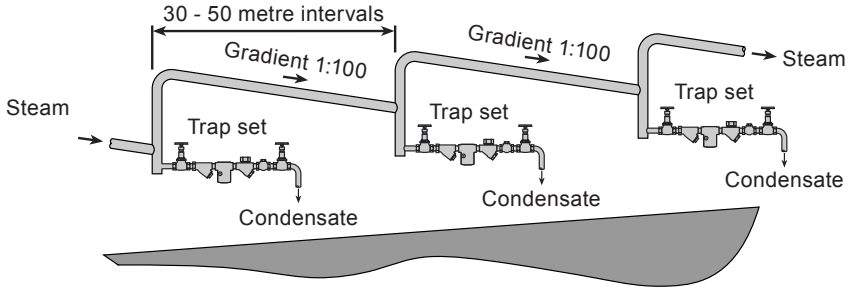
### Safe Handling

Cast Iron is a brittle material. If the product is dropped during installation and there is any risk of damage the product should not be used unless it is fully inspected and pressure tested by the manufacturer.

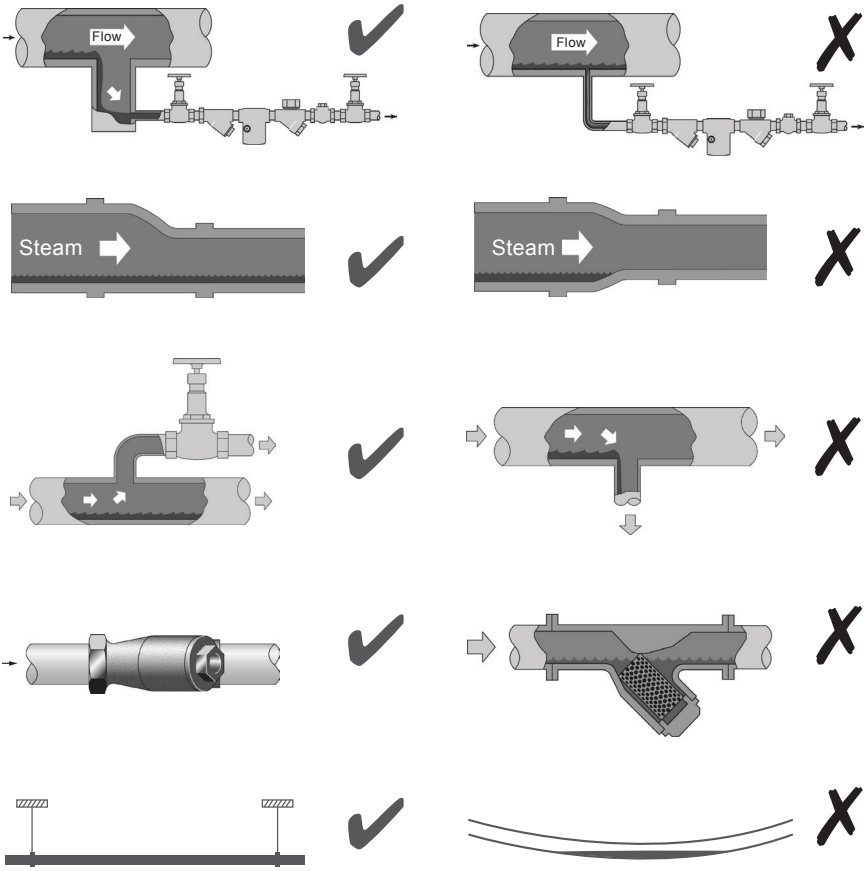


## Prevention of water hammer

Steam trapping on steam mains:

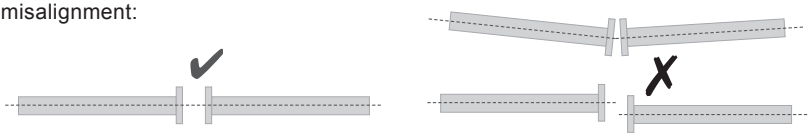



## Steam Mains - Do's and Don'ts:



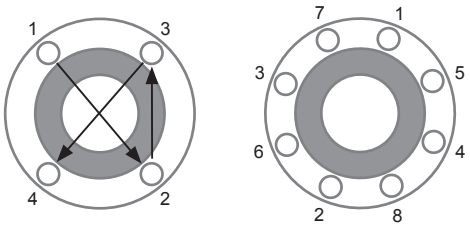
## Prevention of tensile stressing

Pipe misalignment:



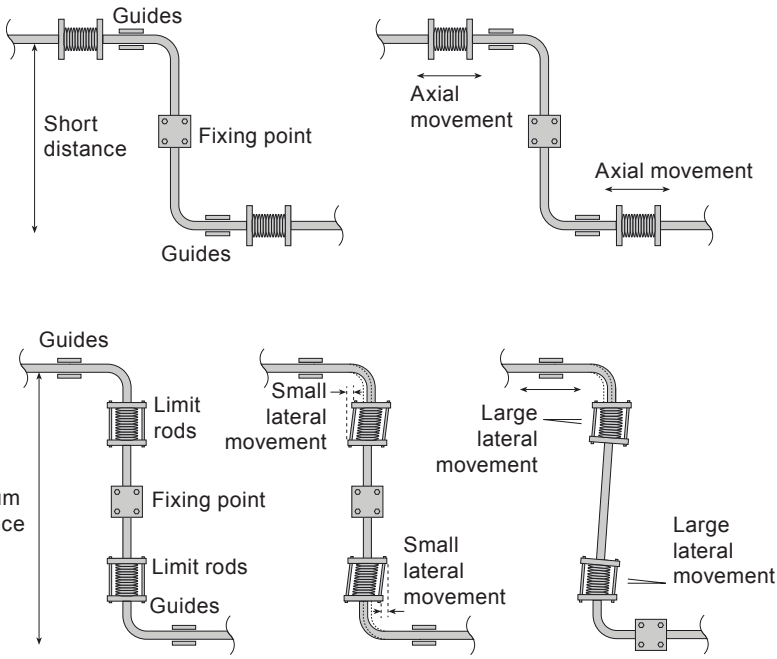
**Installing products or re-assembling after maintenance:**

Do not over tighten.
Use correct torque figures.




Flange bolts should be gradually tightened across diameters to ensure even load and alignment.

**Thermal expansion:**



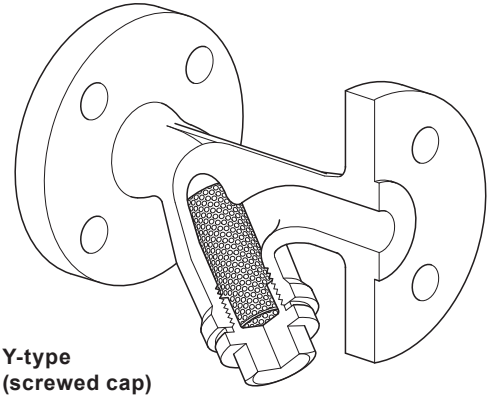
# 2. General product information

## 2.1 General description

The products detailed below are all strainers with flanged connections. They are used to protect other pipeline items from damage due to debris and dirt in the system. The Fig 7 strainer is a pot type design - all the others are Y-type designs. The standard stainless steel screen in the DN15 to DN80 sizes has 0.8 mm perforations. In the DN100 to DN200 sizes, they have 1.6 mm perforations. The Fig 7 is fitted with 3.2 mm perforations only (no optional extras are available for the Fig 7). Optional screens are available for the Y-type strainers only, see Section 2.2.

