

Technical Specifications

# ITSD-44

ITS Series Generators



### Features and Benefits

- Many years of experience in generator construction
- Diesel Engines with Advanced Technology and Quality
- Alternators with Advanced Technology and Quality
- Control Panel Suitable for Flexible Application
- High Quality and Reliable Technology
- Patented Compact Designed and Soundproof Canopy
- Suitable for Heavy-Duty
- Durability
- Wide Range of Affordable Spare Parts
- Low Noise Level
- Low Exhaust Emission
- Low Operating Cost
- Low Fuel Consumption
- Low Oil Consumption
- Tropical 50°C Radiator
- Fuel Filter with Water and Particle Separator
- First Class Product Support
- Global Technical Service and Maintenance Support



### Generator General Information

Generator	Frequency	Voltage	Power Factor	Speed	Diesel Engine		Alternator			Type of	Generator Output		
Model	Hz	V	CosQ	rpm	Brand	Model	Brand	Model	Series	Operation	kVA	kW	A
<b>ITSD-44</b>	<b>50</b>	231/400	0,8	1500	INTER	M54TD	GNP	GNP	180LA	Stand By	44,0	35,2	63,6
										Prime	40,0	32,0	57,8
										Continuous	28,0	22,4	40,5

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## INTER Diesel Engine Technical Parameters and Matching Parameters

### Diesel Engine Main Technical Parameters

#### General

Number of Cylinders		4
Configuration		Vertical, In Line
Aspiration		Turbocharged
Combustion System		Direct Injection
Compression Ratio		19.1:1
Bore	mm	90
Stroke	mm	100
Displacement	L	2,55
Governing Type		Mechanic
Governing Class		G2
Rotation		Counterclockwise
Firing Order		1-3-4-2
Emission		Tier II

#### Filters

Air Filter		Dry Type, Replaceable
Fuel Filter		With Water Separator
Oil Filter		Element Type, Particulate Trap

#### Electrical System

Voltage	V	12
Starter	kW	3,2
Alternator Output Amperes	A	25
Alternator Output Voltage	V	14
Batteries Capacity	Ah	55

#### Fan

Diameter	mm	400
Drive Ratio		1,25:1
Number of Blades		8
Material		Plastic
Type		Blowing

#### Cooling System

Radiator Type	50°C	Tropical
Total Coolant Capacity	L	13
Max. Perm. Coolant Outlet Temperature	°C	103
Max. Perm. Flow Resis. (Cool. System And Piping)	bar	0,5
Max. Temperature of Coolant Warning	°C	95
Max. Temperature of Coolant Shutdown	°C	98
Thermostat Operation Temperature - Initial Open	°C	68
Thermostat Operation Temperature - Full Open	°C	72
Delivery of Coolant Pump	m <sup>3</sup> /h	1,60
Min. Pressure Before Coolant Pump	bar	0,15
Radiator Face Area	m <sup>2</sup>	0,26
Rows	Row	2
Matrix Density	Per / Inch	15,5
Material		Aluminum
Width of Matrix	mm	440
Height of Matrix	mm	590
Pressure Cap Setting k	Pa	90
Estimated Cooling Air Flow Reserve	kPa	0,125
Engine Pre Heater Tube (with Circulation Pump)	W	1500

#### Lubrication System

Total System	L	8
Minimum Oil Level	L	7
Nominal Motor Operating Temperature	°C	40
Lubricating Oil Pressure (Rated Speed)	bar	5
Relief Valve Opens	kPa	352
Oil / Fuel Consumption Ratio	%	≤0,3
Normal Oil Temperature	°C	110

