



3C.400-E
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5800 and 5800Z Condensate Separators for Steam

Description

Water is present in all steam distribution pipeline systems due to condensation and carry over from boiler turbulence, while, for maximum efficiency, steam should be saturated and dry.

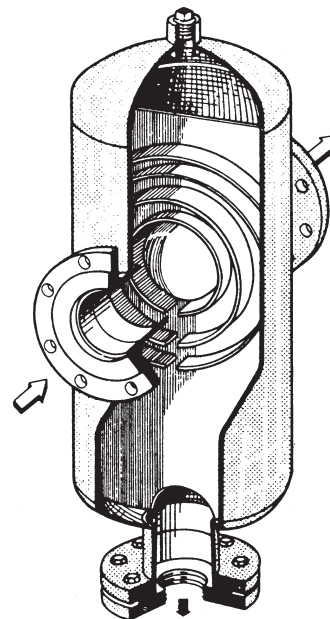
Careful draining and trapping will remove much of condensate but not all. Only the use of separator can solve the problem.

When steam is passed through the separator, any entrained water droplets are encouraged to separate and drain away rather than remain in suspension.

In series 5800 separators, steam flows around a vertical plate provided with baffles and its velocity is reduced because the cross section is large compared with the pipe bore. However the inertia of the condensate droplets carries them on in a straight line so they impinge on the plate with baffles and drain away.

Drainage is then completed by a suitable steam trap.

For the 5800 series, for velocities between 15 and 40 m/s variable depending on the DN from 15 to 350, it is possible to consider a droplet removal efficiency around 90%; this means to increase the steam dryness to 95-99,5%.



Standards

The condensate separators 5800 series are designed and manufactured according to the requirement of the European Pressure Equipment Directive 2014/68/EU.

Certification

Separators are available on demand with material certification to EN10204 3.1.

Note: all certification / inspection requirements must be stated at the time of order placement.

Technical features

| Use | Condensate separation on steam pipelines | | | | | |
|---|--|-----------------------|--|-----------|---|----------------|
| Models and working conditions | Type | Max. working pressure | Maximum temperature | Size DN | Flanged connections | |
| | 5800 | 25 bar g | 300°C | 15 to 350 | UNI 6084/2229 PN 40 | ANSI on demand |
| | 5800Z | 13 bar g | 250°C | 65 to 350 | UNI 2278/2229 PN 16 | |
| Material | Body and internal parts | | Fabricated carbon steel externally painted with primer | | | |
| CE Mark Category Gas and Liquid Group 2 | Type 5800Z | | DN 65 to 80 DN 100 to 150 DN 200 to 250 DN over 250 | | Category 2 Category 3 Category 4 On design | |
| | Type 5800 | | DN 15 to 32 DN 40 to 65 DN 80 to 125 DN 150 to 250 DN over 250 | | Category 1 Category 2 Category 3 Category 4 On design | |

How to size

The separators can be sized with the use of the graphs shown below, using a steam velocity of 10 m/s up to DN 25, of 20 m/s up to DN 50, of 30 m/s up to DN100 and a maximum velocity of 30 to 40 m/s for DN over 100.