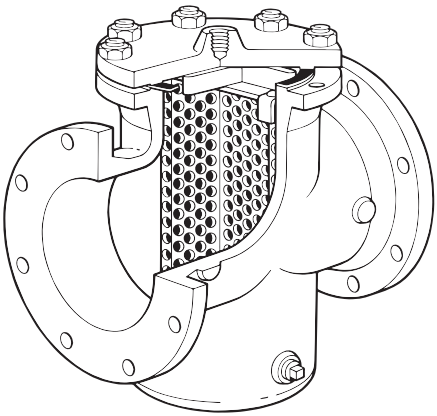
**Note:** For additional information see the following Technical Information Sheets:

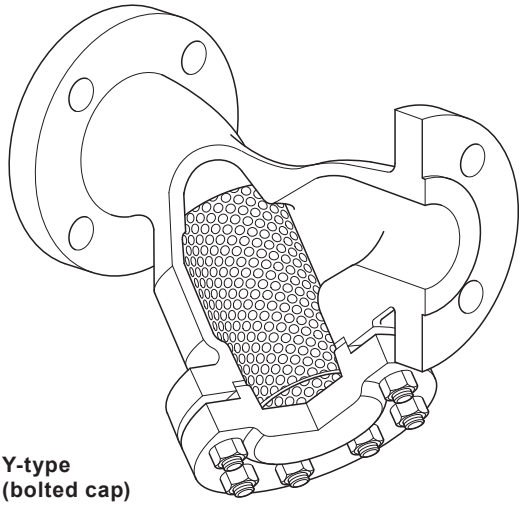
| Strainer | Body material | Body rating | Size | TI reference |
|---|---|---|---|---|
| **Fig 7** | Carbon steel | PN16 - ASME 150 | DN200 - DN250 only | TI-P063-03 |
| **Fig 33** | Cast iron | PN16 - ASME 150 | DN15 - DN200 | TI-S60-03 |
| **Fig 33.1** | SG iron | PN16 | DN15 - DN200 | TI-P166-01 |
| **Fig 34 (DIN)** | Carbon steel | PN40 | DN15 - DN200 | TI-P064-01 |
| **Fig 34 (ASTM)** | Carbon steel | ASME 300 | DN15 - DN200 | TI-P064-02 |
| **Fig 34** | Carbon steel | PN40 - ASME 300 | DN250 - DN400 | TI-P168-07 |
| **Fig 34HP** | Carbon steel | PN100 - ASME 600 | DN15 - DN200 | TI-P168-01 |
| **Fig 36** | Austenitic stainless steel | PN40 - ASME 300 | DN15 - DN200 | TI-P160-02 |
| **Fig 36HP** | Austenitic stainless steel | PN100 - ASME 600 | DN15 - DN200 | TI-P160-11 |
| **Fig 37** | SG iron | PN40 - ASME 150 | DN15 - DN150 | TI-P081-01 |
| | | PN25 - ASME 150 | DN200 | TI-P081-01 |
| **Fig 3616 (DIN)** | Austenitic stainless steel | PN16 | DN15 - DN200 | TI-P160-05 |
| **Fig 3616 (ASTM)** | Austenitic stainless steel | ASME 150 | DN15 - DN200 | TI-P160-04 |
| **Fig 3716** | SG iron | PN16 | DN15 - DN200 | TI-P081-03 |



**Y-type**
**(screwed cap)**

**Fig 7**





**Y-type**
**(bolted cap)**

## 2.2 Optional extras

| | | | |
|---|---|---|---|
| **Strainer screens** | **Stainless steel screen** | Perforations | 1.6, 3 mm |
| | | Mesh | 40, 100, 200 |
| | **Monel screen** (Not available for the Fig 3716) | Perforations | 0.8, 3 mm |
| | | Mesh | 100 |

**Blowdown or drain valve connections**
The cap can be drilled and tapped to the following sizes to enable a blowdown or drain valve to be fitted.

| Strainer | Size | Blowdown valve | Drain valve |
|---|---|---|---|
| **Fig 33<br>Fig 33.1<br>Fig 34** | **DN15** | ¼" | ¼" |
| | **DN20 - DN25** | ½" | ½" |
| | **DN32 - DN40** | 1" | ¾" |
| | **DN50 - DN125** | 1¼" | ¾" |
| | **DN150 - DN200** | 2" | ¾" |
| | **DN250 - DN400** | 2" | 2" |
| **Fig 34HP<br>Fig 36HP** | **DN15** | 2 " | 2 " |
| | **DN20** | ½" | 2 " |
| | **DN25** | ¾" | ½" |
| | **DN40** | 1" | ½" |
| | **DN50** | 1" | ¾" |
| | **DN65** | 1¼" | ¾" |
| | **DN80** | 1½" | ¾" |
| | **DN100** | 1½" | 1" |
| | **DN150** | 2" | 1" |
| | **DN200** | 2" | 1½" |
| **Fig 36<br>Fig 37** | **DN15** | ¼" | ¼" |
| | **DN20 - DN25** | ½" | ½" |
| | **DN32 - DN40** | 1" | ¾" |
| | **DN50 - DN125** | 1¼" | ¾" |
| | **DN150 - DN200** | 2" | ¾" |
| *** Fig 3616<br>* Fig 3716** | **DN15 - DN20** | 2 " | 2 " |
| | **DN25 - DN32** | ½" | ½" |
| | **DN40 - DN80** | ¾" | ¾" |
| | **DN100 - DN200** | 1" | ¾" |

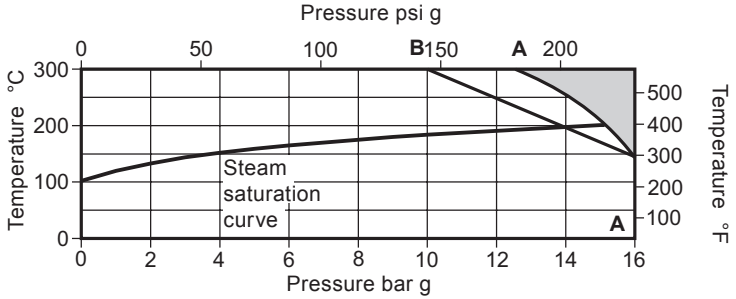
*** Note:** The Fig 3616 and Fig 3716 can be supplied with ¼" tappings for pressure monitoring (upstream and downstream) of the strainer screen.

## 2.3 Pressure / temperature limits (ISO 6552)

**Note:** Values for PMA and TMA are not concurrent for exact operating limits.

### Fig 7

| | | |
|---|---|---|
| Body design conditions | | PN16 |
| PMA - Maximum allowable pressure | 16 bar g | (232 psi g) |
| TMA - Maximum allowable temperature | 300 °C | (572 °F) |
| Minimum operating temperature | 0 °C | (32 °F) |
| Designed for a maximum cold hydraulic test pressure of: | 28 bar g | (406 psi g) |



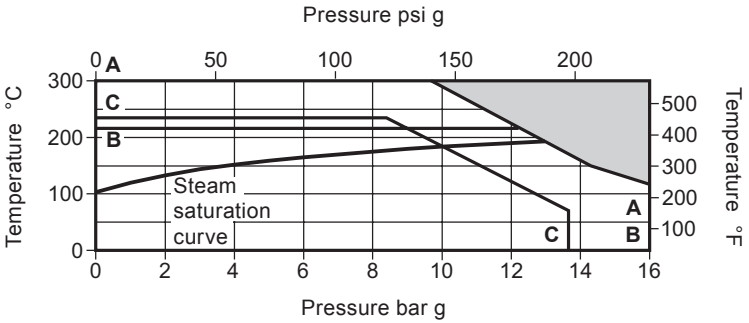

The product **must not** be used in this region.

