

Project	Sparkling
Project nr.	W490
Filename	W490-01_06sec01
Revision	14
Date	5-3-2019
By	ME
Check by	JS
Approved	JS

	case nr.	Contract cases					Cases for information				
		A winter	B winter	B summer	C winter	C summer	Design Allgaier	Part load	Fuel 40% moisture	Fuel 30% moisture	Turbine bypass
Description case		Maximum heat to Ventilex Allgaier hot water heater	Nominal heat to Ventilex Allgaier hot water heater	Nominal heat to Ventilex Allgaier hot water heater and steam heater	All heat to District Heating Hot water temperature 125°C (note 4)	All heat to District Heating Hot water temperature 90°C (note 4)	Full load - minimal 5.7 MW to Allgaier	Only heat to Allgaier No heat to Ventilex	case B winter - wood with 40% moisture	case B winter - wood with 30% moisture	Full load - total steam flow over bypass to Allgaier and Ventilex
Furnace load	% wt. %	100% 49.5%	93% 49.5%	92% 49.5%	94% 49.5%	94% 49.5%	100% 49.5%	50% 49.5%	92% 40%	91% 30%	100% 49.5%
Furnace	kW	16360	15263	15025	15390	15158	16360	8200	15061	14888	16360
fuel input	kg/h	8416 kg/hr @ 49.5% moisture	7851 kg/hr @ 49.5% moisture	7729 kg/hr @ 49.5% moisture	7911 kg/hr @ 49.5% moisture	7797 kg/hr @ 49.5% moisture	8416 kg/hr @ 49.5% moisture	4218 kg/hr @ 49.5% moisture	6172 kg/hr @ 49.5% moisture	5031 kg/hr @ 30% moisture	8416 kg/hr @ 49.5% moisture
fuel mass flow	kJ/kg	18600	18600	18600	18600	18600	18600	18600	18600	18600	18600
fuel LHV, dry, excl ash	kJ/kg	6999	6999	6999	6999	6999	6999	6999	6999	6999	6999
fuel LHV, wet, incl ash	wt. %	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%
fuel ash content, dry											
furnace net capacity	kW/h	15910	14813	14581	14918	14703	15910	7974	14610	14454	15910
combustion air surplus	-	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.42	1.40	1.45
combustion air volume flow	Nm3/h	25191	23502	23136	23662	23340	25191	12626	21500	20120	25191
fluegas composition											
CO2	vol. %	10.8%	10.8%	10.8%	10.8%	10.8%	10.8%	10.8%	11.6%	12.2%	10.8%
H2O	vol. %	23.3%	23.3%	23.3%	23.3%	23.3%	23.3%	23.3%	19.5%	16.3%	23.3%
O2	vol. %	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
N2	vol. %	60.9%	60.9%	60.9%	60.9%	60.9%	60.9%	60.9%	63.9%	66.4%	60.9%
fluegas temperature without recirculation	°C	1117	1115	1115	1115	1115	1117	1117	1248	1361	1117
fluegas temperature with recirculation	°C	975	975	975	975	975	975	975	975	975	975
fluegas volume flow without recirculation	Nm3/h	32718	30524	30048	30758	30314	32718	16399	26614	23940	32718
fluegas volume flow recirculation	Nm3/h	6167	5671	5582	5858	5611	6167	3098	9697	12426	6167
fluegas flow total	Nm3/h	38885	36196	35630	36616	35925	38885	19457	36311	36366	38885
Boiler (incl. HT ECO and LT ECO)											
boiler capacity	kW/h	14103	13127	12922	12904	13029	14103	7102	13118	13084	14103
feedwater temperature	°C	110	110	110	136	110	110	110	110	110	110
deareator pressure	bara	1.4	1.4	1.4	3.2	1.4	1.4	1.4	1.4	1.4	1.4
steam flow from boiler	t/h	18.3	17.0	16.8	17.4	16.9	18.3	9.2	17.0	17.0	18.3
steam temperature	°C	420	420	420	420	420	420	420	420	420	420
steam pressure outlet boiler	bara	53.0	53.0	53.0	53.0	53.0	53.0	53.0	53.0	53.0	53.0
steam flow to steam ejector (note 3)	t/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
pressure drop boiler to turbine	bar	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
fluegas temperature outlet boiler	°C	224	224	224	236	224	224	200	224	224	224
fluegas temperature outlet LT ECO	°C	140	140	140	166	140	140	130	140	140	140
Turbine											
steam flow turbine inlet	t/h	18.3	17.0	16.8	17.4	16.9	18.3	9.2	17.0	17.0	18.3
turbine electrical capacity (gross, at generator clamps)	kWe	1941	1803	1694	1607	1810	1916	927	1802	1797	1941
expanded steam temperature	°C	100	100	113	175	100	100	133	100	100	100
expanded steam pressure	bara	1.02	1.02	1.02	2.90	1.02	1.02	1.02	1.02	1.02	1.02