

**OUR HEAD OFFICE AND PLANT ARE CERTIFIED
TO BOTH ISO 9001 AND ISO 14001.**

Niigata plant:

Shimo Aozu, Tsubame-city, Niigata-prefecture, Japan.



**ISO9001 : JQA-0581
ISO14001 : JQA-EM4670**

SAFETY

- Operate safely in accordance with proper operation manual.
- To prevent trouble and accidents, perform daily and preventive maintenance checks without fail.

AIRMAN®

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DISTRIBUTOR :



**ENGINE GENERATOR
SDG series**

AIRMAN®



**Engine
GENERATOR**

SDG series

10.5~800kVA



HOKUETSU INDUSTRIES CO., LTD.



Easier Operation and more developed generator AIRMAN SDG Series

Since 1970, Airman has developed and sold the brush-less generators, our advanced generators, which is developed by our long experience and original technologies, succeeded to spread through our new machines.

Airman will strive to develop our products which has the concept “Environmentally and ECO” friendly day by day.

Export Standard – for the 2nd Emission Control Area.

	Oil Tank	Model Name	Prime KVA																Page				
			50Hz	10.5	20	37	50	80	100	125	150	220	300	400	500	610	800						
S-type (Super Silent)	Standard Tank	Single Voltage	SDG S-3A8																		P5		
		SDG SE-3B2																					
	Dual Voltage	SDG S-3B1/3B2																					
		SDG S-3A5/3A6																					
		SDG S-3A6 (Manual Parallel)																				P6,7	
	STD Tank + Oil fence	SDG S 7A6																				P9	
AS-type (Ultra Super-Silent Model)	Standard Tank	Dual Voltage	SDG AS 3B1																			P8	
			SDG AS 3A6																				
	STD Tank + Oil fence	SDG AS 7B1																					P9
		SDG AS 7A6																					

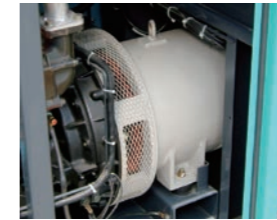
High Performance

Outstanding generation performance

Due to the big drop of Transient Reactance and the reinforcement of the damper winding, we are succeeded to improve our brushless alternator much tolerance dose and few distortion of the wave form.

It is suitable for use of inverter, thyristor, PC, lightning, precision instrument, measurement hardware.

Preset Voltage Regulation
within 0.5%



Cation Electrodeposition Coating

(up to SDG400)

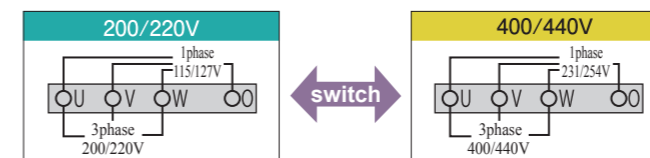
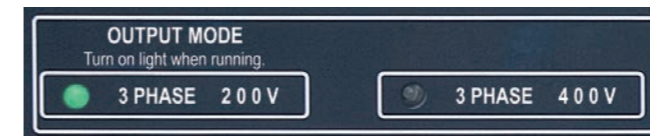
We have adopted the electrodeposition coating, baking finish coating for weather proof, and anti-corrosion and salt pollution.

Dual Voltage: Standard Specification

(from SDG45 to SDG610)

We can convert 200/220V ⇔ 400/440V of 3 phase voltage each other by switching short-circuit plates in the control box.

When the engine is started, the indicator light in the operation box is turn on , and we can recognize the voltage level immediately.



Auto Parallel Operation

(more than SDG150 *But it is excluded SDG150S/AS-7A6,SDG300S-7A6)

By attached controller in the generator, it is synchronized and shared “stop and go running” automatically.

And according to the load, Up to 8 units of machines will be operated each other.



Manual Parallel Operation

(from SDG150S to SDG610S *But it is excluded SDG220S-7A7,SDG220S-7A6)

With our well-controlled AVR(Automatic Voltage Regulator) and CCR(Cross Current Regulator), Machine is controlled by the Manual Parallel Operation.(When they are running, we must always monitor them.)



Eco Friendly

Silences

We are succeeded to be silent by adopting the silent engine, and the high-performance muffler, the special exhaust-duct. Furthermore we are succeeded to achieve more silent noise level by adopting the perfect sealed panel and super-silent "intake manifold".

And we have achieved less vibration by applying the new support method of the muffler.

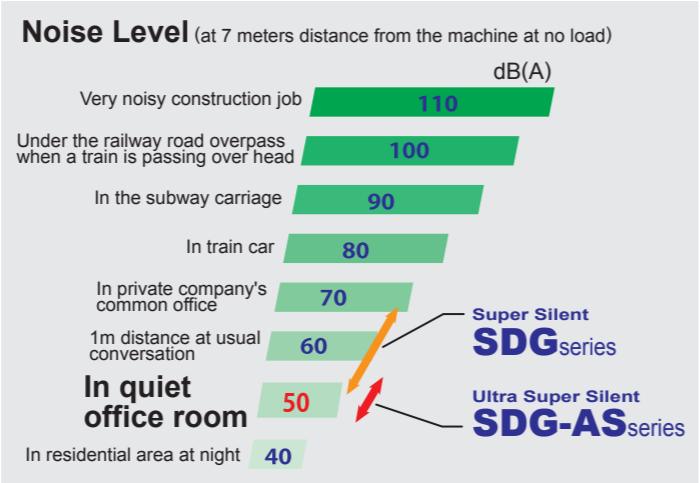
SDG13S~220S

Ultra Super Silent
SDG25AS~150AS



SDG300S~610S





Easy operation

Quick-start engine

[SDG13- SDG220]
We are applying the quick-heating "glow-plug" for preheat engine. And we are succeed to be quick start in low temperature.

