

PRODUCT LITERATURE BROWSER

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RESISTANCE WELDING MACHINES



Pedal Operated Rocker Arm Spot
Compact Spot
Stronghold Spot
Stronghold Seam
Stronghold Projection
Medium Frequency
PA2 Projection
PA3 Projection Heavy Duty
Multi-Spot Welders
– Exhaust Manufacturing

SPECIAL PURPOSE RESISTANCE MACHINES



Aircraft, Jet Engine & Aerospace

PRODUCT RANGE



I.T. Guns
Non I.T. Guns
Microprocessor Based Timers
Transformers for I.T. Guns
Stationary Welding Machines
Cables, Jumpers and Shunts
MIG/MAG Welders & HF Inverter
Weld Analyser
Force Gauges
Tip Dressers & Toggle Clamps
Special Purpose Machines
Equipment for Exhaust Systems
JIGS & Fixtures
Gantry Systems

ROBOT WELDING



FedArc Welding Cell
FedSpot Welding Cell
RoboSpot Gun & Service Stand

WELD TRANSFORMERS

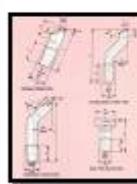


Welding Gun Transformers
Package Weld Transformers

MACHINE SPARES



CABLES
Air Cooled Jumper Cables
Water Cooled Jumper Cables
Kickless Cables



Angle Offset
Double Bend Offset
Cranked Offset
Ball Type
Vertical Centre / Vertical Offset



TOOLS & EQUIPMENT
Tip Dressers
Toggle Clamps

GANTRY SYSTEMS



Gantry Systems

WELD CONTROLS



WS500 / WS700 / WS700ms
WS40XX / WS2003
WS98 PC Software

Federal Resistance Welding Limited

Castle Mill Works,
Birmingham New Road, Dudley,
DY1 4DA, England.

TYPE 117/125

Two robust heavy-duty spot welders featuring:

- **A choice of transformer and arm reach.**
- **A 'T' slotted face plate giving both vertical and horizontal adjustment of the lower arm.**
- **Optional reversible upper and lower electrode arms, one drilled to accept vertical electrodes with the other end a 22½° inclined electrode.**
- **Optional water cooled lower arms and adapters for cross wire and 'T' wire welding.**
- **Adjustable weld time ranges 1 cycle to 100 cycles.**
- **Current range infinitely adjustable from 30% to 100% phase shift control.**
- **Weld/No Weld switch, Weld indicators as standard for safety.**

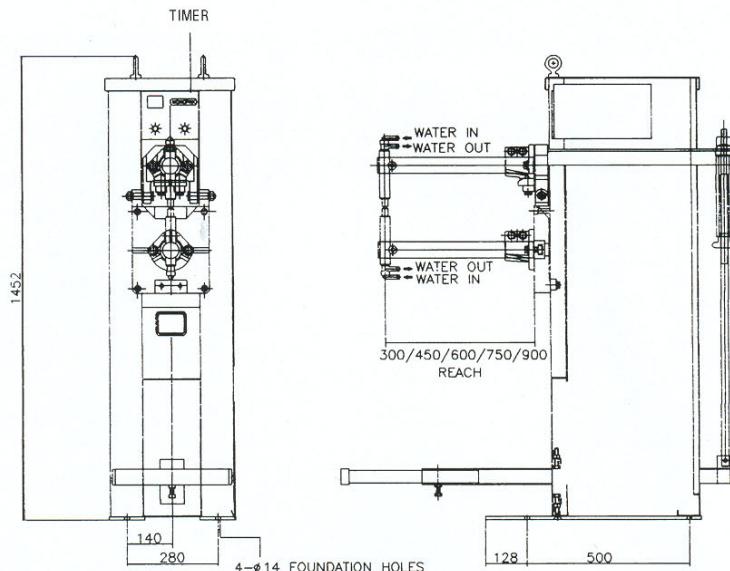
Total reliability is provided by British Federal Monopak type WP1 electronic welding control using 'state of the art' technology providing all electronic fully synchronous welding control and solid-state thyristor switching.

