Low BTU Gas Genset

Low BTU Gas Genset of Tellhow EST

500-3300KW

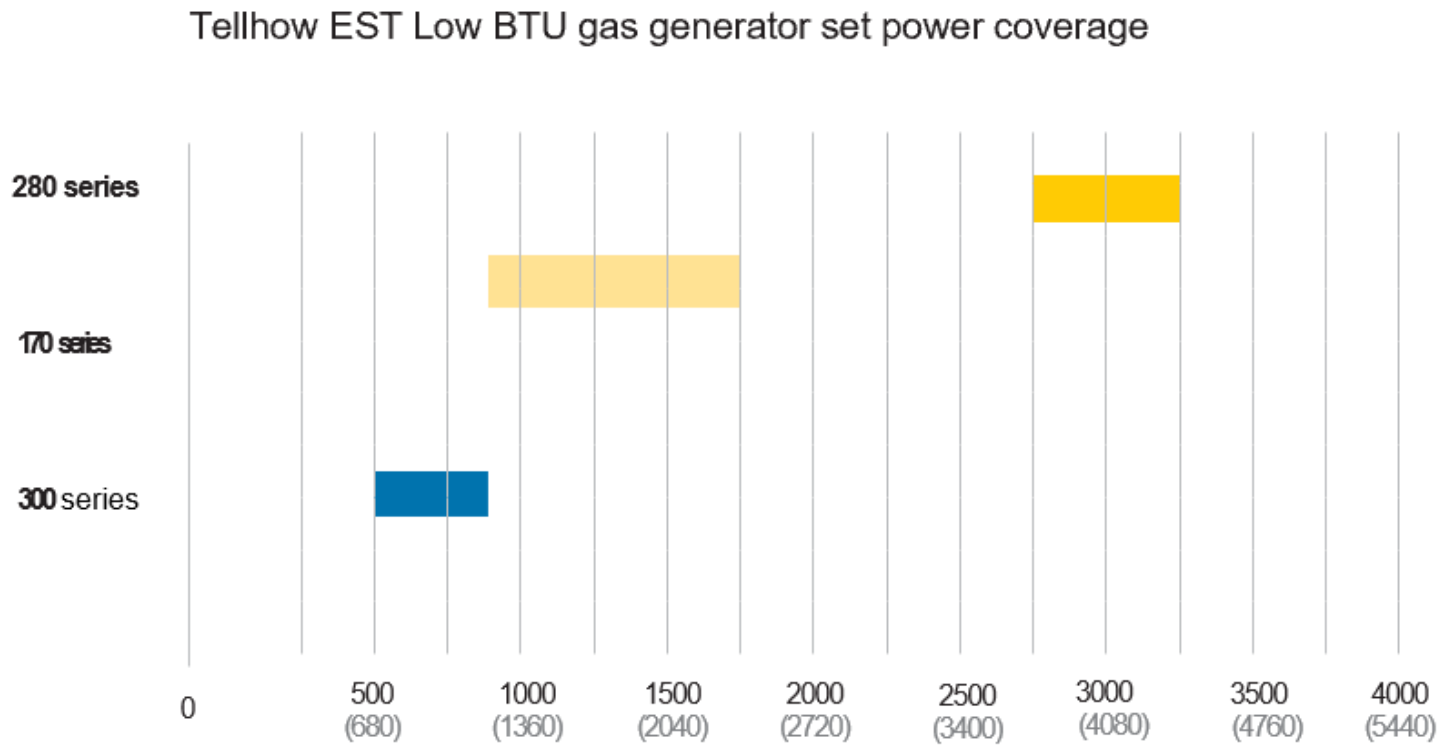
Low BTU Gas Genset

In the industrial field, there are many factory exhausts with a certain calorific value. For example, biomass pyrolysis gas, coke oven gas, blast furnace gas, ferroalloy tail gas, yellow phosphorus tail gas and blue carbon tail gas. We call it low BTU fuel. These fuels have two characteristics: one is the low calorific value, which is only 20% or even lower than natural gas; the other is the complex composition, including high deflagration H_2 and highly toxic CO in addition to methane. These two characteristics will make it difficult for high-speed engine to run. But the potential of this market is very huge, and it is also the main demand of the energy conservation and emission reduction market.