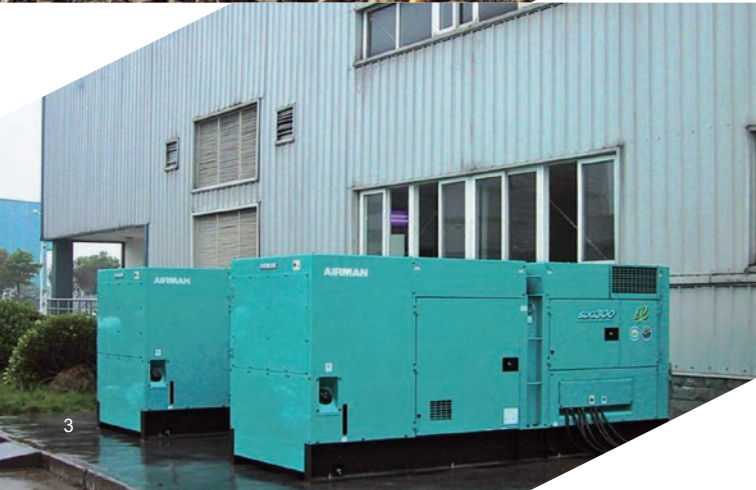
[SDG220 - SDG610]
We are mounting the quick-start engine which is improved turbo and governor for using the hand-auger or vibro-hammer.

Control Box

We have developed "one" control panel which is combined engine control and generator control.



- | | |
|----------------------|-----------------------------------|
| ① 200V,400V signals | ⑨ Single phase breaker |
| ② Alarm lump | ⑩ Water temperature meter |
| ③ Panel light | ⑪ Fuel Meter & Time meter |
| ④ Frequency meter | ⑫ Electric Leakage Relay |
| ⑤ Amp meter | ⑬ Starter switch |
| ⑥ Voltage meter | ⑭ Frequency switching switch |
| ⑦ Voltage controller | ⑮ Frequency adjustment switch |
| ⑧ 3Phase breaker | ⑯ Operation Mode switching switch |



Safety

Various kinds of safety devices

Overcurrent, Short circuit protection
Protect the machine by shutting down the breaker when overcurrent or short circuit occurs.

Electric leakage protection
In case of electric leakage , 3-Phase & single phase breaker will be shutdown with warning light on.



Easy maintenance

Automatic Air Bleeding System

(SDG13~150)
Automatic Air Bleeding Device is equipped to automatically bleed air from fuel line system. This eliminates the need to prime the fuel system again should the generator be shutdown due to running out of fuel. Simply top up the fuel and turn the key switch to operation position, air in the fuel line system is bled automatically. As for both SDG125S/150S/150AS, it is possible to automatically bleed air by pushing the push button provided at the operation panel.



Stainless Bolt

We use stainless bolts on front cover and left-side door which have to be removed when performing maintenance to prevent bolts from rusting. Also we reduce the risk of broken bolts on bonnet that might be resulted from knocking by minimizing the bolts' quantity.

Standard Model SDG series

More portable and more compact

BOX type is designed for being operated on the vehicle. And it enabled to be easy- access to sight.



SDG13S



SDG25S



SDG45S



SDG60S



SDG125S/150S



SDG220S



■ SPECIFICATIONS

Model	SDG13S -3B1		SDG25S -3B1		SDG25S -3A8		SDG25S -3A8R For Reefer Type		SDG45S -3B2		SDG45SE -3B2	
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● Generator													
Type		Dual Voltage		Dual Voltage		Single Voltage		Single Voltage		Dual Voltage		Single Voltage	
Frequency	Hz	50	60	50	60	50	60	50	60	50	60	50	60
Prime Output	kVA	10.5	13	20	25	20	25	20	25	37	45	37	45
Standby Output	kVA	11.5	14.3	22	27.5	22	27.5	22	27.5	37	45	37	45
Voltage	V	200/400	220/440	200/400	220/440	400	440	400	440	200/400	220/440	400	440
Power factor	%	3-phase 0.8 (lagging) / Single-phase 1.0											

● Engine													
Make/Model		KUBOTA D1503-K3A		KUBOTA V2403-K3A		KUBOTA V2403-M-E2B		KUBOTA V2403-M-E2B		KUBOTA V3600-T-K3A		KUBOTA V3600-T-K3A	
Type		Swirl chamber		Swirl chamber		Swirl chamber		Swirl chamber		Swirl Chamber, Turbo-Charged		Swirl Chamber, Turbo-Charged	
Rated output	kW(PS)	15.6(11.5)	18.7(13.7)	26(19.1)	32.2(23.7)	26(19.1)	32.2(23.7)	26(19.1)	32.2(23.7)	47.6(35)	57.8(42.5)	47.6(35)	57.8(42.5)
Rated speed	min ⁻¹	1500	1800	1500	1800	1500	1800	1500	1800	1500	1800	1500	1800
Fuel tank capacity	L	58		70		70		62		100		100	
Engine oil amount	L	7		9.5		9.5		9.5		13.2		13.2	
Battery × quantity		80D26R×1		80D26R×1		80D26R×1		80D26R×1		80D26R×1		80D26R×1	