**A - A** Flanged EN 1092 PN16

**B -A** Flanged ASME 150

## Fig 33

| Body design conditions | | | PN16 |
|---|---|---|---|
| PMA | Maximum allowable pressure | 16 bar g | (232 psi g) |
| TMA | Maximum allowable temperature | 300 °C | (572 °F) |
| Minimum operating temperature | | 0 °C | (32 °F) |
| Designed for a maximum cold hydraulic test pressure of: | | 24 bar g | (348 psi g) |




The product **must not** be used in this region.

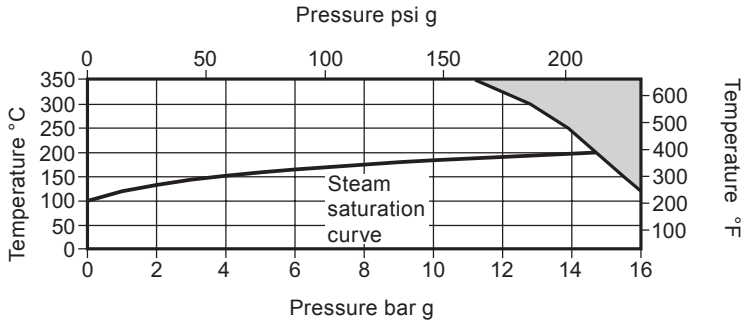
**A - A** Flanged EN 1092 PN16

**B - B** Flanged AS 2129 Table F

**C - C** Flanged ASME 125 (including DN15, DN20 flanged ASME 150)

## Fig 33.1

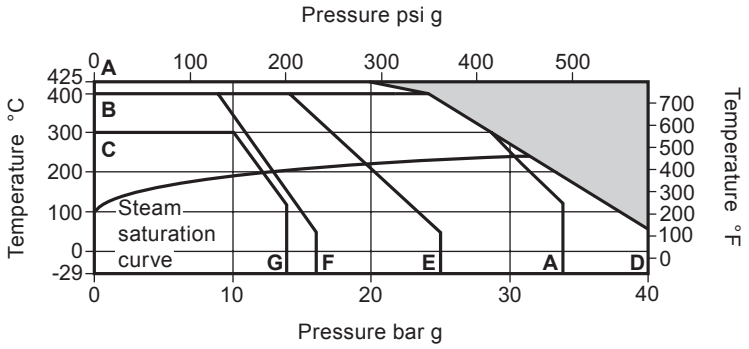
| Body design conditions | | | PN16 |
|---|---|---|---|
| PMA | Maximum allowable pressure | 16 bar g | (232 psi g) |
| TMA | Maximum allowable temperature | 350 °C | (662 °F) |
| Minimum allowable temperature | | -10 °C | (14 °F) |
| PMO | Maximum operating pressure for saturated steam service | 14.7 bar g | (213 psi g) |
| TMO | Maximum operating temperature | 350 °C | (662 °F) |
| Minimum operating temperature | | -10 °C | (14 °F) |
| Designed for a maximum cold hydraulic test pressure of: | | 24 bar g | (348 psi g) |




The product **must not** be used in this region.

## Fig 34 (DIN and JIS/KS)

| Body design conditions | | | PN40 |
|---|---|---|---|
| PMA | Maximum allowable pressure | PN40 | 40 bar g @ 50 °C (580 psi g @ 122 °F) |
| | | PN25 | 25 bar g @ 50 °C (362 psi g @ 122 °F) |
| | | PN16 | 16 bar g @ 50 °C (232 psi g @ 122 °F) |
| | | JIS/KS 20 | 34 bar g @ 120 °C (493 psi g @ 248 °F) |
| | | JIS/KS 10 | 14 bar g @ 120 °C (203 psi g @ 248 °F) |
| TMA | Maximum allowable temperature | PN40 | 400 °C @ 23.8 bar g (752 °F @ 345 psi g) |
| | | PN25 | 400 °C @ 14.8 bar g (752 °F @ 214 psi g) |
| | | PN16 | 400 °C @ 9.5 bar g (752 °F @ 138 psi g) |
| | | JIS/KS 20 | 425 °C @ 20 bar g (797 °F @ 290 psi g) |
| | | JIS/KS 10 | 300 °C @ 10 bar g (572 °F @ 145 psi g) |
| Minimum operating temperature | | | -29 °C (-20 °F) |
| Designed for a maximum cold hydraulic test pressure of 1.5 x PMA of the connection of choice | | | |




The product **must not** be used in this region.

**A - A** Flanged JIS/KS 20

**B - D** Flanged EN 1092 PN40

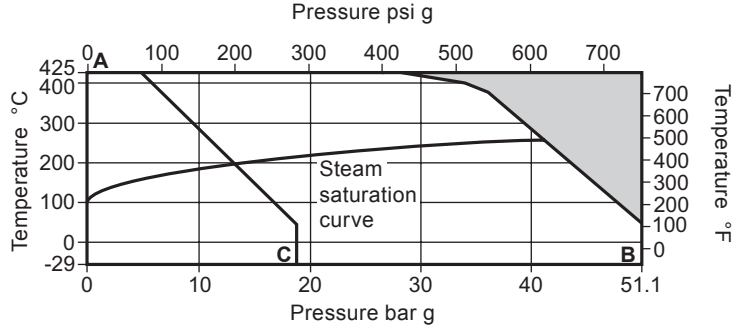
**B - E** Flanged EN 1092 PN25

**B - F** Flanged EN 1092 PN16

**C - G** Flanged JIS/KS 10

## Fig 34 (ASTM)

| | | | | |
|---|---|---|---|---|
| Body design conditions | | | | ASME 300 |
| PMA | Maximum allowable pressure | ASME 150 | 19.6 bar g @ 38 °C | (284 psi g @ 100 °F) |
| | | ASME 300 | 51.1 bar g @ 38 °C | (741 psi g @ 100 °F) |
| TMA | Maximum allowable temperature | ASME 150 | 425 °C @ 5.5 bar g | (797 °F @ 80 psi g) |
| | | ASME 300 | 425 °C @ 28.8 bar g | (797 °F @ 418 psi g) |
| Minimum operating temperature | | | -29 °C | (-20 °F) |
| Designed for a maximum cold hydraulic test pressure of 1.5 x PMA of the connection of choice | | | | |



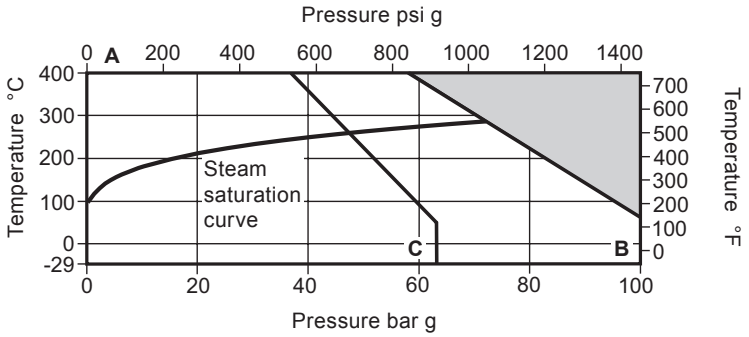

The product **must not** be used in this region.