According to the complexity of this kind of fuel, the team of Tellhow EST united with domestic engine factories to develop a series of products with large cylinder diameter, long piston travel and low rated speed. The key components of the products are carburized, nitride and lined with zinc plate, which greatly improves the tolerance of the engine to complex fuels.

Considering the huge output of low calorific value gas, the products launched by Tellhow EST team are mainly high-power. It includes seven models of 500kW, 800kW, 900KW, 1300KW, 1650kW, 2475KW and 3300kW. Please refer to the table below for specific technical parameters.

Low BTU Gas Genset



ES 500X5 Gas Genset

Engine model			8300D/MJ
Cylinder arrangement			I 8
Bore		mm	300
Displacement		dm^3	215
Engine power[2)]		kW	660
Rated speed		r/min	600
Electrical efficiency		MJ/KWH	≤12
Direction of rotation (viewed from flywheel end)			Clockwise
Starting mode:			Compressed air starting
Exhaust temperature		℃	≤630
Gas inlet pressure		kPa	≥2.0
Gas inlet temperature		℃	≤40
Average consumption of oil @100% load		g/kWh	≤0.8
Genset parament			
Output power [5)]		kW	500
Rated Voltage		V	400
Rated current		A	902
Excitation			Brushless self-excitation
Connection mode			3 phase 4 wire
Voltage steady state speed regulation rate		%	±2.5
Voltage transient speed regulation rate		%	±15
Voltage stability time		s	≤1.5
Voltage fluctuation rate		%	≤0.5
Frequency steady state speed regulation rate		%	≤5（0～5 Adjustable）
Frequency transient speed regulation rate		%	±10
Frequency stabilization time		s	≤7

Introduction

Compared with natural gas, the biggest feature of low calorific value fuel is high hydrogen content, high CO content, and low hydrocarbon content. In order to enable reciprocating engines to burn this type of fuel. We choose a low-speed engine, by modifying the cylinder structure, adjusting the ignition method, etc., so that the engine can run stably.

ES 500 X5 gas generator set uses 8300D engine as power, which can bring good economic benefits to customers.

Model			ES 500 X5
Dimensions			
Length	Approx.	mm	6400
Width	Approx.	mm	1600
Height	Approx.	mm	2900
Net weight	Approx.	kg	22000

Stability description

The main features of the 8300 engine are large cylinder bore (300mm), long piston stroke (380mm), and low rated speed (600 rpm). It can fully mix and burn complex high-hydrogen gas in the cylinder.

Using the "internal mixing" technology developed by Tellhow EST, the gas and air are directly sucked into the cylinder from the two intake pipes to perform work. It can effectively avoid the possibility of mixed deflagration of high-hydrogen gas outside the cylinder.

The rated speed of the generator set is only 600 revolutions per minute, which greatly reduces the mechanical wear of moving parts such as bearing bushes, cylinder liners, pistons, valve seats, and prolongs the service life of the parts. The annual operating time of the unit can reach 7,500 hours, and the overhaul period can reach 50,000 hours.

ES 800X5 Gas Genset

Engine model			9300D/M
Cylinder arrangement			I 9
Bore		mm	300
Displacement		dm^3	242
Engine power[2)]		kW	880
Rated speed		r/min	750
Electrical efficiency		MJ/KWH	≤11
Direction of rotation (viewed from flywheel end)			Clockwise
Starting mode:			Compressed air starting
Exhaust temperature		℃	≤630
Gas inlet pressure		kPa	≥2.5
Gas inlet temperature		℃	≤40
Average consumption of oil @100% load		g/kWh	≤0.8
Genset parament			
Output power [5)]		kW	800
Rated Voltage		V	400
Rated current		A	1443.4
Excitation			Brushless self-excitation
Connection mode			3 phase 4 wire
Voltage steady state speed regulation rate		%	±2.5
Voltage transient speed regulation rate		%	±20
Voltage stability time		s	≤5
Voltage fluctuation rate		%	≤1
Frequency steady state speed regulation rate		%	≤5 (0～5 Adjustable)
Frequency transient speed regulation rate		%	-20～+12
Frequency stabilization time		s	≤10

Introduction

Compared with natural gas, the biggest feature of low calorific value fuel is high hydrogen content, high CO content, and low hydrocarbon content. In order to enable reciprocating engines to burn this type of fuel. We choose a low-speed engine, by modifying the cylinder structure, adjusting the ignition method, etc., so that the engine can run stably.

