

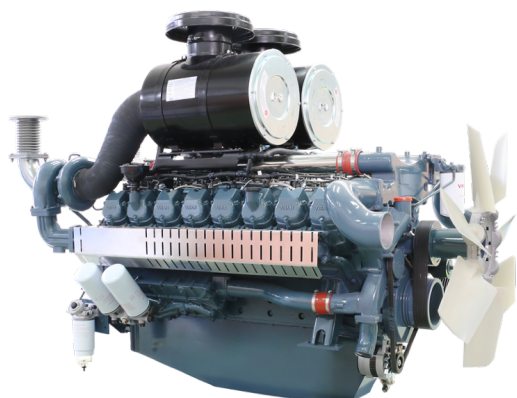
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2020

# D30 SERIES ENGINE

## TECHNICAL DATA SHEET

## D30 (V16) SERIES DIESEL ENGINE



### RATINGS DEFINITION

The power ratings of Emergency Standby and Prime are in accordance with the standard of ISO8528. Fuel Stop power in accordance with the standard of ISO3046.

Electric power (kW) should be estimated by considering generator efficiency, cooling fan power loss and power derating due to altitude and temperature.

**STANDBY POWER RATING** is applicable for supplying emergency power for the duration of the utility power outage. No overload capability is available for this rating. A standby rated engine should be sized for a maximum of a 70% average load factor and 200 hours of operation per year, this includes less than 25 hours per year at the Standby Power rating.

**PRIME POWER RATING** is available for an unlimited of hours per year in variable load application. Variable load should not exceed a 70% average the Prime Power rating during any operating period hours., The Total operating time at 100% Prime Power shall not exceed 500 hours per year.

10% overload capability is available for a period of 1 hour within a 12 hours period of operation. Total operating time at the 10% overload power shall not exceed 25 hours per year,

**CONTINUOUS POWER RATING** is the power that the engine can continue to use under the prescribed speed and the specific environment condition in the normal maintenance period stipulated in the manufacturing plant. And continuous power applicable for supplying utility power at a constant 100% for an unlimited number of hours per year. No overload capability is available for this rating.

Ratings (kW/PS)	1500rpm / 50Hz					1800rpm / 60Hz				
	D30AP	D30A	D30A1	D30A2	D30A3	D30BP	D30B1	D30B2	D30B3	D30B4
Prime	1000/1360	910/1238	875/1190	795/1081	705/959	1000/1360	930/1265	800/1197	825/1122	750/1020
Standby	1100/1496	1020/1387	960/1306	880/1197	780/1060	1100/1496	1020/1388	965/1312	910/1238	850/1156
Continuous	770/1047	705/958	665/904	604/821	536/728	770/1047	707/961	669/909	627/852	570/775

### GENERAL ENGINE DATA

Engine Model	D30AP	D30A	D30A1	D30A2	D30A3	D30BP	D30B1	D30B2	D30B3	D30B4
Engine Type	4-Cycle, V-type, 16-Cylinder, Turbo charged & inter-cooled (air to air)									
Speed	1500 rpm					1800 rpm				
Bore x stroke	128 * 142 mm									
Displacement	29.235 L									
Compression ratio	14.6 : 1		15.5 : 1			14.6 : 1		15.5 : 1		
Rotation {Looking at flywheel}	Counter clockwise {CCW}									
Firing order	1-15-6-12-8-5-16-7-11-4-9-2-14-10-3-13									
Injection timing	18° ±1° BTDC @ 1500 rpm					20° ±1° BTDC @ 1800 rpm				
Dry weight {W/O cooling system}	2100 kg									
Dimension {L x W x H}	2340*1392*1360 mm									
Flywheel housing	SAE 0									
Flywheel	18{PCD:543mm/31.38inch}									
Number of teeth on flywheel	160									
Piston speed	200 m/s					240 m/s				

### ENGINE MOUNTING

Max.Bending Moment at Rear Face to Block	1325 N.m									
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### INTAKE & EXHAUST SYSTEM

