

BOLDNESS WITH CARE

AB&CO BOILERS & HEATERS



Sustainable  
Process Heating

## Electric Steam Boilers Industrial Design



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TT BOILERS AB&CO



# GENERAL SPECIFICATIONS | ELECTRIC STEAM BOLERS | Type L-DH

| AB&CO Model   | STEAM RATE KG/H    |                   | STEAM RATE HP      |                   | THERMAL POWER |           | NUMBER STAGES | AMPERS |             |             | TRANSPORT WEIGHT | DIMENSIONS |           |               | STEAM OUTLET |
|---------------|--------------------|-------------------|--------------------|-------------------|---------------|-----------|---------------|--------|-------------|-------------|------------------|------------|-----------|---------------|--------------|
|               | Feed water* 103 °C | Feed water* 20 °C | Feed water* 103 °C | Feed water* 20 °C |               |           |               | 230 V  | 400 V       | 690 V       |                  | Length (A) | Width (B) | Height*** (C) |              |
|               | kg/h               | kg/h              | HP                 | HP                | kW            | kCal/h    | A             | A      | A           | kg          | mm               | mm         | mm        | V             |              |
| L-DH-18 kW    | 28                 | 24                | 1,8                | 1,5               | 18            | 15.480    | 1             | 46     | 27          | N.A.        | 350              | 1.400      | 1.090     | 1.300         | 1/2"         |
| L-DH-24 kW    | 37                 | 32                | 2,4                | 2,0               | 24            | 20.640    | 2             | 61     | 35          | N.A.        | 375              | 1.400      | 1.090     | 1.300         | 1/2"         |
| L-DH-30 kW    | 46                 | 40                | 2,9                | 2,6               | 30            | 25.800    | 2             | 76     | 44          | N.A.        | 400              | 1.400      | 1.090     | 1.300         | 1/2"         |
| L-DH-42 kW    | 64                 | 56                | 4,1                | 3,6               | 42            | 36.120    | 2             | 106    | 61          | N.A.        | 550              | 1.400      | 1.190     | 1.300         | 1/2"         |
| L-DH-54 kW    | 83                 | 72                | 5,3                | 4,6               | 54            | 46.440    | 2             | 136    | 79          | N.A.        | 600              | 1.400      | 1.290     | 1.300         | 1/2"         |
| L-DH-66 kW    | 101                | 88                | 6,5                | 5,6               | 66            | 56.760    | 3             | 166    | 96          | N.A.        | 625              | 1.400      | 1.290     | 1.300         | 1/2"         |
| L-DH-96 kW    | 147                | 128               | 9,4                | 8,2               | 96            | 82.560    | 3             | 242    | 139         | N.A.        | 800              | 2.095      | 1.350     | 1.725         | 3/4"         |
| L-DH-120 kW   | 184                | 160               | 11,8               | 10,2              | 120           | 103.200   | 3             | 302    | 174         | N.A.        | 900              | 2.095      | 1.450     | 1.725         | 3/4"         |
| L-DH-132 kW   | 202                | 176               | 12,9               | 11,2              | 132           | 113.520   | 3             | 332    | 191         | N.A.        | 925              | 2.095      | 1.450     | 1.725         | 3/4"         |
| L-DH-160 kW   | 245                | 213               | 15,7               | 13,6              | 160           | 137.600   | 3             | 403    | 232         | N.A.        | 1.075            | 2.095      | 1.450     | 1.725         | DN25         |
| L-DH-180 kW   | 275                | 240               | 17,6               | 15,3              | 180           | 154.800   | 3             | 453    | 261         | N.A.        | 1.100            | 2.095      | 1.450     | 1.725         | DN25         |
| L-DH-220 kW   | 337                | 293               | 22                 | 18,7              | 220           | 189.200   | 4             | 553    | 318         | N.A.        | 1.250            | 2.450      | 1.650     | 2.115         | DN32         |
| L-DH-280 kW   | 428                | 373               | 27                 | 23,9              | 280           | 240.800   | 4             | 704    | 405         | N.A.        | 1.450            | 2.450      | 1.650     | 2.115         | DN32         |
| L-DH-336 kW   | 514                | 447               | 33                 | 28,6              | 336           | 288.960   | 4             | 845    | 486         | N.A.        | 1.500            | 2.450      | 1.650     | 2.115         | DN40         |
| L-DH-400 kW   | 612                | 533               | 39                 | 34,1              | 400           | 344.000   | 4             | 1.006  | 579         | N.A.        | 1.600            | 2.450      | 1.725     | 2.190         | DN40         |
| L-DH-500 kW   | 765                | 666               | 49                 | 42,6              | 500           | 430.000   | 4             | 1.257  | 723         | N.A.        | 1.700            | 2.450      | 1.725     | 2.190         | DN50         |
| L-DH-600 kW   | 918                | 799               | 59                 | 51,1              | 600           | 516.000   | 4             | 1.508  | 867         | N.A.        | 1.800            | 2.450      | 1.800     | 2.250         | DN50         |
