

NES SERIES

Diesel Engine Generator



**Earth-friendly Green generator
that shines for a bright future**

400-year-old Japanese beech at the Shirakami-sanchi World Heritage site

NES SERIES Powerful and earth-friendly generator



As a manufacturer of construction equipment such as pile drivers with many years of construction experience, Nippon Sharyo delivers leading-edge portable generators designed considering environmental issues such as global warming, air pollution and noise.



- Environment-friendly Green generator
- High performance and high quality chosen by professionals
- Useful and safe equipment and structure
- Well-received NISSHA generators
- Wide-ranging options

Environment-friendly Green generator

■ Conforming to the Third Emission Regulation

NES Series generators are equipped with a super low emission engine conforming to the Third Emission Regulation. Since the generators can help prevent air pollution, they can be used in works under the direct control of the Ministry of Land, Infrastructure, Transport and Tourism.

■ Super low noise design

Low noise design for environment-friendliness. Models NES25TI to NES220TI feature super low noise design.

■ Compact and light-weight

The body is small and light-weight, enabling easy transportation by truck and reducing transportation costs.

■ Oil guard equipped as standard

An oil guard is equipped as standard on all models that conform to the Third Emission Regulation. This reduces ground contamination from oil leakage.

■ Reduced fuel consumption

Fuel consumption can be reduced by using an optional e-Pon and/or energy saving remote control.

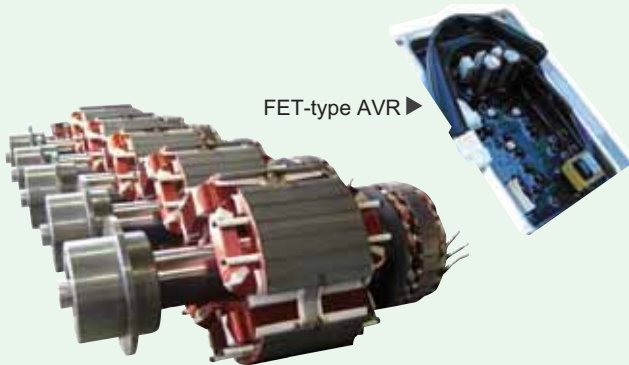


PRODUCT INFORMATION

High performance and high quality chosen by professionals

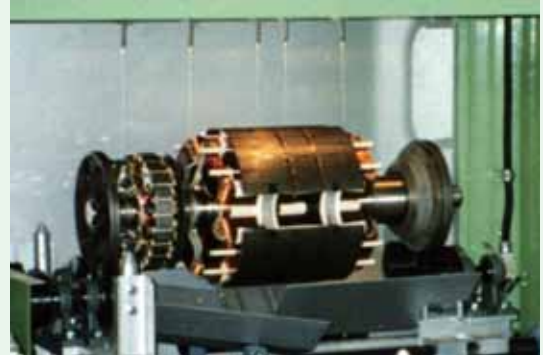
High-quality power supply

The FET-type AVR (automatic voltage regulator) and high-performance damper winding provide high-quality power with a voltage regulation of $\pm 0.5\%$. In addition to working well with general linear loads, the generator also works well with non-linear loads such as inverters.



High insulation performance

The alternator winding is coated with varnish using dripping impregnation and vacuum impregnation to provide high insulation performance.



Dual voltage support for globalization

All models are equipped with a dual voltage feature to select either 200V for general use or 400V for large-capacity equipment. The dual voltage feature meets the need for globalization since 400V loads are more common overseas. The voltage currently selected is shown by the voltage indicator.

The NES25TI and 25TIL models are triple voltage models, allowing a single-phase, 3-wire to be selected in addition to the 3-phase 200V/400V.



▲ Voltage changeover terminal (NES150-800)



▲ Voltage changeover terminal (NES25-125)



◀ Voltage indicator

Weather resistant coating

Electrodeposition and weather-resistant baking finish are used on all models, providing high resistance to corrosion.

Tough and durable

NISSHA generators are known for toughness and durability. We continue to create products that satisfy our customers.



Note: Some of the above features are not included in some models.

PRODUCT INFORMATION

Useful and safe equipment and structure

Oil guard

All models complying with the Third Emission Regulation are equipped with an oil guard that has passed a leak test to protect the environment. In addition to offering rain protection, a drain cock is also provided to drain rainwater that has entered the oil guard.



Leak test ▶

Note: Rainwater collected in the oil guard needs to be drained.

