



S20

OPTIONS

Generator Set

- Oil temperature alarm – required for NFPA Level 1
- Heavy-duty air filter w/ restriction indicator
- Oil temperature shutdown
- Closed crankcase ventilation canister kit

Enclosed Unit

- Weather protective enclosure, internally mounted exhaust system
- Sound attenuated enclosure, internally mounted exhaust system

Exhaust System Open Units

- Residential silencer
- Critical silencer
- Exhaust pipe kit

Fuel System

- Flexible fuel line
- Fuel/water separator filter

Electrical System

- 3.5-amp battery charger, float
- 6-amp battery charger, float-equalize
- 6-amp battery charger, float-equalize with alarms
- 10-amp battery charger, float-equalize
- 10-amp battery charger, float-equalize with alarms
- Battery warmer
- 120-volt alternator anti-condensation heater

Control Panel

- Remote annunciator
- GenConnect monitoring and control communication system

Additional Accessories

- Automatic transfer switch
- Main line circuit breaker options
- Additional owners manuals

Service And Extended Warranty

- Trained service personnel providing IR parts, service and planned maintenance agreements
- Extended warranty

WEIGHT AND MEASUREMENTS

Open Model S20

Weight (422-S5 model)	496 kg (1,094 lb)
Weight (422-L9 model)	526 kg (1,160 lb)
Overall Size – l x w x h	mm (in) 1644 (65) x 825 (32) x 1080 (43)

Weather Protected Model

Weight (422-S5 model)	687 kg (1,515 lb)
Weight (422-L9 model)	717 kg (1,581 lb)
Overall Size – l x w x h	mm (in) 2100 (85) x 825 (32) x 1257 (49)

Sound Attenuated Model

Weight (422-S5 model)	699 kg (1,541 lb)
Weight (432-L9 model)	729 kg (1,607 lb)
Overall Size – l x w x h	mm (in) 2100 (85) x 825 (32) x 1257 (49)

Note: All weights with coolant and oil.

Distributed by:



(877) IR POWER www.irenergysystems.com

Nothing contained in this brochure is intended to extend any warranty or representation, expressed or implied, regarding the products described herein. Any such warranties or other terms and conditions of sale shall be in accordance with Ingersoll-Rand's standard terms and conditions of sale for such products which are available upon request. Product improvement is a continuing goal at Ingersoll-Rand. Designs and specifications are subject to change without notice or obligation. © 2003 Ingersoll-Rand Co. Form 32-0001. Printed in USA 11-04

Diesel Generator

S20

STANDARD FEATURES

- Mitsubishi heavy-duty, EPA-compliant industrial diesel engine
- 12-volt electric starter and engine-driven battery-charging alternator
- Mechanical governor
- Leroy Somer high-performance, AREP-excited brushless alternator
- 40°C ambient temperature unit-mounted radiator with radiator duct adapter flange
- Integral anti-vibration engine-alternator mounts
- Dry-type, single-stage air filter
- UL main line circuit breaker
- Ingersoll-Rand Intellisys™ autostart control panel, NFPA 110 compatible
- Voltage adjust potentiometer +/-5%
- 12-volt lead acid-type cranking battery with rack and cables
- Thermostically controlled external block heater with isolation valves
- Flexible fuel lines
- External drains and valves for oil and coolant
- Flexible exhaust connection
- Owners manual
- Protective guards, shields and labeling per UL2200
- UL2200 listing available

- Ingersoll-Rand provides single-source service and supply for the entire generating system and accessories.
- Ingersoll-Rand generator sets are prototype and production tested.
- Ingersoll-Rand diesel generators accept rated load in one step.
- Superior motor starting and short circuit capability achieved via the "AREP" excitation system.
- A 1-year / 1,500-hour limited warranty included.

