

Thermal schedule - Hayes Data Centre Emergency Back-up Generation Facility

Emission point Ref	Emission Source Description	Gen Set Supplier	Genset Manufacturer	Genset model	Engine model	max fuel (litre/hr)	Electrical Output (kW)	Electrical Output (kVa)	Thermal Capacity (MW) AMPS Method	Comments
EP1	Generator 1	AVK	RollsRoyce	DS4000	MTU 20V4000	818	3200	4000	8.0089	
EP2	Generator 2	AVK	RollsRoyce	DS4000	MTU 20V4000	818	3200	4000	8.0089	
EP3	Generator 3	AVK	RollsRoyce	DS4000	MTU 20V4000	818	3200	4000	8.0089	
EP4	Generator 4	AVK	RollsRoyce	DS4000	MTU 20V4000	818	3200	4000	8.0089	
EP5	Generator 5	AVK	RollsRoyce	DS4000	MTU 20V4000	818	3200	4000	8.0089	
EP6	Generator 6	AVK	RollsRoyce	DS4000	MTU 20V4000	818	3200	4000	8.0089	
EP7	Generator 7	AVK	RollsRoyce	DS4000	MTU 20V4000	818	3200	4000	8.0089	
EP8	Generator 8	AVK	RollsRoyce	DS4000	MTU 20V4000	818	3200	4000	8.0089	
EP9	Generator 9	AVK	RollsRoyce	DS4000	MTU 20V4000	818	3200	4000	8.0089	
EP10	Generator 10	AVK	RollsRoyce	DS4000	MTU 20V4000	818	3200	4000	8.0089	
EP11	Generator 11	AVK	RollsRoyce	DS4000	MTU 20V4000	818	3200	4000	8.0089	
EP12	Generator 12	AVK	RollsRoyce	DS4000	MTU 20V4000	818	3200	4000	8.0089	
EP13	Generator 13	AVK	RollsRoyce	DS4000	MTU 20V4000	818	3200	4000	8.0089	
EP14	Generator 14	AVK	RollsRoyce	DS4000	MTU 20V4000	818	3200	4000	8.0089	

Aggregated net thermal input capacity (MW) **112.125**

Thermal capacity calculation completed in line with Environment Agency guidance:

"AMPS Determination of thermal input power of an engine driven generator" (Equation 4):

Max fuel	818	litre/hr
MK	677.304	MK = max fuel x 0.828 (fuel density)
Hu	42.5688	Hu = calorific value
Pth	8008.894032	Pth = MK x Hu / 3.6
MWth	8.01	

Engine		Liquid capacity (lubrication)	
Manufacturer	mtu	Total oil system capacity: l	390
Model	20V4000G94LF	Engine jacket water capacity: l	260
Type	4-cycle	Intercooler coolant capacity: l	50
Arrangement	20V		
Displacement: l	95.4	Combustion air requirements	
Bore: mm	170	Combustion air volume: m ³ /s	4.7
Stroke: mm	210	Max. air intake restriction: mbar	30
Compression ratio	16.4		
Rated speed: rpm	1500	Cooling/radiator system	
Engine governor	ADEC (ECU 9)	Coolant flow rate (HT circuit): m ³ /hr	80
Max power: kWm	3308	Coolant flow rate (LT circuit): m ³ /hr	44
Air cleaner	dry	Heat rejection to coolant: kW	1270
		Heat radiated to charge air cooling: kW	930
		Heat radiated to ambient: kW	105
		Fan power for electr. radiator (40°C): kW	105
Fuel system			
Maximum fuel lift: m	5	Exhaust system	
Total fuel flow: l/min	27	Exhaust gas temp. (after engine, max.): °C	482
		Exhaust gas temp. (before turbocharger): °C	693
Fuel consumption ²⁾		Exhaust gas volume: m ³ /s	11.9
At 100% of power rating:	l/hr	Maximum allowable back pressure: mbar	50
At 75% of power rating:	818	g/kwh	205
At 50% of power rating:	598		215
	429	Minimum allowable back pressure: mbar	-

Standard and optional features

System ratings (kW/kVA)

Generator model	Voltage	NEA (ORDE) + Tier 2 optimized		
		without radiator		
		kWel	kVA*	AMPS
Leroy Somer LSA54.2 ZL12 (Medium volt. Leroy Somer)	11 kV	3160	3950	207
Marathon 1040FDH7105 (Medium volt. Marathon)	11 kV	3200	4000	210
Leroy Somer LSA54.2 ZL14 (MV Leroy Somer oversized)	11 kV	3160	3950	207
Leroy Somer LSA54.2 ZL14 (Engine output optimized)	11 kV	3200	4000	210

* cos phi = 0.8