Engine Model	D30AP	D30A	D30A1	D30A2	D30A3	D30BP	D30B1	D30B2	D30B3	D30B4
Max.Intake Restriction (kPa)	5									
Max.Exhaust Back Pressure (kPa)	<10									
Combustion Air Consumption (m³/h)	7115	6368	5651	5154	4591	7351	6580	5881	5330	4978
Max.Exhaust Temp.(After Turbo°C)	518	510	500	487	473	665	540	506	480	475
Exhaust Gas Flow (m³/h)	17461	15366	13462	12071	10556	18735	16487	14119	12368	11476
Cooling fan air flow (m³/h)	1755	1755	1755	1755	1365	1750	1750	1750	1400	1400

**AIR INDUCTION SYSTEM**

Engine Model	D30AP	D30A	D30A1	D30A2	D30A3	D30B0	D30B1	D30B2	D30B3	D30B4
Maximum Intake Air Restriction										
- With Clean Filter Element (m <sup>3</sup> /h)	7115	6368	5651	5154	4591	7351	6580	5881	5330	4978
- With Dirty Filter Element (m <sup>3</sup> /h)	20491	18340	16275	14844	13222	21171	18950	16937	15350	14337
Max.static pressure after radiator (Pa)	1500 Pa @1500rpm					3000 Pa @1800rpm				

**COOLING SYSTEM****Water circulation by centrifugal pump on engine**

Cooling method	Fresh water forced circulation
Coolant capacity	Engine only : Approx.23 lit, With Radiator (*Air On 43°C : Approx 114 lit )
Coolant flow rate	1040 liters / min @1800 rpm, 860 liters / min @1500 rpm
Pressure Cap	49 kPa
Coolant Capacity for Engine	26 L
Max.Permissible Temperature	90 °C
Max.Coolant warning Temperature	95 °C
Max.Coolant Shutdown Temperature	105 °C
Thermostat Open Temperature	71 °C
Max.external coolant system restriction	Not available

Two radiator options are provided, based on allowable maximum Air temperature On radiator inlet ( Air On 40 °C) Air On 50 °C

- ATB (Ambient Temperature before Boiling ) of generator set varies depending on the engine room ventilation design, even if the same radiator applied. Adequate selection of radiator options by means of the cooling test is highly recommended, and generator set makers are responsible for the selection.

**LUBRICATION SYSTEM****Force-feed lubrication by gear pump, lubricating oil cooling water circuit of engine**

Lub.Method	Fully forced pressure feed type
Oil filter	Full flow, cartridge type
Lube oil specification	CF-4
Lube oil pressure	Idle Speed : Min 160 kPa Governed Speed: Min 200 kPa
Maximum oil temperature	110 °C
Max.Permissible Oil Temperature	90 °C
Oil Consumption (as % of fuel consumption)	≤0.5
Oil capacity	78 L

**FUEL SYSTEM****In-line pump with integrated, HEINZMANN electromagnetic actuator**

Engine Model	D30AP	D30A	D30A1	D30A2	D30A3	D30BP	D30B1	D30B2	D30B3	D30B4
Governor	Electric type ( HEINZMANN Speed governor )									
Speed drop	G2 Class (ISO 8528)									
Feed pump	Mechanical type in injpump									
Injection nozzle	Multi hole type									
Opening pressure	28 MPa									
Fuel filter	Full flow, Cartridge type with water drain valve									
Maximum fuel inlet restriction	30 kPa									
Maximum fuel return restriction	60 kPa									
Fuel feed pump Capacity										
Fuel	Diesel fuel									
Fuel Consumption of generator set										
Standby power- 100% load (l/h)	295	268	248	224	197	301	274	250	219	206
Prime Power - 100% load (l/h)	266	241	223	200	175	272	248	224	197	180
- 75% load (l/h)	197	179	166	149	127	201	183	164	148	138
- 50% load (l/h)	138	125	116	104	91	145	131	116	104	96
- 25% load (l/h)	81	74	69	61	53	81	74	67	60	56
Continuous power - 100% load (l/h)	202	184	170	152	133	207	188	170	150	137
Lowest Fuel Consumption Ratio(g/kW.h)	225	210	198	197	198	228	217	205	197	197

**ELECTRICAL SYSTEM**

Charging Alternator Voltage	28V
Charging Alternator Capacity	45A
Voltage regulator	Built-in type IC regulator
Starting motor	11kW
Battery Voltage	24V
Battery Capacity	2 * 250 Ah ( recommended )
Starting aid (Option)	Block heater ( Min. Temperature for Unaided Cold Start -10°C )