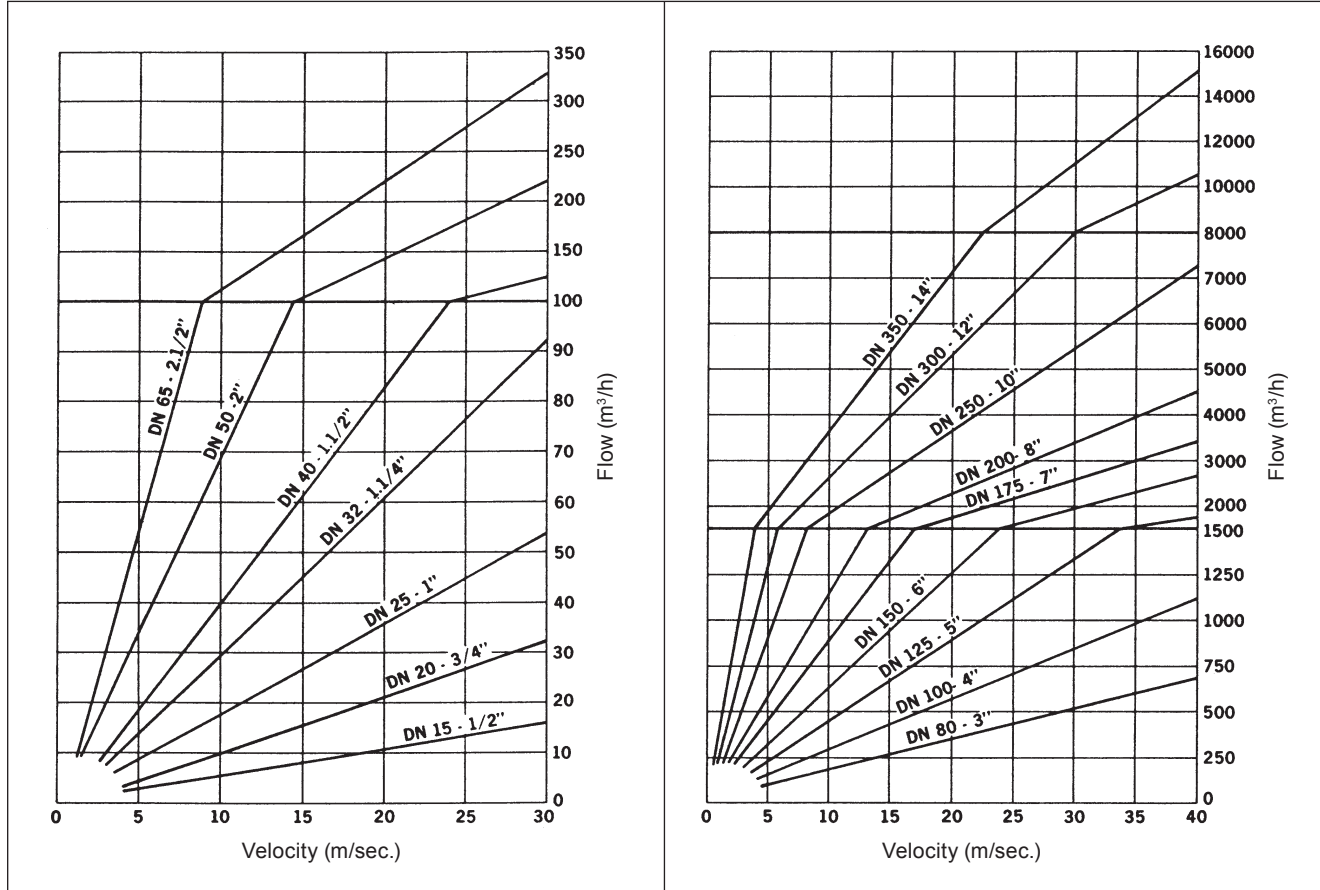
Capacities are given in m³/h. Ponderal flow can be converted from kg/h to m³/h multiplying the flow by the specific volume at the working pressure given in the table below.

Pressure drops with the above velocities are negligible.

Generally, in an existing plant, it is advisable to fit a separator of the same size of the pipe line: never use a smaller size. Should the separator size be larger, connect it to pipe by means of eccentric conical fittings.

On new plants it is advisable to proceed as first to the pipe sizing and afterwards to the selection of the appropriate size of separators.

