

Main configuration and features:

- Highly efficient gas engine
- AC synchronous alternator
- Gas safety train and gas protection device against leakage
- Exhaust and jacket water heat exchanger
- Heating water and jacket water circulation system
- Expansion tank and water jacket heater
- Advanced engine control system, including: ignition system, detonation control system ,speed control system , air/fuel ratio control system and cylinder temp. protection system
- Strict shop test for all CHP unit
- Ventilation fan
- Industrial silencer reduces the noise by 12-20dB(A)
- Unattached switch cabinet and electric control cabinet
- Multi-functional control system with easy operation
- Data communication interfaces integrated into control system
- Lighting and smoke alarm system
- Monitoring battery voltage and charging automatically
- Auto refilling oil system
- Bus interface for connecting to higher level control unit



Power and efficiency @50Hz

Electric power -kW	70	Electric efficiency	35.5%
Heat power-kW	101.5	Heat efficiency	51.5%
Input power -kW	197.2	Total efficiency	87.0%

Soundproof canopy and control cabinet

Structure Type	Soundproof canopy
Spraying Process	High quality powder coating
Electrical control cabinet	Integrated into canopy,IP54
Noise level@7m, dB(A)	57

Dimension and weight

Dimension (LxWxH) , mm	2850x990x1800
Weight ,kg	1650

Special statement :

- 1、 The technical data are based on natural gas with a lower calorific value of 36MJ/N.m³. The technical data indicated is based on standard conditions according to ISO8528/1, ISO3046/1 and BS5514/1.
- 2、 The technical data is measured in standard conditions:
Absolute atmospheric pressure:100kPa
Ambient temperature:25°C
Relative air humidity:30%
- 3、 Rating adaptation at ambient conditions acc to DIN ISO 3046/1.
The tolerance for the specific fuel consumption is + 5 % at rated output.
- 4、 Dimension and weight above are just for standard product, and may be subject to change. As this document is used only for presale reference, take the specification supplied by Smart Action before ordering as final.

Fuel and emission

Fuel type	Natural gas
Methane number	MN > 80
Excess air factor (Lambda)	1. 47
NOx , mg/Nm ³	≤500
CO , mg/Nm ³	≤1000
HCHO (formaldehyde) , mg/Nm ³	≤60
NMHC , mg/Nm ³	≤150
Fuel consumption @100% load, m ³ /h	21.2
Supply gas pressure range (gage pressure), kPa	2~7

CHP Unit performance data and manufacturing technology

CHP unit model	AB70NSC	Power and efficiency			
Electric output power (kW)	70	Load	100%	75%	50%
Heat output power (kW)	101.5	Electric power (kW)	70	52.5	35
CHP unit electric efficiency	35.5%	Heat power (kW)	108.8	82.1	66
CHP unit heat efficiency	51.5%	Energy input (kW)	211.3	155.8	120
CHP unit total efficiency	87.0%	Electric efficiency	35.5%	33.7%	31.2%
Overload run-time at 1.1xSe(hour)	1	Heat efficiency	51.5%	52.7%	54.8%
Steady-state voltage deviation	≤±1%	Total efficiency	87.0%	86.4%	86.0%
Transient-state voltage deviation	-15%~20%	Manufacturing technology <ul style="list-style-type: none"> ● Special welded base frame, inner vibration isolators and design for whole lifting ● With high quality paint, enduring brightness as well resistance against abrasion and defacing ● Installation manual, operation and maintenance manual circuit diagram Standards and certificate <ul style="list-style-type: none"> ● ISO3046 , ISO8528 , GB2820 ● BS5000PT99 , AS1359 , IEC34 ● ISO9001:2008 quality system certification 			
Voltage recovery time(s)	≤4				
Voltage unbalance	1%				
Steady-state frequency regulation	±0.5%				
Transient -state frequency regulation	±5%				
Frequency recovery time(s)	≤3				
Steady-state frequency band	0.5%				
Recovery time response(s)	0.5				
Telephone interference factor(TIF)	≤50				
Telephone harmonious factor(THF)	≤2% , as per BS4999				

AC alternator performance data

Alternator brand	Leroy-Somer	Voltage	Power
Alternator model	LSA44.2VS3	380V	72 kW
Rated output power (kW)	72	400V	72 kW
Power factor	0.8	415V	72 kW
Rated current @ 380V and 100% load (A)	137	440V	64 kW
Excitation system	Brush-less		
THF (BS EN60034- 1)	<2%		
Bearing number	1		
Winding material	100% copper		
Wiring connection	Star		
Rotor insulation class	H		
Winding pitch	2/3		
A.V.R. model	R438		
Voltage fluctuation(no load to full load)	± 0.5%		
Housing protection	IP23		
TIF (NEMA MG 1-22)	<50		
Excitation method	PMG		
Rated ambient temperature(°C)	40		
Rated stator temperature rise(°C)	125		

Efficient gas engine

General data

NO. of cylinders		4
Engine type	4-stroke, turbo charged and air to water cooled, lean burn	
Cylinder arrangement		In line
Bore x stroke	mm	108x125
Displacement	L	4.58
Compression ratio		11: 1
Rated speed	rpm	1500
Rated output power	kW	80
Excess air factor		1.47
Rotation direction	Anti-clockwise viewed on flywheel	
Ignition timing	°BTDC	18

Cooling system

Coolant refilling capacity	L	12
Max. jacket water operating pressure	kPa	200
Min. jacket water circulation flow	L/min	137
Min. jacket water temperature	°C	80
Max. jacket water temperature	°C	88
Max. jacket water difference(inlet-outlet)	K	6
Coolant type	Mixture of 40 % antifreeze and 60% clean fresh water. Lower ambient temperature, higher content of antifreeze.	