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Pedal Operated Rocker Arm Spot Welder Type 117/125


All measurements shown in mm unless otherwise indicated

Technical Specifications

		Type 117	Type 125
Transformer - Air cooled	Continuous rating 100% duty cycle Maximum power Number of taps Secondary volts Short circuit current at 450mm reach Maximum primary current Rating at 50% duty cycle	kVA kVA 1 V Amp A kVA	12 45 1 4.0 11,000 110 17
Electronic controls	Timer		Monopak WP1 Synchronous timer 1 - 100 cycles in 2 ranges Thyristor contactor 30% to 100% phase shift control
Arm details	Reach Diameter top and bottom Electrode holders Electrodes (mallory 328) Water cooled arms are available as an optional extra Pressure adjustable using a spring up to 1.3 kN (300lbs)	mm ins(mm) ins(mm) ins(mm) 300, 450, 600, 750 or 900 2" (51) 1 1/4" (32) 3/4" B.S. 807 taper (19)	300, 450, 600, 750 or 900 2" (51) 1 1/4" (32) 3/4" B.S. 807 taper (19)
Shipping specifications	Nett weight Gross weight Case size	kg kg mm	225 325 1190 x 480 x 1750
Services required	Electrics (via customer's switch fuse) Water Suggested PVC multicore cable and fuse size (BS 88)	2 phase 380/440 V 50Hz 5/10 litres per minute 10mm ² /32A HRC	2 phase 380/440 V 50Hz 5/10 litres per minute 16mm ² /50A HRC

Welding Capacity Guide

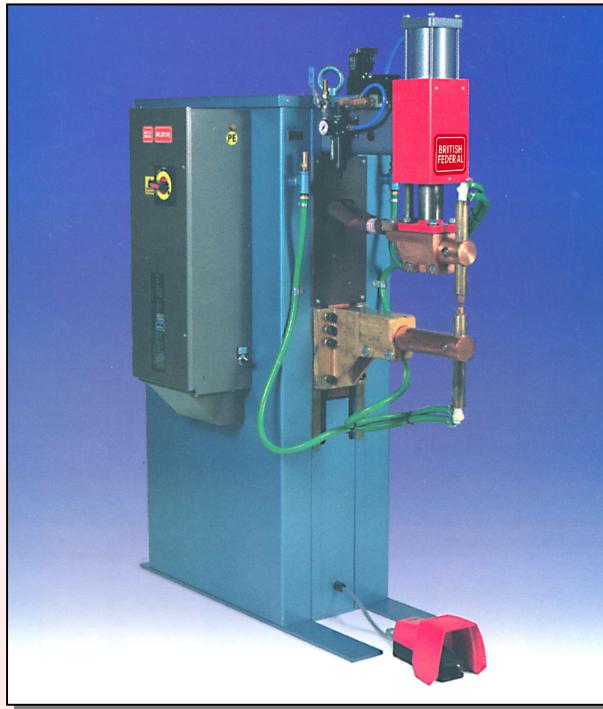
Material Thickness		Mild Steel				Gavanised				Mild Steel Wire		
mm	swg	press lbs	current amps	time cycles	press lbs	current amps	time cycles	diameter mm	press lbs	current amps	time cycles	
0.5	26	140	5,000	5	300	3,000	6	2.5	125	1,800	9	
1.0	20	280	7,000	8	550	11,000	12	4.5	360	3,300	14	
1.6	16	550	10,000	16				6.0	600	4,500	20	