● Dimension & Weight													
Overall length	mm(inch)	1480 (58.3)		1550 (61.0)		1550 (61.0)		1640 (64.6)		1870 (73.6)		1870 (73.6)	
Overall width	mm(inch)	650 (25.6)		700 (27.6)		700 (27.6)		650 (25.6)		860 (33.9)		860 (33.9)	
Overall Height	mm(inch)	950 (37.4)		980 (38.6)		1010 (39.8)		900 (35.4)		1220 (48.0)		1220 (48.0)	
Operating weight	kg	580		680		695		680		1020		1020	

● Other													
Sound power level in decibels	dB	80	83	86	90	88	92	90	93	86	88	86	88
Sound pressure level	dB(A)	55	57	59	63	60	64	63	66	58	61	58	61
Designated emissions regulation		JPN Stage 3		JPN Stage 3		JPN Stage 2		JPN Stage 2		JPN Stage 3		JPN Stage 3	

• For other voltages except the above-mentioned ones, contact us. • Sound pressure level is measured at 7m in 4 directions average.
• Above figures are applied under operation in standard atmosphere conditions as per JIS D0006.
• "Standby Output" rating is applied only under intermittent or emergency operation for approximately 1 hour.

■ SPECIFICATIONS

Model	SDG60S -3A6		SDG100S -3A5		SDG125S -3A6		SDG150S -3A6		SDG220S -3A6	
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● Generator													
Type		Dual Voltage		Dual Voltage		Dual Voltage		Dual Voltage		Dual Voltage (Manual parallel)			
Frequency	Hz	50	60	50	60	50	60	50	60	50	60	50	60
Prime Output	kVA	50	60	80	100	100	125	125	150	200	220	200	220
Standby Output	kVA	55	66	88	110	110	137.5	137.5	165	220	242	220	242
Voltage	V	200/400	220/440	200/400	220/440	200/400	220/440	200/400	220/440	200/400	220/440	200/400	220/440
Power factor	%	3-phase 0.8 (lagging) / Single-phase 1.0											

● Engine													
Make/Model		ISUZU BB-4BG1T		ISUZU DD-6BG1T		HINO J08C-UP		HINO J08C-UP		MITSUBISHI 6D24-TLE2B			
Type		Direct-Injection, Turbo-Charged		Direct-Injection, Turbo-Charged		Direct-Injection, Turbo-Charged		Direct-Injection, Turbo-Charged		Direct-Injection, Turbo-Charged, Intercooled			
Rated output	kW(PS)	65.4(48.1)	78(57.4)	100.1(73.6)	124(91.2)	131(96.3)	153(113.6)	160(118)	190(140)	246(181)	271(199)	246(181)	271(199)
Rated speed	min ⁻¹	1500	1800	1500	1800	1500	1800	1500	1800	1500	1800	1500	1800
Fuel tank capacity	L	135		225		250		250		390			
Engine oil amount	L	14		18		24.5		24.5		37			
Battery × quantity		80D26R×1		95D31R×2		95D31R×2		95D31R×2		170F51×2			

● Dimension & Weight													
Overall length	mm(inch)	2090 (82.3)		2600 (102.4)		2990 (117.7)		2990 (117.7)		3700 (145.7)			
Overall width	mm(inch)	860 (33.9)		1000 (39.4)		1180 (46.5)		1180 (46.5)		1300 (51.2)			
Overall Height	mm(inch)	1220 (48.0)		1400 (55.1)		1480 (58.3)		1480 (58.3)		1670 (65.7)			
Operating weight	kg	1260		1870		2300		2430		3630			

● Other													
Sound power level in decibels	dB	86	90	88	91	90	92	92	94	93	94	93	94
Sound pressure level	dB(A)	59	63	61	64	63	64	63	66	65	66	65	65
Designated emissions regulation		JPN Stage 2		JPN Stage 2		JPN Stage 2		JPN Stage 2		JPN Stage 2			

• For other voltages except the above-mentioned ones, contact us. • Sound pressure level is measured at 7m in 4 directions average.
• Above figures are applied under operation in standard atmosphere conditions as per JIS D0006.
• "Standby Output" rating is applied only under intermittent or emergency operation for approximately 1 hour.



SDG300S



SDG500S



SDG610S



Ultra Super Silent Models SDG-AS series

You are surely surprised at "the quietness" of this machine.

AS series are suitable for using in the silent place like the hospital, the bank office, the office building, the theater, event site. And already equipped in that place.



