# APT
# Selection and Sizing

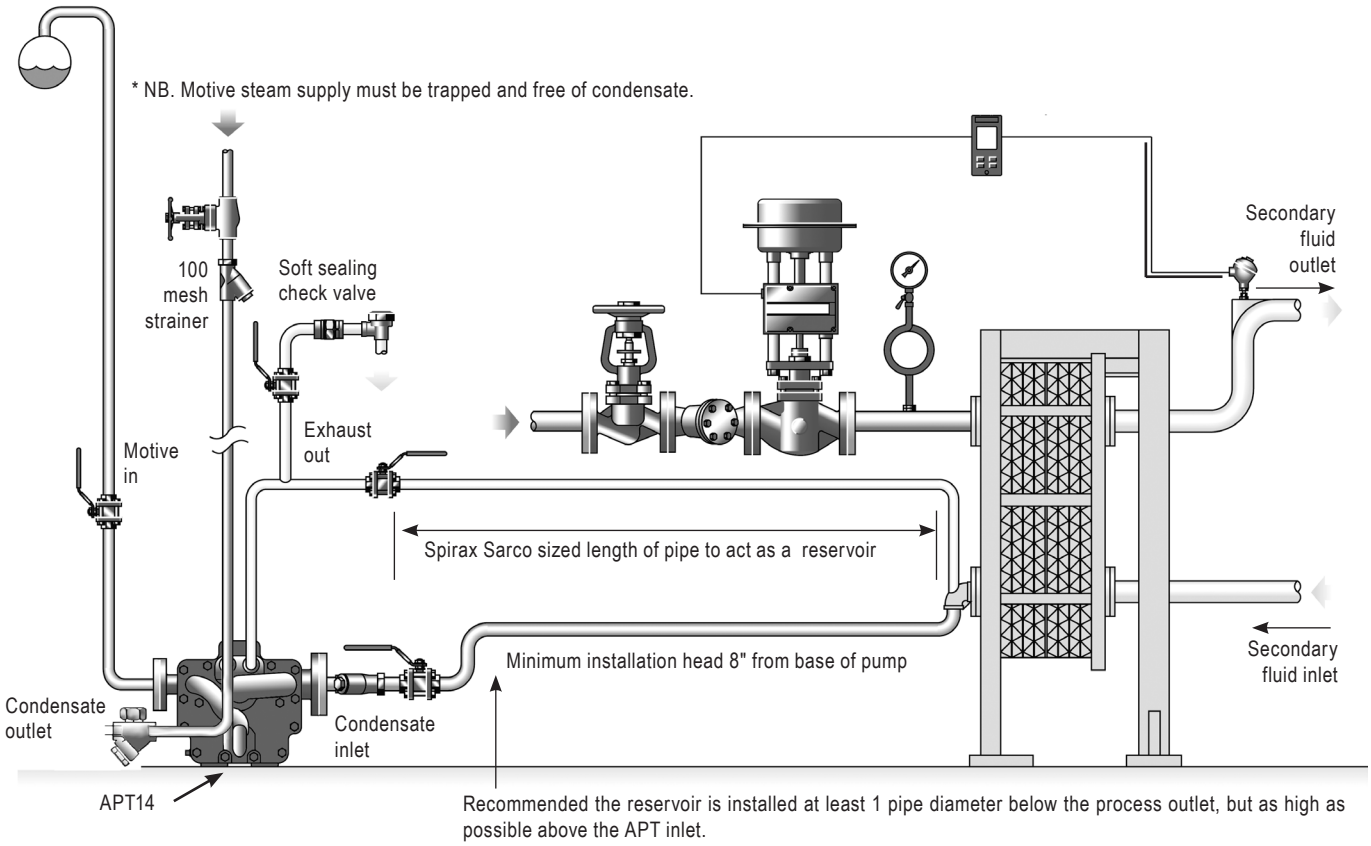
Spirax Sarco will ensure that the APT is accurately matched to your process and will provide you with a detailed sizing chart, tailored to your specific application.

Providing the information below is known, we can even provide you with confirmation over the telephone and fax you your specific chart.

