



## RESISTANCE MEDIUM FREQUENCY THREE PHASE SPOT/PROJECTION WELDERS

The MF range of medium-frequency inverter resistance welders is the ultimate answer to increasing demand for quality in resistance welding applications. Constant current control, fast millisecond current regulation, high quality and perfect control of the energy transferred to the weld nugget are the main advantages versus traditional 50 Hz equipment. MF models fully meet the toughest mass production industrial applications. Thanks to their features, they represent the ideal solution for resistance spot welding of thin thickness and of hardly weldable material, such as copper, brass, aluminium alloys, zinc plated and other coated steel.



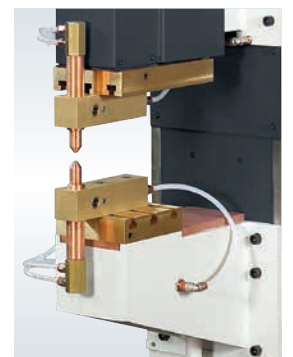
Inverter

DC  
+ -

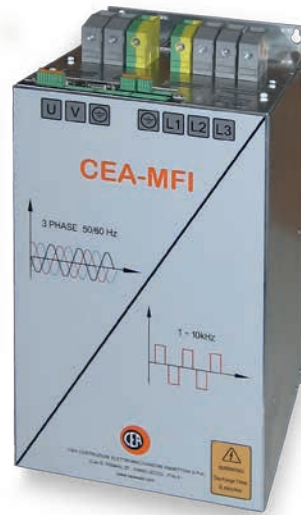
DIGITAL  
888



- ▶ All MF equipment can be converted into bench version types (BSW) or utilized in seamwelding applications too.
- ▶ High welding quality and process reliability
- ▶ Direct current welding
- ▶ Large power for welding with increased arm lengths
- ▶ Possibility of monitoring the welding process each 1ms (1000 Hz) or even each 0,2 ms with MF5040 versus 20 ms of traditional 50 Hz equipment.
- ▶ The presence of magnetic materials between the arms does not affect welding
- ▶ Self-lubricated pneumatic components to eliminate oil deposits and to safeguard the environment from contaminants
- ▶ Water cooled secondary circuit
- ▶ Low tendency for welding spatters
- ▶ Less imprint and deformation
- ▶ Very long electrode life



- ▶ High power factor and efficiency
- ▶ Balanced power absorption on the three mains phases
- ▶ Low primary consumption
- ▶ Lower energy consumption costs
- ▶ Ability to produce quality joints on hardly weldable materials
- ▶ Ability to reduce welding time to a few milliseconds with a consequent saving in welding time

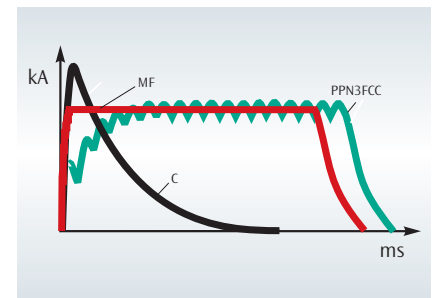
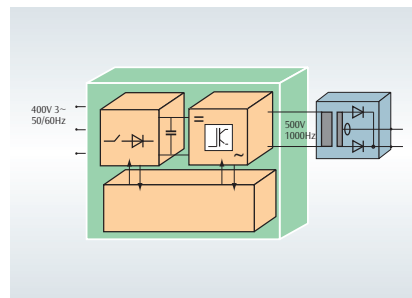


