

**Note:**

The strainer must be installed with the direction arrow on the body coincident with the direction of flow in the pipeline. For vertical pipework the flow direction shall be downwards only. If strainers are installed in horizontal pipework the strainer body must be lowestmost. For the purpose of maintenance the strainer shall be installed with sufficient room so that the strainer element can be withdrawn from beneath in a downwards direction. Also sufficient room is needed for the Fig 911 pressure tapped strainers to enable the connection of test probes. End protectors should only be permanently removed immediately before installation. The strainer interior should be inspected through the end ports to determine whether it is clean and free from foreign matter. The mating flange (both strainer and pipework flanges) should be checked for correct gasket contact face, surface finish and condition. If a condition is found which might cause leakage, no attempt to assemble should be made until the condition has been corrected. The gasket should be suitable for operating conditions or maximum pressure/temperature ratings. The gaskets should be checked to ensure freedom from defects or damage. Care should be taken to provide correct alignment of the flanges being assembled. Suitable lubricant on bolt threads should be used. In assembly, bolts are tightened sequentially to make the initial contact of flanges and gaskets flat and parallel followed by gradual and uniform tightening in an opposite bolting sequence to avoid bending one flange relative to the other, particularly on flanges with raised faces. Parallel alignment of flanges is especially important in the case of the assembly of a strainer into an existing system. Flanged joints depend on compressive deformation of the gasket material between the flange surfaces. The bolting must be checked for correct size, length, material and that all connection flange bolt holes are utilized.

**OPERATING**

The element will require cleaning after the flushing process and periodically thereafter.

**Fig 910/911 Strainers -**

Test points can be supplied with strainers to assist with determining maintenance requirements.

Each test point is fitted with a captive cap retained by a coloured strap:

Upstream (HP) - Red

Downstream (LP) - Blue

**Note:** For safety reasons all probe insertions/connections must be carried out with the system cold. For the Figure 631, these measurements are taken by directly inserting the test probe into the test point, a silicone oil / grease should be lightly smeared onto the test probe prior to insertion. For the Figure 750, these measurements are taken by opening the isolation valve on the test point using an air vent key (Hattersley Fig. 426) after manometer probe connection.

**MAINTENANCE**

The strainers should be at zero pressure and ambient temperature prior to any maintenance. Maintenance Engineers & Operators are reminded to use correct fitting tools and equipment.

A full risk assessment and methodology statement must be compiled prior to any maintenance. The risk assessment must take into account the possibility of the limits of use being exceeded whereby a potential hazard could result. A maintenance programme should therefore include checks on the development of unforeseen conditions, which could lead to failure. In systems where corrosion could be a potential hazard, wall thickness checks on the body and cover should be made. This requires either the removal of the strainer from the pipeline or removal of the cover with the system at zero pressure. If the wall thickness has reduced by 25%, the strainer must be replaced.

**Strainer Element Cleaning and Gasket replacement**

These strainer have a bolted cover which requires removing to allow withdrawal of the strainer element.

1. Isolate the strainer from the system pressure and drain.
2. Slacken all bolts gradually and remove sequentially taking care to support the weight of the cover as the final bolt is removed. (If the optional drain plug is fitted please note the position for re-assembly).
3. Clean the strainer element using a brush and or water jet. A face mask should be worn as a precaution to prevent inhalation of particles or contaminated water.
4. Once the strainer element has been cleaned the strainer can be re-assembled. The sealing gasket should be renewed if damage has occurred. Ensure the body and cover joint faces are clean.
5. Locate the strainer in the cover and offer up to the body, aligning the bolt holes. (If the optional drain plug is fitted, position the cover as previously noted). Fit bolts and tighten sequentially.

**Optional Drain Plug**

The drain plug may be removed to allow debris to be flushed from the strainer and will require isolation of the strainer from the system. Prior to commissioning a drain cock may be fitted to replace the plug which will allow strainer flushing whilst under line pressure. For the supply of genuine Hattersley spares or technical assistance contact Hattersley:



## 'Y' Type Strainers - Fig 810, 811, 910 & 911



### CE MARKING AND THE PRESSURE EQUIPMENT DIRECTIVE 97/23/EC

This has been implemented in United Kingdom law by the Pressure Equipment Regulations 1999 (SI 1999/2001).

The regulations apply to all piping with a maximum allowable pressure greater than 0.5 bar. Piping with a maximum allowable pressure not exceeding 0.5 bar is outside the scope of the Directive. Piping is categorised in accordance with the maximum working pressure, size and ascending level of hazard, which is dependent on the fluid being transported. Fluids are classified as Group 1, dangerous fluids or Group 2, all other fluids including steam. Categories are SEP (sound engineering practice) and for ascending levels of hazard, I, II, III or IV. All piping designated as SEP does not bear the CE mark nor require a Declaration of Conformity. Categories I, II, III or IV carry the CE mark and require a Declaration of Conformity (Note- all piping up to and including 25mm (1") having a maximum allowable pressure greater than 0.5 bar are designated SEP regardless of fluid group.)