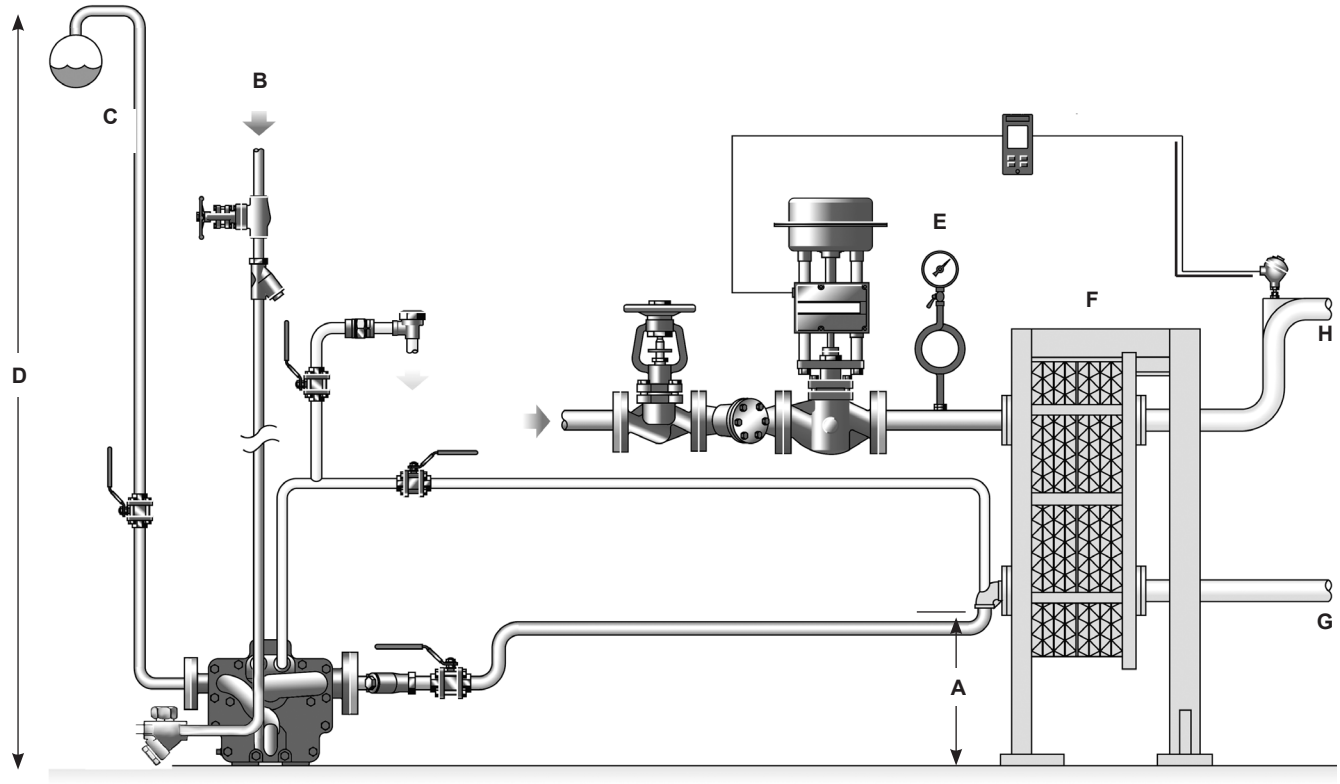
Alternatively arrange a visit for your local Spirax Sarco representative who can provide detailed APT sizing information for all your specific needs.

To help us size the APT for your application simply provide us with the following information: -

## Recommended installation



## Recommended installation




| | | |
|---|---|---|
| **A** | Installation head available from the base of the pump to the centerline of the heat exchanger/process condensate outlet. | ft |
| **B** | Motive steam pressure available to power the pump trap. | psi g |
| **C** | Pressure in the condensate return system. | psi g |
| **D** | Height of condensate return from floor level. | fl |

| | | |
|---|---|---|
| **E** | Heat exchanger full load operating pressure. | psi g |
| **F** | Maximum steam load on the heat exhanger. | lb/hr |
| **G** | Minimum secondary fluid temperature. | °F |
| **H** | Maximum controlled temperature of secondary fluid. | °F |

## How to select and size

From the inlet pressure, back pressure and filling head conditions given below, select the APT size which meets the capacity requirement of the application.

For GPM, multiply the capacities below by 0.002.

For kg/h, multiply the capacities below by 0.454.

* Back pressure is the lift height (D) in feet x 0.433 plus psi g in return line, (C), plus piping friction in psi g.