SDG25AS



SDG60AS



SDG100AS



SDG150AS

■ SPECIFICATIONS

Model	SDG300S -3A6		SDG400S -3A6		SDG500S -3A6		SDG610S -3AK6		SDG610S -3AV6		SDG800S -3A6		
● Generator													
Type		Dual Voltage (Manual parallel)		Dual Voltage (Manual parallel)		Dual Voltage (Manual parallel)		Dual Voltage (Manual parallel)		Dual Voltage (Manual parallel)		Dual Voltage (Manual parallel)	
Frequency	Hz	50	60	50	60	50	60	50	60	50	60	50	60
Prime Output	kVA	270	300	350	400	450	500	555	610	555	610	700	800
Standby Output	kVA	297	330	385	440	472.5	525	610.5	671	610.5	671	770	880
Voltage	V	200/400	220/440	200/400	220/440	200/400	220/440	200/400	220/440	200/400	220/440	200/400	220/440
Power factor	%	3-phase 0.8 (lagging) / Single-phase 1.0											
● Engine													
Make/Model		KOMATSU SAA6D125E-2-B		KOMATSU SA6D140E-3-A		KOMATSU SAA6D140E-3-B		KOMATSU SA6D170-A-1		VOLVO TAD1642GE		KOMATSU SAA6D170E2-3	
Type		Direct-Injection, Turbo-Charged, Intercooled		Direct-Injection, Turbo-Charged, Intercooled		Direct-Injection, Turbo-Charged, Intercooled		Direct-Injection, Turbo-Charged, Intercooled		Direct-Injection, Turbo-Charged, Intercooled		Direct-Injection, Turbo-Charged, Intercooled	
Rated output	kW(PS)	316(232)	350(257)	421(310)	485(357)	520(382)	580(427)	660(485)	763(561)	684(503)	723(532)	834(613)	1022(752)
Rated speed	min ⁻¹	1500	1800	1500	1800	1500	1800	1500	1800	1500	1800	1500	1800
Fuel tank capacity	L	490		490		490		490		490		490	
Engine oil amount	L	62		79		91.5		119		48		141	
Battery × quantity		170F51×2		225H52×2		225H52×2		225H52×2		225H52×2		225H52×2	
● Dimension & Weight													
Overall length	mm(inch)	3900(153.5)		4150(163.4)		4550(179.1)		4650(183.1)		4650(183.1)		5350(210.6)	
Overall width	mm(inch)	1400(55.1)		1400(55.1)		1600(63.0)		1600(63.0)		1600(63.0)		1900(74.8)	
Overall Height	mm(inch)	1760(69.3)		2040(80.3)		2090(82.3)		2350(92.5)		2350(92.5)		2450(96.5)	
Operating weight	kg	4290		5670		6750		7960		6640		9850	
● Other													
Sound power level in decibels	dB	95	98	95	99	96	99	98	102	101	104	99	102
Sound pressure level	dB(A)	66	69	67	70	67	70	69	72	71	75	69	73
Designated emissions regulation		JPN Stage 2		JPN Stage 2		JPN Stage 2		-		JPN Stage 2		-	

• For other voltages except the above-mentioned ones, contact us. • Sound pressure level is measured at 7m in 4 directions average.
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• "Standby Output" rating is applied only under intermittent or emergency operation for approximately 1 hour.

■ SPECIFICATIONS

Model	SDG25AS -3B1		SDG45AS -3B1		SDG60AS -3A6		SDG100AS -3A6		SDG150AS -3A6		
● Generator											
Type		Dual Voltage		Dual Voltage		Dual Voltage		Dual Voltage		Dual Voltage	
Frequency	Hz	50	60	50	60	50	60	50	60	50	60
Prime Output	kVA	20	25	37	45	50	60	80	100	125	150
Standby Output	kVA	22	27.5	40.7	49.5	55	66	88	110	137.5	165
Voltage	V	200/400	220/440	200/400	220/440	200/400	220/440	200/400	220/440	200/400	220/440
Power factor	%	3-phase 0.8 (lagging) / Single-phase 1.0									
● Engine											
Make/Model		KUBOTA V2403-K3A		KUBOTA V3800-DI-T-K3A		ISUZU BB-4BG1T		ISUZU DD-6BG1T		HINO J08C-UD	
Type		Swirl chamber		Direct-Injection, Turbo-Charged		Direct-Injection, Turbo-Charged		Direct-Injection, Turbo-Charged		Direct-Injection, Turbo-Charged, Intercooled	
Rated output	kW(PS)	26(19.1)	32.2(23.7)	51.7(38)	62(45.6)	65.4(48.1)	78(57.4)	100.1(73.6)	124(91.2)	160(118)	190(140)
Rated speed	min ⁻¹	1500	1800	1500	1800	1500	1800	1500	1800	1500	1800
Fuel tank capacity	L	80		165		170		225		265	
Engine oil amount	L	9.5		84		14		18		24.5	
Battery × quantity		80D26R×1		80D26R×1		80D26R×1		95D31R×2		95D31R×2	
● Dimension & Weight											
Overall length	mm(inch)	1570(61.8)		1995(78.5)		2090(82.3)		2700(106.3)		3200(126.0)	
Overall width	mm(inch)	800(31.5)		950(37.4)		950(37.4)		1140(44.9)		1200(47.2)	
Overall Height	mm(inch)	1090(42.9)		1300(51.2)		1300(51.2)		1500(59.1)		1630(64.2)	
Operating weight	kg	810		1215		1440		2,100		2,850	
● Other											
Sound power level in decibels	dB	80	83	79	82	80	83	81	84	85	88
Sound pressure level	dB(A)	53	56	51	54	55	56	54	57	55	58
Designated emissions regulation		JPN Stage 3		JPN Stage 3		JPN Stage 2		JPN Stage 2		JPN Stage 2	

• For other voltages except the above-mentioned ones, contact us. • Sound pressure level is measured at 7m in 4 directions average.
• Above figures are applied under operation in standard atmosphere conditions as per JIS D0006.
• "Standby Output" rating is applied only under intermittent or emergency operation for approximately 1 hour.

Oil Fence Type SDG series

Further environmental friendly.

Oil fence tank is adopted "the double shell" for avoiding the oil leakage.



