

34 MW Gas Engine Power Plant w/ Heat Recovery Boilers

Manufacturer: Wartsila
 Model: 20V34SG
 Quantity: 4
 Total Output: 4 x 8.73 MW
 Fuel Type: Nat. Gas
 Electric Efficiency: %46.5
 Manufacturing Year: 2 x 2005 , 1 x 2009 , 1 x 2008

Working Hours:

Engine No.1 (2005) - 32.000 hrs
 Engine No.2 (2005) - 36.000 hrs
 Engine No.3 (2008) - 15.000 hrs
 Engine No.4 (2009) - 10.000 hrs

The photographs of the Power Plant are enclosed herewith. The expected price of the power plant, delivered ex-foundation, ex-site on As Is Where Is basis is Million Only. The above price is subject to the Power Plant remaining unsold

Performance data as guidelines for CHP calculations – Wärtsilä gas fuelled generating sets at 50 and 60 Hz

Performance data	Wärtsilä gas engines at frequency 50 Hz							Wärtsilä gas engines at frequency 60 Hz							
	9L34SG	16V34SG	20V34SG	20V34DF		18V500F		9L34SG	16V34SG	20V34SG	20V34DF		18V500F		
				Gas mode	Liquid fuel mode	Gas mode	Liquid fuel mode				Gas mode	Liquid fuel mode	Gas mode	Liquid fuel mode	
Engine optimization: NO _x (dry @ 15 vol-% O ₂)	mg/Nm ³	95-190*	95-190*	95-190*	190-380*	1460-2000* (LFO) 1600-2000 (HFO)	190-380*	2000*	95-190*	95-190*	95-190*	190-380*	1460-2000* (LFO) 1600-2000 (HFO)	190-380*	2000*
Electric power	kW	3888	6070	8730	8730	8730	16621	16621	3758	6737	8439	8439	8439	17076	17076
Heat rate ¹⁾	kJ/kWh	7817	7753	7737	8036	8127	7616	8185	7817	7753	7737	8036	8127	7616	8186
Efficiency ¹⁾	%	46.1	46.4	46.5	44.8	44.3	47.3	44.0	46.1	46.4	46.5	44.8	44.3	47.3	44.0
Cooling circuit inlet/outlet ²⁾	°C	36/59	36/66	36/67	36/69	36/77	36/68	42/83	36/58	36/65	36/66	36/68	36/75	36/68	42/85
- HT/CAC temperature inlet/outlet	°C	42/52	45/57	46/58	47/59	49/65	45/59	54/72	42/52	45/56	45/57	46/58	48/64	45/59	55/73
- Cylinder temperature inlet/outlet	°C	84/91	82/91	82/91	81/91	83/91	80/85	79/85	84/91	83/91	82/91	81/91	83/91	80/85	78/85
- Lubrication oil circuit inlet/outlet	°C	63/74	63/76	63/77	63/78	63/80	63/74	63/78	63/74	63/76	63/76	63/78	63/79	63/74	63/78
- LTCAC temperature inlet/outlet	°C	36/37	36/38	36/39	36/39	36/41	36/38	42/46	36/37	36/38	36/38	36/39	36/40	36/38	42/46
Charge air flow ± 5%	kg/s	6.2	11.1	13.8	14.1	17.5	26.2	32.5	6.0	10.7	13.4	13.5	16.7	26.1	32.5
Exhaust gas flow ± 5%	kg/s	6.4	11.4	14.2	14.5	17.9	27.0	33.5	6.2	11.0	13.8	13.9	17.2	26.6	33.5
Exhaust gas temp. ± 15	°C	400	400	400	380	335	400	377	400	400	400	380	335	401	369
Exhaust gas energy ± 10%	kW	2657	4733	5924	5714	5975	11016	12705	2567	4672	5722	5486	5718	11379	12415
Cooling circuit energy ± 10%	kW	1929	3436	4294	4595	5631	7403	9504	1868	3322	4147	4432	5404	7400	9991
- HT/CAC energy ± 10%	kW	840	1405	1723	1710	2238	3237	4129	817	1369	1680	1659	2168	3219	4117
- Cylinder cooling energy ± 10%	kW	560	1005	1254	1404	1587	2101	2514	540	965	1214	1354	1517	2238	2925
- Lubrication oil energy ± 10%	kW	424	761	961	1065	1149	1528	1967	414	741	920	1035	1108	1538	2048
- LTCAC energy ± 10%	kW	105	265	357	416	662	542	884	97	247	333	384	611	539	901
Heat losses by radiation ± 20%	kW	130	230	290	350	350	630	670	120	220	280	340	340	640	670

