

Safety precautions

- Set this machine at places indoor where ventilation is possible and there are no combustibles.
- Before operating this machine, read the instruction manual carefully to ensure proper use.

Nippon Steel & Sumikin Welding Co., Ltd.

<http://www.welding.nssmc.com/>

Plasma Welding Machinery Unit

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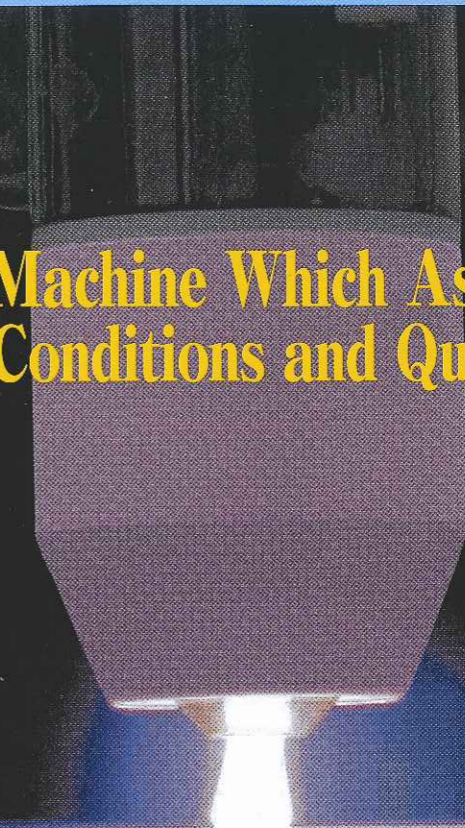
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FULL DIGITAL PLASMA WELDING MACHINE NW-150AH-III/NW-350AH-III



A Welding Machine Which Assures Excellent Welding Conditions and Quality Control



Nippon Steel & Sumikin Welding Co., Ltd.

Characteristics

Digital Setting of Welding Conditions

- Reproducibility of welding is improved and setting fluctuation of operators is reduced to zero by the digital setting of welding conditions. Visibility is excellent due to digital display and handling is also excellent due to large knobs.
- Welding conditions can be changed for each production item since it is possible to store up to 99 welding conditions in the internal memory.

Standard Features for Communication Function (RS232C)

- Automatic setting of welding conditions is possible using external computers, sequence, etc. Also, it is possible to readout output values such as welding currents, etc. on external equipment. This makes the storing of welding history and centralized control of welding conditions possible.

High Quality and High Speed Welding

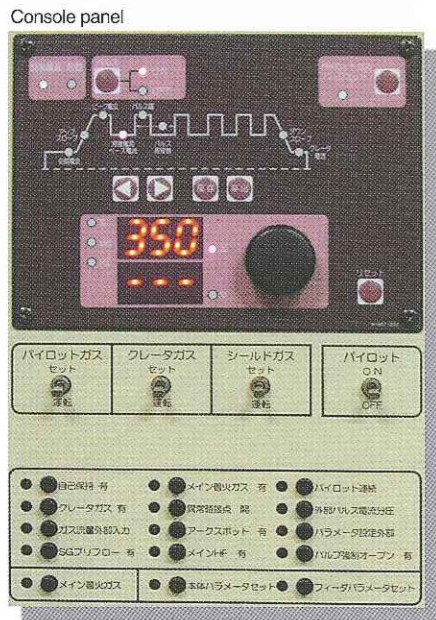
- High speed, efficiency and quality welding is assured since high density plasma arc with rigidity due to inverter control and high pulse is obtainable. In addition, the control of heat input by pulse prevents undercut and burning through and assures the formation of an excellent bead.

Various Kinds of Torches Suitable for Production Methods and Usage

- It is possible to select the most suitable torch fit for the use from various kinds of torches.

A Large Choice of Optional Equipment

- We are able to provide various kinds of welding object and system as optional item to meet customer required.



Function

Fully Equipped with Functions Required for Automatic Welding

- Interlock functions such as robots, automatic machines, etc. are installed as standard equipment. Robots to be used with the machine must be those for plasma and TIG welding. Please contact us for details.
- A pilot gas mass flow control unit is installed as standard equipment.
- It is possible to have a wire feed control function built-in (optional).
- A plasma gas control function is installed for crater treatment as standard equipment.
- It also can be used with a primary power source of AC380/400V (a transformer for optional cooling water circulation pump).
- It is possible to set pulse frequency from 0.5 to 999 Hz.
- It is possible to set current patterns necessary for arc starting and crater treatment.
- Cooling fans and cooling water circulation pumps stop operation automatically during standby (when welding arc and pilot arc are off).
- The following functions are equipped with to ensure the starting of welding arc..
 - Control of pilot current increase
 - Control of pilot gas flow rate increase
 - Control of the combined use of high frequency