SDG45AS-F



SDG60AS-F



SDG220S-F



■ SPECIFICATIONS

Model	SDG25AS -7B1 Ultra Super Silent & Oil Fence Type		SDG45AS -7B1 Ultra Super Silent & Oil Fence Type		SDG60AS -7A6 Ultra Super Silent & Oil Fence Type		SDG60S -7A6 Oil Fence Type		SDG220S -7A6 Oil Fence Type		
	Dual Voltage		Dual Voltage		Dual Voltage		Dual Voltage		Dual Voltage (Manual parallel)		
Frequency	Hz	50	60	50	60	50	60	50	60	50	60
Prime Output	kVA	20	25	37	45	50	60	50	60	200	220
Standby Output	kVA	22	27.5	40.7	49.5	55	66	55	66	220	242
Voltage	V	200/400	220/440	200/400	220/440	200/400	220/440	200/400	220/440	200/400	220/440
Power factor	%	3-phase 0.8 (lagging) / Single-phase 1.0									
● Generator											
Type		Swirl chamber		Direct-Injection, Turbo-Charged		Direct-Injection, Turbo-Charged		Direct-Injection, Turbo-Charged		Direct-Injection, Turbo-Charged, Intercooled	
Rated output	kW(PS)	26 (19.1)	32.2 (23.7)	51.7 (38)	62 (45.6)	65.4 (48.1)	78 (57.4)	65.4 (48.1)	78 (57.4)	246 (181)	271 (199)
Rated speed	min ⁻¹	1500	1800	1500	1800	1500	1800	1500	1800	1500	1800
Fuel tank capacity	L	195		325		400		135 (400)		980	
Engine oil amount	L	9.5		84		14		14		37	
Battery × quantity		80D26R×1		80D26R×1		80D26R×1		80D26R×1		170F51×2	
● Dimension & Weight											
Overall length	mm(inch)	1570 (61.8)		1995 (78.5)		2080 (81.9)		2050 (80.7)		3550 (139.8)	
Overall width	mm(inch)	800 (31.5)		950 (37.4)		1080 (42.5)		860 (33.9)		1300 (51.2)	
Overall Height	mm(inch)	1380 (54.3)		1670 (65.7)		1300 (51.2)		1830 (72.0)		2150 (84.6)	
Operating weight	kg	980		1500		1725		1650		4550	
● Other											
Sound power level in decibels	dB	79	82	79	82	81	83	86	89	92	95
Sound pressure level	dB(A)	51	54	52	54	54	56	59	61	63	66
Designated emissions regulation		JPN Stage 3		JPN Stage 3		JPN Stage 2		JPN Stage 2		JPN Stage 2	
Vollume allowance	L	95		208		150		160		538	
Oil level at alarm lump	L	35		91		65		60		185	

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 • Above figures are applied under operation in standard atmosphere conditions as per JIS D0006.
 • "Standby Output" rating is applied only under intermittent or emergency operation for approximately 1 hour.

Emission control Stage3 SDG series

Stage3 Engine Type.

Line-up models for engine emission regulation Stage3.



SDG300L



SDG25S



SDG45AS



SDG60L



SDG45LX



SDG60LAX

■ SPECIFICATIONS

Model	Prime Output kVA		Standby Output kVA		Engine	Sound pressure level dB(A)	
	50Hz	60Hz	50Hz	60Hz		50Hz	60Hz
SDG Series Standard Type							
SDG60S-3B1	50	60	55	66	ISUZU BJ-4JJ1X	59	62
SDG100S-3B1	80	100	88	110	ISUZU BI-4HK1X	60	64
SDG125S-3B1	100	125	110	137.5	ISUZU BI-4HK1X	61	64
SDG150S-3B1	125	150	137.5	165	ISUZU BH-6HK1X	64	68
SDG-L Series Leak Guard Type							
SDG25L-5B1	20	25	22	27.5	KUBOTA V2403-K3A	59	63
SDG45L-5B2	37	45	37	45	KUBOTA V3600-T-K3A	57	60
SDG60L-5B1	50	60	55	66	ISUZU BJ-4JJ1X	59	62
SDG220L-5B1	200	220	220	242	ISUZU BH-6UZ1X	61	65
SDG300L-5B1	270	300	297	330	KOMATSU SAA6D125E-5-B	65	69
SDG400L-5B1	350	400	385	440	KOMATSU SAA6D140E-5-C	67	72
SDG-LX Series Leak Guard & Big Tank Type							
SDG13LX-5B1	10.5	13	11.55	14.3	KUBOTA D1503-K3A	55	58
SDG25LX-5B1	20	25	22	27.5	KUBOTA V2403-K3A	59	63
SDG45LX-5B2	37	45	37	45	KUBOTA V3600-T-K3A	57	60
SDG60LX-5B1	50	60	55	66	ISUZU BJ-4JJ1X	59	62
SDG-LA Series Leak Guard Type							
SDG25LA-5B1	20	25	22	27.5	KUBOTA V2403-K3A	59	63
SDG45LA-5B2	37	45	37	45	KUBOTA V3600-T-K3A	57	60
SDG60LA-5B1	50	60	55	66	ISUZU BJ-4JJ1X	59	62
SDG-LAX Series Leak Guard & Big Tank Type							
SDG13LAX-5B1	10.5	13	11.55	14.3	KUBOTA D1503-K3A	55	58
SDG25LAX-5B1	20	25	22	27.5	KUBOTA V2403-K3A	59	63
SDG45LAX-5B2	37	45	37	45	KUBOTA V3600-T-K3A	57	60
SDG60LAX-5B1	50	60	55	66	ISUZU BJ-4JJ1X	59	62
SDG-7 Series Oil Fence Type							
SDG100S-7B1	80	100	88	110	ISUZU BI-4HK1X	60	64
SDG125S-7B1	100	125	110	137.5	ISUZU BI-4HK1X	61	64
SDG150S-7B1	125	150	137.5	165	ISUZU BH-6HK1X	64	68
SDG-AS Series Ultra Super Silent Type							
SDG25AS-3B1	20	25	22	27.5	KUBOTA V2403-K3A	53	56
SDG45AS-3B1	37	45	40.7	49.5	KUBOTA V3800-DI-T-K3A	51	54
SDG60AS-3B1	50	60	55	66	ISUZU BJ-4JJ1X	55	57
SDG-AS Series Ultra Super Silent & Oil Fence Type							
SDG25AS-7B1	20	25	22	27.5	KUBOTA V2403-K3A	51	54
SDG45AS-7B1	37	45	40.7	49.5	KUBOTA V3800-DI-T-K3A	52	54
SDG60AS-7B1	50	60	55	66	ISUZU BJ-4JJ1X	54	56