**VALVE SYSTEM**

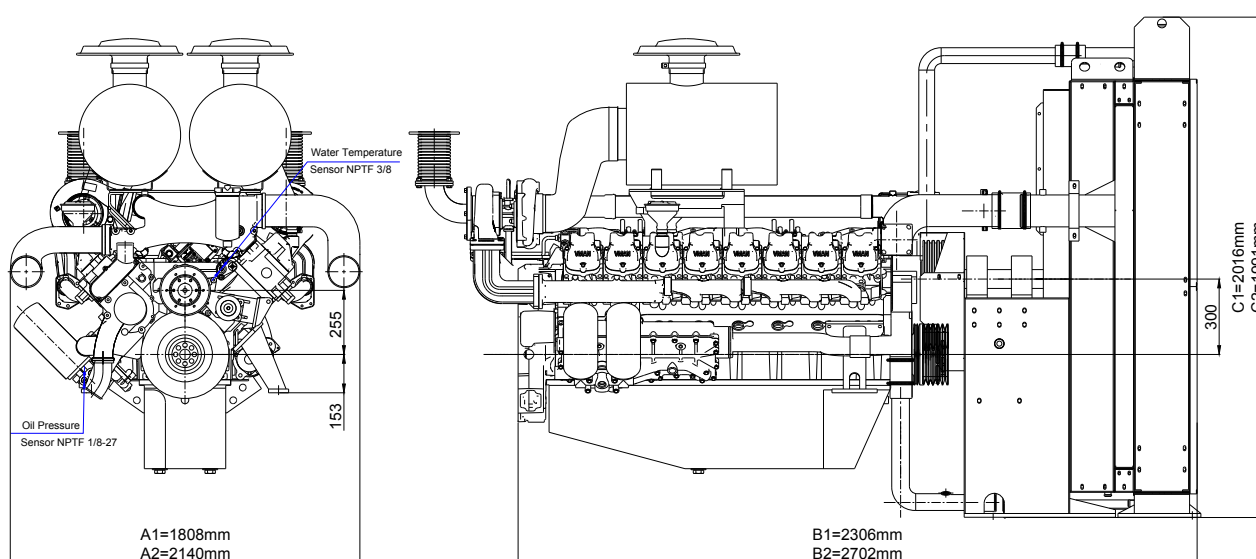
Type	Overhead valve type	
Number of valve	Intake 1, exhaust 1 per cylinder	
Valve lashes at cold	Intake 0.3 mm, Exhaust 0.4 mm	
Valve timing		
	Opening	Close
- Intake valve	24 deg.BTDC	36 deg.ABDC
- Exhaust valve	63 deg.BBDC	27 deg.ATDC

**Engine Data with Dry Exhaust Manifold (Standby Power)**

Engine Model	D30AP	D30A	D30A1	D30A2	D30A3	D30BP	D30B1	D30B2	D30B3	D30B4
Cooling Water Circulation	866 L/min (1500 rpm)					1040L/min (1800 rpm)				
Heat Rejection to Exhaust (kW)	898	839	773	701	614	916	856	782	685	644
Heat Rejection to Coolant (kW)	392	366	337	306	268	399	373	341	298	281
Heat Rejection to Intercooler (kW)	261	244	225	204	178	266	249	227	199	187
Radiated Heat to Ambient (kW)	143	134	124	112	98	147	137	125	109	103

**Engine Data with Dry Exhaust Manifold (Prime Power)**

Engine Model	D30AP	D30A	D30A1	D30A2	D30A3	D30BP	D30B1	D30B2	D30B3	D30B4
Cooling Water Circulation	866 L/min (1500 rpm)					1040L/min (1800 rpm)				
Heat Rejection to Exhaust (kW)	815	762	705	633	555	835	780	713	621	568
Heat Rejection to Coolant (kW)	355	332	307	276	242	364	340	311	271	248
Heat Rejection to Intercooler (kW)	236	221	205	184	161	243	227	207	180	165
Radiated Heat to Ambient (kW)	131	122	113	101	89	134	125	114	99	91

**D30 (V16) Series diesel engine drawing**

The size of A1 B1 C1 for D30A3 & D30B4

The size of A2 B2 C2 for D30AP D30A D30A1 D30A2 & D30BP D30B1 D30B2 D30B3



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