Volumetric flow



Saturated steam specific volume table

| Gauge pressure bar g | Specific volume m ³ /kg | Gauge pressure bar g | Specific volume m ³ /kg | Gauge pressure bar g | Specific volume m ³ /kg |
|-------------------------|---------------------------------------|-------------------------|---------------------------------------|-------------------------|---------------------------------------|
| 0.0 | 1.673 | 2.2 | 0.568 | 9 | 0.194 |
| 0.1 | 1.533 | 2.4 | 0.536 | 10 | 0.177 |
| 0.2 | 1.414 | 2.6 | 0.509 | 11 | 0.163 |
| 0.3 | 1.312 | 2.8 | 0.483 | 12 | 0.151 |
| 0.4 | 1.225 | 3.0 | 0.461 | 13 | 0.141 |
| 0.5 | 1.149 | 3.5 | 0.413 | 14 | 0.132 |
| 0.6 | 1.083 | 4.0 | 0.374 | 15 | 0.124 |
| 0.7 | 1.024 | 4.5 | 0.342 | 16 | 0.117 |
| 0.8 | 0.971 | 5.0 | 0.315 | 17 | 0.110 |
| 0.9 | 0.923 | 5.5 | 0.292 | 18 | 0.105 |
| 1.0 | 0.881 | 6.0 | 0.272 | 19 | 0.100 |
| 1.2 | 0.806 | 6.5 | 0.255 | 20 | 0.0949 |
| 1.4 | 0.743 | 7.0 | 0.240 | 21 | 0.0906 |
| 1.6 | 0.689 | 7.5 | 0.227 | 22 | 0.0868 |
| 1.8 | 0.643 | 8.0 | 0.215 | 24 | 0.0797 |
| 2.0 | 0.603 | 8.5 | 0.204 | 25 | 0.0768 |

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions supplied with the product.

The pressure equipments are engineered taking into consideration no corrosion extra thickness. To evaluate the full integrity of the construction it will be advisable to follow the recommendations in the Installation and Maintenance Instructions manual.

Installation

The use of condensate separator is suggested:

- a) **Immediately after the steam boiler take off**, to eliminate foams and liquid priming coming from the boiler and to avoid water hammer in the distribution pipes. The application is always advisable and become mandatory when in presence of **high flow variation** imposed by the plant or when **boiler capacity is at the limit of the plant requirements**.
- b) **Upstream of the most important or critical steam users** or plant sections. In this situation the purpose is to avoid the presence of humidity and of condensate droplets that are produced by the steam during the ran in the pipe work; otherwise they may badly affect the output and performance of the steam users and of the whole plant.

Separators 5800 series must be installed in line with the pipe, with the discharge connection at the bottom and according with the direction of the flow indicated by the arrow on the body.

The separator must be equipped with a suitable steam trap and related strainer to discharge immediately the separated condensate; a sight glass will be useful to check efficiency of the system. Installation must be done as indicated at fig. 1, 2 and 3. For low-medium pressures a float and thermostatic steam trap is the most suitable while for medium and high pressures it advisable to install an inverted bucket or a thermodynamic steam trap.

To size the mechanical steam trap (ball float or inverted bucket) the following criteria can be used:

- Separators up to DN 32, 1/2" or 3/4" traps;
- Separators up to DN 50, 3/4" or 1" traps;
- Separators up to DN 350, 1 1/2" traps.

For thermodynamic steam traps, in particular with medium-high pressure, reduce by one step the indicated sizes.

An higher accuracy can be obtained calculating the heat loss of pipes or using the related tables and evaluating the humidity percentage and carryover linked to boiler efficiency.

The strainer installed upstream the steam trap will protect it from foreign material an dirty as welding slag, rust scales, gasket fragments, etc., assuring a reliable working.

Some steam trap type are already equipped with an inbuilt strainer.

The sight glass should be installed after the trap and at least 1m away when used with blast discharge steam traps. It will facilitate and speed up inspections to verify the regular working of the system avoiding any possible loss of efficiency.