ES 800 X5 gas generator set uses 9300D engine as power, which can bring good economic benefits to customers.

Model			ES 800 X5
Dimensions			
Length	Approx.	mm	8500
Width	Approx.	mm	1900
Height	Approx.	mm	3400
Net weight	Approx.	kg	41000

Stability description

The main features of the 9300 engine are large cylinder bore (300mm), long piston stroke (380mm), and low rated speed (600 rpm). It can fully mix and burn complex high-hydrogen gas in the cylinder.

Using the "internal mixing" technology developed by Tellhow EST, the gas and air are directly sucked into the cylinder from the two intake pipes to perform work. It can effectively avoid the possibility of mixed deflagration of high-hydrogen gas outside the cylinder.

The rated speed of the generator set is only 600 revolutions per minute, which greatly reduces the mechanical wear of moving parts such as bearing bushes, cylinder liners, pistons, valve seats, and prolongs the service life of the parts. The annual operating time of the unit can reach 7,500 hours, and the overhaul period can reach 50,000 hours.

ES 900X5 Gas Genset

Engine model			12V170
Engine power[2)]		kW	932
Rated speed		r/min	1500
BMEP		MPa	1.72
Exhaust temperature		℃	≤500
Wet exhaust flow	Approx.	kg/h	4706
Combustion air flow	±8%	kg/h	4544
Intake air temperature after intercooling	±5	℃	50
Ventilation [3)]	Approx.	kg/h	25325
Technical parameters of engine			
Bore / stroke		mm	170/195
Displacement		dm^3	53.1
Average piston speed		m/s	9.75
Lubricating oil capacity [4)]		dm^3	180
Average consumption of oil @100% load		g/kWh	≤0.4
Alternator			
Efficiency [5)]		%	96.6
Energy balance			ES 900 N5
Output power [5)]		kW	900
Power of HT	±8%	kW	533
Power of LT	±8%	kW	88
Power of exhaust (to 120 ℃)	±8%	kW	521
Radiated heat of engine	Approx.	kW	35
Radiant heat of alternator	Approx.	kW	32
Fuel consumption	±5%	kW	2368
Electrical efficiency		%	38.0
Thermal efficiency		%	46.7
Total efficiency		%	84.7

Introduction

Tellhow EST has optimized the design of the 170 series gas engine in the application scenarios of low-calorific value gas in order to reduce the user's use cost to adapt it to fuels with high hydrogen content. The engine can be operated at reduced power under the premise of only adjusting the software settings. There are already more than 200 operating cases.ES 900X5 uses ES 12V170 engine as power. When this unit uses Low BTU fuel, the power generation efficiency can reach 38.0%.

Model			ES 900 X5
Dimensions			
Length	Approx.	mm	5300
Width	Approx.	mm	1700
Height	Approx.	mm	2300
Net weight	Approx.	kg	13000

Higher efficiency

The power efficiency of the unit is as high as 38.0% as LOW BTU fuel, the highest in the country of the same type, and the comprehensive energy utilization rate exceeds 84%.

Low emissions

NOx emission index is less than 500mg/Nm^3

High reliability

Except for the cylinder block, cylinder head, crankshaft, connecting rod, camshaft, the main moving parts and large parts are the same as the foreign supply system of the same unit accessories, such as: turbocharger, moving parts, cylinder head assembly, combustion chamber, electronic control For systems, generators, safety protection systems, etc., the unit overhaul cycle is 45,000 hours, and the annual operating hours is as high as 7500-7800 hours.