Induction/exhaust system

Exhaust flow(wet)	kg/h	392
Combustion air flow	kg/h	377
Exhaust temperature	°C	450
Max. exhaust back pressure	mbar	40
Max. suction restriction	mbar	15

Fuel control system

Gas train, Including:	ball valves
	filters
	gas pressure gauge
	safety solenoid valves
	constant pressure regulator etc
	gas pressure relief valve

Lubrication system

Max. refilling capacity	L	13
Min. refilling capacity	L	9
Max. consumption	kg/h	0.1
Lubrication oil pump	Gear driven	

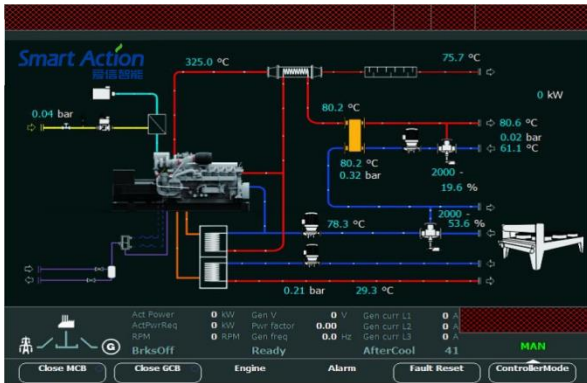
Ignition system

Ignition type	Electronic ignition system	
Polarity	Negative earth	
Spark plug	Separate for every cylinder	

Fuel: Natural Gas – LHV = 36MJ/m³

SAC-300 control system

Open control system is adopted with touch screen display , and various functions, including: engine protection and control, paralleling between gensets or gensets and mains, and CHP control functions, as well as communication functions , etc.



Main functions

- Engine monitor : coolant, lubrication, exhaust, battery
- Supply gas circuit monitor :pressure, temperature and CH4 content
- Auto paralleling and load share
- Voltage and PF control
- Alternator data : U, I, Hz, kW, kVA, kVAr, PF, kWh, kVAh
- Grid data : U, I, Hz, kW, kVAr, PF
- Modbus communication protocol based on RS232 and RS485 interfaces
- Internet connection
- Internet monitor, auto orientation
- 1000 history events log

Advantages

- Accordant with consumer requirement
- Complete control solution
- Convenient remote monitor and service
- Simplified engine start/stop control
- Enhanced stability and safety

Standard protection functions	Standard control functions	
Alternator protection <ul style="list-style-type: none"> - 2xReverse power - 2xOverload - 4xOvercurrent - 1xOvervoltage - 1xUndervoltage - 1xOver/under frequency - 1xUnbalanced current 	Power control <ul style="list-style-type: none"> - RPM control(synchronization) - Power control(grid connection) - Load share(island) 	Voltage control <ul style="list-style-type: none"> - Voltage tracking (synchronization) - Voltage control(island) - PF control(grid connection) - Reactive power share (island)
	Lubrication control <ul style="list-style-type: none"> - Auto refilling - Warning and monitoring 	Pump control <ul style="list-style-type: none"> - Cooling system - Emergency radiator
Busbar/mains protection <ul style="list-style-type: none"> - 1xOvervoltage - 1xUndervoltage - 1xOver/under frequency - 1xPhase sequence - 1xROCOF alarm 	Fan control <ul style="list-style-type: none"> - Ventilation for engine room - Radiator fan - Emergency radiator fan 	Valve control <ul style="list-style-type: none"> - Cooling system - Heating system - Emergency radiator
	Engine protection <ul style="list-style-type: none"> - Various routine and customized protection functions - Monitoring 	

Standard configuration

Engine	Alternator	Canopy and base	Electrical cabinet
Gas engine Ignition system Lambda controller Electronic governor actuator Electrical start motor Battery system Auto charging system Detonation control system Cylinder temp. protection system	AC alternator H class insulation IP23 protection AVR voltage regulator PF control	Engine bracket Vibration isolators Alternator base Soundproof canopy	Air circuit breaker Paralleling control system 10-inch touch screen Communication interfaces Electrical switch cabinet Lighting system Smoke alarm system
Gas supply system	Lubrication system	Standard voltage	Induction/ exhaust system
Gas safety train Gas leakage protection Air/fuel mixer	Oil filter Daily auxiliary oil tank Auto refilling oil system	380/220V 400/230V 415/240V 440/254V	Air filter Exhaust silencer Exhaust bellows Ventilation fan
Heat exchange system	Service and documents		
Exhaust heat exchanger Jacket water circulation pump Jacket water heat exchanger Mixture circulation pump Mixture radiator Expansion tank, Shut-off valve Three-way auto proportional valve Emergency radiator	Tools package Installation and operation manual Maintenance manual Software manual Parts manual	Engine operation and maintenance manual Gas quality specification Control system manual After service guide Standard package	

Optional configuration

Engine	Alternator	Lubrication system
Heavy duty air filter Backfire safety control valve	Space heater Treatments against humidity and corrosion AVR	New and used oil tank Oil consumption gauge
Electrical system	Gas supply system	Voltage
Lightning protection	Gas flow gauge	220V 230V 240V
Service and documents	Exhaust system	Heat exchange system
Service tools Maintenance and service parts	Three-way catalytic converter Guard shield from touch Residential silencer	Emergency radiator