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TYPE 40/63

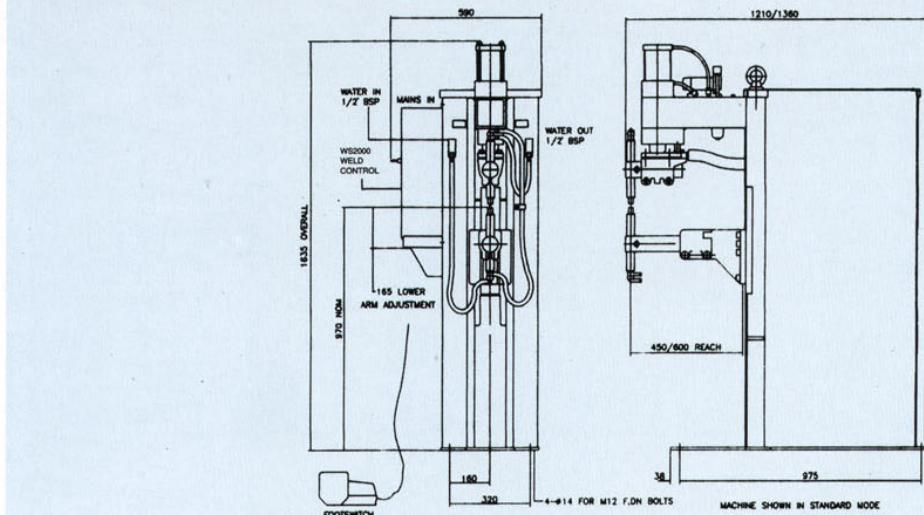
Compact spot welding machines incorporate a weld head design, easily adapted to the 'low force approach' system. They are supplied with ISO standard water-cooled transformers and the WS2000 programmable weld control giving constant current and full monitoring capabilities.

Features include.

Adaptability	- 450mm or 600mm reach.
High Quality Welding	- 16 programmable microprocessor weld control.
High Productivity	- Up to 250 spot welds per minute.
Reliability	- 50% duty cycle encapsulated transformers.
Versatility	- Adjustable lower arm.

Options include.

- High lift system.
- Low force approach system.
- Water-cooled lower arm.
- Reversible arms for angled electrodes.
- Closed circuit water-cooled system.
- Analogue valve.

COMPACT Spot Welder Type 40/63


Drawing shows machine in standard mode

All dimensions shown are in mm

Technical Specifications

Continuous power @ 100% duty cycle	S_p	kVA	28	45
Max short circuit power	S_{cc}	kVA	125	170
Max welding power	S_{max}	kVA	100	136
Nominal power @ 50% DC	S_{50}	kVA	40	63
Nominal supply voltage	U_{1n}	Volts	380/440	380/440
Continuous primary current @ 100% dc	I_{1p}	Amps	70	108
Supply frequency		Hz	50	50
Supply phases			2	2
Supply capacity		kVA	75	102
HRC Fuse size to BS88		Amps	80	125
Feed cable c.s.a up to 30m long		mm ²	25	35
Max short circuit primary current	I_{1cc}	Amps	300	410
Max short circuit secondary current	I_{2cc}	Amps	19,000	22,000
Max welding current	I_{2max}	Amps	15,200	17,600
Duty cycle for max welding	X_{max}	%	8.1	10.7
Continuous secondary current @ 100% dc	I_{2p}	Amps	4,500	6,300
Number of taps			3	3
Secondary open circuit Volts	U_{20}	Volts	6.3/5.6/5.1	7.0/6.3/5.6
Weld cylinder diameter		mm	100	100
Weld force min/max with a 5.5 bar supply		kN	1.2/4.3	1.2/4.3
Weld force min/max with an 80 psi supply		lbs	270/980	270/980
Weld cylinder stroke max		mm	63	63
Free air consumption for spot with 1,000 strokes		m ³	2.2	2.2
Air pressure normal	P_1	bar	5.5	5.5
Air pressure max operating	P_2	bar	7.0	7.0
Air connection/hose size		BSP/inch	3/8" / 1/2"	3/8" / 1/2"
Cooling water min operating pressure		bar	3	3
Cooling water consumption		litre/min	20	20
Cooling water max inlet temperature		°C/F	30/86	30/86
Shipping specifications		width	600	600
Machine size		depth	1,175	1,175
		height	1,635	1,635
Machine weight		kg (nett)	408	408

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Stronghold welding machines set the standard for multi-purpose resistance welding equipment, having adjustable reach for spot welding. They are easily adapted for projection welding and are available as a seam welding version.