**A** - **A** Flanged ASME 300

**A - C** Flanged ASME 150

## Fig 34HP (DIN)

| Body design conditions | | | | PN63 and PN100 |
|---|---|---|---|---|
| PMA | Maximum allowable pressure | PN63 | 63 bar g @ 50 °C | (914 psi g @ 122 °F) |
| | | PN100 | 100 bar g @ 50 °C | (1 450 psi g @ 122 °F) |
| TMA | Maximum allowable temperature | PN63 | 400 °C @ 37.5 bar g | (752 °F @ 544 psi g) |
| | | PN100 | 400 °C @ 59.5 bar g | (752 °F @ 863 psi g) |
| Minimum operating temperature | | | -29 °C | (-20 °F) |
| Designed for a maximum cold hydraulic test pressure of: | | PN63 | 95 bar g | (1 378 psi g) |
| | | PN100 | 150 bar g | (2 176 psi g) |



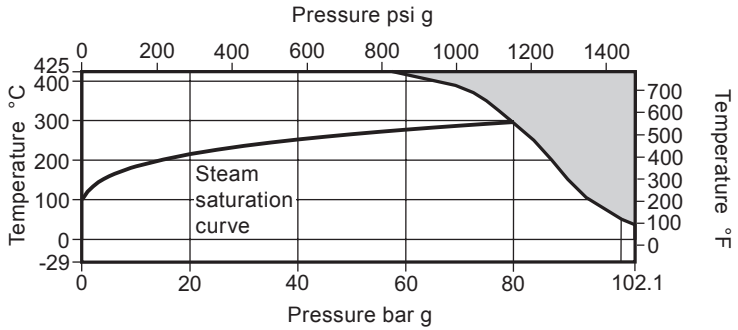

The product **must not** be used in this region.

**A** - **B** Flanged PN100

**A - C** Flanged PN63

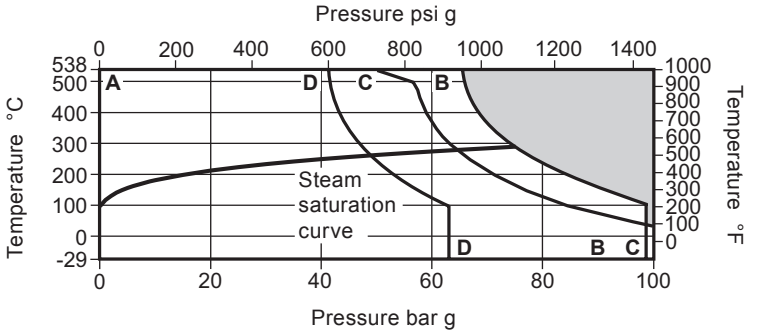
## Fig 34HP (ASTM)

| | | | |
|---|---|---|---|
| Body design conditions | | | ASME 600 |
| PMA | Maximum allowable pressure | 102 bar g @ 38 °C | (1480 psi g @ 100 °F) |
| TMA | Maximum allowable temperature | 425 °C @ 57.5 bar g | (797 °F @ 833 psi g) |
| Minimum operating temperature | | -29 °C | (-20 °F) |
| Designed for a maximum cold hydraulic test pressure of: | | 152 bar g | (2 204 psi g) |




The product **must not** be used in this region.

## Fig 36HP




The product **must not** be used in this region.

**A - B** Flanged ASME B16.5 Class 600, ASME 600 RTJ, Screwed NPT, Socket weld ASME B16.11 Class 3000 and Butt weld ASME B 16.25 Schedule 40 and Schedule 80

| Body design conditions | | | ASME 600 |
|---|---|---|---|
| PMA | Maximum allowable pressure | 99.3 bar g | (1 440 psi g) |
| TMA | Maximum allowable temperature | 538 °C | (1 000 °F) |
| Minimum operating temperature | | -29 °C | (-20 °F) |
| Designed for a maximum cold hydraulic test pressure of: | | 153 bar g | (2 219 psi g) |

**A - C** Flanged EN 1092 PN100 and Screwed BSP

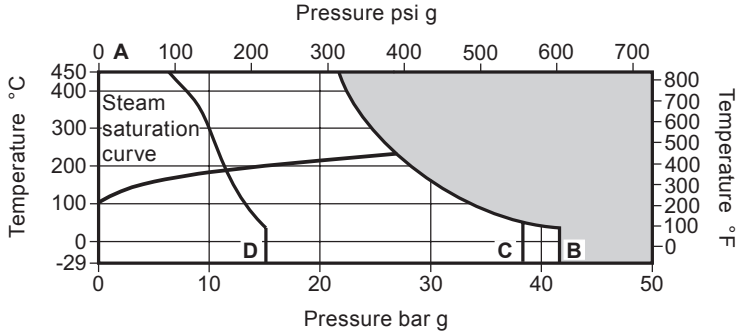
| Body design conditions | | | PN100 |
|---|---|---|---|
| PMA | Maximum allowable pressure | 100 bar g | (1 450 psi g) |
| TMA | Maximum allowable temperature | 538 °C | (1 000 °F) |
| Minimum operating temperature | | -29 °C | (-20 °F) |
| Designed for a maximum cold hydraulic test pressure of: | | 150 bar g | (2 175 psi g) |

**A - D** Flanged EN 1092 PN63

| Body design conditions | | | PN63 |
|---|---|---|---|
| PMA | Maximum allowable pressure | 63 bar g | (913 psi g) |
| TMA | Maximum allowable temperature | 538 °C | (1 000 °F) |
| Minimum operating temperature | | -29 °C | (-20 °F) |
| Designed for a maximum cold hydraulic test pressure of: | | 95 bar g | (1 377 psi g) |

## Fig 36

| | | | |
|---|---|---|---|
| Body design conditions | | | ASME 300 or PN50 |
| PMA | Maximum allowable pressure | 41 bar g | (595 psi g) |
| TMA | Maximum allowable temperature | 450 °C | (842 °F) |
| Minimum operating temperature | | -29 °C | (-20 °F) |
| Designed for a maximum cold hydraulic test pressure of: | | 76 bar g | (1 102 psi g) |




The product **must not** be used in this region.

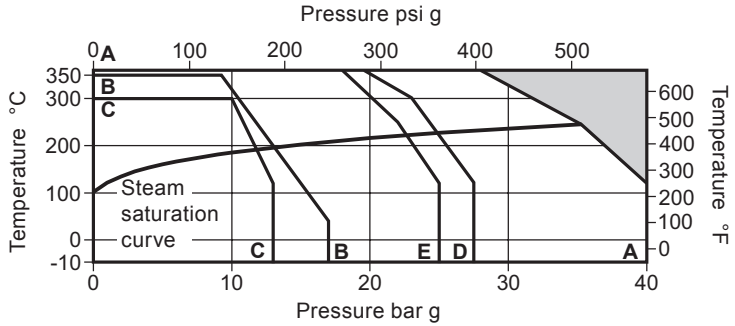
**A** - **B** Flanged PN100

**A - C** Flanged PN63

**C - D** Flanged ASME / ANSI 150

## Fig 37

| | | | | |
|---|---|---|---|---|
| Body design conditions | | | | PN40 |
| | | DN200 only | | PN25 |
| PMA | Maximum allowable pressure | | 40 bar g | (580 psi g) |
| | | DN200 only | 25 bar g | (363 psi g) |
| TMA | Maximum allowable temperature | | 350 °C | (662 °F) |
| Minimum operating temperature | | | -10 °C | (14 °F) |
| | | DN65 and above | 0 °C | (32 °F) |
| Designed for a maximum cold hydraulic test pressure of: | PN40 | | 60 bar g | (870 psi g) |
| | PN25 | DN200 only | 38 bar g | (551 psi g) |




The product **must not** be used in this region.

