



Sales area exhaust certificate	[rpm]	1D42	1D50	1D81	1D81C	1D90E	1D90	1D90V
US EPA T4f/CARB constant		–	–	–	–	3000	–	–
USA EPA T4f variable		–	–	–	–	3000	–	–
Europe EU V constant		1500, 1800, 3000	3000	1500, 1800, 3000	1500, 1800, 3000	1500, 3000	1500, 1800, 3000	1500, 3000
Europe EU V variable		2000-3200	2400-3200	1500-3000	1500-3000	3000	1500-3000	2300-3000
Less regulated		1500-3600	1500-3600	1500-3600	1500-3000	3000	1500-3000	

Technical Data, Performance Table

Technical data		1D42	1D50	1D81	1D81C	1D90E	1D90	1D90V	
Type		Air-cooled 4 stroke diesel engine							
Cylinder		1							
Direct injection		mechanical	mechanical	mechanical	mechanical	electronical	mechanical	mechanical	
Position of crank shaft		horizontal						vertical	
Bore x stroke [mm / in]		90 x 70 / 3.54 x 2.76	97 x 70 / 3.82 x 2.76	100 x 85 / 3.94 x 3.35	100 x 85 / 3.94 x 3.35	104 x 85 / 4.09 x 3.35	104 x 85 / 4.09 x 3.35	104 x 85 / 4.09 x 3.35	
Displacement [l / cu in]		0.445 / 27.2	0.517 / 31.5	0.667 / 40.7	0.667 / 40.7	0.722 / 44.0	0.722 / 44.0	0.722 / 44.0	
Average piston speed @ 3000 rpm [m/s / ft/min]		8.5 / 1673							
Engine	Compression ratio	21.5 : 1						20.5 : 1	
	Lubrication oil consumption, related to full load	approx. 1 % of fuel consumption							
	Oil filling	max. [l / US qts]	1.2 / 1.27	1.5 / 1.59	1.9 / 2.0			1.6 / 1.7	
		min. [l / US qts]	0.8 / 0.85	1.0 / 1.06	1.0 / 1.06			0.9 / 0.95	
	Lowest idle speed [rpm]		approx. 800						
	Speed control	Static speed droop @ 3000 rpm	approx. 5%			configurable		approx. 5%	
		Control method	mechanical			CAN J1939, multi stage switch, analog		mechanical	
	Amount of combustion air @ 3000rpm approx. [kg/h / cfm] ¹		47.7 / 23.3	56.4 / 27.6	72.3 / 35		79.5 / 39		
	Amount of cooling air @ 3000 rpm approx. [kg/h / cfm] ¹		325.1 / 159	397.4 / 195	780.3 / 380	606.9 / 297	780.3 / 380		1083.7 / 530
	Installation information	Mass moment of inertia J _{engine} [kgm ² / lb ft ²]	Standard flywheel	0.24 / 5.67	0.41 / 9.7	0.51 / 12.05			
Heavy flywheel			0.28 / 7.08	—	0.63 / 14.9			—	
Starter [V]		12 [2.0 kW / 2.7 hp] 24 [3.0 kW / 4.0 hp]							
Alternator charging current @ 3000/1500 rpm [A]		approx. 9/4 [14 V] approx. 5/2 [28 V]			approx. 16/5 [14 V] approx. 9/4 [28 V]				
Battery capacity min. / max. [Ah]		45 / 88 [12 V] 36 / 55 [24 V]							
Dimensions	Engine with crankhandle start [kg / lb]	71 / 156.5	80 / 176.4	97 / 213.8	118 / 260.0	—	98 / 216.0	—	
	Engine with electric start [kg / lb]	78 / 172.0	83 / 183.0	105 / 231.4	126 / 277.7	107 / 235.9	106 / 233.6	106 / 233.6	
	L x W x H [mm / in]	357 x 432 x 500 / 14.1 x 17.0 x 19.7	357 x 432 x 512 / 14.1 x 17.0 x 20.2	373 x 472 x 599 / 14.7 x 18.6 x 23.6	505 x 523 x 591 / 19.9 x 20.6 x 23.2	373 x 505 x 599 / 14.7 x 19.9 x 23.6	373 x 472 x 599 / 14.7 x 18.6 x 23.6	583 x 486 x 429 / 23.0 x 19.1 x 16.9	