Standard Features for spot welding include:-

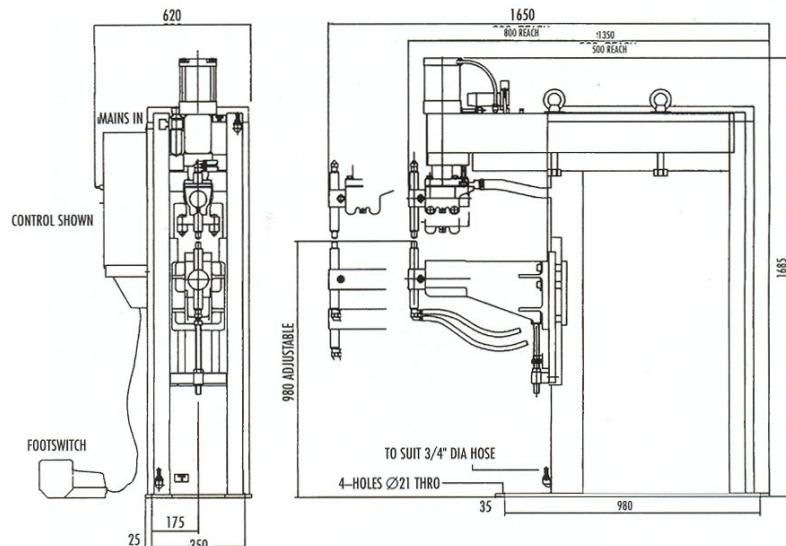
- **ADAPTABILITY** - Infinitely adjustable reach from 500-800mm.
- **HIGH QUALITY WELDING** - Choice of 8 or 16 program microprocessor weld control.
- **PRODUCTIVITY** - Welding speeds up to 250 spots per minute.
- **RELIABILITY** - 50% duty cycle encapsulated transformer.
- **VERSATILITY** - Simple adaption to projection welding.

Optional extras

- Retract/high lift and or 160mm air cylinder.
- 100KVA , 150KVA single phase AC or 100KVA.
- 3-phase DC Medium Frequency Transformer.
- Low Force Approach System.
- Closed circuit water cooled system.
- Integration of automatic nut and bolt feed machines.

Stronghold spot welding machines are available as inverter controlled medium frequency machines and offer the following added benefits:-

- Improved weld quality.
- Reduced Power consumption costs.
- Lower peak currents providing increased electrode life.
- 3-phase even load distribution.
- Ideal for welding coated materials and aluminium.
- Weld times reduced through increased rate of heat input to work piece.
- Reduced weld splash owing to lower peak currents.
- Can be retrofitted to existing machines.

Stronghold Spot Welder with adjustable reach


Drawing shows machine in standard mode

All measurements shown in mm unless otherwise indicated

Technical Specifications

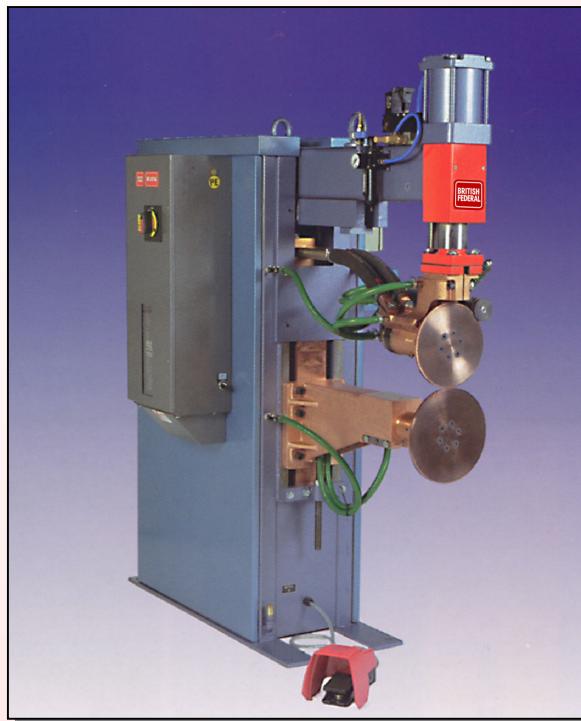
		75 Stronghold	100 Stronghold	150 Stronghold
Continuous power @ 100% duty cycle	S_p	kVA	53	71
Max short circuit power	S_{sc}	kVA	290	360
Max welding power	S_{max}	kVA	230	290
Nominal power @ 50% duty cycle	S_{50}	kVA	75	100
Nominal supply voltage	U_{1n}	V	380 / 440	380 / 440
Continuous primary current at 100% DC	I_{1p}	A	130	170
Supply frequency		Hz	50	50
Supply phases			2	2
Supply capacity		kVA	170	210
HRC fuse size to BS88		A	160	200
Feed cable c.s.a up to 30m. long		mm ²	50	70
Max. short circuit primary current	I_{1cc}	A	690	860
Max short circuit secondary current	I_{2cc}	A	32,000	35,000
Max welding current	I_{2max}	A	25,000	28,000
Duty cycle for max welding	X_{max}	%	5.4	6.1
Continuous secondary current at 100% DC	I_{2p}	A	6,000	7,200
Number of taps			3	3
Secondary open circuit volts	U_{20}	V	8.8 / 8 / 7	9.9 / 8.8 / 8
Weld cylinder		mm	125	125
Weld force min/max with a 1.5/5.5 bar supply		kN	1.8 / 6.7	1.8 / 6.7
Weld force min/max with an 20/80 psi supply		lbf	400 / 1,500	400 / 1,500
Weld cylinder stroke max.		mm	76	76
Air pressure normal		bar	5.5	5.5
Air pressure max operating		bar	7	7
Air connection/hose size		BSP/in	1/2" / 1/2"	1/2" / 1/2"
Cooling water min operating pressure		bar	3	3
Cooling water consumption		Lit./min	20	20
Cooling water max inlet temp.		°C/°F	30 / 86	30 / 86
Cooling water connection/hose size		BSP/in	1/2" / 3/4"	1/2" / 3/4"
Shipping specifications	machine size machine weight.	mm kg	590W x 1,350D x 1,685H 595	590W x 1,350D x 1,685H 595
			590W x 1,350D x 1,685H 595	590W x 1,350D x 1,685H 655

