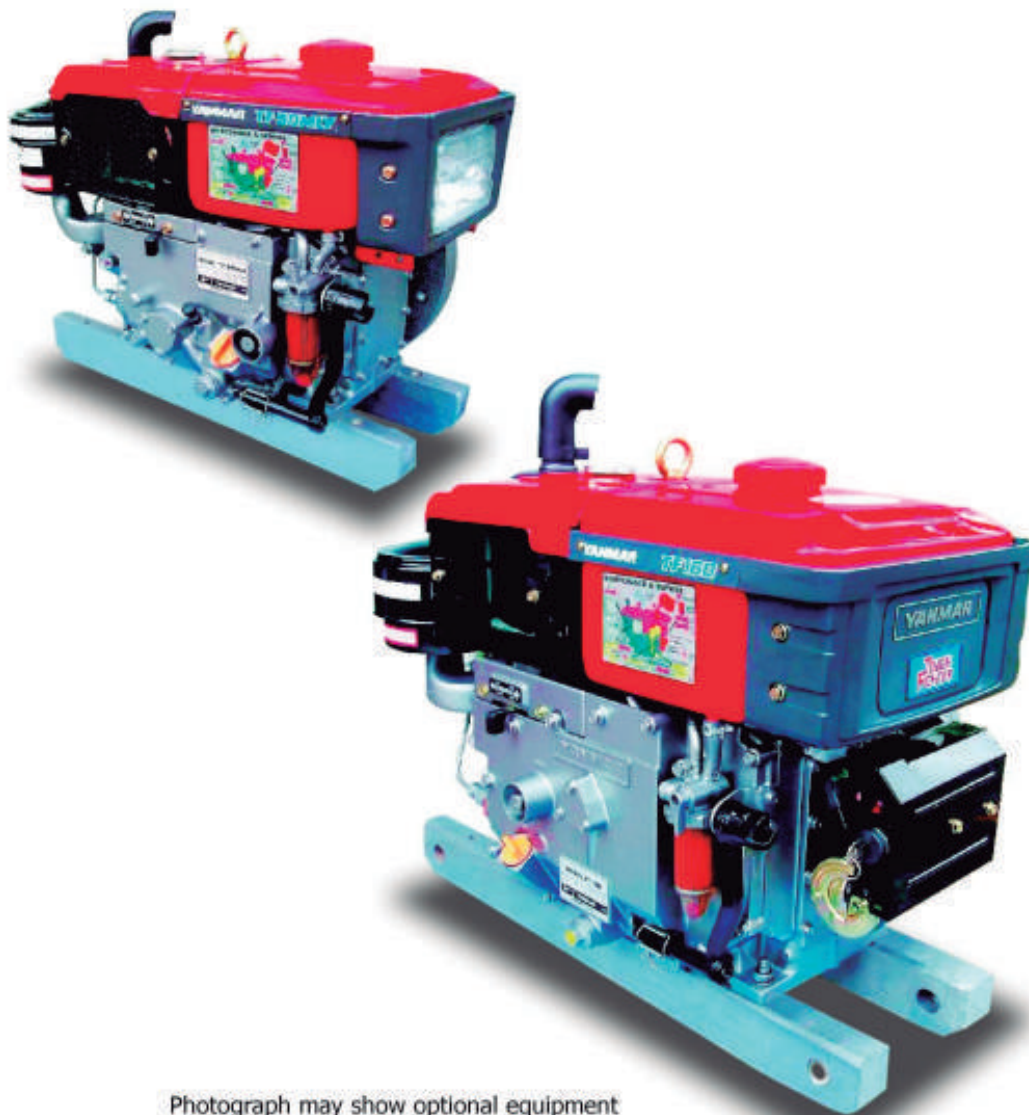


DIESEL ENGINES

TF (M), TS series

5.2 - 22.4 Kw (7 - 30hp)