**A - B** Flanged EN 1092 PN40

**A - D** Flanged JIS/KS 20K

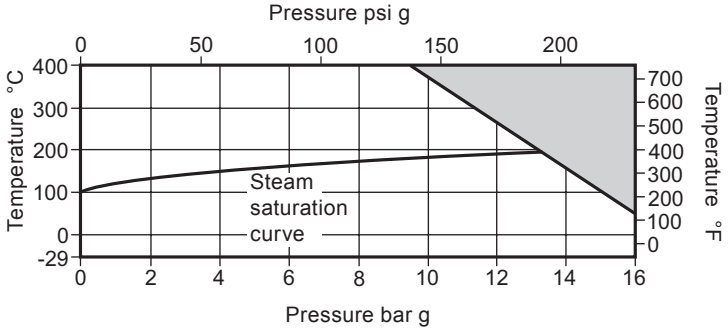
**A - E** Flanged EN 1092 PN25

**B - B** Flanged ASME 150

**C - C** Flanged JIS/KS 10K

## Fig 3616 (DIN)

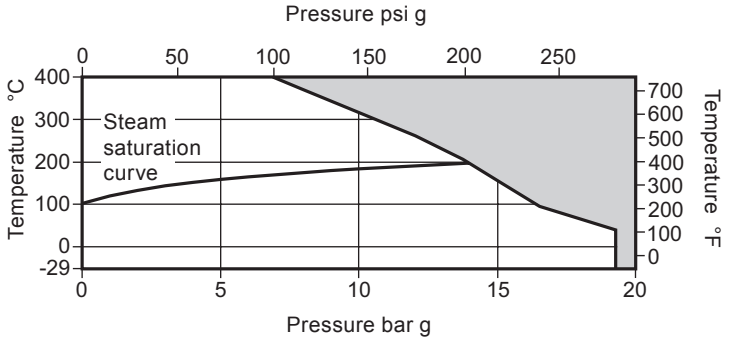
| | | | |
|---|---|---|---|
| Body design conditions | | | PN16 |
| PMA | Maximum allowable pressure | 16 bar g | (217.5 psi g) |
| TMA | Maximum allowable temperature | 400 °C | (572 °F) |
| Minimum operating temperature | | -29 °C | (14 °F) |
| Designed for a maximum cold hydraulic test pressure of: | | 24 bar g | (348 psi g) |




The product **must not** be used in this region.

## Fig 3616 (ASTM)

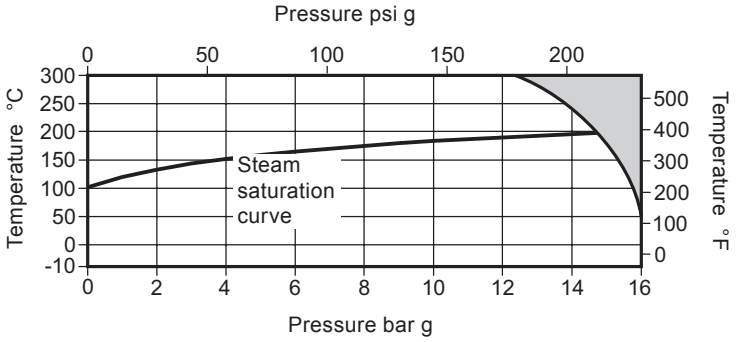
| | | | |
|---|---|---|---|
| Body design conditions | | | ASME 150 |
| PMA | Maximum allowable pressure | 19 bar g | (275.5 psi g) |
| TMA | Maximum allowable temperature | 400 °C | (752 °F) |
| Minimum operating temperature | | -29 °C | (-20 °F) |
| Designed for a maximum cold hydraulic test pressure of: | | 30 bar g | (435 psi g) |




The product **must not** be used in this region.

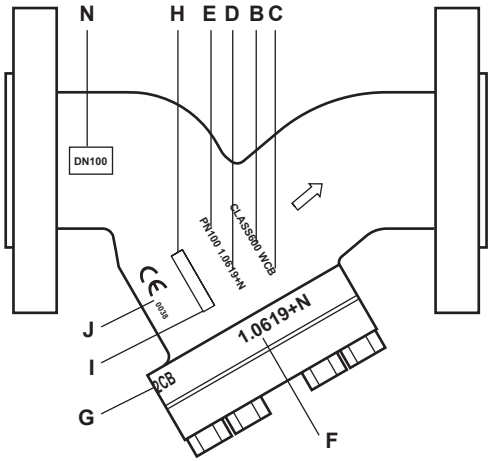
## Fig 3716 (DIN)

| Body design conditions | | PN16 |
|---|---|---|
| PMA Maximum allowable pressure | 16 bar g | (232 psi g) |
| TMA Maximum allowable temperature | 300 °C | (662 °F) |
| Minimum operating temperature | -10 °C | (14 °F) |
| Designed for a maximum cold hydraulic test pressure of: | 24 bar g | (348 psi g) |

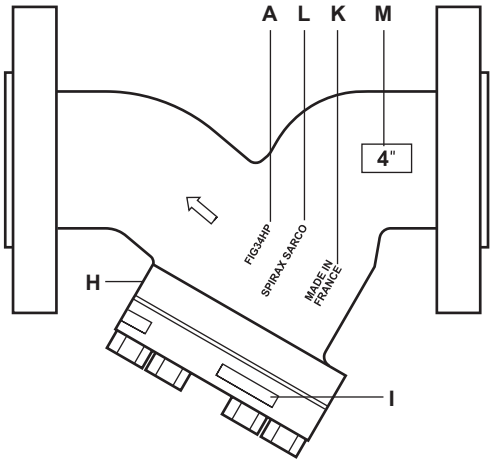



The product **must not** be used in this region.

## 2.4
## Body marking information




| Part | Material | | | | | | |
|---|---|---|---|---|---|---|---|
| | Body | | | | | Cover | |
| | A | B | C | D | E | F | G |
| **Fig 7** | Fig 7 | A216 WCB | | | | | |
| **Fig 33** | Fig 33 | GG 20 | | | PN16 | | |
| **Fig 33.1** | Fig 33.1 | JS 1030 | | | | | |
| **Fig 34HP** | Fig 34HP or 34HP | ASME 600 | WCB | 1.0619+N | PN100 | 1.0619+N | WCB |
| **Fig 34HP UE** | Fig 34HP or 34HP | ASME 600 | WCB | 1.0619+N | PN100 | 1.0460 | A105N |
| **Fig 34 ASME 150** | Fig 34 | ASME 150 | WCB | | | C22.8 | A105N |
| | | | | | | 1.0619+N | WCB |
| **Fig 34 ASME 300** | Fig 34 | ASME 300 | WCB | | | C22.8 | A105N |
| | | | | | | 1.0619+N | WCB |
| **Fig 34 EN** | Fig 34 | | | 1.0619+N or 1.0619+QT | PN40 | C22.8 | A105N |
| | | | | | | 1.0619+N | WCB |
| **Fig 36** | Fig 36 | ASME 300 | CF3M | 1.4404 | PN40 | | 316L |
| | | | | | | | CF3M |
| **Fig 37** | Fig 37 | GGG.40 | | | PN40 | C22.8 | A105N |
| | | | | | PN25 | 1.0619+N | WCB |
| **Fig 3616 ASTM** | Fig 3616 | ASME 150 | CF8M | | | 1.4401 | 316L |
| **Fig 3616 EN** | Fig 3616 | | | 1.4408 | PN16 | | |
| **Fig 3716** | Fig 3716 | GGG.40 | | | PN16 | GGG.40 | |




| Foundry identification | Melt number | CE marking if necessary | CE0038 | Made in France | SPIRAX SARCO or SXS or SPIRAX | DN |
|---|---|---|---|---|---|---|
| H | I | J | | K | L | M |
| • | • | | DN200 to DN250 | • | • | • |
| • | • | DN32 to DN50 | DN65 to DN200 | • Made in China | • | • |
| • | • | | DN25 to DN200 | • | • | • |
| • | • | | | • | • | • |
| • | • | | DN32 to DN200 | • | • | • |
| • | • | | | • | • | • |
| • | • | | | • | • | • |
| • | • | | | • | • | • |
| • | • | | | • | • | • |
| • | • | | | • | • | • |
| • | • | | | • | • | • |
| • | • | | | • | • | • |
| • | • | | | • | • | • |
| • | • | | | • | • | • |
| • | • | DN32 to DN50 | DN65 to DN200 | • | • | • |
| • | • | | | • | • | • |
| • | • | | | • | • | • |

# 3. Installation

**Note: Before actioning any installation observe the 'Safety information' in Section 1.**

Referring to the installation and Maintenance Instructions, name-plate and Technical Information Sheet, check that the product is suitable for the intended installation:

**3.1** Check materials, pressure and temperature and their maximum values.If the maximum operating limit of the product is lower than that of the system in which it is being fitted,ensure that a safety device is included in the system to prevent overpressurisation.

