

KAIYUAN

MF Inverter DC Spot / Projection Welder

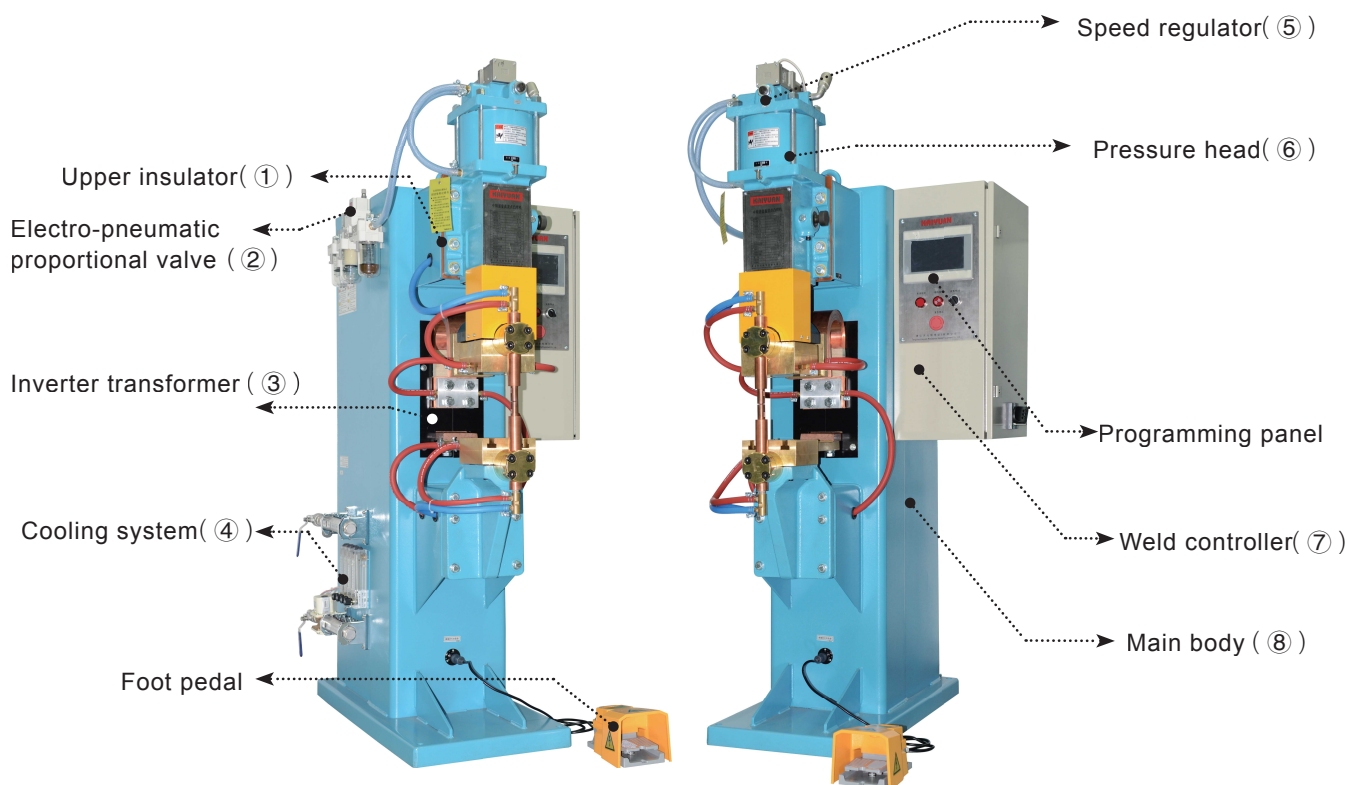


KAIYUAN WELDING & CUTTING AUTOMATION INDIA PVT., LTD.

Stand type spot / projection welder

For spot or projection welding on MS, SS, GA, Ti, AL and AL alloy.

Structure and traits



- 1** Upside insulation is convenient for other device installation. Lowerside accident like short circuit when installing welding jigs can be prevented.
- 2** Use electro-pneumatic proportional valve. Gas pressure can be set quickly. It is controlled by controller. Easily program, store and recall the welding current, time and pressure.
- 3** DC output reduces the impact to welding current caused by secondary side inductance. The power factor is almost 1. Output welding current is fully constant and no zero crossing period. Energy consumption less and production cost less.
- 4** Parallel cooling water route is used in this machine. Every route is adjustable with separate display and easy to check the cooling status. Warning function works through water flow detector.