Earth leakage device

To prevent electric shocks, a high-sensitivity, high-speed earth leakage relay is provided.



New IC monitor

A new IC monitor checks the system for abnormalities at all times before and during operation.

Note: Except models NES610 and 800.



Item		Engine stop	Breaker trip	Lamp
Monitor	Low oil pressure	○	—	○
	High water temperature	○	—	○
	Overspeed	○	—	○
	Battery voltage failure	—	—	○
	Non charge	—	—	○
	Low fuel level	○	—	○
	Oil guard *1	—	—	○
	Diagnosis (ECU error) *2	○	—	○
	Voltage selection error *3	○	○	○
Overcurrent	—	○	—	
Earth leakage	—	○	○	

*1: Big tank models only (NES25TIL, 45TYL and 60TIL).

*2: ECU models only (NES45TY2 to 400TI).

*3: NES25TI and TIL only.

Easy radiator washing

The front cover of the radiator is either a full-open type (NES25TI to NES60TIL) or hinged type (NES220TI to NES800SM) to enable easy washing of the radiator.



Daily checking on one side

The fuel filler port, oil filler/inspection port, reserve tank and output terminal board are placed on one side, allowing easy access for daily checking and wiring.



Easy oil change

Oil can be changed quickly and easily without special tools. Maintenance time is reduced and your hands will not get dirty.

(For NES25TI, 25TIL, 45TY2, 60TI and 60TIL)



▲ Oil drain hose

Fuel tank changeover cock

A single-lever, fuel tank changeover cock (patent pending) for switching between the internal and external tanks is provided to allow for long time operation. The cock is easy to operate and prevents mistakes switching. (Provided on NES25 to 220, except NES25TIL, 45TYL and 60TIL.)



▲ Changeover cock of fuel tank



Well-received NISSHA generators

Government agencies and others trust Nissha.

The specifications, registration and certification of government agencies and other organizations in Japan show the trust placed in NISSHA generators.



Construction equipment conforming to the Third Emission Regulation designated by the Ministry of Land, Infrastructure, Transport and Tourism (NES25TI to 400TI)



Super low noise construction equipment designated by the Ministry of Land, Infrastructure, Transport and Tourism (NES25TI to 220TI)



Low noise construction equipment designated by the Ministry of Land, Infrastructure, Transport and Tourism (NES400TI to 800SM)



Oil guard integrated generator registered with NETIS by the Ministry of Land, Infrastructure, Transport and Tourism (NES25TI to 400TI)



Portable generator certified by the Nippon Engine Generator Association (all models)

We work steadily and diligently.

For more than half a century, Nippon Sharyo has worked hard, manufacturing and delivering high-quality products to meet customer requirements.

We are determined to work even harder to continue to keep our customers satisfied with our generators.

SPECIFICATIONS

Model specifications



▲ NES25TI



▲ NES60TI

Super Silent Models															
Item			NES25TI *1		NES25TIL		NES45TY2		NES45TYL		NES60TI		NES60TIL		
Alternator	Frequency	Hz	50	60	50	60	50	60	50	60	50	60	50	60	
	Output	Prime	kVA	20	25	20	25	37	45	37	45	50	60	50	60
			kW	16	20	16	20	29.6	36	29.6	36	40	48	40	48
		Standby	kVA	22	27.5	22	27.5	40.7	49.5	40.7	49.5	55	66	55	66
			kW	17.6	22	17.6	22	32.6	39.6	32.6	39.6	44	52.8	44	52.8
Voltage	V	Dual Voltage (see below)													
Type & Power Factor		Brushless Alternator, 3-Phase, 4-Wire, 4-Poles, Power Factor 80% Lagging													
Engine	Engine model		ISUZU BV-4LE1		ISUZU BV-4LE1		YANMAR 3-4TNV98TG		YANMAR 3-4TNV98TG		ISUZU BJ-4JJ1X		ISUZU BJ-4JJ1X		
	Type		Swirl chamber type				Direct injection type with turbocharger				Direct injection type with turbocharger and intercooler				
	Cylinders - Bore x Stroke	mm	4-85 × 96		4-85 × 96		4-98 × 110		4-98 × 110		4-95.4 × 104.9		4-95.4 × 104.9		
	Total displacement	ℓ	2.179		2.179		3.319		3.319		2.999		2.999		
	Rated output	kW	19.1	23.5	19.1	23.5	37.9	45.6	37.9	45.6	51.6	61.0	51.6	61.0	
	Speed	min ⁻¹	1500	1800	1500	1800	1500	1800	1500	1800	1500	1800	1500	1800	
	Fuel consumption	50% load	ℓ/H	2.9	3.6	2.9	3.6	4.2	5.3	4.2	5.3	5.6	6.9	5.6	6.9
		75% load	ℓ/H	3.8	4.8	3.8	4.8	5.9	7.4	5.9	7.4	7.9	9.6	7.9	9.6
	Engine oil volume	ℓ	8.4		8.4		11.2		11.2		15.0		15.0		
	Battery		85D26L × 1		85D26L × 1		105D31L × 1		105D31L × 1		120E41R × 1		120E41R × 1		
	Fuel tank capacity	ℓ	70		195		145		330		180		400		
	Fuel		Diesel fuel												
	Oil guard capacity Total/Effective *2	ℓ	70/70		285/80		245/80		460/135		275/75		400/140		
Dimensions and weight	Length *3	mm	1,540		1,540		1,740		2,000		2,050		2,050		
	Width	mm	680		680		880		880		930		930		
	Height	mm	1,080		1,415		1,350		1,585		1,390		1,600		
	Dry weight	kg	610		690		1,020		1,125		1,235		1,310		
	Operating weight	kg	685		875		1,170		1,440		1,415		1,675		
Sound power level *4	dB	89(Super low noise)		88(Super low noise)		90(Super low noise)		88(Super low noise)		90(Super low noise)		89(Super low noise)			
Sound level at 7 meters *5	dB	61	63	59	61	61	63	57	60	59	62	58	62		