### Examples:

| | | |
|---|---|---|
| Steam condensate load | **(F)** | 750 lb/h |
| Steam pressure available for operating APT | **(B)** | 100 psi g |
| Vertical lift from APT to the return piping | **(D)** | 50 feet |
| Pressure in the return piping (piping friction negligible) | **(C)** | 50 psi g |
| Filling head available from base of APT | **(A)** | 8 inches |
| System pressure | **(E)** | 150 psi g |

### Solution:

1. Calculate "C + D", the total lift or back pressure, against which the condensate must be pumped. = (50 x 0.433) + 50 = 72 psig
2. From capacity table, with 100 psig inlet pressure and 72 psig back pressure, choose a APT14 which has a capacity of 1,695 lb/h.

**Note: The capacity charts shown on the following pages are applicable for the specific conditions only.**
**Any variance in system conditions A, B, C, D, or E will alter the capacities shown, and hence these figures can be used as a rough guide only.**

**Your local Spirax Sarco representive will provide detailed APT sizing information for all conditions.**

## Capacities - APT10-4.5

| | | 65 psi motive steam (B) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 0 psi back pressure (C+D) | | 25 psi back pressure (C+D) | | 58 psi back pressure (C+D) | |
| Installation head (A) inches | System pressure (E) psig | Pumping capacity lb/h | Trapping capacity lb/h | Pumping capacity lb/h | Trapping capacity lb/h | Pumping capacity lb/h | Trapping capacity lb/h |
| 39 | 65 | | 2231 | | 1974 | | 1306 |
| 30 | | | 2229 | | 1970 | | 1293 |
| 20 | | | 1937 | | 1937 | | 1277 |
| 16 | | | 1620 | | 1620 | | 1271 |
| 12 | | | 1223 | | 1223 | | 1223 |
| 8 | | | 607 | | 607 | | 607 |
| 39 | 50 | | 2088 | | 1757 | 930 | |
| 30 | | | 2085 | | 1751 | 901 | |
| 20 | | | 1937 | | 1745 | 847 | |
| 16 | | | 1620 | | 1620 | 809 | |
| 12 | | | 1223 | | 1223 | 744 | |
| 8 | | | 607 | | 607 | 542 | |
| 39 | 35 | | 1909 | | 1414 | 832 | |
| 30 | | | 1905 | | 1403 | 806 | |
| 20 | | | 1900 | | 1390 | 755 | |
| 16 | | | 1620 | | 1385 | 719 | |
| 12 | | | 1223 | | 1223 | 658 | |
| 8 | | | 607 | | 607 | 471 | |
| 39 | 20 | | 1164 | 1425 | | 665 | |
| 30 | | | 1657 | 1342 | | 643 | |
| 20 | | | 1649 | 1197 | | 601 | |
| 16 | | | 1620 | 1104 | | 572 | |
| 12 | | | 1223 | 957 | | 521 | |
| 8 | | | 607 | 592 | | 369 | |
| 39 | 0 | 1163 | | 971 | | 327 | |
| 30 | | 1088 | | 900 | | 316 | |
| 20 | | 961 | | 780 | | 297 | |
| 16 | | 879 | | 706 | | 282 | |
| 12 | | 754 | | 594 | | 258 | |
| 8 | | | 547 | 339 | | 183 | |