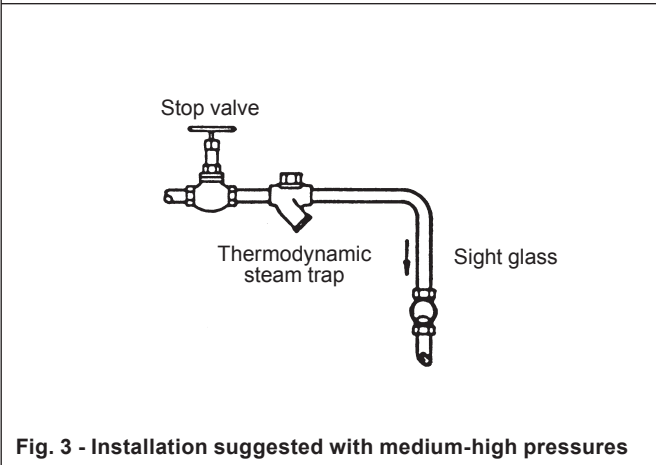
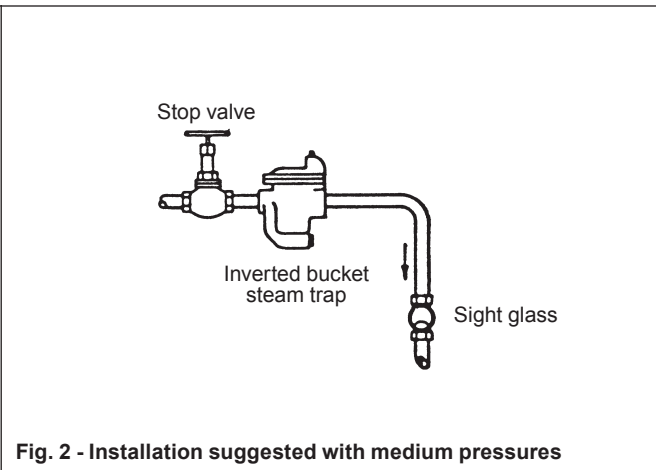
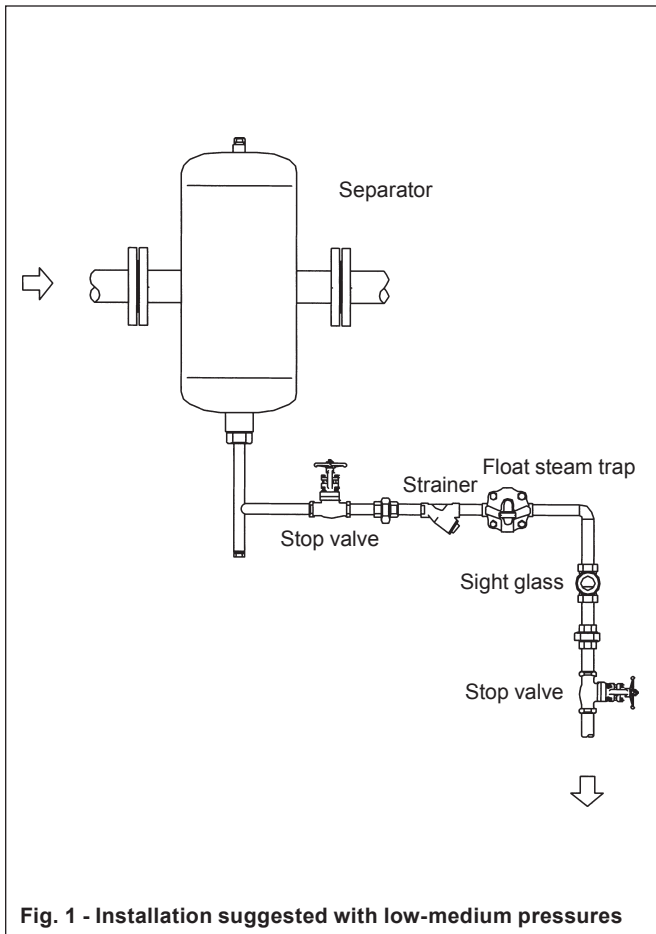
The product can not withstand external stresses that may be induced by any system / pipe to which they are fitted. Adequate precautions must be taken to minimise external stresses by properly fixing upstream and downstream pipes.

It will be advisable to arrange for a suitable insulation after having protected the external surface with an heat resistant coating.