Rated Voltage Classification

50 Hz	60 Hz
190 - 210 V	210 - 240 V
380 - 420 V	420 - 480 V



▲ NES100TI



NES150TI ▲



NES220TI ▲

Super Silent Models									Silent Models					
NES100TI		NES125TI		NES150TI		NES220TI		NES400TI		NES610SM		NES800SM		
50	60	50	60	50	60	50	60	50	60	50	60	50	60	
80	100	100	125	125	150	200	220	350	400	554	610	700	800	
64	80	80	100	100	120	160	176	280	320	443	488	560	640	
88	110	110	138	138	165	220	242	368	440	554	610	770	880	
70.4	88	88	110	110	132	176	194	294	352	443	488	616	704	
Dual Voltage (see below)														
Brushless Alternator, 3-Phase, 4-Wire, 4-Poles, Power Factor 80% Lagging														
ISUZU BI-4HK1X		ISUZU BI-4HK1X		ISUZU BH-6HK1X		ISUZU BH-6UZ1X		ISUZU BH-6WG1X		MITSUBISHI S6R-PTA		MITSUBISHI S12A2-PTA		
Direct injection type with turbocharger and intercooler														
4-115×125		4-115×125		6-115×125		6-120×145		6-147×154		6-170×180		12-150×160		
5.193		5.193		7.790		9.839		15.681		24.5		33.9		
95.8	113.6	95.8	113.6	135.2	166.5	185.2	203.7	309	346	517	565	677	758	
1500	1800	1500	1800	1500	1800	1500	1800	1500	1800	1500	1800	1500	1800	
9.6	12.5	11.8	15.2	14.1	18.0	22.1	25.8	39.6	50.6	60	72	82	105	
13.9	17.4	17.0	21.4	19.9	24.5	32.4	36.5	55.9	67.6	84	99	113	141	
23.5		23.5		41		42		52		92		130(+Sub Tank85)		
170F51×1		170F51×1		120E41R×2		195G51×2		195G51×2		180G51×2		180G51×4		
250		250		250		390		490		580		730		
Diesel fuel														
255/205		255/205		390/280		435/265		605/410		—		—		
2,900		2,900		3,480		3,835		4,780(4,490)		5,173(4,690)		6,235(5,600)		
1,180		1,180		1,180		1,290		1,500		1,650		1,950		
1,550		1,550		1,650		1,790		2,200		2,400		2,580		
2,000		2,050		2,720		3,650		5,520		8,190		11,000		
2,250		2,300		2,990		4,050		6,050		8,860		12,000		
93(Super low noise)		93(Super low noise)		92(Super low noise)		94(Super low noise)		97(Low noise)		101(Low noise)		101(Low noise)		
61	64	60	64	60	65	64	67	66	69	69	72	70	73	

*1: Models marked ▲ have passed the 3rd Emission Regulation prescribed by the Ministry of Land, Infrastructure, Transport and Tourism.
 *2: Total capacity means the capacity of the oil guard itself. Effective capacity means the capacity considering the fuel tank and other components.
 *3: Values in parentheses are dimensions excluding the rain cover.
 *4: Values at 60 Hz, no load (LWA).
 *5: Average sound pressure in 4 directions at no load.