CEA MFI

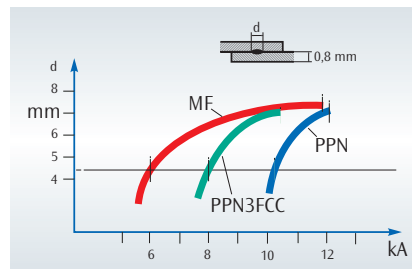


H+W MF

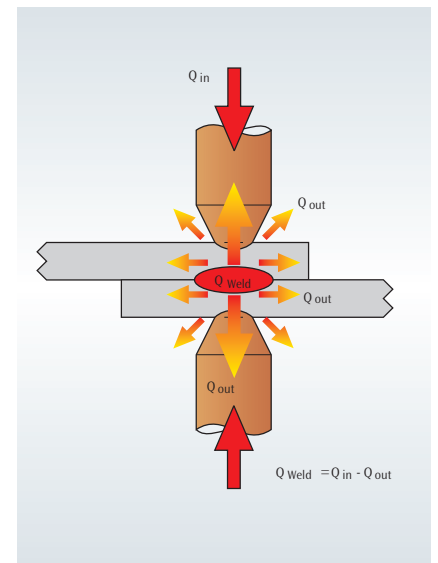
- ▶ Welding tasks previously solved by capacitor discharge welding are now possible by MF range in a more economical way
- ▶ Quick upsloping to the preset welding current
- ▶ The energy converts mostly in the weld nugget



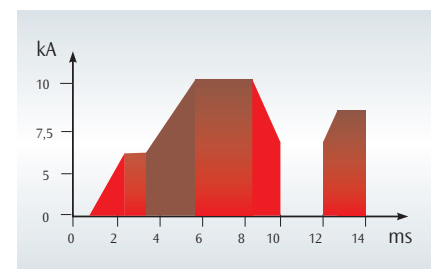
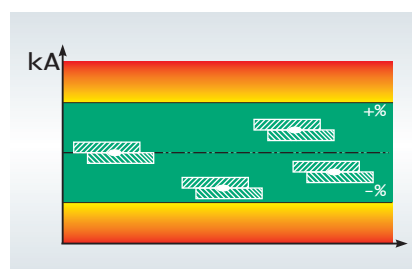
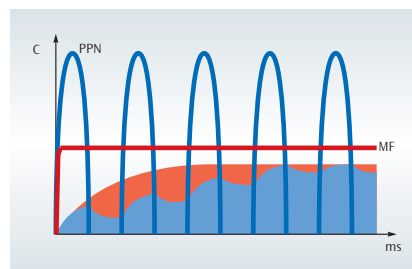
- ▶ Nugget temperature comparison between single phase machines (PPN) and MF equipment
- ▶ Less thermal loss through the workpiece and the electrodes



- ▶ Weld nugget quality indirect control



- ▶ Ability to modify the current waveform with dedicated inverter controls



## MF 1040 - MF 1041 - MF 5020

The most enhanced inverter technology for medium frequency spotwelding available for everyone. These equipment, fitted with new inverters with WSI 100 or WS 3000 MF or FILIUS COMPACT controls, represent a valid solution for anybody looking for all Medium Frequency benefits in both spotwelding applications and nut projection welding too.

MF 1040 and 1041 models allow to monitor the whole welding process every 1 ms (1000 Hz).

The far faster MF 5020, whose inverter operates at 5000 Hz, are able to even control the process every 0.2 ms.

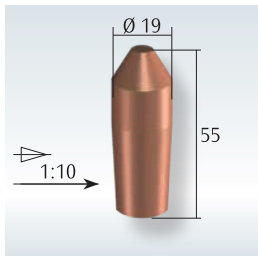
- ▶ Lower round arm with adjustable height and lateral adjustment
- ▶ Electrodeholders with electrodes for spotwelding
- ▶ Lower arm can be lowered and adjusted for use with larger arm gap

UPON REQUEST ALSO AVAILABLE WITH:

- ▶ Different length arms (optional)
- ▶ Lower arms with pressed-in electrode (for entering pipes or boxes) and longer electrodeholder on the upper arm (optional)



