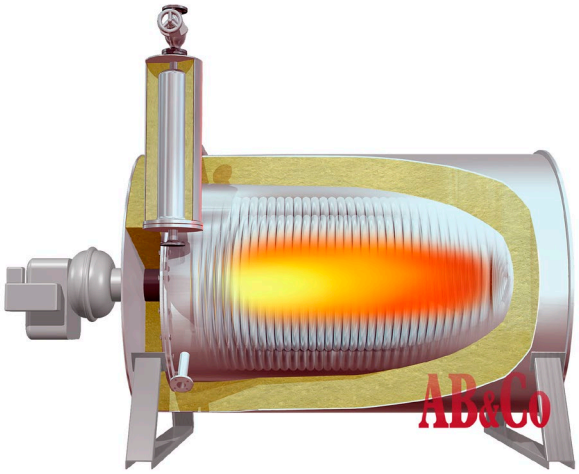
BOLDNESS WITH CARE

Sustainable
Process Heating

Steam Generator
Industrial Design



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TT BOILERS AB&Co

AB&Co TEKNIK

Steam Generator Boiler

'Economical & High Quality'

MAIN DATA - Horizontal Model											
Type	L-DT (H)	200	300	450	750	1000	1200	1500	2000	2500	3000
Steam Output	kg/h	200	300	450	750	1000	1200	1500	2000	2500	3000
Heat Capacity @ 10 bar & 75°C F.W.	Mcal/h	118	177	266	443	590	708	885	1180	1475	1770
Heat Capacity @ 10 bar & 75°C F.W.	kW	137	206	309	515	686	824	1030	1373	1716	2059
Max. Steam / Design Pressure (PS)	bar	10/12	10/12	10/12	10/12	10/12	10/12	10/12	10/12	10/12	10/12
Back Pressure Flue Gas	Pa	200	200	200	500	500	500	600	800	850	850
No. of Feed Water Pumps	-	1	1	1	1	1	1	1	2	2	2
Burner Stages (default)	-	1	2	2	2	2	2	2	2	2	2
Steam Outlet / Steam Valve	DN	32	32	40	40	50	50	65	80	80	100
Feed Water Inlet	BSP	1"	1"	1"	1"	1"	1"	1½"	2"	2"	2"
Flue Gas Outlet	mm	ø120	ø120	ø160	ø200	ø250	ø300	ø350	ø350	ø450	ø450
Blow-down Discharge	DN	20	20	25	25	25	25	40	40	40	40
Safety Valve Discharge	BSP / DN	1"	1"	1"	1"	DN40	DN40	DN40	DN50	DN50	DN50
Length excl. Burner	mm	1270	1270	1530	2030	2430	2670	2700	3000	3320	3750
Max. Length incl. Burner	mm	1550	1800	2050	2650	3300	3550	3540	3900	4200	4700
Width	mm	1300	1300	1450	1450	1450	1450	1600	1600	1700	1700
Height	mm	1500	1500	1700	1900	1900	1900	2150	2200	2250	2250
Total Volume of Pressure Vessel (V)	Liter	50	50	89	118	135	171	198	215	246	255
Weight / Total in Operation	kg	800	900	1500	1850	2150	2300	2700	3400	3650	3850

The above data are subject to changes without any notice and without any responsibility to AB&CO

AB&Co TEKNIK

Steam Generator Boiler

'Economical & High Quality'

MAIN DATA - Vertical Model							
Type	L-DT (V)	125	200	300	400	550	700
Steam Output	kg/h	125	200	300	400	550	700
Heat Capacity @ 10 bar & 75°C F.W.	Mcal/h	74	118	177	236	325	413
Heat Capacity @ 10 bar & 75°C F.W.	kW	86	137	206	275	377	480
Max. Steam / Design Pressure (PS)	bar	10/12	10/12	10/12	10/12	10/12	10/12
Back Pressure Flue Gas	Pa	200	200	200	200	300	400
Burner Stages (default)	-	1	1	2	2	2	2
No. of Feed Water Pumps	-	1	1	1	1	1	1
Steam Outlet / Steam Valve	DN	32	32	40	40	40	40
Feed Water inlet	BSP	1"	1"	1"	1"	1"	1"
Flue Gas Outlet	mm	ø120	ø120	ø160	ø160	ø160	ø160
Blow-down Discharge	BSP	1"	1"	1"	1"	1"	1"
Safety Valve Discharge (outlet)	BSP	1"	1"	1"	1"	1"	1"
Height excl. Burner	mm	1600	1600	1600	1600	1600	1800
Max. Height incl. Burner	mm	1880	1880	2150	2150	2150	2450
Depth	mm	1250	1350	1350	1350	1350	1350
Width	mm	800	900	900	900	900	900
Total Volume of Pressure Vessel (V)	Liter	38	38	62	65	72	87
Weight / Total in Operation	kg	650	650	850	900	1000	1100