**A** = Distance from the floor to the reservoir pipe

**B** = Motive steam pressure

**C** = System back pressure

**D** = Vertical lift to condensate return valve main

**E** = Process operating pressure

## Capacities - APT14

| | | 200 psi motive steam (B) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Pressure (C+D) | | Pressure (C+D) | | Pressure (C+D) | |
| Installation head (A) inches | System pressure (E) psi g | Pumping capacity lb/h | Trapping capacity lb/h | Pumping capacity lb/h | Trapping capacity lb/h | Pumping capacity lb/h | Trapping capacity lb/h |
| 39 | 200 | | 10021 | | 9561 | | 8592 |
| 30 | | | 8491 | | 8491 | | 8491 |
| 20 | | | 6375 | | 6374 | | 6374 |
| 16 | | | 5296 | | 5296 | | 5296 |
| 12 | | | 3932 | | 3932 | | 3932 |
| 8 | | | 1695 | | 1695 | | 1695 |
| 39 | 150 | | 9120 | | 8386 | | 7135 |
| 30 | | | 8491 | | 8378 | | 7126 |
| 20 | | | 6375 | | 6374 | | 6374 |
| 16 | | | 5296 | | 5296 | | 5296 |
| 12 | | | 3932 | | 3932 | | 3932 |
| 8 | | | 1695 | | 1695 | | 1695 |
| 39 | 75 | | 7034 | | 5820 | 3075 | |
| 30 | | | 7022 | | 5804 | 2844 | |
| 20 | | | 6374 | | 5786 | 2490 | |
| 16 | | | 5296 | | 5296 | 2272 | |
| 12 | | | 3932 | | 3932 | | 2165 |
| 8 | | | 1695 | | 1695 | | 1695 |
| 39 | 30 | | 5018 | 2419 | | 2104 | |
| 30 | | | 4998 | 2248 | | 1955 | |
| 20 | | | 4975 | 1695 | | 1707 | |
| 16 | | | 4966 | 1792 | | 1557 | |
| 12 | | | 3932 | 1534 | | 1332 | |
| 8 | | | 1695 | 941 | | 815 | |
| 39 | 0 | | 1553 | 1223 | | 1066 | |
| 30 | | | 1406 | 1136 | | 990 | |
| 20 | | 1220 | | 994 | | 865 | |
| 16 | | 1119 | | 908 | | 790 | |
| 12 | | | 992 | 780 | | 678 | |
| 8 | | | 850 | 487 | | 423 | |

**A** = Distance from the floor to the reservoir pipe

**B** = Motive steam pressure

**C** = System back pressure

**D** = Vertical lift to condensate return valve main

**E** = Process operating pressure

**APT14 continued on next page**

## Capacities - APT14 (continued)

| | | 100 psi motive steam (B) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 0 psi back pressure (C+D) | | 30 psi back pressure (C+D) | | 72 psi back pressure (C+D) | |
| Installation head (A) inches | System pressure (E) psi g | Pumping capacity lb/h | Trapping capacity lb/h | Pumping capacity lb/h | Trapping capacity lb/h | Pumping capacity lb/h | Trapping capacity lb/h |
| 39 | 200 | | 10021 | | 9561 | | 8592 |
| 30 | | | 8491 | | 8491 | | 8491 |
| 20 | | | 6374 | | 6374 | | 6374 |
| 16 | | | 5296 | | 5296 | | 5296 |
| 12 | | | 3932 | | 3932 | | 3932 |
| 8 | | | 1695 | | 1695 | | 1695 |
| 39 | 150 | | 9120 | | 8386 | | 7137 |
| 30 | | | 8491 | | 8378 | | 7126 |
| 20 | | | 6374 | | 6374 | | 6374 |
| 16 | | | 5296 | | 5296 | | 5296 |
| 12 | | | 3932 | | 3932 | | 3932 |
| 8 | | | 1695 | | 1695 | | 1695 |
| 39 | 75 | | 7034 | | 5820 | 2694 | |
| 30 | | | 7022 | | 5804 | 2569 | |
| 20 | | | 6374 | | 5786 | 2345 | |
| 16 | | | 5296 | | 5296 | | 2200 |
| 12 | | | 3932 | | 3932 | | 2165 |
| 8 | | | 1695 | | 1695 | | 1695 |
| 39 | 30 | | 5018 | 2626 | | 1974 | |
| 30 | | | 4998 | 2475 | | 1875 | |
| 20 | | | 4975 | 2215 | | 1700 | |
| 16 | | | 4966 | 2050 | | 1587 | |
| 12 | | | 3932 | 1795 | | 1408 | |
| 8 | | | 1695 | 1160 | | 941 | |
| 39 | 0 | 1763 | | 1425 | | 1112 | |
| 30 | | 1657 | | 1337 | | 1050 | |
| 20 | | 1478 | | 1189 | | 944 | |
| 16 | | 1366 | | 1097 | | 877 | |
| 12 | | 1196 | | 958 | | 773 | |
| 8 | | | 850 | 620 | | 513 | |