- 5** Pressure head up and down speed is adjustable continuously. It reduces the pressure impact to the work piece and reduces noise also.
- 6** Vertical type pressure mechanism has good following performance, low noise and long life.
- 7** Three phase power input ensures the balance among 3 phases. Based on 1k Hz invert frequency, the current is controlled and monitored in millisecond level, effectively increases the welding quality.
- 8** All the basic structures are welded by automatic robot. Good anti-vibration and impact rigidity will assure good weld.

MF Inverter DC Spot / Projection Welder

Specification

Item(unit)	Model	MF Inverter DC Spot Welder			MF Inverter DC Spot / Projection Welder				
		DBZ-50SA	DBZ-80SA	DBZ-160SA	DTBZ-50SA	DTBZ-80SA	DTBZ-160SA	DTBZ-320SA	DTBZ-480SA
Rated Power (kVA)		50	80	160	50	80	160	320	480
Rated Voltage (V)		3 phase 415	3 phase 415	3 phase 415	3 phase 415	3 phase 415	3 phase 415	3 phase 415	3 phase 415
Rated duty cycle(%)		50	50	50	50	50	50	50	50
Rated frequency(Hz)		50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60
Max. Shot current(kA) (Duty cycle)		25 (2.4%)	33 (3.5%)	52 (5.7%)	25 (2.4%)	33 (3.5%)	52 (5.7%)	76 (6.9%)	86 (12.1%)
Continuous output current(kA)		3.9	6.2	12.4	3.9	6.2	12.4	19.9	29.9
Max. pressure(N)		5200	12000	12000	5200	12000	12000	30000	30000
Throat size (mm)	Spot	200×600	200×600	200×600	170×400	165×425	200×425	225×450	225×450
	Proj.	—	—	—	170×300	165×300	200×300	225×450	225×450
Electrode stroke(mm)		20/60	20/80	20/80	20/60	20/80	20/80	80	80
Water flow(L/min)		15	18	28	15	18	28	28	34
Welding capacity	MS	3+3	6+6	8+8	3+3	6+6	8+8	8+8	8+8
	AL	1+1	2+2	3+3	1+1	2+2	3+3	6+6	8+8
Net weight(kg)		215	380	620	215	380	580	1150	1200

Table type spot welder

Precision welding for low voltage appliance and precision devices etc.

Features

- Vertical pressure with linear guide. Buffer integrated inside the weld head reduces the instant shock.
- MF inverter DC power source offers fine current accuracy control.
- Different JIGs can be available for different kinds of parts.

Main specification

Item(unit)	Model	MF Inverter DC Table Type Spot Welder
		DBZ-50SF
Rated power (kVA)		50
Rated voltage (V)		415
Rated duty cycle(%)		50
Rated frequency(Hz)		50/60
Max. short current(kA) (duty cycle)		13 (8.9%)
Continuous output current(kA)		3.9
Max. pressure(N)		850
Throat size(mm)		180×155
Electrode stroke(mm)		20
Water flow(L/min)		8
Net weight(kg)		150
Overall dimensions (mm)		1100×800×1465



MF Inverter DC Spot / Projection Welder

Welding system

Advanced inverter welding system.

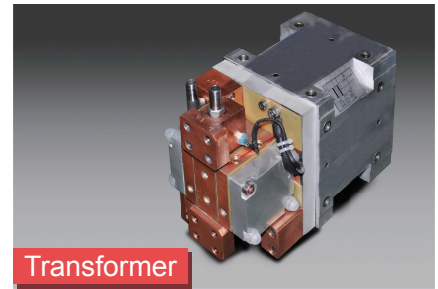
Controller features

- DC output much reduced the impact to welding current caused by secondary side inductance. The power factor is almost 1.
- Balanced load for 3 phase power input reduces the requirement for power capacity. And no sharp load to any single phase.
- Output welding current is fully constant and no zero crossing period. Energy consumption less and production cost less.
- 15 program menus can be set.
- 3 heating periods: preheating, welding, rewelding. Upslope and downslope can be set in welding period.
- Pressure control is programmable. Maximum 10 pressure periods can be set.
- Programmable I/O interface: 3 periods output is programmable. Adapt to connect to PLC or Robot.
- Spot count, electrode repair functional.