• Above figures are applied under operation in standard atmosphere conditions as per JIS D0006.
 • "Standby Output" rating is applied only under intermittent or emergency operation for approximately 1 hour.

List of Optional Equipment

● : Standard equipment ○ : Option upon manufacture

Model / Item	SDG13	SDG25	SDG45	SDG60	SDG100	SDG125	SDG150	SDG220	SDG300	SDG400	SDG500	SDG610	SDG800
Automatic Starting System	○*	○*	○	○	○	○	○	○	○	○	○	○	○
With built-in battery charger	○*	○*	○	○	○	○	○	○	○	○	○	○	○
Manual Operated Parallel Operation System	—	—	—	—	S/AS:—	S:●	S/AS:●	●	●	●	●	●	●
Auto-Parallel Operation System	—	—	—	—	—	—	—	○	—	○	○	○	○
Fuel Auto-feed System	S:○	S/AS:○	S/AS:○	S/AS:○	S/AS:○	S:○	S/AS:○	S:○	○	○	○	○	○
Three way valve Fuel Feed from outside tank	S:●	S/AS:●	S/AS:●	S/AS:●	S/AS:●	S:●	S/AS:●	S:●	●	●	●	●	●
Engine Oil Auto-Feed System	—	S:○ AS:—	○	○	○	○	○	○	○	○	○	○	○
Flange at outlet of muffler	○	○	○	○	○	○	○	○	○	○	○	○	○
Protection against salt damage	○	○	○	○	○	○	○	○	○	○	○	○	○
Anti-theft cover	○	○	○	○	○	○	○	—	—	—	—	—	—
Engine Oil Pressure Meter	○	○	○	○	●	●	●	●	●	●	●	●	●

* Automatic starting system and battery charger cannot be built into at the same time.

General purpose Emergency backup Generator for failure of utility source SDG-E series

When an electric utility outage takes place, the set is automatically switched from the utility source to the backup generator, and when the utility power is restored, it is automatically switched back to the utility power source.

Three Attempts starting operation

If the engine failed to start up after 10 seconds cranking, additional two more attempts to start will be included to ensure the engine to be started up. "Difficulty in starting" indication lamp will only be on after engine failed to start after three attempts.

Trial (Test) operation availability

Test operation is available for maintenance and inspection as standard function.

Built-in Battery charger

ATS panel incorporates a battery charger to keep charging the battery of a standby generator.

Fault Indication Lamp

Generator fault indication lamp is equipped on the ATS panel. This is a consolidated indication for out of fuel, fuel filter clogging, low engine oil pressure, high coolant temperature, overcurrent and earth leakage.

Specifications of ATS panel

	For SDG13/25	For SDG45/60	For SDG100/125/150	For SDG220/300	For SDG400/500
Type	Wall mounted type		Floor standing type		
Rated voltage(V)	AC 200/220				
Control voltage(V)	DC 12		DC 24		
L×W×H(mm)	850×550×300	1,000×600×300	1,600×650×300	1,700×800×500	1,700×750×600
Mass(kg)	57	75	125	260/280	300



ATS panel

* ATS panel in photo is ground standing type for outdoor use. (upon customer' request before production process this is available.)

Features and benefits

1. Simplified construction incorporating all required functions
2. Light-weight and compact
3. Easy connection between ATS panel and generator

Examples of Backup Power Supply

- Poultry facilities and Swinery
- Gas-station
- Housing, Villa residence, Office and Factory
- Communication station, Broadcasting station, Lighting facilities and Traffic signal station
- On-line system of bank, Credit union, Agricultural cooperative association
- Battery for portable telephones base
- Facilities for draining water for underground engineering construction

Selection of Optimum Generators

Example of AC arc welder

● AC arc welder is in general single phase load. So when a three phase generator is used for single phase load, it shall be equally connected to three phase.

● Three times more generating power is required for single load welding.

Generators are capable of operating following numbers of arc welders.

Model	SDG25		SDG45		SDG60		SDG100		SDG125		SDG150		SDG220		SDG300		SDG400		SDG500		SDG610		SDG800		
	50	60	50	60	50	60	50	60	50	60	50	60	50	60	50	60	50	60	50	60	50	60	50	60	
180A	1	1	3	3	3	5	7	8	10	12	13	14	18	20											
200A		1	2	2	3	4	6	6	8	9	10	11	15	16											
250A			2	2	3	3	5	6	7	8	9	10	14	15											
300A					2	2	3	4	5	6	6	7	10	11	14	17	19	21	24	27	30	33	38	42	
400A							3	3	3	3	5	5	6	7	9	12	13	14	16	19	21	24	27	30	
500A									2	3	3	3	5	6	7	10	11	12	13	15	17	18	21	23	

Note: Numbers of welders in the above table are for such ones without condensers equipped for reference purpose only. When using generators for extremely low efficient welders, reduce the numbers of welders. When using generators for AC arc welders equipped with condenser, it is necessary to be very careful for self-exciting phenomena (Output voltage of generator extremely increases in case of no load or light load).