**A** = Distance from the floor to the reservoir pipe

**B** = Motive steam pressure

**C** = System back pressure

**D** = Vertical lift to condensate return valve main

**E** = Process operating pressure

**APT14 continued on next page**

## Capacities - APT14 (continued)

| | | 30 psi motive steam (B) | | | |
|---|---|---|---|---|---|
| | | 0 psi back pressure (C+D) | | 30 psi back pressure (C+D) | |
| Installation head (A) inches | System pressure (E) psi g | Pumping capacity lb/h | Trapping capacity lb/h | Pumping capacity lb/h | Trapping capacity lb/h |
| 39 | 200 | | 10021 | | 9561 |
| 30 | | | 8491 | | 8491 |
| 20 | | | 6374 | | 6374 |
| 16 | | | 5296 | | 5296 |
| 12 | | | 3932 | | 3932 |
| 8 | | | 1695 | | 1695 |
| 39 | 150 | | 9120 | | 8386 |
| 30 | | | 8491 | | 8378 |
| 20 | | | 6374 | | 6374 |
| 16 | | | 5296 | | 5296 |
| 12 | | | 3932 | | 3932 |
| 8 | | | 1695 | | 1695 |
| 39 | 75 | | 7034 | | 5820 |
| 30 | | | 7022 | | 5804 |
| 20 | | | 6374 | | 5786 |
| 16 | | | 5296 | | 5296 |
| 12 | | | 3932 | | 3932 |
| 8 | | | 1695 | | 1695 |
| 39 | 30 | | 5018 | | 1553 |
| 30 | | | 4998 | | 1406 |
| 20 | | | 4975 | | 1205 |
| 16 | | | 4966 | | 1107 |
| 12 | | | 3932 | | 992 |
| 8 | | | 1695 | | 850 |
| 39 | 0 | 1915 | | | |
| 30 | | 1835 | | | |
| 20 | | 1692 | | | |
| 16 | | 1598 | | | |
| 12 | | 1445 | | | |
| 8 | | 1026 | | | |

**A** = Distance from the floor to the reservoir pipe
**B** = Motive steam pressure
**C** = System back pressure
**D** = Vertical lift to condensate return valve main
**E** = Process operating pressure

## Capacities - APT14HC

| | | 200 psi motive steam (B) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 0 psi back pressure (C+D) | | 30 psi back pressure (C+D) | | 72 psi back pressure (C+D) | |
| Installation head (A) inches | System pressure (E) psi g | Pumping capacity lb/h | Trapping capacity lb/h | Pumping capacity lb/h | Trapping capacity lb/h | Pumping capacity lb/h | Trapping capacity lb/h |
| 39 | 200 | | 10021 | | 9561 | | 8592 |
| 30 | | | 8491 | | 8491 | | 8491 |
| 20 | | | 6375 | | 6374 | | 6374 |
| 16 | | | 5296 | | 5296 | | 5296 |
| 12 | | | 3932 | | 3932 | | 3932 |
| 8 | | | 1695 | | 1695 | | 1695 |
| 39 | 150 | | 9120 | | 8386 | | 7137 |
| 30 | | | 8491 | | 8378 | | 7126 |
| 20 | | | 6375 | | 6374 | | 6374 |
| 16 | | | 5296 | | 5296 | | 5296 |
| 12 | | | 3932 | | 3932 | | 3932 |
| 8 | | | 1695 | | 1695 | | 1695 |
| 39 | 75 | | 7034 | | 5820 | 6186 | |
| 30 | | | 7022 | | 5804 | 5879 | |
| 20 | | | 6374 | | 5786 | 5275 | |
| 16 | | | 5296 | | 5296 | 4873 | |
| 12 | | | 3932 | | 3932 | | 2165 |
| 8 | | | 1695 | | 1695 | | 1695 |
| 39 | 30 | | 5018 | 5191 | | 3539 | |
| 30 | | | 4998 | 4907 | | 3338 | |
| 20 | | | 4975 | 4431 | | 3003 | |
| 16 | | | 4966 | 4135 | | 2796 | |
| 12 | | | 3932 | 3680 | | 2480 | |
| 8 | | | 1695 | 2569 | | 1716 | |
| 39 | 0 | | 1553 | 2024 | | 1370 | |
| 30 | | | 1406 | 1900 | | 1278 | |
| 20 | | 2927 | | 1677 | | 1129 | |
| 16 | | 2731 | | 1554 | | 1035 | |
| 12 | | | 992 | 1353 | | 903 | |
| 8 | | | 850 | 907 | | 601 | |