**3.2** Determine the correct installation situation and the direction of fluid flow.

**3.3** Remove protection covers from all connections and protective film from all name-plates, where appropriate, before installation on steam or other high temperature applications.

**3.4** Strainers can be fitted on liquid or steam / gas systems in either horizontal pipework or vertical pipework where the flow is downward. In a horizontal line on steam / gases the strainer pocket should be in the horizontal plane as this reduces the possibility of waterhammer. On liquid systems the strainer pocket should point downwards.

**3.5** The strainers may be lagged if required.

# 4. Commissioning

After installation or maintenance ensure that the system is fully functional. Carry out tests on any alarms or protective devices.

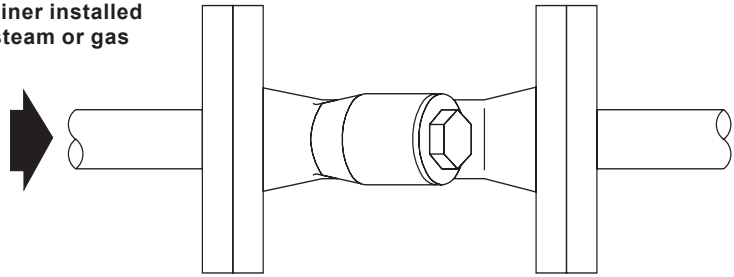
# 5. Operation

Strainers are passive items and will prevent the onward movement of dirt and debris, which is larger than the holes in the screen. The pressure drop across the strainer will increase as the screen becomes blocked. Regular cleaning / blowdown is recommended to keep the screen clean.

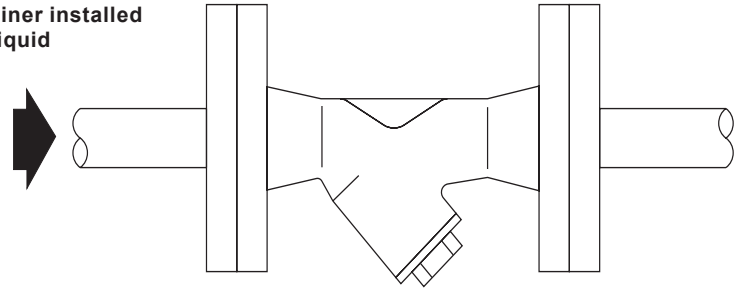
# 6. Fault finding

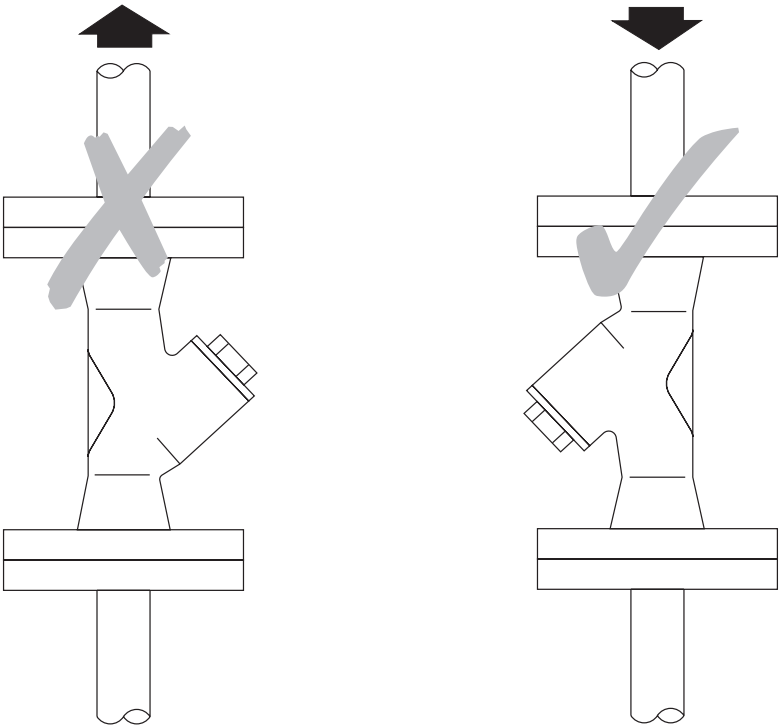
| Symptom | Possible cause | Remedy |
|---|---|---|
| **No flow through strainer** | Blocked screen | Clean or replace screen See Section 7.2 |
| | System is isolated | Check isolation valves |
| **Increased pressure drop across strainer** | Screen is blocked up | Clean or replace screen See Section 7.2 |

**Strainer installed on steam or gas**



**Strainer installed on liquid**





# 7. Maintenance

**Note: Before actioning any maintenance programme observe the 'Safety information' in Section 1.**

## Warning

**The cover gasket contains a thin stainless steel support ring which may cause physical injury if not handled and disposed of carefully.**

## 7.1 General information

Before undertaking any maintenance on the strainer, it must be isolated from both the supply line and return line and any pressure allowed to safely normalise to atmosphere. The trap should then be allowed to cool. When reassembling, ensure that all joint faces are clean.

## 7.2 How to clean or replace the strainer screen:

**For identification of parts refer to Section 8 'Spare parts'**

- Remove the strainer cap.
- On most sizes up to DN25 the cap is simply unscrewed.
- On all other sizes the cap is retained by bolts / nuts. The number of bolts / nuts used will depend on the strainer size, material of construction and design rating.
- Once the cap is removed the strainer screen can be taken out.
- Clean the screen or replace with a new one.
- Reassemble the screen into the cap by pushing the end into the recess.
- Always fit a new strainer cap gasket ensuring the jointing faces are clean.
- Refit the strainer cap or bolts / nuts using 'Neverseize' compound and tighten to the recommended torque (refer to the relevant Table, pages 25 to 27).
- Ensure that the nuts are tightened equally before final torque is applied.
- Check for leaks.

## Fig 7 strainer - Recommended tightening torques

| Item | Qty | Size |  or mm  | | N m | (lbf ft) |
|---|---|---|---|---|---|---|
| 6 | 8 | DN200 | (¾ UNC) to | | 80 - 90 | (59 - 66) |
| | 10 | DN250 | BS 1769 | | 110 - 120 | (81 - 88) |
| 7 | 1 | DN200 | | ¾" BSP | 50 - 55 | (37 - 40) |
| | 1 | DN250 | | 1" BSP | 50 - 55 | (37 - 40) |

## Fig 33 and Fig 33.1 strainer - Recommended tightening torques

| Item | Qty | Size |  or mm  | | N m | (lbf ft) |
|---|---|---|---|---|---|---|
| 2 | 1 | DN15 | 22 A / F | M28 | 50 - 55 | (37 - 40) |
| | 1 | DN20 | 27 A / F | M32 | 60 - 66 | (44 - 49) |
| | 1 | DN25 | 27 A / F | M42 | 100 - 110 | (74 - 81) |
| | 1 | DN32 | 41 A / F | M56 | 150 - 165 | (110 - 121) |
| | 1 | DN40 | 41 A / F | M60 | 170 - 185 | (125 - 136) |
| | 1 | DN50 | 55 A / F | M72 | 190 - 210 | (140 - 154) |
| 5 | 8 | DN65 | 19 A / F | M12 x 40 | 20 - 24 | (15 - 18) |
| | 8 | DN80 | 19 A / F | M12 x 40 | 30 - 35 | (22 - 26) |
| | 8 | DN100 | 24 A / F | M16 x 50 | 70 - 77 | (51 - 57) |
| | 8 | DN125 | 24 A / F | M16 x 50 | 80 - 88 | (59 - 65) |
| | 8 | DN150 | 30 A / F | M20 x 60 | 100 - 110 | (74 - 81) |
| | 12 | DN200 | 30 A / F | M20 x 70 | 90 - 100 | (66 - 74) |