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STRONGHOLD 80KVA

The 'Stronghold' range of resistance welding machines enhances its adaptability with the seam-welding version.

The transformer is specially designed for the high duty seam welding. A machine rating of 80KVA provides the economic solution for many overlap joint welding applications.

The British Federal welding control system with software and adaptation for seam welder operation guarantees consistent weld results and reliability for which the 'Stronghold' name is renowned.

- **Circumferential or Longitudinal Modes.**
- **Alternative Drive Systems.**
- **50% Duty Cycle Encapsulated Transformer.**
- **Welding Speeds Up To 3 metres per minute.**
- **C.E. Conformity.**

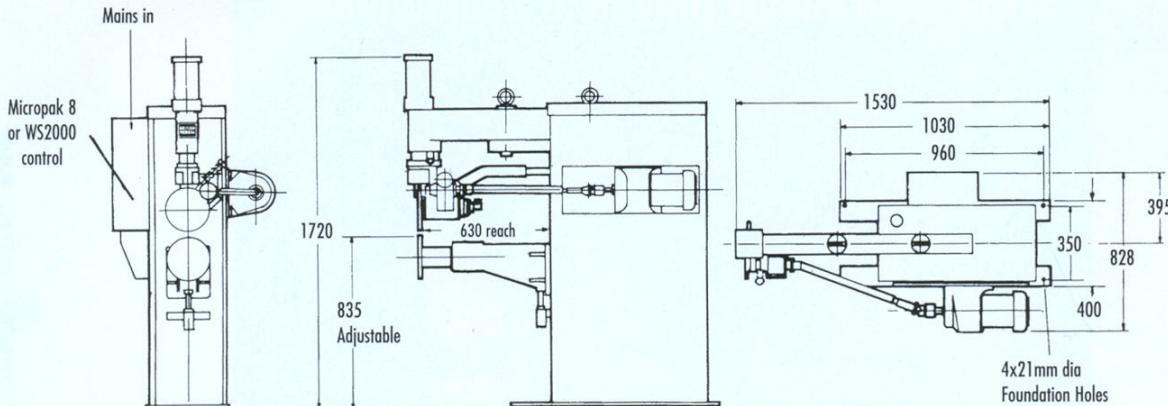
With over 25 years of continuous development and refinement, the Stronghold concept continues to set the standard for multi-purpose resistance welding machines.