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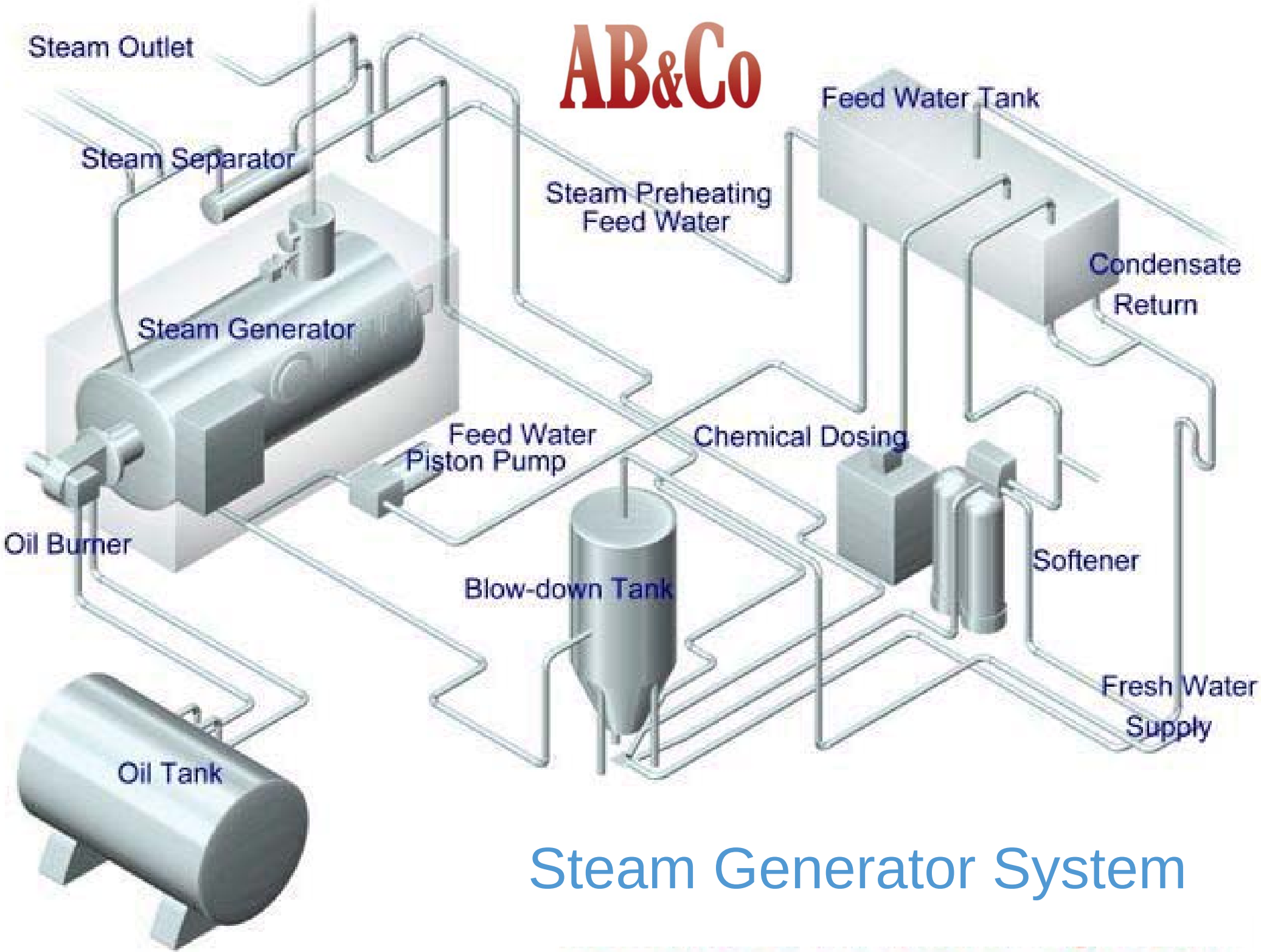
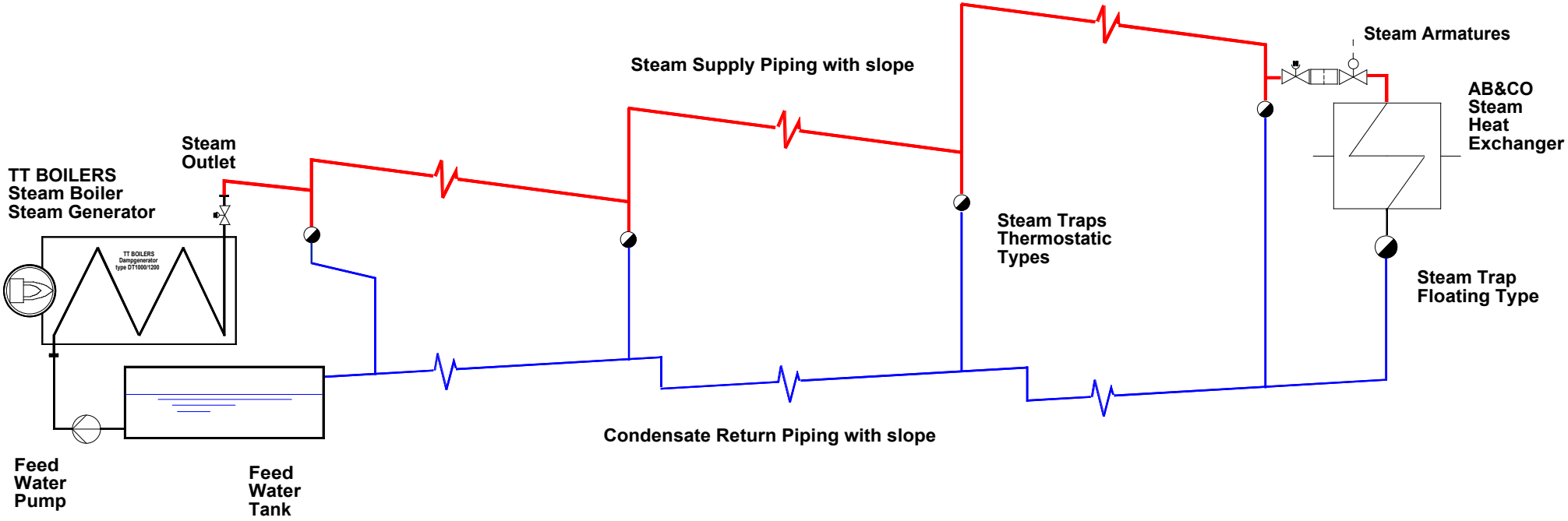