The above table shows the numbers of welders when operating 40%. In case of more Percentage than 40%, reduce the numbers of welders. When using generators for more welders than 2 units, connect evenly it to each welder, not concentrating one unit only.

Example of electric motors (three-phase squirrel-cage motor)

Engine generators are used for large and small various type electric motors.

In general capacity of electric motor is specified in kW or PS.

This shows motor output capacity, not motor input capacity or not required to operate motor (machine). The relation between motor output and input is shown in the following formula.

$$1 \text{ PS} = 0.7355 \text{ kW}$$

$$\text{Efficiency} = 85\% \text{ (three phase induction motor)}$$

$$\text{Power factor} = 0.8 \text{ (three phase induction motor)}$$

$$\frac{\text{Output(kW)}}{\text{Efficiency}} = \frac{0.7355 \times \text{Output(PS)}}{\text{Efficiency}} = \text{Input(kW)}$$

$$\frac{\text{Input(kW)}}{\text{Power factor}} = \text{Input(kVA)}$$

Motor starting capacity

Model	SDG13		SDG25		SDG45		SDG60		SDG100		SDG125		SDG150	
	50	60	50	60	50	60	50	60	50	60	50	60	50	60
Generator(kVA)	10.5	13	20	25	37	45	50	60	80	100	100	125	125	150
Motor capacity	Direct start		Simultaneously(kW)		4	4.5	6.5	7.5	12	14	17	19	26	32
	By turns(kW)		7.5	9	15.1	18.8	27.9	34	37.7	45.3	60.4	75.5	75.5	94.4
	λ-Δ start(open)(kW)		6	6.8	9.8	11.3	18	21	22.5	28.5	39	48	52.5	64.5
	λ-Δ start(closed)(kW)		7.5	9	15.1	18.8	27.9	34	37.7	45.3	60.4	75.5	75.5	94.4

Model	SDG220		SDG300		SDG400		SDG500		SDG610		SDG800	
	50	60	50	60	50	60	50	60	50	60	50	60
Generator(kVA)	200	220	270	300	350	400	450	500	555	610	700	800
Motor capacity	Direct start		Simultaneously(kW)		68	76	91	102	130	145	160	181
	By turns(kW)		147	166	188	226	265	302	340	377	415	453
	λ-Δ start(open)(kW)		102	114	137	153	195	218	240	272	270	285
	λ-Δ start(closed)(kW)		147	166	188	226	265	302	340	377	415	453

* The motor capacities in the above table are only for reference purpose. The generator capacities vary upon instantaneous voltage drop, motor start class, efficiency, old and new type machine.

● The instantaneous voltage drop when motor starts shall be within 30% of no load voltage. ● Motor starting kVA shall be 7 kVA per one (1) kW.

● Motor efficiency shall be 85% and load 90%.

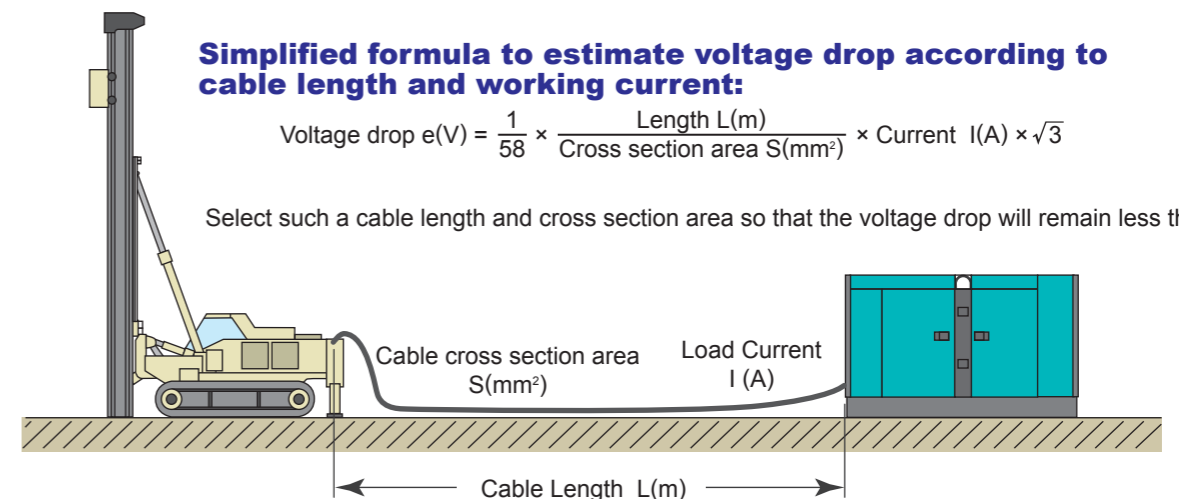
● When operating many motor loads (starting by turns one by one) and total capacity of the loads within the values in the above table, it can operate as many loads as expected. But the total capacity of the motors which are operated first shall be within the capacity at direct start instantaneous start.

● The engine load of the engine complete with turbo-charger sometimes may be influenced by engine net average efficient pressure.

Simplified formula to estimate voltage drop according to cable length and working current:

$$\text{Voltage drop } e(V) = \frac{1}{58} \times \frac{\text{Length } L(m)}{\text{Cross section area } S(mm^2)} \times \text{Current } I(A) \times \sqrt{3}$$

Select such a cable length and cross section area so that the voltage drop will remain less than 5%.