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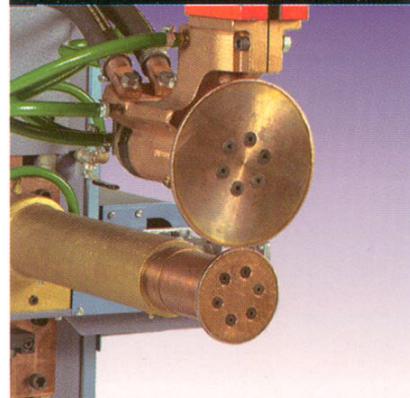
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Stronghold 80kVA Universal Seamwelder


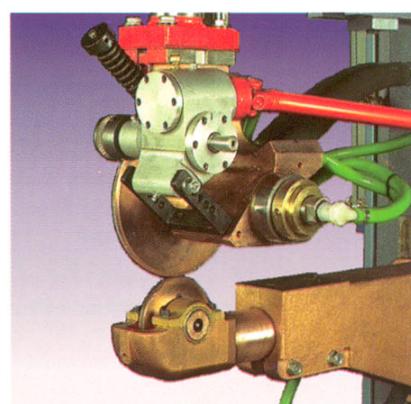
All measurements shown in mm unless otherwise indicated

Technical Specifications

Nominal power @ 50% DC	Sn	kVA	80
Max short circuit power	Sc	kVA	145
Max welding power	Smax	kVA	113
Nominal supply voltage (+5% -10%)	U1n	Volts	415
Nominal primary current @ 50%	I1n	Amps	190
Supply frequency		Hz	50
Supply phases			2
Supply capacity		kVA	90
Fuse size (HRC) to BS88		Amps	200
Feed cable c.s.a <30m. run		mm ²	70
Max short circuit Pu current	I1cc	Amps	350
Nominal secondary current @ 50% DC	12n	Amps	11,000
Max short circuit current	12cc	Amps	20,000
Max welding current	12max	Amps	16,000
Duty cycle for ma. welding	Xmax	%	25
Number of taps			2
Secondary open circuit Volts	U2o	Volts	4.3/7.2
Welding speed min./max.		mm/min	250/3,000
Circumferential electrode	Upper/lower diameter	mm	200/200
Longitudinal electrode	Upper/lower diameter	mm	200/125
Weld cylinder diameter		mm	125
Electrode force min/max @ 5.5 bar supply		kN	1.9/7.1
Electrode force min/max @ 80 p.s.i supply		lbs	400/1,500
Electrode stroke max		mm	76
Free air consumption per 10mm stroke		m ³	0.5
Air pressure normal		bar	5.5
Air pressure max operating		bar	7.0
Air hose connection		mm	12
Cooling water min operating temp.		bar	3
Cooling water consumption		lit./min	20
Cooling water max inlet temp.		°C/F	36/97
Cooling water hose connection diameter		mm	18
Shipping specifications	Nett weight	kg	900
	Gross weight	kg	1,100
	Machine size	mm	828W x 1,530D x 1,720H

Optional Head/Drive Configuration


Circumferential



Longitudinal

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Stronghold projection welding machines are designed for light to medium duty applications. Built to GB Federal's high quality standards, they are available as dedicated projection welders, complete with custom built tooling or as conversions from the Stronghold spot welder. Standard Features for projection welding include:-

- **EASY TOOLING ALIGNMENT** - Spherical seating for the lower platen.
- **TOOLING VERSATILITY** - Fully adjustable platen gap.
- **RELIABILITY** - 50% duty cycle encapsulated transformer.
- **HIGH QUALITY WELDING** - Choice of 8 or 16 program microprocessor weld control.