OPTION

The NES series generators feature a simple design to allow easy operation at construction sites.
A wide variety of options are also available to add useful functions and environment-friendly features.

Options list

○ : Optional item ◎ : Standard equipment *1 : External installation on separate board

Classification	Item	25TI	25TIL	45TY2	45TYL	60TI	60TIL	100TI	125TI	150TI	220TI	400TI	610SM	800SM
Parallel running	NAC-300 (Full-auto parallel running device)	—	—	—	—	—	—	—	—	—	○	○	○	○
	Manual synchronizing device	—	—	—	—	—	—	—	—	○	○	◎	◎	◎
	Percent power meter	—	—	—	—	—	—	—	—	○	○	○	○	○
Output	Single-phase/3-phase selector cam switch	—	—	○	○	○	○	—	—	—	—	—	—	—
	Auxiliary output for 200V	—	—	—	—	—	—	—	—	—	○	○	○	○
Operation control	e-Pon (Simplified auto starter)	—	○	—	○	—	○	○	○	○	○	○	—	—
	e-Stop (Auto shutdown for oil guard full level)	○	○	○	○	○	○	○	○	○	○	○	—	—
	Energy-saving remote controller	—	—	—	—	—	—	○	○	○	○	○	○	○
	Slowdown device	—	—	—	—	—	—	—	—	○	○	○	○	○
	Auto idling device	—	—	—	—	—	—	—	—	○	○	○	○	◎
	Auto start/stop unit	○*1	○*1	○*1	○*1	○*1	○*1	○*1	○*1	○	○	○	○	○
	Battery charger	○*1	○*1	○	○	○	○	○	○	○	○	○	○	○
Oil/fuel	Fuel tank changeover cock	◎	—	◎	—	◎	—	◎	◎	◎	◎	○	○	○
	Automatic oil supply unit	—	○	—	○	—	○	—	—	—	○	○	○	◎
	Oil drain pump	—	—	—	—	—	—	—	—	—	○	○	◎	◎
	Fuel supply device	—	—	—	—	—	—	○	○	○	○	○	○	○
	Oil guard	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○
Others	Muffler flange	○	○	○	○	○	○	○	○	○	○	○	○	○
	Anti-theft cover	○	○	○	○	○	○	○	○	○	○	○	○	○
	Salt damage prevention	○	○	○	○	○	○	○	○	○	○	○	○	○
	Wooden sleeper	○	○	○	○	○	○	○	○	○	○	○	○	○
	Panel door with key	○	○	○	○	○	○	○	○	○	○	○	○	○
	Fuel filler with key	○	○	○	○	○	○	○	○	○	○	○	○	○
	Specified color	○	○	○	○	○	○	○	○	○	○	○	○	○
	Trailer	○	—	○	—	○	—	○	○	○	○	○	○	○

Note: Please consult with Nippon Sharyo if you have a specific requirement for options or specifications other than the above.
Some combinations of options are not available. Please consult with Nippon Sharyo for more information.

NAC-300 (Full-auto parallel running device)

The NAC-300 is an auto-parallel running device for NES series generators. This controller includes auto start/stop, synchronizing, load sharing, controlling the number of operating units, and measurement and protection, allowing fully automatic parallel running of generators.

■ Features

- Compact unit that enables all-in-one control
- Full automatic control with a single switch
- Efficient operation for lower fuel consumption
- Up to 8 generators can be connected
- Auto start/stop of one or more generators via remote control



Front panel of NAC-300

■ Functions

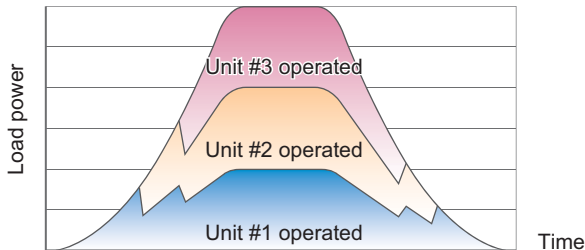
1. Auto start/stop
2. Auto synchronizing, load sharing
3. Control for constant frequency and voltage
4. Auto control of the number of operating units
Parallel running and disconnection are automatically controlled to run the optimum number of units according to changes in load power.