## Diesel Engine Matching Parameters

50 Hz @ 1500 r/min		Stand By	Prime
Gross Engine Power	kW	44,0	40,0
Net Engine Power	kW	41,0	36,7
Fan Power Consumption (Belt Pulley Driven)	kW	2,5	2,5
Other Power Loss	kW	1,0	0,8
Mean Effective Pressure	MPa	1,38	1,26
Intake Air Flow	m <sup>3</sup> / min	2,10	2,10
Exhaust Temperature Limit	°C	400	400
Exhaust Flow	m <sup>3</sup> / min	3,55	3,23
Boost Pressure Ratio		6,70	6,10
Mean Piston Speed	m / s	5,0	5,0
Cooling Fan Air Flow	m <sup>3</sup> / min	46,6	46,6
Typical Generator Output Power	kVA	44	40

Heat Rejection		Stand By	Prime
Energy In Fuel (Heat Of Combustion)	kW	113,0	102,0
Gross Heat To Power	kW	44,0	40,0
Energy To Coolant And Lubricating Oil	kW	28,4	25,5
Heat Dissipation Capacity*	kW	-	-
Energy To Exhaust	kW	33,1	29,8
Heat To Radiation	kW	7,6	6,8

\*Intake Intercooled System

## ITS POWER GENERATORS Alternator Technical Parameters and Specifications

### Alternator Technical Parameters

Insulation Class		H
Winding Pitch		2/3 - (N° 6)
Wires		12
Protection		IP 23
Altitude	m	1000
Overspeed	rpm	2250
Air Flow	m <sup>3</sup> /sec	0.095
Bearing Drive	N/A	-
Rotor Winding	100%	Copper

Field Control System		Self excited
A.V.R. Model	Standard	SX460
Voltage Regulation	%	± 1
Sustained Short-Circuit Current	10 sec	300% (3 IN)
Total Harmonic (*) TGH / THC	%	< 5
Wave Form :NEMA = TIF - (*)		< 50
Wave Form :I.E.C. = THF - (*)	%	< 2
Bearing Non - Drive	Bearing	6306-2RZ
Stator Winding	100%	Copper

(\*) Total harmonic content line to line, at no load or full rated linear and balanced load

ITS POWER GENERATORS synchron alternators are produced according to TSE 60034-1; IEC 60034-22; GB755; BS4999-5000; NEMA MG 1.22 standards

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### Alternator Specifications

50 Hz - 231/400V - Cos Q 0,8 - 1500 rpm

Standard Using Alternator			Optional Using Alternator						
Brand/Model	ITS POWER	180LA	Leroy Somer	TAL042E	Stamford	S1L2K			
Duty		Continuous				Stand By			
Ambient	C°	40°C				27°C			
Class/Temp. Rise	C°	H / 125° K				H / 163° K			
Series Star (V)	V	380/220	400/231	415/240	1 Phase	380/220	400/231	415/240	1 Phase
Parallel Star (V)	V	190/110	200/115	208/120	220	190/110	200/115	208/120	220
Series Delta (V)	V	220	230	240	230	220	230	240	230
Output Power	kVA	40,0	40,0	42,0	27,0	44,0	44,0	46,0	29,0
Output Power	kW	32,0	32,0	33,6	21,6	35,2	35,2	36,8	23,2

### Generator Dimensions

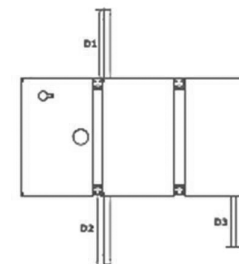
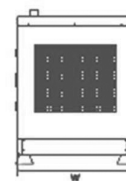
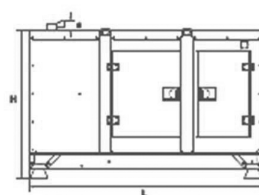
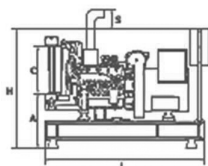
Values		Open Type Generator	Canopy Type Generator
Width	mm	622	1000
Length	mm	1600	2300
Height	mm	1329	1190
Weight (Net)	Kg	657	830
Fuel Tank Capacity	L	55	100



Control operator / Display panel

### Generator Technical Drawings

SYMBOL	OPEN	CANOPY
L	1600	2300
M	367	1000
H	1329	1190
N	429	450
P	529	550
R	429	450
C	450	450
D1	300	300
D2	300	300
D3	400	400
D4		
D5		



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## Diesel Engine and Genset Rating Classifications

The below ratings represent the engine performance capabilities to conditions specified in TS ISO 8528/1, 8528-4, 8528-5, 8528-8, BS5000, ISO 3046/1:1986, NEMA MG-1.22.1, BS 5514/1.