Optional extras

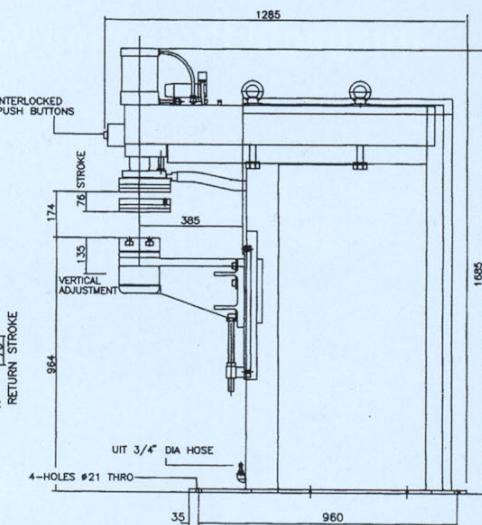
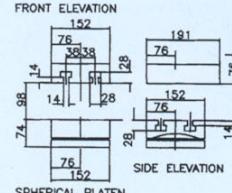
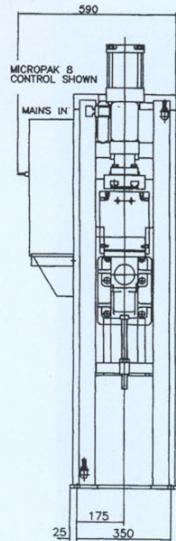
- High lift and/or 160mm air cylinder.
- 100KVA, 150KVA single phase AC or 100KVA 3-phase DC Medium Frequency Transformer.
- Low Force Approach System.
- Closed circuit water cooled system.
- Integration of automatic nut and bolt feed machines.
- Light guard and peripheral guarding systems.

Stronghold spot welding machines are available as inverter controlled medium frequency machines and offer the following added benefits:-

- Improved weld quality.
- Reduced Power consumption costs.
- Lower peak currents providing increased electrode life.
- 3-phase even load distribution.
- Ideal for welding coated materials and aluminium.
- Weld times reduced through increased rate of heat input to work piece.
- Reduced weld splash owing to lower peak currents.
- Can be retrofitted to existing machines.

Federal Resistance Welding Limited

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Stronghold Projection Welder


All measurements shown in mm unless otherwise indicated

Technical Specifications

	75 Stronghold	100 Stronghold	150 Stronghold
Continuous power @ 100% duty cycle	S _p kVA	53	70
Max short circuit power	S _{cc} kVA	300	330
Max welding power	S _{max} kVA	240	350
Nominal power @ 50% duty cycle	S ₅₀ kVA	75	100
Nominal supply voltage	U _{1n} V	415	415
Continuous primary current at 100% duty cycle	I _{1p} A	125	170
Supply frequency	Hz	50	50
Supply phases		2	2
Supply capacity	kVA	180	200
HRC fuse size to BS88	A	160	200
Feed cable c.s.a up to 30m long	mm ²	50	70
Max short circuit primary current	I _{1cc} A	730	800
Max short circuit secondary current	I _{2cc} A	34,000	37,000
Max welding current	I _{2 max} A	27,000	29,000
Duty cycle for max welding	X _{max} %	4.8	7.1
Continuous secondary current at 100% duty cycle	I _{2p} A	6,000	7,299
Number of taps		3	3
Secondary open circuit volts	U ₂₀ V	8.8	9.9
Weld cylinder diameter	mm	125	125
Weld force min/max with a 1.5/5.5 bar supply	kN	1.8/6.7	1.8/6.7
Weld force min/max with a 20/80 psi supply	lbf	400/1,500	400/1,500
Weld cylinder stroke max	mm	76	76
Air pressure normal	bar	5.5	5.5
Air pressure max operating	bar	7	7
Air connection/hose size	BSP/in	1/8" / 1/4"	1/8" / 1/4"
	mm	12/10	12/10
Cooling water min operating pressure	bar	3	3
Cooling water consumption	lit/min	20	20
Cooling water max inlet temp	°C	30	30
Cooling water connection/hose size	BSP/in	1/8" / 1/4"	1/8" / 1/4"
	mm	12/19	12/19
Shipping specification	machine weight kg	570	570
	machine size mm	590W x 1,285D x 1,685H	590W x 1,285D x 1,685H
			630
			590W x 1,285D x 1,685H

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The British Federal 'Compact' and 'Stronghold' spot and projection pedestal welding machines are available as inverter controlled medium frequency machines for **improved weld quality and reduced power consumption costs**.

Features of medium frequency Compact and Stronghold pedestal welding machines.