Steam Generator System

PRELIMINEARY SKETCH - NOT BINDING

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.

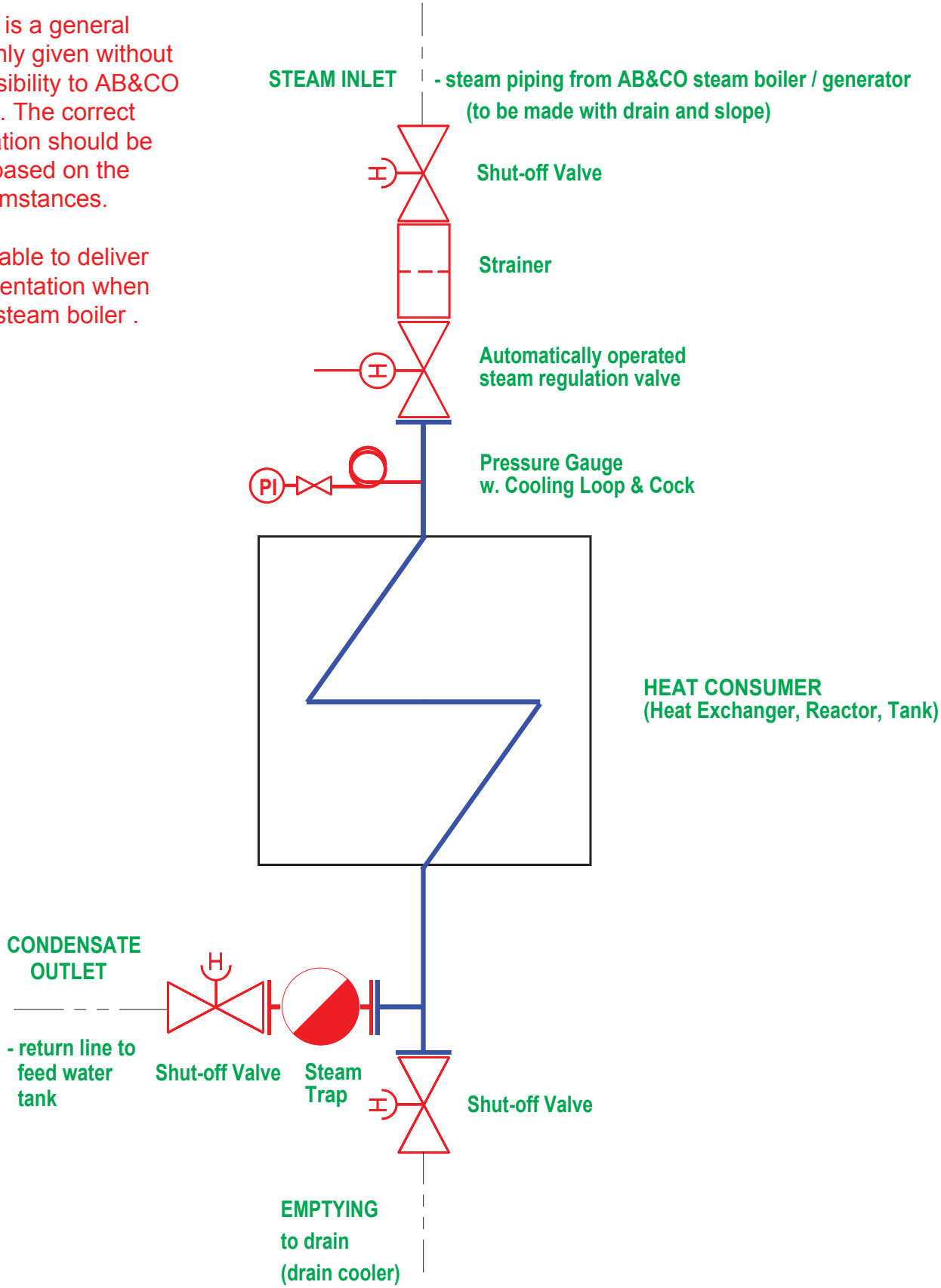


AB&CO TT BOILERS Copenhagen • Denmark		SUBJECT/THEMA: Guideline Steam & Condensate Piping	
AB&CO REF. NO.:	DRWG.: steamcon	PROJECT/PROJEKT:	Only CAD corrections
DATE/DATO: 06.02.15	SIGN.:	CLIENT/KLIENT:	

IMPORTANT NOTE !

This sketch is a general guidance only given without any responsibility to AB&CO whatsoever. The correct instrumentation should be determine based on the actual circumstances.

AB&CO is able to deliver this instrumentation when deliver the steam boiler .



AB&Co
AB&CO Thermal Transfer A/S
Copenhagen, Denmark

SUBJECT/THEMA:

GUIDANCE - Recommended Steam Armatures for Consumers connected to AB&CO steam boilers

AB REF. NO.:	DRWG.:	PROJECT/PROJEKT:
DATE/DATO: 31.12.2017	SIGN.: ab	CLIENT/KLIENT:

BOLDNESS WITH CARE

Environmental Process Heating

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.

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