Controller main specification

Item (unit)	Model			
	SMF3-600	SMF3-800	SMF3-1200	SMF3-2400
Rated input voltage(V)	3 phase 415V	3 phase 415V	3 phase 415V	3 phase 415V
Rated frequency(Hz)	50/60	50/60	50/60	50/60
Output voltage(V)	500	500	500	500
Inverter frequency(Hz)	1000	1000	1000	1000
Max. output current(A)	600	800	1200	2400
Water flow(L/Min)	6	6	8	8



Transformer

Features

- Compact size, light weight: MF transformer works under 1000 Hz. The transformer size is much smaller and the weight is 30% less compare to traditional one.
- Because of DC output of transformer, there is no inductive reactance in welding circuit. Output capacity increased and efficiency increased around 30%.
- Integrated monitor function: temperature, voltage and current.

Main specification

Item (unit)	Model	MFT-130
Output power P(kVA 20%)		130
No-load voltage U_{sec} [V]		9
Continuous current I_{sec} [kA]		6.3
Water flow(L/Min)		8
Net weight m[kg]		16

Program panel

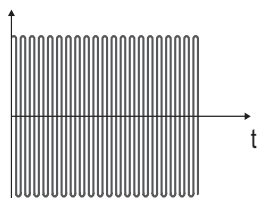
Excellent welding operation HMI



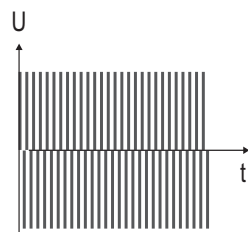
Features

- Color touch screen operation.
- Parameters programming and fault diagnosis.
- User authority management.