¹ For other speeds, there is a linear reduction in the air requirement. ² Power ratings include generator power



Technical Data, Performance Table

Technical data, performance table

Engine output [kW / hp]	[rpm]	1D42	1D50	1D81	1D81C	1D90E ²	1D90	1D90V
Blocked ISO brake horsepower (IFN) for intermittent loading according to ISO 3046-1. For variable speed.	3200	6.8 / 9.1	7.5 / 10.1	—	—	—	—	—
	3000	6.6 / 8.9	7.5 / 10.1	10.0 / 13.4	9.5 / 12.7	10.5 / 14.1	11.0 / 14.8	—
	2800	6.4 / 8.6	7.2 / 9.7	9.6 / 12.9	9.1 / 12.2	10.1 / 13.4	10.6 / 14.2	—
	2600	6.1 / 8.2	6.8 / 9.1	9.2 / 12.3	8.7 / 11.7	9.6 / 12.8	10.1 / 13.5	—
	2300	5.4 / 7.2	—	6.3 / 8.4	8.0 / 10.7	8.8 / 11.8	9.2 / 12.3	—
	2000	4.7 / 6.3	—	7.5 / 10.1	7.1 / 9.5	7.7 / 10.3	8.1 / 10.9	—
	1800	—	—	6.8 / 9.1	6.5 / 8.7	7.1 / 9.5	7.3 / 9.8	—
	1500	—	—	5.5 / 7.4	5.4 / 7.2	5.7 / 7.6	6.1 / 8.2	—
Blocked ISO brake horsepower (IFN) for intermittent loading according to ISO 3046-1. For constant speed.	3000	6.6 / 8.9	7.5 / 10.1	10.0 / 13.4	9.5 / 12.7	10.5 / 14.1	11.0 / 14.8	—
	1800	4.1 / 5.5	—	6.8 / 9.1	6.5 / 8.7	—	7.3 / 9.8	—
	1500	3.3 / 4.4	—	5.5 / 7.4	5.4 / 7.2	5.7 / 7.6	6.1 / 8.2	—
Blocked ISO brake horsepower (IFN) for intermittent loading according to ISO 3046-1. For variable speed. Less regulated markets	3600	7.0 / 9.4	7.5 / 10.1	10.1 / 13.5	—	—	—	—
	3000	6.6 / 8.9	7.5 / 10.1	10.1 / 13.5	9.6 / 12.9	10.5 / 14.1	11.2 / 15.0	—
	2800	6.4 / 8.6	7.2 / 9.7	9.7 / 13.0	9.2 / 12.3	10.1 / 13.4	10.7 / 14.3	—
	2600	6.1 / 8.2	6.8 / 9.1	9.3 / 12.5	8.8 / 11.8	9.6 / 12.8	10.3 / 13.8	—
	2300	5.4 / 7.2	6.0 / 8.0	8.4 / 11.3	8.1 / 10.9	8.8 / 11.8	9.5 / 12.7	—
	2000	4.7 / 6.3	5.2 / 7.0	7.6 / 10.2	7.1 / 9.5	7.7 / 10.3	8.4 / 11.3	—
	1800	4.1 / 5.5	4.6 / 6.2	6.8 / 9.1	6.5 / 8.7	7.1 / 9.5	7.6 / 10.2	—
	1500	3.3 / 4.4	3.7 / 5.0	5.5 / 7.4	5.4 / 7.2	5.7 / 7.6	6.4 / 8.6	—

¹For other speeds, there is a linear reduction in the air requirement. ²Power ratings include generator power