Specification

Model		NW-150AH-III	NW-350AH-III
Input voltage	V	3φ AC 200/220V ±10%	50/60Hz
Rated input	KVA	9.5	22.0
Rated output current	A	150	350
Output current range	A	5~150	10~350
Rated duty cycle	%	70	
Maximum no-load voltage	V	160	
Rated load voltage	V	40	
Control method		IGBT inverter control constant current system	
Output characteristic		Constant current characteristic	
Cooling method		Forced air cooling	
Outside dimensions (W×D×H)	mm	400×770×792	
Weight	kg	95	
Pulse frequency	Hz	0.5~999	
Pulse width	%	15~85	
Arc spot time	sec	0.5~5	
Pilot gas flow rate	ℓ/min	0.1~5.0	
Shield gas flow rate	ℓ/min	2~15 (internal SG flow rate adjustment unit)	
Cooling water pressure	Mpa	0.6	
Cooling water flow rate	ℓ/min	1.5~3.5 (depending on the torch)	
Water tank capacity	ℓ	7.6	

Peripheral Equipment (option)

●Wire Feed Control Unit

Model	WCU-093
Feed speed display	Displayed by digital meter
External interlock function	Feed amount analog command, wire sticking signal, etc. from robots and so on.



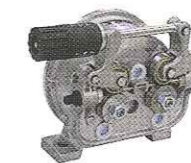
Note)The wire feed control unit consists of a wire feed control panel and a control system. The wire feed control panel is located on the power source, and the control system is built into the power source.

●Wire Feeder

Model	NF-1600
Applicable wire diameter	φ1.0/φ1.2 (φ0.8/φ0.9, φ1.4/φ1.6: option)
Wire feed speed	40~450 cm/min.
Maximum diameter of applicable spool	300 mm diam. (axis diameter: 51 mm diam)



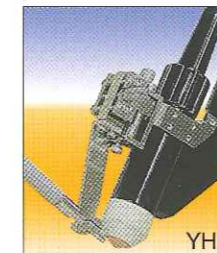
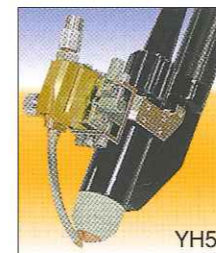
NF-1600



NF-1600R

●Wire Head

Model	YH-5	YH-6
Applicable wire diameter	Applicable to all plasma welding torch models	
Applicable wire diameter	φ0.8~1.2 mm diam	φ0.8~1.6 mm diam
Remark	For welding narrow places	For welding in general



YH5

YH6

●Chiller

Model	NC-3000	NC-5000
Power source	3 phase.200V±10% (50/60Hz)	
Cooling Capacity	2.00 / 2.20kW	4.30 / 4.65kW
Power consumption	0.85 / 1.05kW	1.6 / 2.1kW
Ambient temperature range	5 to 40deg.℃	
Service water temperature range	5 to 25deg.℃	
Refrigerant	R-407C	
External dimensions(H×D×W)	534×405×398(mm)	650×500×600(mm)
Mass(Tank dryness)	Approx.43kg	Approx.70kg
Applicable welding machines	NW-150AH-III NW-350AH-III	NW-350AH-III

Suitable Torch Heads



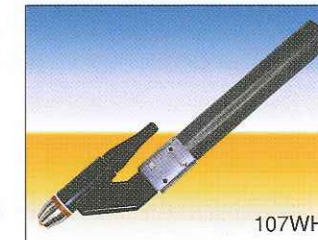
51KWH



101WH



504WH

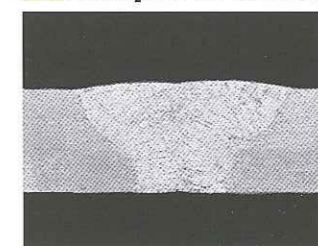


107WH

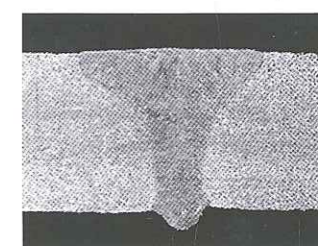
Model No.	Maximum operation current (A)	Duty cycle (%)	Torch head weight (g)	Torch shape		Remark
				Horizontal type	Vertical type	
50WH	100/85	60	360	○		
51WH	100/85	60	370		○	
50KWH	100/85	60	400	○		Suitable for the welding of fillets and narrow places
51KWH	100/85	60	410		○	
100WH	180	60	500	○		Suitable for the welding of fillets and narrow places using a fine point insert tip (maximum welding current is 120A)
101WH	180	60	520		○	
107WH	170	60	650		○	Type of indirect water cooling
503WH	500	50	800	○		
504WH	500	50	810		○	

The above Model Nos. indicate torch head.

Examples of Welding



I butt (Material: SS Plate thickness: 3.2 mm)



I butt (Material: SUS Plate thickness: 8 mm)



Fillet (Material: SUS)

Principle of Plasma Welding

When gas passes through the heat source produced by discharged arc, atoms that form the gas are ionized through the emission of electrons. This state is called plasma (super-heated gas).

Plasma welding uses plasma as the heat source, as shown in the figure on the right. Plasma is generated when argon gas is allowed to pass through a high-temperature discharge arc, which is produced by throttling the narrow, water-cooled nozzle. This is a linear heat source associated with a gas flow in which the heat is very highly concentrated, unlike the heat in other welding methods. Plasma welding is characterized by having such a high penetration (keyhole effect) and narrow welding width that it results in strong, stable welding with little thermal impact on the welded materials and minimal distortion.