Low maintenance cost

The parts have a long service life, and the prices of commonly used after-sales parts are much lower than those of foreign suppliers.

Low lubricating oil consumption

Lubricating oil consumption is less than 0.3g/kwh

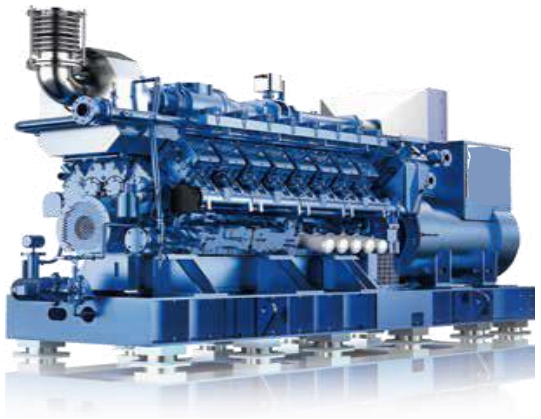
ES 1300X5 Gas Genset

Engine model			16V170
Engine power[2]		kW	1344
Rated speed		r/min	1500
BMEP		MPa	1.71
Exhaust temperature		℃	≤500
Wet exhaust flow	Approx.	kg/h	7191
Combustion air flow	±8%	kg/h	2931
Intake air temperature after intercooling	±5	℃	50
Ventilation [3]	Approx.	kg/h	32053
Technical parameters of engine			
Bore / stroke		mm	170/195
Displacement		dm^3	70.8
Average piston speed		m/s	9.75
Lubricating oil capacity [4]		dm^3	240
Average consumption of oil @100% load		g/kWh	≤0.4
Alternator			
Efficiency [5]		%	96.7
Energy balance			ES 1300 X5
Output power [5]		kW	1300
Power of HT	±8%	kW	833
Power of LT	±8%	kW	117
Power of exhaust (to 120 ℃)	±8%	kW	827
Radiated heat of engine	Approx.	kW	48
Radiant heat of alternator	Approx.	kW	46
Fuel consumption	±5%	kW	3412
Electrical efficiency		%	38.1
Thermal efficiency		%	46.5
Total efficiency		%	84.6

Introduction

Tellhow EST has optimized the design of the 170 series gas engine in the application scenarios of low-calorific value gas in order to reduce the user's use cost to adapt it to fuels with high hydrogen content. The engine can be operated at reduced power under the premise of only adjusting the software settings. There are already more than 200 operating cases.

ES 1300X5 uses ES 16V170 engine as power. When this unit uses Low BTU fuel, the power generation efficiency can reach 38.1%.



Model			ES 1300 X5
Dimensions			
Length	Approx.	mm	6150
Width	Approx.	mm	1700
Height	Approx.	mm	2615
Net weight	Approx.	kg	15000

Higher efficiency

The power efficiency of the unit is as high as 38.0%, the highest in the country of the same type, and the comprehensive energy utilization rate exceeds 84%.

Low emissions

NOx emission index is less than 500mg/Nm^3

High reliability

Except for the cylinder block, cylinder head, crankshaft, connecting rod, camshaft, the main moving parts and large parts are the same as the foreign supply system of the same unit accessories, such as: turbocharger, moving parts, cylinder head assembly, combustion chamber, electronic control For systems, generators, safety protection systems, etc., the unit overhaul cycle is 45,000 hours, and the annual operating hours is as high as 7500-7800 hours.

Low maintenance cost

The parts have a long service life, and the prices of commonly used after-sales parts are much lower than those of foreign suppliers.