| L-DH-640 kW   | 979                | 852               | 63                 | 54,5              | 640           | 550.400   | 4             | 1.609  | 925         | N.A.        | 1.900            | 2.200      | 2.050     | 2.200         | DN50         |
| L-DH-720 kW   | 1.102              | 959               | 71                 | 61,3              | 720           | 619.200   | 4             | 1.810  | 1.041       | N.A.        | 3.500            | 3.900      | 2.200     | 2.250         | DN50         |
| L-DH-800 kW   | 1.224              | 1.065             | 78                 | 68,2              | 800           | 688.000   | 4             | 2.011  | 1.157       | N.A.        | 3.600            | 3.900      | 2.200     | 2.250         | DN65         |
| L-DH-960 kW   | 1.469              | 1.278             | 94                 | 81,8              | 960           | 825.600   | 4             | 2.413  | 1.388       | N.A.        | 3.800            | 3.900      | 2.275     | 2.250         | DN65         |
| L-DH-1040 kW  | 1.591              | 1.385             | 102                | 88,6              | 1.040         | 894.400   | 4             | 2.614  | 1.503       | N.A.        | 4.000            | 3.900      | 2.275     | 2.250         | DN65         |
| L-DH-1200 kW  | 1.836              | 1.598             | 118                | 102,2             | 1.200         | 1.032.000 | 4             | 3.016  | 1.735       | N.A.        | 4.250            | 4.050      | 2.275     | 2.250         | DN80         |
| L-DH-1280 kW  | 1.959              | 1.704             | 125                | 109,1             | 1.280         | 1.100.800 | 4             | 3.217  | 1.850       | N.A.        | 4.500            | 4.050      | 2.275     | 2.250         | DN80         |
| L-DH-1360 kW  | 2.081              | 1.811             | 133                | 115,9             | 1.360         | 1.169.600 | 8             | 3.418  | 1.966       | 1.140       | 8.500            | 4.050      | 3.150     | 3.200         | DN80         |
| L-DH-1700 kW  | 2.601              | 2.263             | 166                | 144,8             | 1.700         | 1.462.000 | 10            | 4.273  | 2.457       | 1.425       | 9.000            | 4.050      | 3.150     | 3.200         | DN80         |
| L-DH-2000 kW  | 3.060              | 2.663             | 196                | 170,4             | 2.000         | 1.720.000 | 10            | N.A.   | 2.891       | 1.676       | 13.500           | 4.050      | 3.950     | 3.400         | DN80         |
| L-DH-2400 kW  | 3.673              | 3.195             | 235                | 204,5             | 2.400         | 2.064.000 | 10            | N.A.   | 3.469       | 2.011       | 14.000           | 5.900      | 4.100     | 4.100         | DN100        |
| L-DH-2800 kW  | 4.285              | 3.728             | 274                | 238,6             | 2.800         | 2.408.000 | 10            | N.A.   | 4.047       | 2.346       | 14.500           | 5.900      | 4.100     | 4.100         | DN100        |
| L-DH-3200 kW  | 4.897              | 4.260             | 313                | 272,6             | 3.200         | 2.752.000 | 10            | N.A.   | 4.625       | 2.681       | 15.000           | 7.500      | 3.800     | 3.400         | DN100        |
| L-DH-3600 kW  | 5.509              | 4.793             | 353                | 306,7             | 3.600         | 3.096.000 | 10            | N.A.   | 2 x 2.530** | 3.017       | 15.600           | 7.500      | 3.800     | 3.400         | DN125        |
| L-DH-4000 kW  | 6.121              | 5.325             | 392                | 340,8             | 4.000         | 3.440.000 | 10            | N.A.   | 2 x 2.890** | 3.352       | 16.200           | 7.500      | 3.800     | 3.400         | DN125        |
| L-DH-4800 kW  | 7.345              | 6.390             | 470                | 409,0             | 4.800         | 4.128.000 | 10            | N.A.   | 2 x 3.620** | 4.022       | 18.000           | 8.000      | 4.350     | 3.950         | DN125        |
| L-DH-5600 kW  | 8.569              | 7.455             | 548                | 477,1             | 5.600         | 4.816.000 | 10            | N.A.   | 2 x 4.200** | 4.692       | 20.100           | 8.000      | 4.490     | 4.100         | DN150        |
| L-DH-6000 kW  | 9.181              | 7.988             | 588                | 511,2             | 6.000         | 5.160.000 | 10            | N.A.   | 2 x 4.336** | 2 x 2.515** | 22.500           | 8.000      | 4.590     | 4.200         | DN150        |
| L-DH-7000 kW  | 10.712             | 9.319             | 686                | 596,4             | 7.000         | 6.020.000 | 10            | N.A.   | N.A.        | 2 x 2.940** | 23.800           | 8.000      | 4.590     | 4.200         | DN150        |
| L-DH-8000 kW  | 12.242             | 10.650            | 783                | 681,6             | 8.000         | 6.880.000 | 10            | N.A.   | N.A.        | 2 x 3.355** | 25.500           | 10.000     | 4.790     | 4.400         | DN200        |
| L-DH-9000 kW  | 13.772             | 11.981            | 881                | 766,8             | 9.000         | 7.740.000 | 10            | N.A.   | N.A.        | 2 x 3.355** | 27.000           | 10.000     | 4.790     | 4.400         | DN200        |
| L-DH-10000 kW | 15.302             | 13.313            | 979                | 852,0             | 10.000        | 8.600.000 | 10            | N.A.   | N.A.        | 2 x 4.200** | 28.500           | 11.500     | 4.790     | 4.400         | DN200        |