### PRODUCT LIFE CYCLE

The life of the strainer is dependent on its application, frequency of use and freedom from misuse. Compatibility with the system into which it is installed must be considered. The properties of the fluid being transported such as pressure, temperature and the nature of the fluid must be taken into account to minimise or avoid premature failure or non-operability. A well-designed system will take into consideration all the factors considered in the strainer design, but additionally electrolytic interaction between dissimilar metals in the strainer and the system must be examined. Before commissioning a system, it should be flushed to eliminate debris and chemically cleaned as appropriate to eliminate contamination, all of which will prolong the life of the strainer.



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## LIMITS OF USE

The strainers to which these installation, operation and maintenance instructions apply have been categorised in accordance with the Pressure Equipment Directive.

Fig. No 810 is categorised for Group 1 Liquid, but is not necessarily suitable for all fluids in this group. Refer to Hattersley Technical Application Engineers for advice. Codes of practice, specifications and regulations should be referred to for specific guidance for valve selection on hazardous service.

These strainers may be used on Group 2 Liquids and Group 2 Gases, which includes steam service.

FLUID	GROUP 1 LIQUIDS		
FIG NO.	PN	DN	CATEGORY
810	13.8	2"-2½"	SEP
	Class 125	3-5"	I*
		6- 12"	II*
810	16	50	SEP
		65-125	I*
	40	150 - 300	II*

\* Categories I and II require the CE mark

For DN350 to DN600 Fig 810 strainers, the fluid to be transported is limited to Group 2 liquids i.e. non-hazardous and on no account must these strainers be used on any Group 1 or 2 gases and Group 1 liquids.

FLUID	GROUP 2 LIQUIDS		
FIG NO.	PN	DN	CATEGORY
810	16	350 - 600	I*

Category I requires: the CE mark

Fig. No 811 is categorised for Group 1 Liquids, but are not necessarily suitable for all fluids in this group. Refer to Hattersley Technical Application Engineers for advice. Codes of practice, specifications and regulations should be referred to for specific guidance for valve selection on hazardous service.

These strainers may be used on Group 2 Liquids, but on no account must they be used on any Group 1 or Group 2 Gases and are therefore unsuitable for steam service.

FLUID	GROUP 1 LIQUIDS		
FIG NO.	PN	DN	CATEGORY
811	25	50 - 65	SEP
		80 - 350	II*
811	40	50 - 300	II*

\* Categories I and II require the CE mark

For Fig 910 and Fig 911 strainers the fluid to be transported is limited to Group 2 liquids i.e. non-hazardous and on no account must these strainers be used on any Group 1 or 2 gases and Group 1 liquids.

FLUID	GROUP 2 LIQUIDS		
FIG NO.	PN	DN	CATEGORY
910	13.8	2" - 12"	SEP
	Class 125	350 - 700	I*
910		16	50 - 300
	350 - 600		I*
911	25	50 - 200	SEP
		250 - 300	I*
911	40	50 - 200	SEP
		250-300	I*

\* Category I requires the CE mark

## OPERATING PRESSURE/TEMPERATURE RATING

FIG NO	PN	NON-SHOCK PRESSURE AT TEMPERATURE RANGE	NON-SHOCK PRESSURE AT MAX. TEMPERATURE
810	13.8	13.8 bar from -10°C to 66°C	9.7 bar at 220°C
810	16	16 bar from -10°C to 120°C	11.8 bar at 230°C
811	25	25 bar from -10°C to 120°C	21 bar at 230°C
811	40	40 bar from -10°C to 120°C	33.6 bar at 230°C
910	13.8	13.8 bar from -10°C to 66°C	12 bar at 120°C
910	16	16 bar from -10°C to 120°C	16 bar at 120°C
911	25	25 bar from -10°C to 120°C	23 bar at 180°C
911	40	40 bar from -10°C to 120°C	36.8 bar at 180°C

Not suitable for fatigue loading, creep conditions, fire testing, fire hazard environment, corrosive or erosive service.

## PRESSURE/TEMPERATURE RATING

Strainers must be installed in a piping system whose normal pressure and temperature do not exceed these ratings. The maximum allowable pressure in strainers as specified in the standards is for non-shock conditions. Water hammer and impact for example, should be avoided. If the limits of use specified in these instructions are exceeded or if the Strainer is used on applications for which it was not designed, a potential hazard could result.

## LAYOUT AND SITING

It should be considered at the design stage where strainers will be located to give access for operation, cleaning, maintenance and repair. Strainers must be provided with adequate support. Adjoining pipework must be supported to avoid the imposition of pipeline strains on the strainer. Heavy strainers may need independent support or anchorage.

## INSTALLATION

Prior to installation, a check of the identification plate and body marking must be made to ensure that the correct strainer is being installed. Strainers are precision manufactured items and as such, should not be subjected to misuse such as careless handling, allowing dirt to enter the strainer through the end ports, lack of cleaning both strainer and system before operation and excessive force during bolting. All special packaging material must be removed. Strainers must be provided with adequate support. Adjoining pipework must be supported to avoid the imposition of pipeline strains on the strainer. When large strainers are provided with lifting lugs or eye nuts, these should be used to lift the strainer prior to installation, the pipework to which the strainer is to be fastened should be checked for cleanliness and freedom from debris.