Maintenance

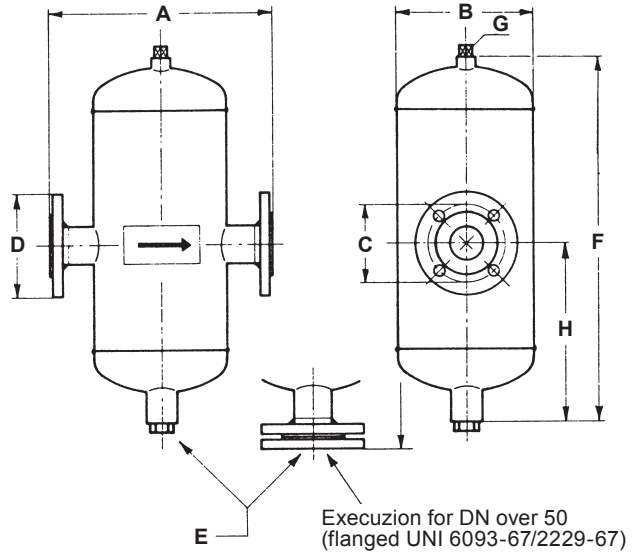
No specific maintenance are required by condensate separators. Possible foreign bodies and materials can be blown out through the plug of the strainer installed upstream the steam trap.

For a more efficient and accurate cleaning by washing and eventually to extract foreign bodies of bigger dimensions, open the lower cover, having disconnected the steam trap group. That can be considered as extraordinary maintenance or a requirement of new plant start up.



Dimensions in mm **and weights** in kg (approximate)

| Size DN | Type 5800 | | | | | | | | Weight |
|------------|-----------|-----|-----|-----|--------|------|------|------|--------|
| | A | B | C | D | E | F | G | H | |
| 15 | 188 | 108 | 65 | 95 | 1/2" | 300 | 3/4" | 163 | 6 |
| 20 | 265 | 133 | 75 | 105 | 3/4" | 328 | 3/4" | 166 | 11 |
| 25 | 265 | 133 | 85 | 115 | 3/4" | 365 | 3/4" | 184 | 12 |
| 32 | 308 | 168 | 100 | 140 | 3/4" | 417 | 3/4" | 214 | 18.5 |
| 40 | 359 | 219 | 110 | 150 | 3/4" | 507 | 3/4" | 248 | 27 |
| 50 | 359 | 219 | 125 | 165 | 3/4" | 573 | 3/4" | 278 | 29.5 |
| 65 | 433 | 273 | 145 | 185 | 1" | 704 | 3/4" | 348 | 45 |
| 80 | 494 | 324 | 160 | 200 | 1" | 864 | 3/4" | 423 | 72 |
| 100 | 586 | 410 | 190 | 235 | 1" | 965 | 3/4" | 474 | 120 |
| 125 | 606 | 410 | 220 | 270 | 1 1/2" | 1106 | 3/4" | 540 | 144 |
| 150 | 708 | 510 | 250 | 300 | 1 1/2" | 1205 | 3/4" | 599 | 198 |
| 200 | 950 | 616 | 320 | 375 | 1 1/2" | 1630 | 3/4" | 821 | 325 |
| 250 | 950 | 616 | 385 | 450 | 1 1/2" | 1780 | 3/4" | 888 | 402 |
| 300 | 1100 | 711 | 450 | 515 | 1 1/2" | 1930 | 3/4" | 960 | 540 |
| 350 | 1100 | 711 | 510 | 580 | 1 1/2" | 2090 | 3/4" | 1035 | 635 |
| Type 5800Z | | | | | | | | | |
| 65 | 433 | 273 | 145 | 185 | 1" | 704 | 3/4" | 348 | 44 |
| 80 | 494 | 324 | 160 | 200 | 1" | 864 | 3/4" | 423 | 70 |
| 100 | 586 | 410 | 180 | 220 | 1" | 965 | 3/4" | 474 | 116 |
| 125 | 606 | 410 | 210 | 250 | 1 1/2" | 1106 | 3/4" | 540 | 140 |
| 150 | 708 | 510 | 240 | 285 | 1 1/2" | 1205 | 3/4" | 599 | 190 |
| 200 | 950 | 616 | 295 | 340 | 1 1/2" | 1630 | 3/4" | 821 | 303 |
| 250 | 950 | 616 | 355 | 405 | 1 1/2" | 1780 | 3/4" | 888 | 345 |
| 300 | 1100 | 711 | 410 | 460 | 1 1/2" | 1930 | 3/4" | 960 | 495 |
| 350 | 1100 | 711 | 470 | 520 | 1 1/2" | 2090 | 3/4" | 1035 | 570 |



G, E: gas ISO 7/1 Rp