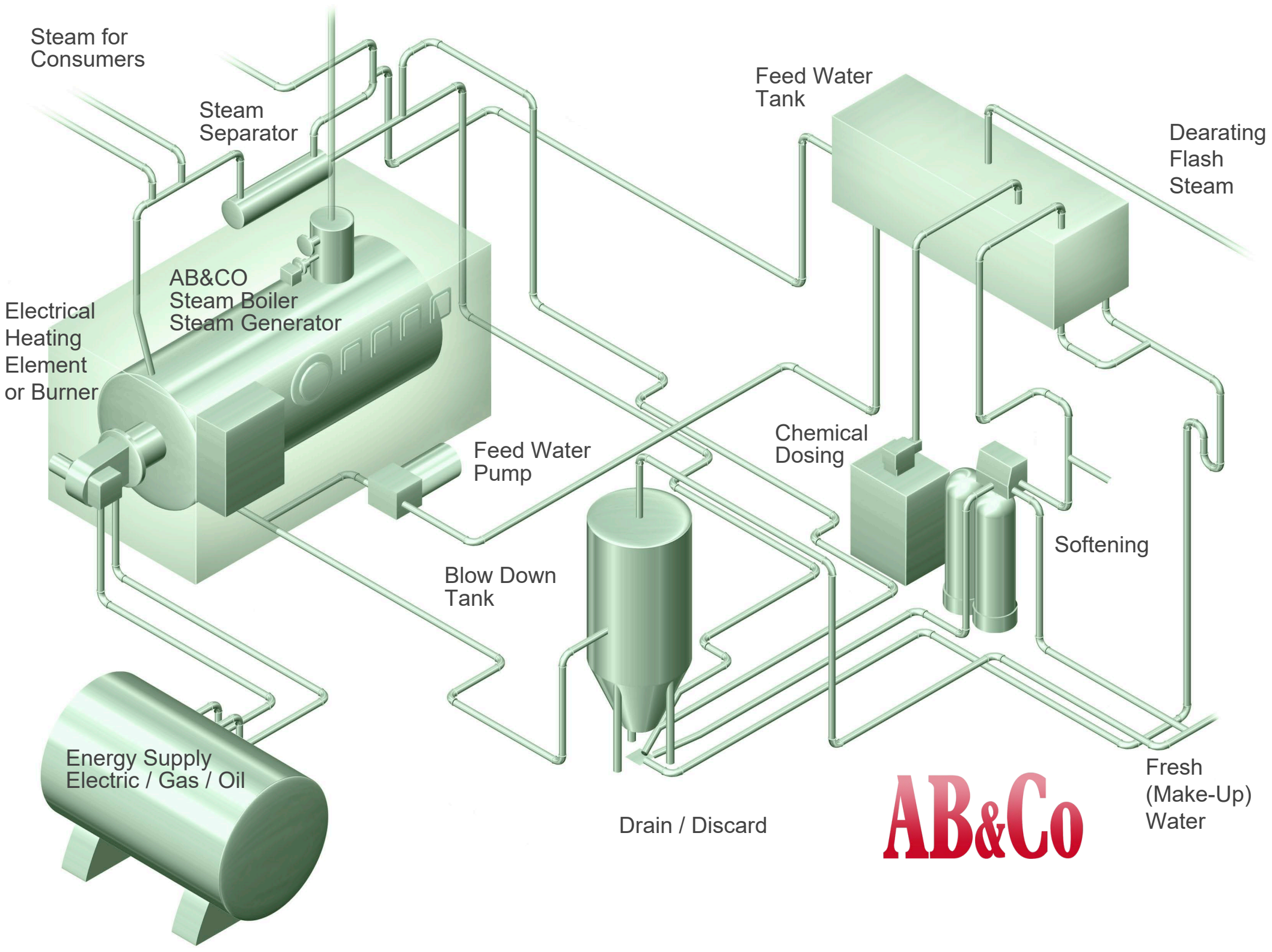
\*Steam rate at 4 bar and feed water at indicated temperature.