Electrodeholder set



Standard Electrode



Concomitant push button unit



Offset electrode holder set

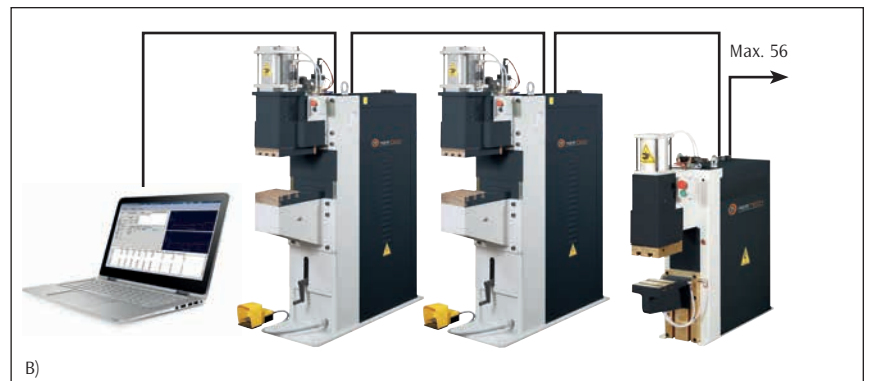


Barholder sets with bars

## MF 100 - MF 160 - MF 200

Medium frequency (1000 Hz) MF 100 - 160 - 200 are particularly suitable for projection welding applications requiring high welding current and force and also for spotwelding special material and alloys to be joined with elevated currents and short welding time.

- ▶ High power spot and projection welding
- ▶ Lower platen adjustable in height and fitted, like the upper one, with T-slots, enabling the quick assembly of barholders, electrodeholders or any dedicated tooling for specific applications
- ▶ Platens gap is easily and quickly adjustable without any intervention on the secondary circuit
- ▶ Safety cycle start by means of concomitant side buttons or, as alternative only if the operator can work in safe conditions, by electric pedal. Either option can be chosen by a selector with removable key
- ▶ Upper head linear low friction driving system for very precise welding
- ▶ Manual valve for upper head descent without pressure for cleaning, centering and ordinary maintenance of the electrodes
- ▶ Solenoid valve to stop water circulation whenever the machine is switched off from the mains supply

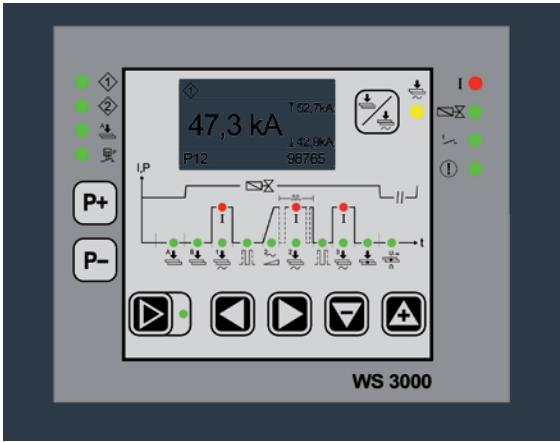


### INTEGRATED CONTROL PANEL (A)

- ▶ 64/128 programs
- ▶ Constant current facility
- ▶ Limit current monitoring
- ▶ Preheating current
- ▶ Annealing current
- ▶ Linearized stepper function
- ▶ Two 24 V DC solenoid valves
- ▶ Proportional valve
- ▶ Weld/no weld switch
- ▶ Error message logbook
- ▶ Weld counter
- ▶ Main voltage compensation
- ▶ Single or multi spot
- ▶ Liquid crystal display

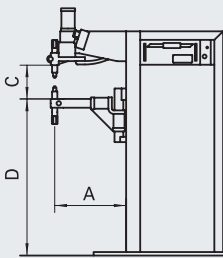
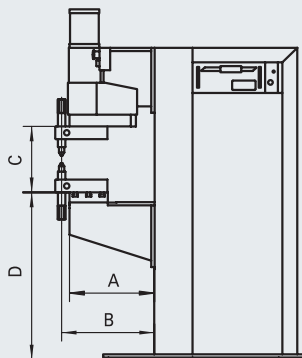
### REMOTE CONTROL BY PERSONAL COMPUTER (B)