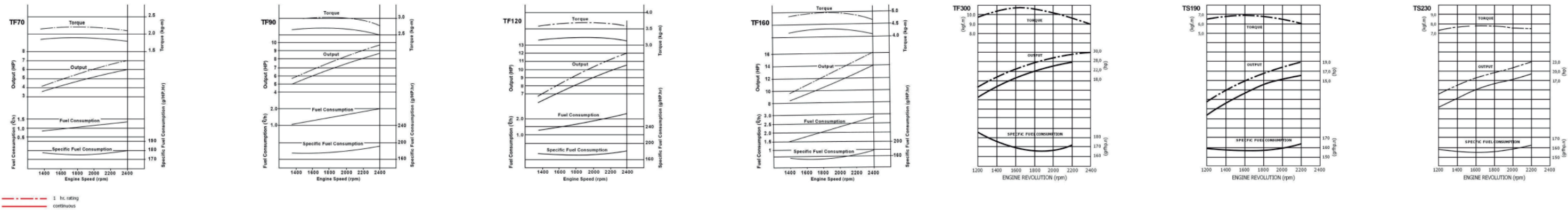
Photograph may show optional equipment

SPECIFICATIONS

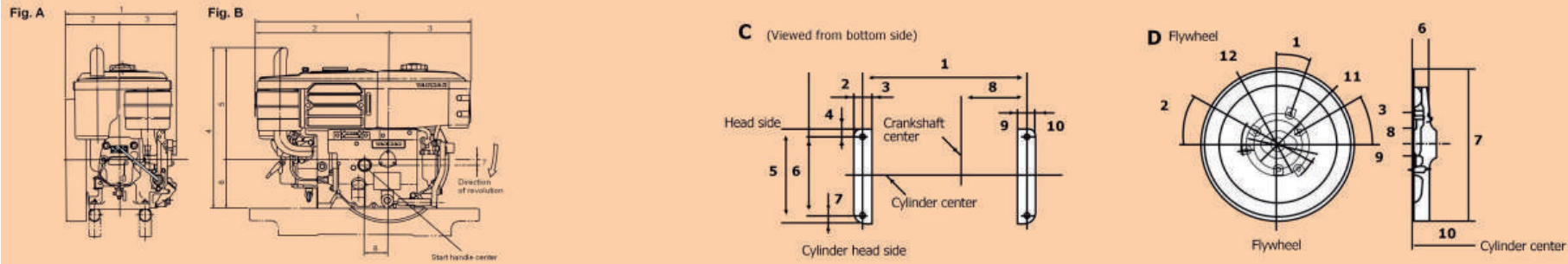
No.	Model	TF 70 H	TF 70	TF 70 L	TF 90 MH	TF 90 M	TF 90 MLY	TF 120 MH	TF 120 M	TF 160 H	TF 160	TF 300 H	TS 190 H	TS 190 R	TS 230 H	TS 230 R	
1	Type																
2	Combustion system																
3	Number of cylinder																
4	Injection timing	deg.	bTDC 17°			bTDC 18°			bTDC 17°			bTDC 20°	bTDC 19°				
5	Bore x stroke	mm	78 x 80			85 x 87			92 x 96		102 x 105		125 x 120		110 x 106		112 x 115
6	Displacement	lit.	0.382			0.493			0.638		0.857		1.472		1.007		1.132
7	Rated continuous output	hp / rpm (kW)	6.0 / 2400 (4.5)			8.5 / 2400 (6.3)			10.5 / 2400 (7.8)		14.0 / 2400 (10.4)		26.0 / 2200 (19.4)		16.0 / 2200 (11.9)		19.0 / 2200 (14.2)
8	At 1-hr. rated output	hp / rpm (kW)	7.0 / 2400 (5.2)			9.5 / 2400 (7.1)			12.0 / 2400 (9.0)		16.0 / 2400 (11.9)		30.0 / 2400 (22.4)		19.0 / 2200 (14.2)		23.0 / 2200 (17.2)
9	Maximum torque	kgf.m / rpm	2.48 / 1800			3.4 / 1600			4.42 / 1800		6.17 / 1600		10.99 / 1600		6.95 / 1600		7.75 / 1600
10	Compression ratio		18.1			18.0			17.7		17.8		15.5		16.3		16.1
11	Direction of crankshaft rotation																
12	Specific fuel consumption	gr / hp.h	175			170			169		155		171		162		
13	Fuel injection pump																
14	Injection pressure	kg / cm ²	Bosch Type 200														
15	Lubrication system	Forced lubrication with trochoid pump & hydroulic regulator valve															
16	F.O. tank capacity	lit.	7.1			10.5			11.0		14.3		29.5		16.6	13.7	21.5
17	Lubricating oil capacity (oil pan)	lit.	1.8			2.2			2.8		3.0		9.8		3.6		6.0
18	Lubricating oil applicable	API grade CB, CC or CD (SAE #30, 40, 50, 20W-50)															
19	Cooling water system		Hopper	Radiator		Hopper	Radiator		Hopper	Radiator		Hopper	Radiator		Hopper	Radiator	Hopper
20	Cooling water capacity	lit.	8.0	1.25		8.9	1.65		12.0	2.30		13.0	3.00		26.7	16.3	4.00
21	Starting system	Manual (hand starting) or electric starter (radiator type only)															
22	Dimensions :		607.5			672.0			695.0		776.0		954.5		881.5	894.5	963.5
	- length	mm															
	- width	mm	311.5			330.5			348.5		379.5		486.5		454.5		467.5
	- height	mm	469.0			496.0			530.0		621.0		795.5		660.0		657.0
23	Lamp	V - W / W			12 - 25 / 25			12 - 45 / 45									
24	Netto weight	kg	65.0	67.5	69.0	88.5	88.0	89.0	102.0	101.0	133.5	140.0	260.0	181.0	186.0	196.0	203.0