Low lubricating oil consumption

Lubricating oil consumption is less than 0.3g/kwh

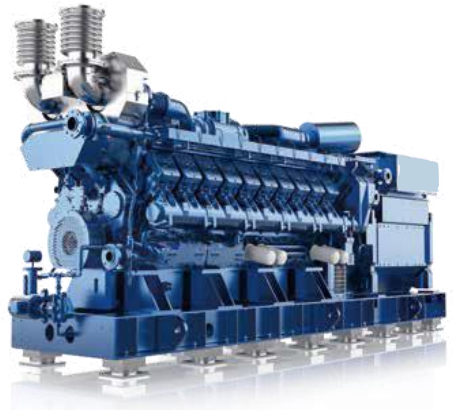
ES 1650X5 Gas Genset

Engine model			20V170
Engine power[2)]		kW	1700
Rated speed		r/min	1500
BMEP		MPa	1.68
Exhaust temperature		℃	≤500
Wet exhaust flow	Approx.	kg/h	8776
Combustion air flow	±8%	kg/h	8492
Intake air temperature after intercooling	±5	℃	50
Ventilation [3)]	Approx.	kg/h	45346
Technical parameters of engine			
Bore / stroke		mm	170/195
Displacement		dm^3	88.5
Average piston speed		m/s	9.75
Lubricating oil capacity [4)]		dm^3	300
Average consumption of oil @100% load		g/kWh	≤0.3
Alternator			
Efficiency [5)]		%	97.1
Energy balance			ES 1650 X5
Output power [5)]		kW	1650
Power of HT	±8%	kW	1041
Power of LT	±8%	kW	154
Power of exhaust (to 120 ℃)	±8%	kW	950
Radiated heat of engine	Approx.	kW	68
Radiant heat of alternator	Approx.	kW	51
Fuel consumption	±5%	kW	4034
Electrical efficiency		%	40.9
Thermal efficiency		%	44.6
Total efficiency		%	85.5

Introduction

Tellhow EST has optimized the design of the 170 series gas engine in the application scenarios of low-calorific value gas in order to reduce the user's use cost to adapt it to fuels with high hydrogen content. The engine can be operated at reduced power under the premise of only adjusting the software settings. There are already more than 200 operating cases.

ES 1800X5 uses ES 20V170 engine as power. When this unit uses Low BTU fuel, the power generation efficiency can reach 40.9%.



Model			ES 1650 X5
Dimensions			
Length	Approx.	mm	7320
Width	Approx.	mm	1700
Height	Approx.	mm	2615
Net weight	Approx.	kg	17000

Higher efficiency

The power efficiency of the unit is as high as 40%, the highest in the country of the same type, and the comprehensive energy utilization rate exceeds 85%.

Low emissions

NOx emission index is less than 500mg/Nm^3

High reliability

Except for the cylinder block, cylinder head, crankshaft, connecting rod, camshaft, the main moving parts and large parts are the same as the foreign supply system of the same unit accessories, such as: turbocharger, moving parts, cylinder head assembly, combustion chamber, electronic control For systems, generators, safety protection systems, etc., the unit overhaul cycle is 45,000 hours, and the annual operating hours is as high as 7500-7800 hours.

Low maintenance cost

The parts have a long service life, and the prices of commonly used after-sales parts are much lower than those of foreign suppliers.

Low lubricating oil consumption

Lubricating oil consumption is less than 0.3g/kwh

ES 2475X5 Gas Genset

Genset model			ES 2475 X5
Rated power:	2700 kW (NG)	Operating power:	2475 kW (syngas)
Rated power factor:	0.8 lagging	Speed of generator set:	1000 rpm
Rated voltage:	10500 V	Gas consumption:	9026 kJ/kWh
Phase number and connection:	3 phases, star	Generation efficiency:	36.56% （Standard）
Rated current:	226 A	Oil consumption rate:	Above 0.60 g/kWh
Rated frequency:	50 Hz	Exhaust temperature:	420～470 ℃
Mechanical noise:	100～108 dBA	Cooling mode:	Closed double circuit forced cooling
Connection mode:	Elastic coupling	Operation mode:	Remote electronic control
Speed regulation	Digital speed control technology	Voltage regulation	AVR
Ignition mode:	Digital ignition technology	Annual operation time:	Above 7500 h
Start mode:	Compressed air motor start	Trouble free operation time:	720
Unit weight:	51000 kg±5%	Dimension:	7800×2150×3450mm

Introduction

Due to the application scenarios of low-calorific value fuels, they often have a large power generation scale. Therefore, Tellhow EST uses 280 series gas engines with independent intellectual property rights in high-power industries (such as coke oven gas). The 280 series engine is optimized on the basis of MAN's 16V280 engine and adopts an internal mixing combustion method, which can be well adapted to fuels with high hydrogen content. Currently in China, the equipment that has been put into operation has reached 100MW.