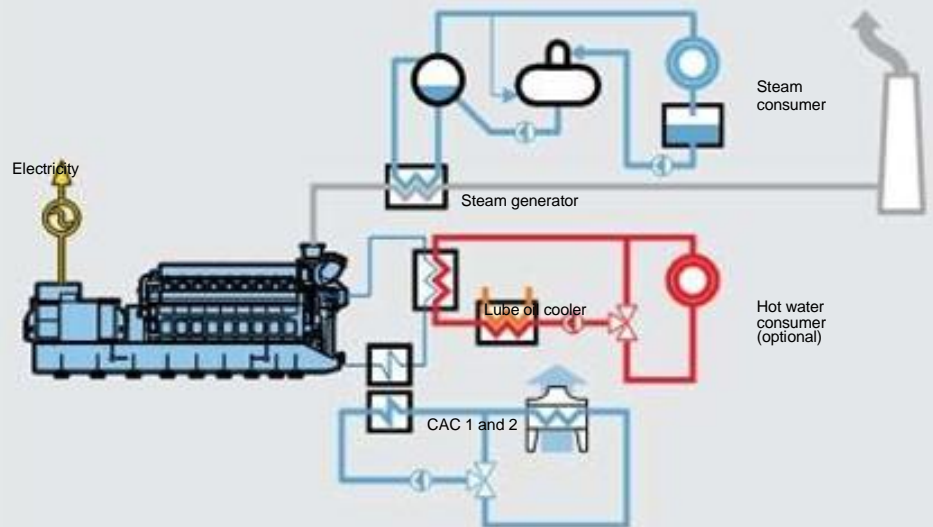
GAS ENGINES

Wärtsilä 34SG

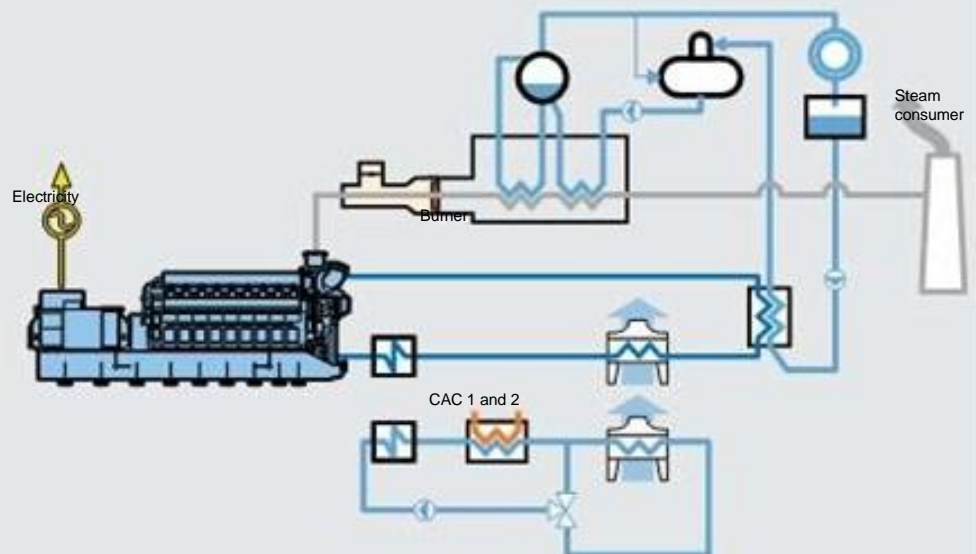
Technical data 50 Hz/750 rpm	Unit	9L34SG	16V34SG	20V34SG
Power, electrical	kW	4343	7744	9730
Heat rate	kJ/kWh	7843	7819	7779
Electrical efficiency	%	45.9	46.0	46.3
Technical data 60 Hz/720 rpm				
Power, electrical	kW	4169	7434	9341
Heat rate	kJ/kWh	7843	7819	7779
Electrical efficiency	%	45.9	46.0	46.3
Dimensions and dry weight of generating set				
Length	mm	10400	11300	12890
Width	mm	2780	3300	3300
Height	mm	3840	4240	4440
Weight	tonne	77	120	130