- ▶ Network up to 56 machines
- ▶ 128 programs
- ▶ Constant current facility
- ▶ Limit current monitoring
- ▶ Preheating current
- ▶ Annealing current
- ▶ Linearized stepper function
- ▶ Two 24 V DC solenoid valves
- ▶ Proportional valve
- ▶ Production monitoring
- ▶ Error message logbook
- ▶ Weld counter
- ▶ Mains voltage compensation
- ▶ Single or multi spot
- ▶ Stored data files
- ▶ Back up file
- ▶ Operating parameter software



FUNCTIONS	WSI 100	WS 3000 MF	FILIUS MF CLASSIC
Pre-squeeze time	●	●	
Squeeze time	●	●	●
Preheating time	●	●	●
Preheating current	●	●	●
Cooling time	●	●	●
Slope up	●	●	●
Welding time	●	●	●
Welding current	●	●	●
Welding time adjustable in ms	●	●	●
Welding time 2 (2 pedal version)	●	●	●
Welding current 2 (2 pedal version)	●	●	●
Pulse interval time	●	●	●
Pulse number	●	●	●
Post heating time	●	●	●
Post heating current	●	●	●
Holding time	●	●	●
Pause time	●	●	●
Auto-repeat	●	●	●
Program no.	64	100	128
Welding current display	●	●	●
Limit monitoring	●	●	●
Constant current	●	●	●
Mains voltage compensation	●	●	●
Error message	●	●	●
Spot counter	●	●	●
Pressure contact	●	●	●
Cycle end contact	●	●	●



MF 1040 - 1041 - 5020		MF							
		1040	1041	5020	100	160	200		
	A	mm	435	435	435	400	400	445	
	A (Optional)	mm	650	650	650	650	650	650	
		mm	750	750	750	---	---	---	
	B	mm	---	---	---	445	445	490	
	C	MIN.	mm	180	180	180	145	145	200
		MAX.	mm	510	510	510	300	300	330
	D	MIN.	mm	615	615	615	800	800	865
		MAX.	mm	945	945	945	955	955	995
		Ø mm	60	60	60	---	---	---	
		Ø mm	35	35	35	30	35	35	
	Ø mm	19	19	19	25	25	25		
	E	F	E mm	---	---	---	180	180	200
		F mm	---	---	---	180	180	200	
		G	G mm	---	---	---	63	63	63
		T	T	---	---	---	3	3	3

TECHNICAL DATA		MF						
		1040	1041	5020	100	160	200	
Three phase input 50/60 Hz	V	400	400	400	400	400	400	
Rated power at 50%	kVA	40	40	20	100	160	200	
Installed power	kVA	40	40	40	50	70	100	
Cross section connecting cables	mm <sup>2</sup>	35	35	35	35	50	70	
Delayed fuse	A	63	63	63	63	100	160	
Open Circuit Voltage	V	5,0	5,0	11,5	10	10	12	
Short circuit current	kA	22	22	16	28	45	55	
Max. welding current	kA	20	20	14	23	36	44	
Thermal secondary current at 100%	kA	5,4	5,4	---	6,5	12,0	12,0	
Work stroke	mm	65	65	65	100	100	100	
Max. electrode force 600 kPa (6 bar)	daN	470	470	470	900	1200	1800	
Water consumption at 300 kPa (3 bar)	l/min	6	6	6	20	20	20	
Dimensions	↗ mm	1070	1070	1070	1115	1115	1210	
	→ mm	430	430	430	400	400	460	
	↑ mm	1520	1520	1520	1650	1650	1800	
Weight	kg	260	260	255	530	550	850	

Other voltages on request.

Technical features might change without notice.