**A** = Distance from the floor to the reservoir pipe

**B** = Motive steam pressure

**C** = System back pressure

**D** = Vertical lift to condensate return valve main

**E** = Process operating pressure

**APT14HC continued on next page**

## Capacities - APT14HC (continued)

| | | 100 psi motive steam (B) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 0 psi back pressure (C+D) | | 30 psi back pressure (C+D) | | 72 psi back pressure (C+D) | |
| Installation head (A) inches | System pressure (E) psi g | Pumping capacity lb/h | Trapping capacity lb/h | Pumping capacity lb/h | Trapping capacity lb/h | Pumping capacity lb/h | Trapping capacity lb/h |
| 39 | 200 | | 10021 | | 9561 | | 8592 |
| 30 | | | 8491 | | 8491 | | 8491 |
| 20 | | | 6374 | | 6374 | | 6374 |
| 16 | | | 5296 | | 5296 | | 5296 |
| 12 | | | 3932 | | 3932 | | 3932 |
| 8 | | | 1695 | | 1695 | | 1695 |
| 39 | 150 | | 9120 | | 8386 | | 7137 |
| 30 | | | 8491 | | 8378 | | 7126 |
| 20 | | | 6374 | | 6374 | | 6374 |
| 16 | | | 5296 | | 5296 | | 5296 |
| 12 | | | 3932 | | 3932 | | 3932 |
| 8 | | | 1695 | | 1695 | | 1695 |
| 39 | 75 | | 7034 | | 5820 | 4436 | |
| 30 | | | 7022 | | 5804 | 4313 | |
| 20 | | | 6374 | | 5786 | 4089 | |
| 16 | | | 5296 | | 5296 | | 2200 |
| 12 | | | 3932 | | 3932 | | 2165 |
| 8 | | | 1695 | | 1695 | | 1695 |
| 39 | 30 | | 5018 | 6136 | | 2824 | |
| 30 | | | 4998 | 5842 | | 2728 | |
| 20 | | | 4975 | 5339 | | 2556 | |
| 16 | | | 4966 | 5019 | | 2442 | |
| 12 | | | 3932 | 4520 | | 2257 | |
| 8 | | | 1695 | 3247 | | 1737 | |
| 39 | 0 | 4493 | | 2486 | | 1241 | |
| 30 | | 4255 | | 2348 | | 1184 | |
| 20 | | 3854 | | 2102 | | 1086 | |
| 16 | | 3617 | | 1943 | | 1023 | |
| 12 | | 3216 | | 1716 | | 925 | |
| 8 | | 2260 | 850 | 1175 | | 670 | |

**A** = Distance from the floor to the reservoir pipe

**B** = Motive steam pressure

**C** = System back pressure

**D** = Vertical lift to condensate return valve main

**E** = Process operating pressure

**APT14HC continued on next page**

## Capacities - APT14HC (continued)

| | | 30 psi motive steam (B) | | | |
|---|---|---|---|---|---|
| | | 0 psi back pressure (C+D) | | 30 psi back pressure (C+D) | |
| Installation head (A) inches | System pressure (E) psi g | Pumping capacity lb/h | Trapping capacity lb/h | Pumping capacity lb/h | Trapping capacity lb/h |
| 39 | 200 | | 10021 | | 9561 |
| 30 | | | 8491 | | 8491 |
| 20 | | | 6374 | | 6374 |
| 16 | | | 5296 | | 5296 |
| 12 | | | 3932 | | 3932 |
| 8 | | | 1695 | | 1695 |
| 39 | 150 | | 9120 | | 8386 |
| 30 | | | 8491 | | 8378 |
| 20 | | | 6374 | | 6374 |
| 16 | | | 5296 | | 5296 |
| 12 | | | 3932 | | 3932 |
| 8 | | | 1695 | | 1695 |
| 39 | 75 | | 7034 | | 5820 |
| 30 | | | 7022 | | 5804 |
| 20 | | | 6374 | | 5786 |
| 16 | | | 5296 | | 5296 |
| 12 | | | 3932 | | 3932 |
| 8 | | | 1695 | | 1695 |
| 39 | 30 | | 5018 | | 1553 |
| 30 | | | 4998 | | 1406 |
| 20 | | | 4975 | | 1205 |
| 16 | | | 4966 | | 1107 |
| 12 | | | 3932 | | 992 |
| 8 | | | 1695 | | 850 |
| 39 | 0 | 6174 | | | |
| 30 | | 5867 | | | |
| 20 | | 5379 | | | |
| 16 | | 5067 | | | |
| 12 | | 4597 | | | |
| 8 | | 3331 | | | |

**A** = Distance from the floor to the reservoir pipe

**B** = Motive steam pressure

**C** = System back pressure

**D** = Vertical lift to condensate return valve main

**E** = Process operating pressure