5. Control for heavy loads

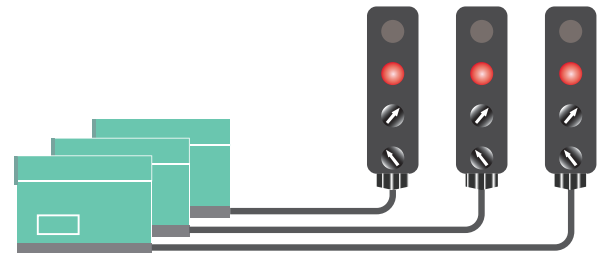
The number of operating units can be increased in advance with a forced operation command, allowing heavy load equipment such as vibratory pile drivers, earth augers and tunnel excavators to be connected.

6. Remote control of auto start/stop

Each generator can be controlled remotely. Various control methods are available.



Control of the number of operating units
(Conceptual illustration for 3 units)



7. Provided with reverse power protection and measurement display

Percent power meter

The shared power of each generator in parallel running is displayed in percentages so that the power balance can be checked at a glance. Reverse power protection is also provided.



⚠ Notes on parallel running

Although parallel running involves complicated procedures such as load sharing, as well as monitoring the operation state, it offers a number of benefits:

- Allows large power supply.
- The number of operating units can be easily set according to the load demand.
- Even if one generator fails, operation can be continued with other units.

Furthermore, an advanced power generation system can be built by controlling the number of operating units and using the remote start/stop.

	Start/stop	Synchronizing	Load sharing	No. of operating units	Remote control
NAC-300	Auto	Auto	Auto	Auto	Option
Manual synchronizing	Manual	Manual	Manual	Manual	Option

Note: This table shows the basic functions of parallel running.

OPTION

Single-phase/3-phase selector cam switch

This voltage selector allows simple switching between single-phase, 3-wire and 3-phase, 200V.



Auxiliary output for 200V

Even if the main output is set to 400V, a separate terminal board can provide 200V output. This is useful when supplying power to 200V load equipment such as lighting fixtures and welders while using 400V load equipment such as heavy-duty electric augers.



e-Pon (Simplified auto starter)

Start/stop and run/idle control of a generator can be controlled using external signals, enabling many useful applications.

■ Example 1

If a generator is used as a power supply for a temporary office at a work site where commercial power is unavailable, and the main circuit breaker on the distribution board in the office is equipped with an auxiliary contact, the generator can be started and stopped by turning the main circuit breaker on and off.

■ Example 2

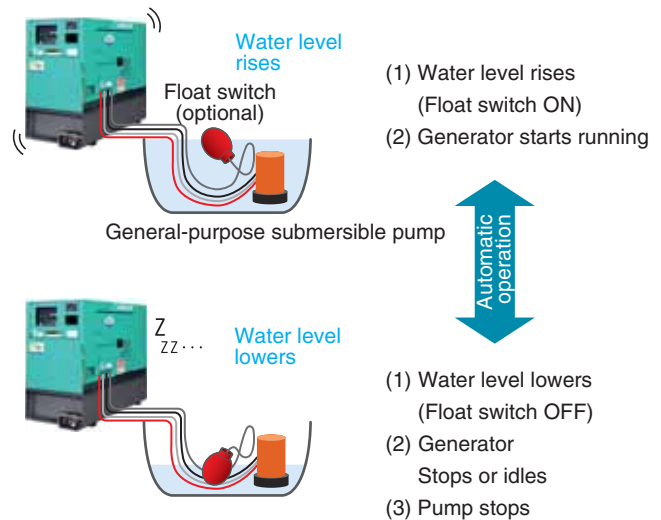
If two or more generators are used as a power supply for an event and one of them fails, a back-up generator automatically starts up to supply power.

■ Example 3

A system that automatically controls the start/stop or run/idle of a generator according to the water level can be built by combining a generator, submersible pump and float switch. (The float switch is optional equipment; the water pump is out of our scope of supply.)

With the conventional powering of a submersible pump from a generator, the generator keeps running at almost no-load rated speed when the water level is lower, consuming fuel. If the e-Pon is incorporated in the generator, fuel consumption can be reduced.

Generator equipped with e-Pon



■ Benefits

- Allows energy-saving operation of a submersible pump.
- Reduced fuel consumption means reduced CO₂ emissions.
- Reduced fuel consumption adds value to the system.
- Prevents dry operation of the submersible pump, extending pump life.
- Reduces low-load operation of the generator, leading to shorter operation hours.