\*\*Electric supply by two independent connections with same power.

\*\*\*Height for boilers without steam superheater.

N.A. Not available

Values are meant for guidance only and they are subject to alterations without prior notice by AB&CO.



Steam for Consumers

Steam Separator

Feed Water Tank

Dearating Flash Steam

AB&CO Steam Boiler Steam Generator

Electrical Heating Element or Burner

Feed Water Pump

Chemical Dosing

Blow Down Tank

Softening

Energy Supply Electric / Gas / Oil

Drain / Discard

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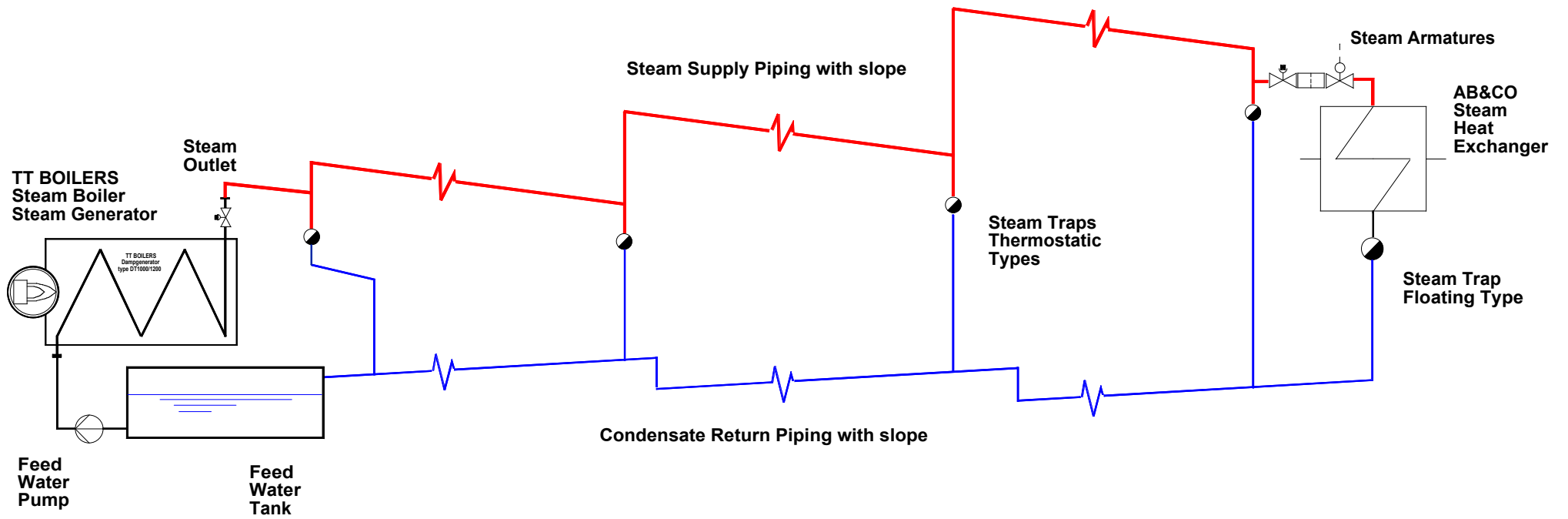
Fresh (Make-Up) Water