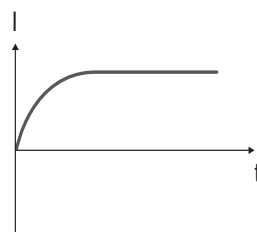
Power frequency 1000 Hz



MF transformer output volatge



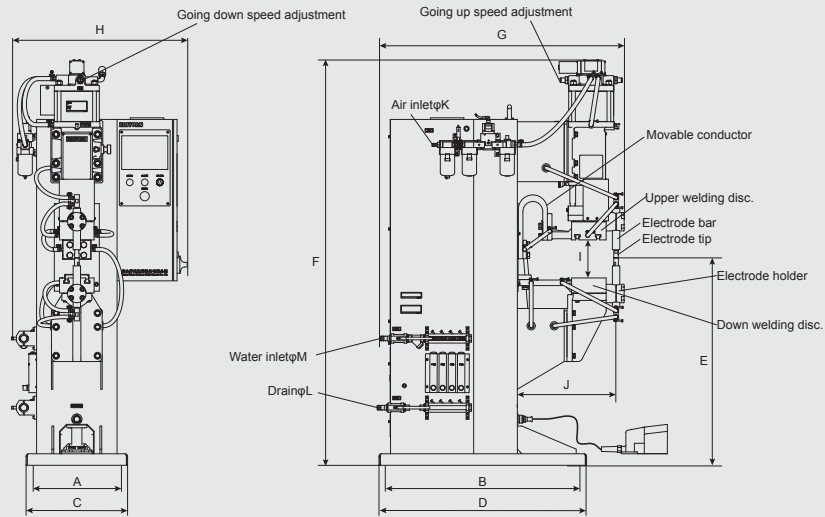
Output welding current wave



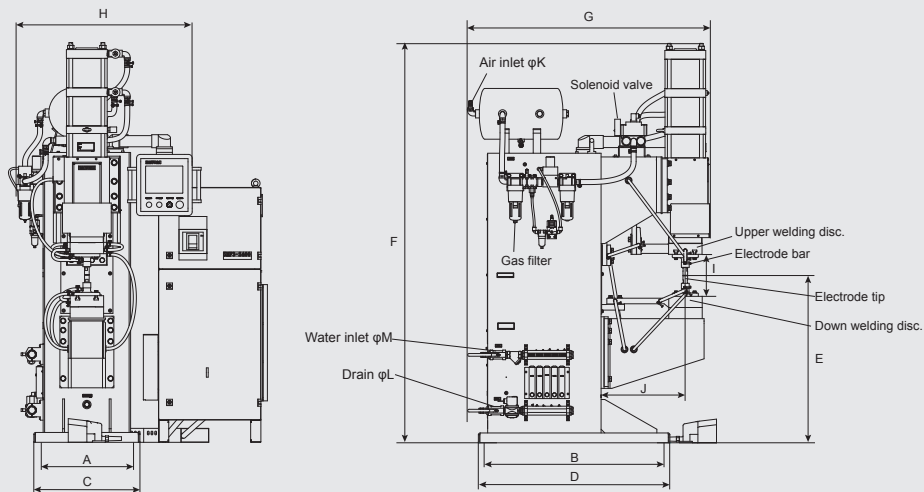
MF Inverter DC Spot / Projection Welder

Overall dimensions (unit:mm)

DBZ-50~160SA
DTBZ-50~160SA



DTBZ-320SA
DTBZ-480SA



Model	A	B	C	D	E	F	G	H	I	J	K	L	M
DBZ-50SA	290	850	340	900	900	1640	1125	700	200	600	12	20	20
DBZ-80SA	390	850	440	900	900	1765	1300	760	200	600	12	20	20
DBZ-160SA	450	880	500	930	900	1765	1325	860	200	600	12	20	20
DTBZ-50SA	290	710	340	760	900	1640	960	700	170	400	12	20	20
DTBZ-80SA	390	850	440	900	900	1765	1125	760	165	425	12	20	20
DTBZ-160SA	450	880	500	930	900	1787	1150	860	200	425	12	20	20
DTBZ-320SA	500	970	570	1030	900	2150	1330	990	225	450	20	25	25
DTBZ-480SA	550	970	610	1030	900	2135	1350	990	225	450	20	25	25

MF Inverter DC Spot / Projection Welder

Customer prepare

Item (unit)		Model	DBZ-50SF	DBZ-50SA DTBZ-50SA	DBZ-80SA DTBZ-80SA	DBZ-160SA DTBZ-160SA	DTBZ-320SA	DTBZ-480SA
Power supply	Input voltage(V)	3 phase 415±10%						
	Power capacity(kVA)	※1 According to welder power capacity (refer to rated specification)						
	Breaker capacity(A)	63	63	100	200	400	600	
	Cable size(mm ²)	≥16	≥16	≥16	≥50	≥95	≥2×95	
Cooling water	Water pressure(MPa)	0.3 ~ 0.4	0.35 ~ 0.4			0.4 ~ 0.5		
	Cooling water flow(L/min)	8	15	18	28	28	34	
	Water temperature(°C)	※2 10 ~ 30						
	Water resistivity(kΩ·cm)	5 above						
	Hose size for water supply(mm)	φ12	φ20	φ20			φ25	
	Hose size for drain(mm)	φ12	φ20	φ20			φ25	
Compressed air	Air pressure(MPa)	0.5 ~ 0.7						
	Hose inner size(mm)	φ8	φ12	φ12	φ12	φ20		
Earthing cable	Earthing cable(mm ²)	16	≥16	≥16	≥25	≥50		

Note: ※ 1. The input voltage value will reduce during Max. current output welding with extension input cable.

Request the power supply capacity should be more than welder rated capacity.