Automatic oil supply unit

This unit consists of an oil sub-tank, solenoid valve, oil level regulator. It automatically supplies engine oil as it is consumed during operation. Long time operation of the generator becomes possible since the oil in the oil pan is maintained at the correct level.



e-Stop (Auto shutdown for oil guard full level)

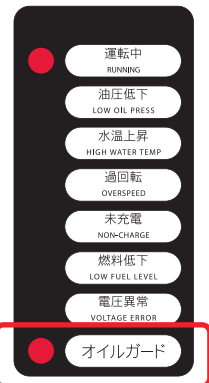
The oil guard of a generator is used to prevent oil leakage from accidents. However, if water stays in the oil guard and fills it, water and oil may overflow. To avoid this problem, level sensors detect the liquid level in the oil guard. The warning lamp notifies the user if water is present. If the oil guard becomes full, the full level sensor notifies the user and stops the engine.
(A warning level sensor is standard on the NES25TIL, 45TYL and 60TIL.)

■ Operation

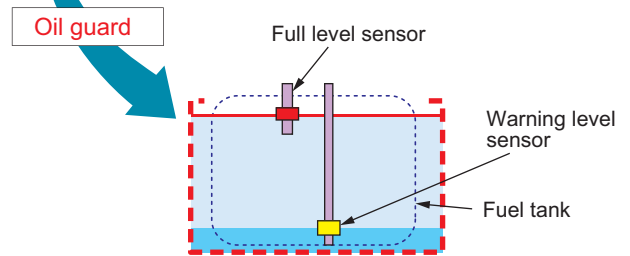
Liquid level	Lamp	Engine
Lower than warning level	OFF	—
Between warning and full levels	Flashes *1	—
Above full level	ON	Stopped *2

*1: For NES25TIL, 45TYL and 60TIL only.

*2: If the oil guard stop switch is on.



Oil guard lamp



Oil guard and liquid level sensors

Energy-saving remote controller and slowdown device

The energy-saving remote controller and slowdown device remotely control engine operation for better fuel economy. Both are wired remote controllers.

○ : Possible operation

Remote control	Energy-saving remote controller	Slowdown device
Idling/rated speed	○	○
Start/stop	—	○
Supplied cable	10m	30m



Slowdown device



Energy-saving remote controller

Auto idling device

This device automatically idles the engine when the engine starts, extending engine life and reducing unnecessary fuel consumption.

OPTION

Auto start/stop unit

This unit automatically starts/stops a generator according to the commercial power state. The generator starts automatically when commercial power fails, and stops automatically after cooling down when commercial power is restored.

The unit is provided with an auto/manual switch to select auto or manual operation in the event of a power failure, as well as a test switch to check if the generator starts automatically.



Auto start/stop unit

Battery charger

This unit charges the battery used for starting the generator engine. The battery slowly discharges to supply stand-by power even when the generator is not operating. The battery charger is indispensable, preventing the battery from running down for an emergency generator that is equipped with an auto starting start/stop unit and maintaining a stand-by state at all times in case of emergencies.

The charger uses commercial power to charge the battery while the generator is in a stand-by state. Chargers for 12 VDC and 24 VDC are available.

Model	Auto start/stop unit		Charger	
	Built in NES unit	Separate board	Built in NES unit	Separate board
NES25	—	○	—	○
NES45 to 125	—	○	○	○
NES150 to 800	○	○	○	○

Muffler flange

A flange structure (conforming to JIS 5k) is used for the muffler outlet of the exhaust piping.

NES model	25TI,TIL	45TY2,TYL	60TI,TIL	100,125TI	150TI	220TI	400TI	610SM	800SM
Size	50A	65A	65A	100A	100A	150A	175A	250A	250A

Anti-theft cover

A special cover with a lock is provided on the hoist hook to prevent generator theft.

Trailer

Single-axle/2-wheel and 2-axle/4-wheel trailers are available for easy movement of the generator on site (maximum speed: 25 km/h).

Salt damage prevention

Assuming use at offshore work sites, the NES series generators are provided with salt damage prevention measures such as enhanced alternator insulation, corrosion resistant paint and stainless steel hinges. Specifications for enhanced protection against salt damage as well as economy specifications for simplified protection are also available as options.