GENERATOR RATINGS

Diesel Ratings

Alternator	Voltage	Phase	Hertz	Power Factor	Standby Rating		Prime Rating	
					150°C / 40°C Rise	Amps	125°C / 40°C Rise	Amps
LSA 42.2S5	346 / 600	3	60	0.8	23 / 28	27	21 / 26	25
	277 / 480	3	60	0.8	23 / 28	34	21 / 26	31
	254 / 440	3	60	0.8	23 / 28	37	21 / 26	34
	139 / 240	3	60	0.8	23 / 28	68	21 / 26	63
	127 / 220	3	60	0.8	23 / 28	74	21 / 26	68
LSA 42.2L9	120 / 208	3	60	0.8	22 / 28	78	20 / 26	71
	120 / 240	3	60	0.8	22 / 28	67	20 / 26	62
	120 / 240	1	60	1.0	23 / 23	94	20 / 20	83

Standby Rating: Applicable for supplying emergency electrical power in the event of a utility power outage, and to varying load requirement up to nameplate rating for the duration of the power outage. No overload capability is available for this rating. Ratings are in accordance with ISO3046, DIN6271 and BS5514. Prime Rating: Applicable for supplying electrical power in lieu of commercially purchased power. Prime power is the maximum power available at a variable load for an unlimited number of hours. A 10% overload capacity is available for maximum 1 hour duration within a 12-hour period. Prime ratings are in accordance with ISO8528. Overload power criteria is in accordance with ISO3046, DIN6271 and BS5514. For continuous ratings (non varying load), consult the factory. For complete rating definitions, please refer to the rating definitions guideline located in the Operations and Maintenance Manual or contact IR Energy Systems for this document.



S20 APPLICATION DATA

ENGINE DATA

Manufacturer	Mitsubishi
Model	S4Q2-Y162SD
Intake Air	Natural
Cylinder Arrangement	In-Line 4
Displacement, L (cu in)	2.5 (152.6)
Bore And Stroke, mm (in)	88 x 103 (3.5 x 4.1)
Compression Ratio	22:1
Rated rpm	1,800
Gross Engine Power Output, bhp (kWm)	35.6 (26.6)
BMEP At Rated Load, psi (kPa)	92.9 (640)
Cylinder Head Material	Cast iron
Piston Type And Material	Aluminum
Crankshaft Material	Forged steel
Valve (Exhaust) Material	High temp
Governor Type	Mechanical
Frequency Regulation, No-Load To Full-Load	3 – 5%
Frequency Regulation, Steady State	+/- 2.5%
Air Cleaner Type	Dry

LUBRICATION SYSTEM

Type Of Oil Pump	Full pressure
Oil Pan Capacity, L (qt)	5.5 (6)
Oil Pan Capacity With Filter, L (qt)	6.5 (7)
Oil Filter: Quantity, Type	1, Cartridge
Oil Cooler	NA
Oil Pressure Normal Operating Range	
At Rated rpm, kPa (psi)	345 (50)
Low Oil Pressure Pre-Alarm Setting, kPa (psi)	103 (15)
Low Oil Pressure Shutdown Setting, kPa (psi)	48 (7)

OPERATING REQUIREMENTS

Air Requirements:	
Combustion Air, m ³ /min (cfm)	2.1 (72)
Radiator-Cooled Cooling Air, m ³ /min (scfm)*	28 (1000)

Heat Rejected To Ambient Air:	
Engine, kW (Btu/min)	4.1 (235)
Generator, kW (Btu/min)	2.0 (112)

* Air density = 1.20 kg/m (0.075 lbfm/ft)

EXHAUST SYSTEM

Exhaust Flow At Rated kW, m/min (cfm)	5.3 (188)
Exhaust Temp At Rated kW, Dry Exhaust, °C (°F)	600 (1112)
Max Allowable Back Pressure, kPa (in Hg)	6.7 (2.0)
Exhaust Outlet Size Connection, mm (in)	50.8 (2.0)

FUEL SYSTEM

Recommended Fuel	#2 Diesel
Fuel Supply Line, Min ID, mm (in)	5/16" I.D. Hose – Line Length Under 10', 7/16" I.D. Hose – Line Length Over 10'
Fuel Return Line, Min ID, mm (in)	5/16" I.D. Hose – Line Length Under 10', 7/16" I.D. Hose – Line Length Over 10'