List of current values at a glance

Unit: ampere (A)

Model	SDG13	SDG25	SDG45	SDG60	SDG100	SDG125	SDG150	SDG220	SDG300	SDG400	SDG500	SDG610	SDG800	
50Hz	200V	30.3	57.7	107	144	231	289	361	563	779	1,010	1,299	1,602	2,021
	380V	16.0	30.4	56.2	76.0	122	152	190	296	410	532	684	843	1,063
	400V	15.2	28.9	53.4	72.2	115	144	180	281	390	505	650	801	1,010
60Hz	220V	34.1	65.6	118	157	262	328	394	577	787	1,050	1,312	1,600	2,100
	440V	17.1	32.8	59.0	78.7	131	164	197	289	394	525	656	800	1,050

List of Neutral Point (O terminal) Allowable Power

Model	SDG13		SDG25		SDG45		SDG60		SDG100		SDG125		SDG150	
Frequency(Hz)	50	60	50	60	50	60	50	60	50	60	50	60	50	60
● 200/220V														
Voltage(V)	115	127	115	127	115	127	115	127	115	127	115	127	115	127
Allowable ampere 3 phase average(A)*1	24.2	27.3	46.2	52.5	85.6	94.4	115	126	185	210	231	262	289	315
Output ratio	80*2													
Allowable ampere Single phase(A)	30.3	34.1	57.7	65.6	107	118	144	157	231	262	289	328	361	394
Output ratio	100*2													
● 400(380)/440V														
Voltage(V)	$\frac{231}{(219)}$	254	$\frac{231}{(219)}$	254	$\frac{231}{(219)}$	254	$\frac{231}{(219)}$	254	$\frac{231}{(219)}$	254	$\frac{231}{(219)}$	254	$\frac{231}{(219)}$	254
Allowable ampere 3 phase average(A)*1	$\frac{12.2}{(12.8)}$	13.7	$\frac{23.1}{(24.3)}$	26.2	$\frac{42.7}{(45.0)}$	47.2	$\frac{57.8}{(60.8)}$	63.0	$\frac{92.9}{(96.8)}$	105	$\frac{115}{(122)}$	131	$\frac{144}{(151)}$	158
Output ratio	80*2													
Allowable ampere Single phase(A)	$\frac{15.2}{(16.0)}$	17.1	$\frac{28.9}{(30.4)}$	32.8	$\frac{53.4}{(56.2)}$	59.0	$\frac{72.2}{(76.0)}$	78.7	$\frac{115}{(121)}$	131	$\frac{144}{(152)}$	164	$\frac{180}{(189)}$	197
Output ratio	100*2													

Model	SDG220		SDG300		SDG400		SDG500		SDG610		SDG800	
Frequency(Hz)	50	60	50	60	50	60	50	60	50	60	50	60
● 200/220V												
Voltage(V)	115	127	115	127	115	127	115	127	115	127	115	127
Allowable ampere 3 phase average(A)*1	462	462	390	394	505	525	650	656	801	800	1,010	1,050
Output ratio	80*4				50*3							
Allowable ampere Single phase(A)	577	577	390	394	505	525	650	656	801	800	1,010	1,050
Output ratio	100*2				50*3							
● 400(380)/440V												
Voltage(V)	$\frac{231}{(219)}$	254	$\frac{231}{(219)}$	254	$\frac{231}{(219)}$	254	$\frac{231}{(219)}$	254	$\frac{231}{(219)}$	254	$\frac{231}{(219)}$	254
Allowable ampere 3 phase average(A)*1	$\frac{231}{(243)}$	231	$\frac{312}{(328)}$	315	$\frac{404}{(426)}$	420	$\frac{520}{(547)}$	525	$\frac{641}{(674)}$	640	$\frac{808}{(851)}$	840
Output ratio	80*4											
Allowable ampere Single phase(A)	$\frac{289}{(304)}$	289	$\frac{390}{(410)}$	394	$\frac{505}{(532)}$	525	$\frac{650}{(684)}$	656	$\frac{801}{(843)}$	800	$\frac{1,010}{(1,064)}$	1,050
Output ratio	100*2											

*1 When you use single phase with O terminal at the same time for each phase from Model SDG13S/25S/AS to SDG150S/AS, the unbalance of current value for each phase should be kept within 50%. When the current values exceed the limit, please note that the output voltages for each phase may be unbalanced.

*2 Output ratio shows an allowable output figure of the rated current. (Rated output 100% = it is allowable to use the rated current value until 100%.)

*3 Output ratio shows an allowable output figure of the rated current. (Rated output 50% = it is allowable to use the rated current value until 50%.)

*4 Output ratio shows an allowable output figure of the rated current. (Rated output 80% = it is allowable to use the rated current value until 80%.)

Leakage Protection Device and Grounding Method

Leakage Protection Device

This machine is equipped with a leakage relay which detects leakage caused by a defective insulation of working load to prevent an accident such as an electric shock by shutting down the circuit. However, for additional safety, install ground fault circuit interrupter (GFCI) for each load equipment close to the load equipment. The sensitivity current of the leakage relay is 30mA.

Grounding Method

<Procedure>

Connect a lead wire fitted with a ground rod to the leakage relay grounding terminal (E) of the three-phase output terminal board.

1. Connect the generator machine ground terminal of the package to ground.
2. Be sure to ground the package of the load equipment as well.
3. These grounding must be carried out in accordance with local regulations.