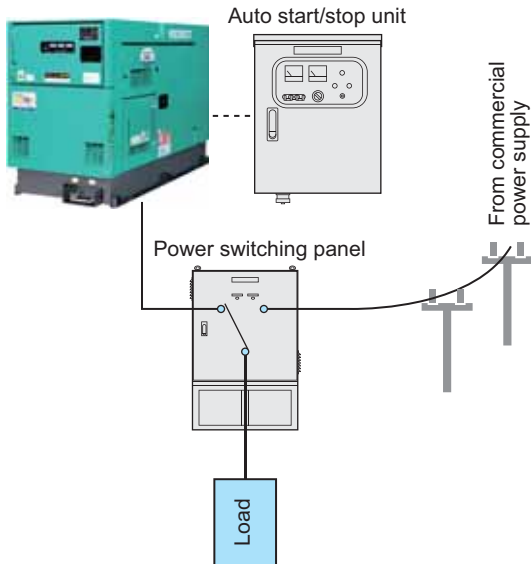
Single-axle/2-wheel trailer



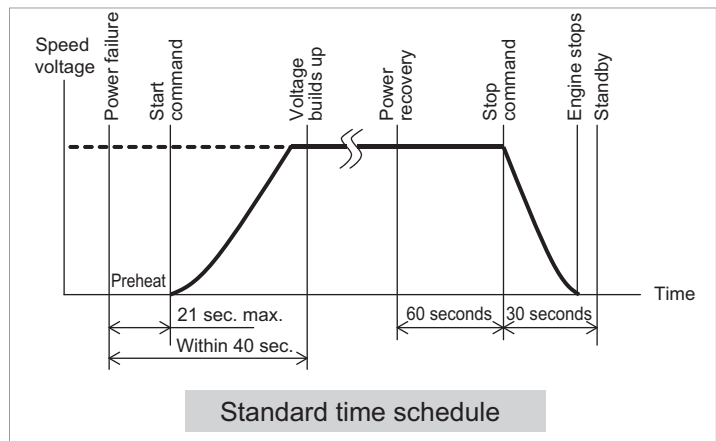
2-axle/4-wheel trailer

AMF system

Although the NES series portable generators are basically designed to provide power supply at work sites, options are available for use as AMF generators that automatically supply power in the event of a power failure. These options include the auto start/stop unit, battery charger and power switching panel, and an AMF generator can be configured using simple optional equipment.

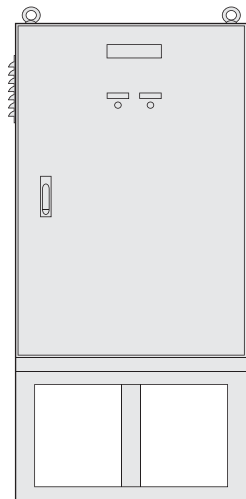


■ Example of installation (NES60 class)
This example shows a system combining an auto start/stop unit, battery charger and power switching panel into one unit.



Power switching panel

This panel incorporates a switch to toggle between commercial power and generator output. The design is similar to a distribution board. Various models are available to meet your requirements for voltage, current and indoor/outdoor use.



Power switching panel
(Conceptual illustration)

Standard size of power switching panel (Indoor type)

Model	Voltage	Current	Dimensions (W×H×D)
TPR-220	200V system	200A	700 × 1000 × 300
TPR-240		400A	
TPR-260		600A	800 × 1650 × 500
TPR-280		800A	800 × 1850 × 500
TPR-2100		1000A	800 × 1950 × 500
TPR-2120		1200A	
TPR-420	400V system	200A	700 × 1000 × 300
TPR-440		400A	700 × 1400 × 300
TPR-460		600A	800 × 1650 × 500
TPR-480		800A	800 × 1850 × 500
TPR-4100		1000A	800 × 1950 × 500
TPR-4120		1200A	

Note: Please consult with Nippon Sharyo for special requirements such as incorporating an auto start/stop unit in the power switching panel.

SELECTION

■ Selecting generator capacity

The following data shows a guideline for selecting a generator when a load of a 3-phase, squirrel-cage induction motor (hereinafter referred to as a motor) is used.

● Conditions for calculating the required generator capacity

Motor efficiency is assumed to be 85%, starting kVA is assumed to be 7 kVA/kW and momentary voltage drop at motor startup is assumed to be 30%. The load applied to the engine may vary depending on the brake mean effective pressure of the engine.

The requirements may vary depending on the motor specifications and operating conditions. Please consult with Nippon Sharyo for more information.