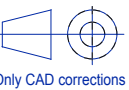
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This is an illustration of the slope (inclination) of steam supply line and condensate return line.

**NOTE!**  
This is an incomplete PI-diagram, where most required steam and condensate instrumentation is omitted - and it therefore focusing only on the piping issue.



|  |                 |  |  |
|--|-----------------|--|--|
| <br><b>AB&amp;CO TT BOILERS</b><br>Copenhagen • Denmark |                 | SUBJECT/THEMA:                                 |  |
|  |                 | <b>Guideline Steam &amp; Condensate Piping</b> |  |
| AB&CO REF. NO.:  | DRWG.:          | PROJECT/PROJEKT:                               |  |
|  | <b>steamcon</b> |  |  |
| DATE/DATO:   | SIGN.:          | CLIENT/KLIENT:                                 |  |
| <b>06.02.15</b>  |                 |  |  |







ELECTRIC STEAM BOILERS  
UP TO 10 MW



**AB&Co**





## TECHNICAL BULLETIN

# Steam Boilers



## The Principle in a Steam Boiler Steam Pressure & Operation

The working principle in any steam boiler and steam generator is in short, that amount of steam from the boiler is automatically adjusted to the amount of steam being called for at the consumer (whether it is a reactor, tank, vessel, heat exchanger or another steam-consuming device). The consumer pulls steam from the boiler – the boiler does not push the steam out to the consumer.

The consumption of steam equals condensation of steam – and what happen here is that a large volume steam becomes a small volume of water. This creates a pull of steam – a demand of steam. This process lead to a small decrease in steam pressure and the moment this decreasing pressure is detected by the steam boiler instrumentation, the boiler will start turning on heat (oil/gas-firing or electric heating), and thereby increase the steam pressure again. When set point of steam pressure is achieved, the boiler starts reducing the heat. This up and down regulation will be done automatically by the boiler control, and continuously.

This explain how steam boilers are self-controlled. Fundamentally, they just deliver what is required and maintain the steam pressure no matter how much steam you consume.

The consumer controls the heat from the steam by a so-called steam control valve (see below), and this valve is to be placed at the consumer together with a steam trap or another type of steam reduction (e.g. orifice or valve) on the condensate outlet of the consumer. All this is beyond the steam boiler scope of supply.

You can compare this with an electrical outlet in the wall in your house. Consider voltage to be your steam pressure and current to be your steam flow. You will always have for instance 230V outlet everywhere which is maintained by the supplier of electricity (power plant) – and you use this voltage to get electrical current (similar to steam flow) for your consumer. At the consumer you control the consumption by contact set, potentiometers or equal. The consumer will only absorb the current that is required – the upper limit is the sizes of the fuses.

Steam is likewise always be available at constant pressure and in an extent that automatically follows the consumption – the upper limit is the max. capacity of the steam boiler.

If you wish to control the steam pressure, this is always done externally by using a pressure reduction station and/or steam pressure control valve. It is not possible - and it is not allowed according to European steam boiler regulations and others authorities – that the operator change the steam pressure. Consequently, you can never have a facility on the steam boiler that changes and adjusts the steam pressure. If this needs to be changes, only the boiler manufacturer are allowed to make this and all the necessary changes that is required to be done at the same time, including consideration as for operational parameters, safety devices set-points (pressure and temperatures), safety valve size, steam outlet size, name plate and others. When the manufacturer changes the pressure, it will also be necessary to verify the consequences of the larger velocities and specific volume (smaller pressure), and pressure vessel design (higher pressure). Documentation must be provided (PED, Declaration of Conformity etc).

Steam flow measurement is very rarely (it is also very rare to measuring electrical current in your house). It can be necessary to use for testing design of unit that used steam - or for instance if energy supplier require this for calculation price of energy.

### AB&CO GROUP

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