* For Hopper type only : This engine model is not specific sale for export, but it can sale for special demand only

PERFORMANCE CURVES



DIMENSIONS



Unit : mm (identify radiator with hopper dimensions)																																	
Model	A			B								C										D											
	1	2	3	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	11	12
TF 70	311.5	143	168.5	607.5	362	235	469	324	145	4	73.8	310	13	20	13	166	140	13	125	20	13	—	30°	30°	Ø146H7	Ø182H7	40	Ø 346	23	25	143	PC Ø124	PC Ø160
TF 90	330.5	150	180.5	672	404	258	496	344	152	7.3	75.1	340	15	20	15	190	160	15	135	20	15	20°	30°	30°	Ø146H7	Ø182H7	38	Ø 384	3	5	148	PC Ø124	PC Ø160
TF 120	348.5	162	186.5	695	434	251	530	365	165	10.2	84.4	370	15	25	15	200	170	15	150	25	15	20°	30°	30°	Ø146H7	Ø182H7	47	Ø 384	8	10	162	PC Ø124	PC Ø160
TF 160	379.5	177.5	202	776	476	290	621	441	180	18	87	420	15	25	15	215	185	15	170	25	15	—	30°	30°	—	Ø182H7	49	Ø 424	25	0	177.5	—	PC Ø160
TF 300	486.5	231.5	255	954.5	633.5	321	795.5	555.5	240	3.9	126.5	455	40	40	20	260	220	20	201	40	40	—	—	—	Ø182H7	Ø —	65	Ø 470	15	—	214.5	PC Ø160	—
TS 190	454.5	229	225.5	881.5	589.5	292	660	482	178	21.5	97.5	400	15	25	15	215	185	15	180	25	15	—	—	—	Ø182H7	Ø —	75	Ø 400	32	—	139	PC Ø160	—
TS 230	467.5	232.5	235.5	963.5	649	313	657	482	175	39.3	72.2	460	17	25	15	250	220	15	210	25	17	—	—	—	Ø182H7	Ø —	62	Ø 445	24	—	146	PC Ø160	—