### STAND BY POWER RATING (ESP):

ESP is applicable for supplying emergency power for the duration of the utility power outage. No overload capability is available for this rating. Under no condition is an engine allowed to operate in parallel with the public utility at the Stand By Power rating. This rating should be applied where reliable utility power is available. A Stand By rated engine should be sized for a maximum of an 70% average load factor and 200 hours of operation per year. This includes less than 25 hours per year at the Stand By Power rating.

Stand By ratings should never be applied except in true emergency power outages. Negotiated power outages contracted with a utility company are not considered an emergency.

### PRIME POWER RATING (PRP):

Applicable for supplying electric power in lieu of commercially purchased power. Prime Power applications must be in the form of one of the following two categories:

#### UNLIMITED TIME RUNNING PRIME POWER (ULTP):

PRP (Prime Power) is available for an unlimited number of hours per year in a variable load application. Variable load should not exceed a 70% average of the Prime Power rating during any operating period of 250 hours. The total operating time at 100% Prime Power shall not exceed 500 hours per year. A 10% overload capability is available for a period of 1 hour within a 12-hour period of operation. Total operating time at the 10% overload power shall not exceed 25 hours per year.

#### LIMITED TIME RUNNING PRIME POWER (LTP):

LTP (Limited Time Prime Power) is available for a limited number of hours in a nonvariable load application. It is intended for use in situations where power outages are contracted, such as in utility power curtailment. Engines may be operated in parallel to the public utility up to 750 hours per year at power levels never to exceed the Prime Power rating. The customer should be aware, however, that the life of any engine will be reduced by this constant high load operation. Any operation exceeding 750 hours per year at the Prime Power rating should use the Continuous Power rating.

### CONTINUOUS POWER RATING (COP):

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

## PAY ATTENTION to the points below in picking and using the generator

- \* Generators can work on Continuous Power at 70% of Prime power value if only all maintenances are done on time with original spare parts and high quality oils that manufacturer advice.
- \* Generators should not operate below 50% of Prime Power value. In such a case, the engine will burn excessive oil and eventually have irreparable damage.
- \* If your need is 1000 kVA or above, you should prefer Synchronic Systems with 2-3 generators with failure back up and simultaneous aging.
- \* These points will provide advantage for you with purchasing and operating the generator.

### Fuel Consumption - Oil Recommendation and Oil Grades

Percent of Prime power	1500 rpm	
	g/kWh	l/hr
110%	245	11,7
100%	241	10,5
75%	245	8,0
50%	250	5,4

*Note: The density of diesel is 0,835 kg/L,*  
Fuel specification: BS 2869: Part 2 1998  
Class A2 or (DIN EN 590) ASTM D975 D2 Diesel.  
The fuel must be clean and without water)