Table 1 Generator capacity required for operation

Motor capacity (kW)	1.5	2.2	3.7	5.5	7.5	11	19	22	37	45	60
Generator capacity (kVA)	2.2	3.2	5.4	8.1	11.0	16.2	27.9	32.4	54.4	66.2	88.2

Table 2 Generator capacity required for starting

Motor capacity (kW)	1.5	2.2	3.7	5.5	7.5	11	19	22	37	45	60	
Generator capacity (kVA)	Line starting	4.9	7.2	12.1	18.0	24.5	35.9	62.1	71.9	121	147	196
	Y-Δ	3.3	4.8	8.1	12.0	16.3	24.0	41.4	47.9	80.6	98.0	131

(1) Starting one motor or multiple motors simultaneously

Referring to Tables 1 and 2 above, find the generator capacity (kVA) corresponding to the motor capacity (kW) and select the higher value generator capacity.

Example: Starting 3.7 kW and 5.5 kW line-starting motors simultaneously

Motor capacity (kW)	3.7	5.5	3.7 + 5.5	
Generator capacity (kVA)	Table 1	5.4	8.1	5.1+8.1=13.5
	Table 2	12.1	18.0	12.1+18.0=30.1

The required generator capacity is 30.1 kVA.

(2) Starting multiple motors sequentially

Find the generator capacity required for the steady-state operation of the motors already started (Table 1), and find the generator capacity required for starting the motor to be started last (Table 2). The sum of these values is the generator capacity required for sequential starting.

Example: Starting 7.5 kW, 11 kW and 19 kW (Y-Δ) motors sequentially

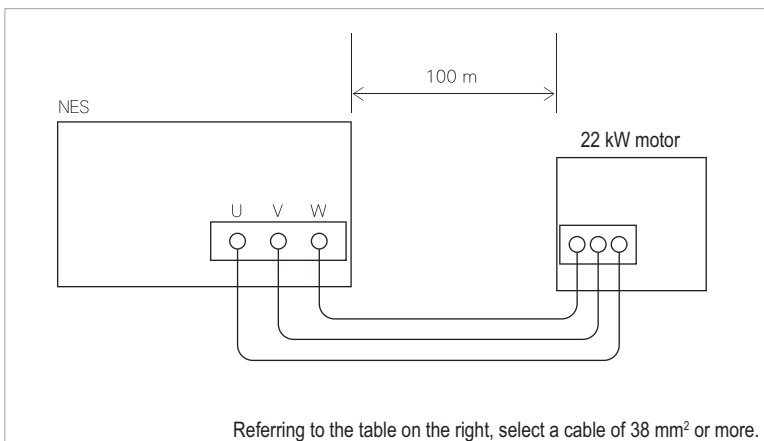
Motor capacity (kW)	7.5	11	19	7.5+11+19
Generator capacity (kVA)	Table 1	11.0	16.2	11.0+16.2+41.4
	Table 2			=68.6

The required generator capacity is 68.6 kVA.

■ Cable selection guide

- 1 Voltage drop of the cable should be within 10V.
- 2 Amperes per square millimeter should be approximately 3 amps.

[Example] Selecting a cable for the following configuration



Motor capacity (kW)	Full-load current (A)	Cable size (mm ²)		
		Within 20m	Within 100m	Within 200m
1.5	7.3	3.5	3.5	5.5
2.2	10	3.5	5.5	8
3.7	16	5.5	5.5	14
5.5	24	8	14	22
7.5	31	14	14	22
11	45	22	22	38
19	74	30	30	60
22	87	38	38	80
37	143	50	60	100
45	175	60	80	150
60	220	80	100	200

Note: If a magnetic contactor is used to start a motor and the contactor chatters when starting, use a larger cable size.

INQUIRY SHEET

When inquiring about Nippon Sharyo diesel generator sets, we would appreciate your filling in the Specification Requirements below and returning it to us. This will enable us to provide a quicker and more accurate quotation for your requirements.

SPECIFICATION REQUIREMENTS

1. End user's name

2. Model

NES _____ — _____

3. Quantity

_____ Unit(s)

4. Application

Prime power Stand-by power

5. Output

_____ kVA or _____ kW _____

6. Operating system

Single operation Parallel running
_____ Units

7. Necessary optional equipment

8. Service conditions

Altitude: _____ meters

Temperature range _____ to _____ °C

9. Maximum humidity

_____ % at _____ °C

Distributor

Manufacturer

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