## Fig 34 strainer - Recommended tightening torques

| Item | Qty | Size |  | or mm  | N m | (lbf ft) |
|---|---|---|---|---|---|---|
| 2 | 1 | DN15 | 22 A / F | M28 | 50 - 55 | (37 - 40) |
| | 1 | DN20 | 27 A / F | M32 | 60 - 66 | (44 - 49) |
| | 1 | DN25 | 27 A / F | M42 | 100 - 110 | (74 - 87) |
| 5 | 4 | DN32 | 19 A / F | M12 x 30 | 20 - 24 | (15 - 18) |
| | 4 | DN40 | 19 A / F | M12 x 30 | 20 - 24 | (15 - 18) |
| | 6 | DN50 | 19 A / F | M12 x 35 | 20 - 24 | (15 - 18) |
| | 8 | DN65 | 19 A / F | M12 x 35 | 20 - 24 | (15 - 18) |
| | 8 | DN80 | 19 A / F | M12 x 35 | 30 - 35 | (22 - 26) |
| | 8 | DN100 | 24 A / F | M16 x 45 | 50 - 55 | (37 - 40) |
| | 8 | DN125 | 30 A / F | M20 x 50 | 70 - 77 | (51 - 57) |
| | 8 | DN150 | 30 A / F | M20 x 55 | 80 - 88 | (59 - 65) |
| | 12 | DN200 | 36 A / F | M24 x 65 | 120 - 130 | (88 - 96) |
| 6 | 16 | DN250 EN and | | | | |
| | | 10" ASME 150 | 1¼" | ¾" - 10UNC | 160 - 180 | (119 - 132) |
| | 16 | 10" ASME 300 | $1\frac{7}{16}$" | ⅞" - 9UNC | 180 - 200 | (132 - 147) |
| | 16 | DN300 EN and | | | | |
| | | 12" ASME 150 | 1¼" | ¾" - 10UNC | 200 - 220 | (147 - 162) |
| | 18 | 12" ASME 300 | $1\frac{7}{16}$" | ⅞" - 9UNC | 210 - 230 | (155 - 170) |
| | 20 | DN350 EN and | | | | |
| | | 14" ASME 150 | 1¼" | ¾" - 10UNC | 220 - 240 | (162 - 177) |
| | 22 | 14" ASME 300 | $1\frac{7}{16}$" | ⅞" - 9UNC | 230 - 250 | (170 - 184) |
| | 22 | DN400 EN and | | | | |
| | | 16" ASME 150 | $1\frac{7}{16}$" | ⅞" - 9UNC | 330 - 350 | (244 - 258) |
| | 16 | 16" ASME 300 | $1\frac{13}{16}$" | 1⅛" - 7UNC | 380 - 400 | (281 - 295) |

## Fig 34HP strainer - Recommended tightening torques

| Item | Qty | Size |  or mm  | | N m | (lbf ft) |
|---|---|---|---|---|---|---|
| 5 | 4 | DN15 | ¾" A/F | ½" - 13 UNC | 20 - 30 | (15 - 20) |
| | 4 | DN20 | ¾" A/F | ½" - 13 UNC | 20 - 30 | (15 - 20) |
| | 4 | DN25 | ¾" A/F | ½" - 13 UNC | 20 - 30 | (15 - 20) |
| | 8 | DN40 | ¾" A/F | ½" - 13 UNC | 30 - 40 | (22 - 29) |
| | 8 | DN50 | ¾" A/F | ½" - 13 UNC | 30 - 40 | (22 - 29) |
| | 8 | DN65 | 1 1/16" A/F | ⅝" - 11 UNC | 50 - 60 | (37 - 44) |
| | 8 | DN80 | 1 1/16" A/F | ⅝" - 11 UNC | 50 - 60 | (37 - 44) |
| | 8 | DN100 | 1¼" A/F | ¾" - 10 UNC | 80 - 90 | (59 - 66) |
| | 8 | DN150 | 1 7/16" A/F | ⅞" - 9 UNC | 100 - 110 | (74 - 81) |
| | 12 | DN200 | 1 13/16" A/F | 1⅛" - 7 UNC | 180 - 190 | (133 - 140) |

## Fig 36 strainer - Recommended tightening torques

| Item | Qty | Size |  or mm  | | N m | (lbf ft) |
|---|---|---|---|---|---|---|
| 5 | 4 | DN15 and DN20 | 17 A/F | M10 x 25 | 22 - 25 | (16 - 18) |
| | 4 | DN25 | 17 A/F | M10 x 25 | 22 - 25 | (16 - 18) |
| | 4 | DN32 and DN40 | 19 A/F | M12 x 35 | 40 - 45 | (29 - 33) |
| | 8 | DN50 | 19 A/F | M12 x 35 | 40 - 45 | (29 - 33) |
| | 8 | DN65 | 19 A/F | M12 x 45 | 40 - 45 | (29 - 33) |
| | 8 | DN80 | 19 A/F | M12 x 50 | 40 - 45 | (29 - 33) |
| | 8 | DN100 | 24 A/F | M16 x 50 | 100 - 110 | (73 - 80) |
| | 8 | DN125 | 30 A/F | M20 x 60 | 160 - 170 | (117 - 125) |
| | 8 | DN150 | 30 A/F | M20 x 65 | 210 - 230 | (154 - 169) |
| | 8 | DN200 | 36 A/F | M20 x 75 | 210 - 230 | (154 - 169) |

## Fig 36HP strainer - Recommended tightening torques

| Item | Qty | Size |  or mm  | | N m | (lbf ft) |
|---|---|---|---|---|---|---|
| 5 | 4 | DN15 | ¾" A/F | ½" - 13 UNC | 20 - 30 | (15 - 20) |
| | 4 | DN20 | ¾" A/F | ½" - 13 UNC | 20 - 30 | (15 - 20) |
| | 4 | DN25 | ¾" A/F | ½" - 13 UNC | 20 - 30 | (15 - 20) |
| | 6 | DN40 | ¾" A/F | ½" - 13 UNC | 30 - 40 | (22 - 29) |
| | 6 | DN50 | ¾" A/F | ½" - 13 UNC | 30 - 40 | (22 - 29) |
| | 6 | DN65 | 1 1/16" A/F | ⅝" - 11 UNC | 50 - 60 | (37 - 44) |
| | 6 | DN80 | 1 1/16" A/F | ⅝" - 11 UNC | 50 - 60 | (37 - 44) |
| | 6 | DN100 | 1¼" A/F | ¾" - 10 UNC | 80 - 90 | (59 - 66) |
| | 8 | DN150 | 1 7/16"A/F | ⅞" - 9 UNC | 100 - 110 | (74 - 81) |
| | 8 | DN200 | 1 13/16" A/F | 1⅛" - 7 UNC | 180 - 190 | (133 - 140) |