Heat rate and electrical efficiency at generator terminals, including engine driven pumps, ISO 3046 conditions and gas LHV > 28 MJ/m³. Tolerance 5%. Power factor 0.8. Gas Methane Number > 80. Nm³ defined at NTP (273.15 K and 101.3 kPa)

LOW-PRESSURE STEAM GENERATION FOR INDUSTRIAL APPLICATIONS



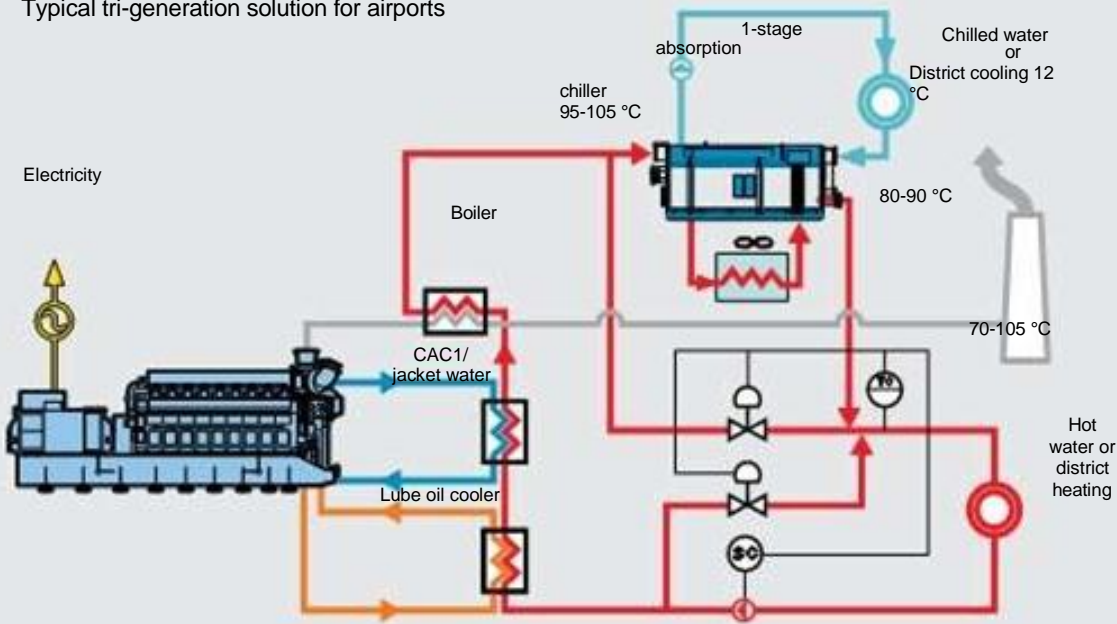
COGEN FOR MAXIMUM STEAM GENERATION



7 °C

TRI-GENERATION

Typical tri-generation solution for airports



HOT WATER GENERATION FOR DISTRICT HEATING APPLICATIONS