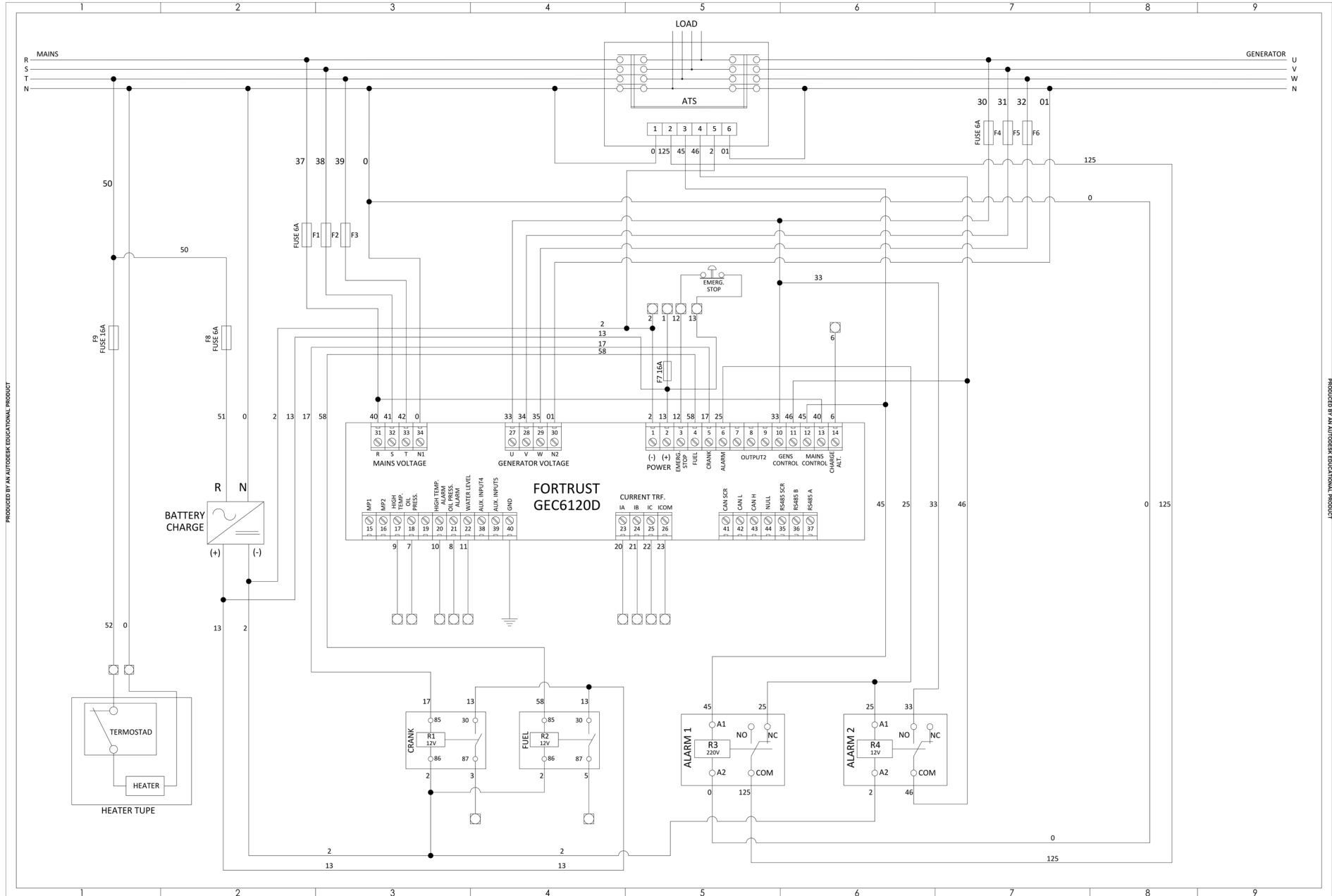
SAE GRADES																	
For Engine Oils Recommended in Relation with the Outside Temperature °C																	
-35	-30	-25	-20	-15	-10	-5	0	+5	+10	+15	+20	+25	+30	+35	+40	+45	+50
SAE 10W																	
SAE 20W																	
SAE 30W																	
SAE 40W																	
SAE 10W-30																	
SAE 10W-40																	
SAE 10W-60																	
SAE 15W-40 Mineral Base																	
SAE 15W-40 Semisynthetic Base																	
SAE 20W-60 Semisynthetic Base																	
SAE 5W-30 Synthetic Base																	
SAE 0W-30 Synthetic Base																	

ITS POWER GENERATORS Recommendation:  
SAE 15W40 to API C14 Viscosity Lubricating oil, mono-grade or multi-grade Diesel Engine oil



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