ES 2475X5 uses ES 12V280 engine as power. When the machine uses low BTU fuel, the power generation efficiency can reach 36.5%.

Advanced engine

The gas engine adopts MAN's advanced engine technology and is licensed in China according to military standards. It has been used in China for over 30 years. It has significant advantages such as compact structure, small size, high power, convenient maintenance and long service life.

Control System

ES 2475X5 gas generator set adopts digital governor, high-energy digital ignition system, high-performance PLC control module and large-screen color LCD display.

Stability

ES 2475X5 can output COP 2475KW @ atmospheric pressure of 100kPa, ambient temperature of 25°C, and air relative humidity of 30%. Unlimited running time.

Low emission

It can meet the index of NOx less than 400mg/Nm^3, which is better than European standards.

Low maintenance cost

It can reach 0.1 yuan/KWH. (The data can only be guaranteed by signing an operation and maintenance contract with our company)

ES 3300X5 Gas Genset

Genset model			ES 3300 X5
Rated power:	3600 kW (NG)	Operating power:	3300 kW（syngas）
Rated power factor:	0.8 lagging	Speed of generator set:	1000 rpm
Rated voltage:	10500 V	Gas consumption rate:	9847% kJ/kWh
Phase number and connection:	3 phases, star	Generation efficiency:	36.56%（Standard）
Rated current:	247 A	Oil consumption rate:	Above 0.60 g/kWh
Rated frequency:	50 Hz	Exhaust temperature:	420～470 ℃
Mechanical noise:	102～110 dBA	Cooling mode:	Closed double circuit forced cooling
Connection mode:	Elastic coupling	Operation mode:	Remote electronic control
Speed regulation	Digital speed control technology	Voltage regulation	AVR
Ignition mode:	Digital ignition technology	Annual operation time:	Above 7500 h
Start mode:	Compressed air motor start	Trouble free operation time:	720
Unit weight:	54000 kg±5%	Dimension:	8712×2244×3722mm

Introduction

Due to the application scenarios of low-calorific value fuels, they often have a large power generation scale. Therefore, Tellhow EST uses 280 series gas engines with independent intellectual property rights in high-power industries (such as coke oven gas). The 280 series engine is optimized on the basis of MAN's 16V280 engine and adopts an internal mixing combustion method, which can be well adapted to fuels with high hydrogen content. Currently in China, the equipment that has been put into operation has reached 100MW.

ES 3300X5 uses ES 16V280 engine as power. When the machine uses low BTU fuel, the power generation efficiency can reach 36.5%.

Advanced engine

The gas engine adopts MAN's advanced engine technology and is licensed in China according to military standards. It has been used in China for over 30 years. It has significant advantages such as compact structure, small size, high power, convenient maintenance and long service life.

Control System

ES 3300X5 gas generator set adopts digital governor, high-energy digital ignition system, high-performance PLC control module and large-screen color LCD display.

Stability

ES 3300X5 can output COP 3300KW @ atmospheric pressure of 100kPa, ambient temperature of 25°C, and air relative humidity of 30%. Unlimited running time.

Low emission

It can meet the index of NOx less than 400mg/Nm^3, which is better than European standards.

Low maintenance cost

It can reach 0.1 yuan/KWH. (The data can only be guaranteed by signing an operation and maintenance contract with our company)

Company vision

We hope and work hard to make our products contribute to China's goal of "carbon neutral, carbon peak" as soon as possible. In order to show that we are a responsible company, we must shoulder a mission: "give priority to the use of advanced technology, products and services, so as to improve the customer experience.". We hope that our small power gas generator sets can provide customers with more competitive procurement costs under the same excellent quality.

Low BTU Gas Genset

THANK YOU !

Energy solutions experts around you, Tellhow EST

www.tellhowest.com

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