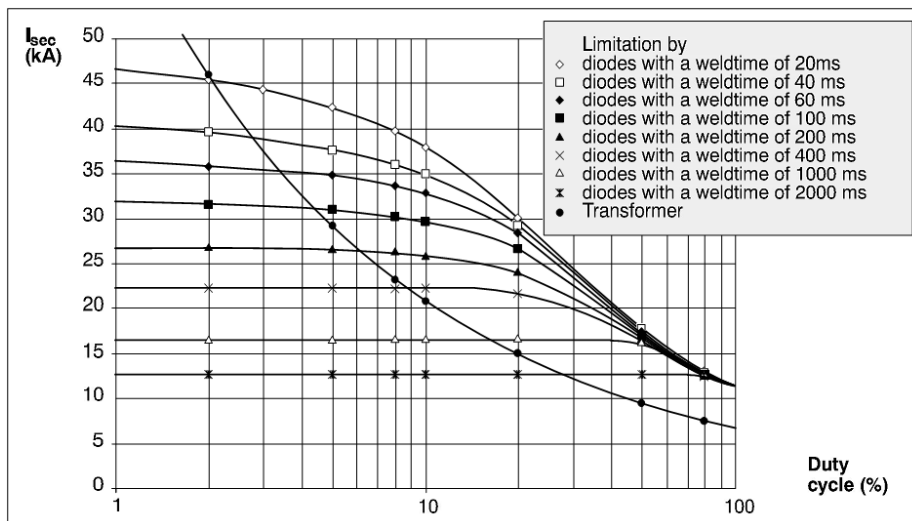
※ 2. Cooling water should be as per specified temperature and volume.

Calculation of transformer duty cycle(transformer actual power duty cycle)

$$\frac{\text{Spots within 1min.} \times \text{cycles per spot}}{60000\text{ms}} \times 100 (\%) \text{ ----- (Formula1)}$$

Calculation of rectifier duty cycle(actual rectifier duty cycle)

$$\frac{\text{Spots within 2sec.} \times \text{cycles per spot}}{2000\text{ms}} \times 100 (\%) \text{ ----- (Formula2)}$$



The actual weld current should be less than the above calculated current value for relative transformer and diodes.

Reference for model selection

Material	Thickness (mm)	"Welding current (kA)"	"Welding time (ms)"	"Pressure (kN)"	Model	Max. duty cycle	Max. cycle time (spot/min)
Carbon Steel	1+1	7.5	150	2	DTBZ-50SA/DBZ-50SA	22%	87
	2+2	8	200	2.2	DTBZ-50SA/DBZ-50SA	19%	57
	2+2	10	200	2.4	DTBZ-80SA/DBZ-80SA	31%	92
	3+3	12	300	4	DTBZ-80SA/DBZ-80SA	21%	43
	4+4	12	450	6	DTBZ-80SA/DBZ-80SA	21%	28
	6+6	12	1500	10	DTBZ-160SA	85%	34
	8+8	12	2200	12	DTBZ-160SA	85%	23
GA	1+1	8	250	2.5	DTBZ-50SA/DBZ-50SA	19%	46
	2+2	11	300	3.5	DTBZ-80SA/DBZ-80SA	25%	51
SS	1+1	7	160	3.5	DTBZ-50SA/DBZ-50SA	25%	93
	1+1	7.5	120	3.5	DTBZ-80SA/DBZ-80SA	55%	273
	2+2	9.5	180	6	DTBZ-80SA/DBZ-80SA	34%	114
	3+3	12	250	8	DTBZ-80SA/DBZ-80SA	21%	51
	4+4	14	300	12	DTBZ-160SA	16%	31
AL alloy	1+1	20	100	3	DTBZ-80SA/DBZ-80SA	8%	46
	2+2	28	150	5	DTBZ-80SA/DBZ-80SA	4%	16
	2+2	32	150	5	DTBZ-160SA	12%	48
	3+3	42	160	8.5	DTBZ-160SA	7%	26
	4+4	50	200	12	DTBZ-160SA	5%	15
	5+5	60	250	15	DTBZ-320SA	9%	21
	6+6	70	350	18	DTBZ-320SA	6%	11
Remarks	<ol style="list-style-type: none"> 1. The data of "Max. duty cycle" and "Max. cycle time" in the table is the actual production requirement based on plate thickness and margin has been added. So, no need consider more margin for Model selection. 2. The Model and related welding parameters are as per general welding requirement. The same may need change for high welding quality requirement segment such as aerospace etc. 3. The parameters shown in the table are main cycle welding parameters. For thick plate welding, pre-heating, reweld and press need to be added according to process requirement. 4. Please confirm actual cycle time at customer end should not be more than the same in the table. 5. The "Max. cycle time" shown in the table is based on welding power source only, does not consider the spot speed of the pressing mechanism. 						



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