## Fig 37 strainer - Recommended tightening torques

| Item | Qty | Size |  or mm  | | N m | (lbf ft) |
|---|---|---|---|---|---|---|
| 5 | 1 | DN15 | 22 A/F | M28 | 50 - 55 | (37 - 40) |
| | 1 | DN20 | 27 A/F | M32 | 60 - 66 | (44 - 49) |
| | 1 | DN25 | 27 A/F | M42 | 100 - 110 | (74 - 81) |
| | 1 | DN32 | 46 A/F | M56 | 250 - 275 | (184 - 202) |
| | 1 | DN40 | 50 A/F | M60 | 250 - 275 | (184 - 202) |
| | 1 | DN50 | 60 A/F | M72 | 310 - 340 | (228 - 250) |
| | 8 | DN65 | 19 A/F | M12 x 35 | 20 - 24 | (15 - 18) |
| | 8 | DN80 | 19 A/F | M12 x 35 | 30 - 35 | (19 - 26) |
| | 8 | DN100 | 24 A/F | M16 x 45 | 50 - 55 | (37 - 40) |
| | 8 | DN125 | 30 A/F | M20 x 50 | 80 - 88 | (59 - 65) |
| | 8 | DN150 | 30 A/F | M20 x 55 | 100 - 110 | (74 - 81) |
| | 12 | DN200 | 36 A/F | M24 x 65 | 090 - 100 | (66 - 74) |

## Fig 3616 strainer - Recommended tightening torques

| Item | Qty | Size |  | or mm  | N m | (lbf ft) |
|---|---|---|---|---|---|---|
| 5 | 4 | DN15 and DN20 | 13 A/F | M8 x 20 | 15 - 20 | (11 - 15) |
| | 4 | DN25 | 13 A/F | M8 x 20 | 15 - 20 | (11 - 15) |
| | 4 | DN32 and DN40 | 13 A/F | M8 x 20 | 15 - 20 | (11 - 15) |
| | 4 | DN50 | 17 A/F | M10 x 25 | 22 - 25 | (16 - 18) |
| | 4 | DN65 | 17 A/F | M10 x 30 | 22 - 25 | (16 - 18) |
| | 6 | DN80 | 17 A/F | M10 x 30 | 22 - 25 | (16 - 18) |
| | 6 | DN100 | 19 A/F | M12 x 35 | 50 - 60 | (37 - 44) |
| | 8 | DN125 | 19 A/F | M12 x 40 | 50 - 60 | (37 - 44) |
| | 8 | DN150 | 19 A/F | M12 x 40 | 50 - 60 | (37 - 44) |
| | 8 | DN200 | 24 A/F | M16 x 50 | 100 - 110 | (74 - 81) |

## Fig 3716 strainer - Recommended tightening torques

| Item | Qty | Size |  | or mm  | N m | (lbf ft) |
|---|---|---|---|---|---|---|
| 5 | 4 | DN15 and DN20 | 13 A/F | M8 x 20 | 15 - 20 | (11 - 15) |
| | 4 | DN25 | 13 A/F | M8 x 20 | 15 - 20 | (11 - 15) |
| | 4 | DN32 and DN40 | 13 A/F | M8 x 20 | 15 - 20 | (11 - 15) |
| | 4 | DN50 | 17 A/F | M10 x 25 | 22 - 25 | (16 - 18) |
| | 4 | DN65 | 17 A/F | M10 x 30 | 22 - 25 | (16 - 18) |
| | 6 | DN80 | 17 A/F | M10 x 30 | 22 - 25 | (16 - 18) |
| | 6 | DN100 | 19 A/F | M12 x 35 | 50 - 60 | (37 - 44) |
| | 8 | DN125 | 19 A/F | M12 x 40 | 50 - 60 | (37 - 44) |
| | 8 | DN150 | 19 A/F | M12 x 40 | 50 - 60 | (37 - 44) |
| | 8 | DN200 | 24 A/F | M16 x 50 | 100 - 110 | (74 - 81) |

# 8. Spare parts

The only parts that are available as spares are detailed in the table below.

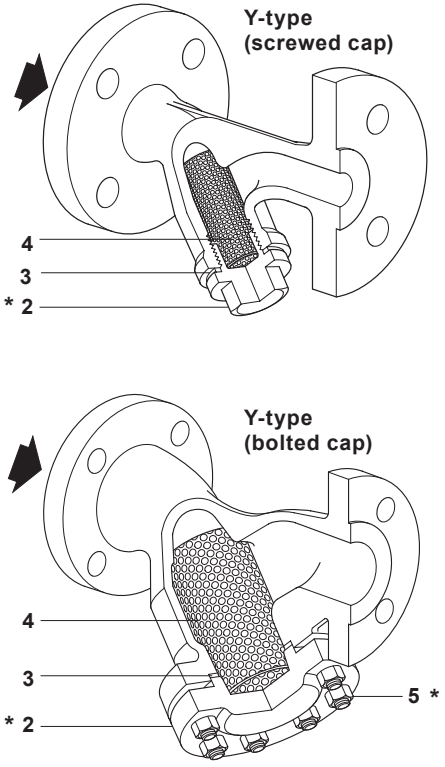
## Available spares

| | |
|---|---|
| Strainer screen (state material, mesh, perforation and size of strainer) | **4** |
| **Note: The Fig 7 pot type is only available with 3.2 mm perforated stainless steel** | |
| Cap gasket (packet of three) | **3** |

## How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size and type.

**Example:** 1 off 100 mesh stainless steel screen for a DN100 Fig 34 steel strainer.




*** Note:** Items 1, 2, 5, 6 and 7 are annotated for identification of parts relating to the tightening torques on pages 31 to 35.

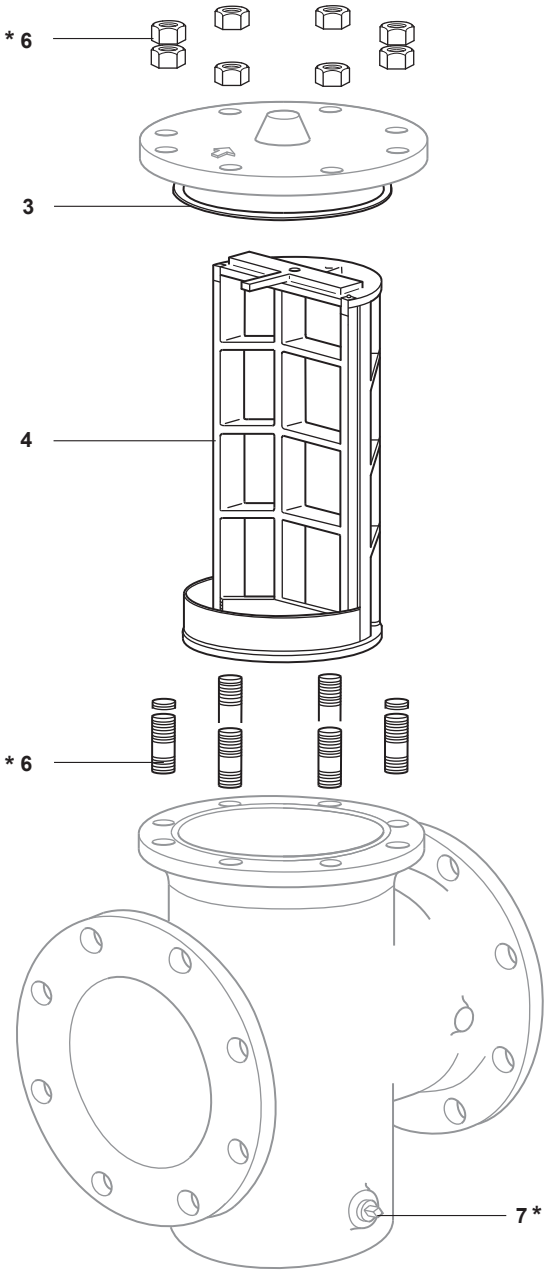



**Fig 7 pot type strainer**