Max Lift, Engine-Driven Fuel Pump, m (ft)	1.3 (4)
Max Fuel Flow, L/h (gph)	7.4 (2)
Fuel Injection Pump	In-Line type
Fuel Prime Pump	Manual
Fuel Filter	Filtering paper type

ENGINE ELECTRICAL SYSTEM

Ignition System	NA
Battery-Charging Alternator	50 amps at 12 volts DC
Ground Polarity	Negative
Starter Motor Voltage (DC)	12-volt
Battery, recommended: Quantity, CCA, temp rating	1-12V, 640, -18°C (0°F)

Site Derating Factors

Temperature:
Derate 1% per 5°C (9°F) temperature above 20°C (68°F)

Elevation:

Derate 1% per 100 m (328') elevation above sea level

FUEL CONSUMPTION

Diesel, L/h (gph) at % load – Standby Rating	
100% — 7.4 (2.0), 75% — 5.6 (1.5), 50% — 4.1 (1.1)	

S20 APPLICATION DATA

COOLING SYSTEM

Type Of System	Pressurized, closed recovery
Ambient Temperature, °C (°F)*	40 (104)
Coolant Temperature Normal Operating Range, °C (°F)	82 – 94 (180 – 201)
Coolant Temperature Pre-Alarm Setting, °C (°F)	107 (225)
Coolant Temperature Shutdown Setting, °C (°F)	113 (235)
Radiator System Capacity, Including Engine, L (gal)	8.1 (2.1)
Coolant Flow Rate, L/min (gpm)	104 (27)
Heat Rejection To Coolant At Rated kW (Btu/min)	25 (1308)
Water Pump Type	Centrifugal
Type Of Fan	Pusher
Number Of Fan Blades	6
Diameter Of Fan, mm (in)	381 (15)
Fan, kWm (hp)	0.7
Max Restriction Of Cooling Air, Intake And Discharge Of Radiator, kPa (in H2O)	.2 (.8) Open unit
Coolant Heater	1500W, 120 VAC

*Max ambient temperature at which the generator set can operate at standby rating having applied appropriate derates for ambient temperature and altitude.

CONTROL PANEL

Intellisys

- Powerful and flexible microprocessor-based digital control panel for easy genset operation
- Built-in generator and engine protection parameters with NFPA 110 capability
- Quick access to all generator and engine measurements and status
- Capable of local or remote monitoring and control of genset via dedicated RS232 port
- Large backlit LCD screen for convenient operator access and six LED status displays

ALTERNATOR SPECIFICATIONS

Manufacturer	Leroy Somer
Design	4-pole, rotating field
Exciter Type	Brushless, AREP
Stator	2/3 pitch
Rotor	Direct coupled by flexible disc
Bearing: Quantity, Type	1, sealed
Amortisseur Windings	Full
Leads: Quantity, Type	LSA 42.2S5 12, reconnectable LSA 42.2L9 12, reconnectable
Insulation Material	Class H per NEMA MG1
Standard Temperature Rise	150°C standby / 125°C prime
Phase Rotation	A, B, C
Total Harmonic Distortion	< 4%
Telephone Influence Factor (TIF)	< 50%
Telephone Harmonic Factor (THF)	< 2%
Voltage Regulator	R438
Voltage Regulation, No-Load To Full-Load	+/- 1.5%
Recovery Time (20% Voltage Dip) ms	500
Unbalanced Load Capability	10%
One-Step Load Acceptance	100% of rating
Peak Motor Starting kVA At 480 V, (0.6 Starting Power Factor):	LSA 42.2S5 65 (35% voltage dip)

- Compliance with IEC 34.1/34.2 - UTE: NFC 51.111 - VDE 0530 - BS 4999 and 5000 - NEMA: MG1.22 - ISO 8528.3 - CSA.

- Generator allows as standard sustained short-circuit current of up to 300% of rated current for up to 10 seconds.

- Vacuum-impregnated windings with epoxy varnish for dependability and long life.

- Alternator is self-ventilated and IP23 drip-proof constructed.