- Lower peak currents give increased electrode life.
- Long reach can be used with greatly reduced power loss.
- Significantly reduced power consumption allows heavier applications to be welded than previously possible with available power supply.
- 3-Phase even load distribution.
- Near unity power factor.
- Ideal for welding coated materials and aluminium.
- Weld times reduced through increased rate of heat input to work piece.
- Reduced weld splash owing to lower peak currents.
- Can be retrofitted to existing machines.
- High specification WS4000 series weld timer as standard.
- Network capability.
- Machines can be supplied with all standard features and options found on the conventional AC equivalent machine.

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PA2 projection welding machines are designed for heavy duty applications. Built to British Federal's high quality standards, they are available complete with custom built tooling. Standard Features for projection welding include the following.

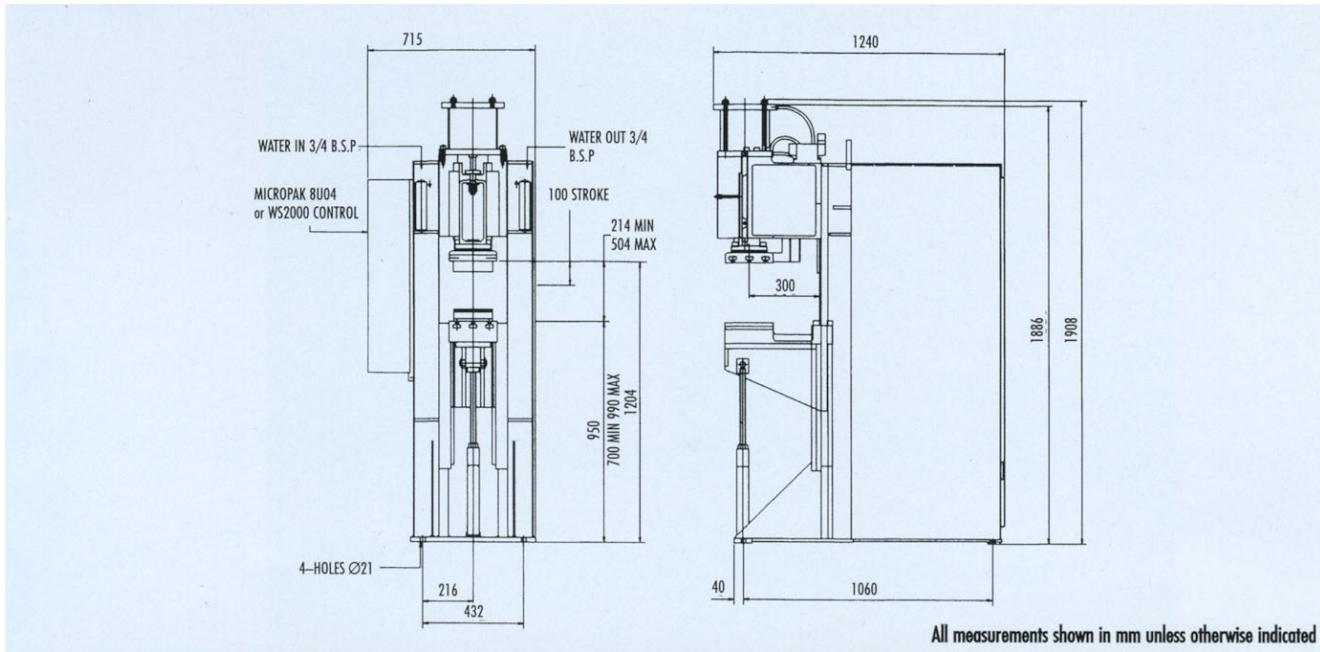
- **FLEXIBILITY** - Choice of 150, 250, 300KVA AC Transformers.
- **TOOLING VERSATILITY** - Fully adjustable platen gap and T-slotted platens.
- **RELIABILITY** - 50% duty cycle encapsulated transformer.
- **HIGH QUALITY WELDING** - Choice of 8 or 16 program microprocessor weld control.
- **OPERATOR SAFETY** - Twin button initiation as standard.
- **LINEAR BEARING HEADSLIDE**

Optional extras

- High lift and or 160mm air cylinder.
- 150KVA , 250KVA, 300KVA single phase AC or 250KVA 3-phase DC Medium Frequency Transformer.
- Custom Built tooling.
- Closed circuit water cooled system.
- Integration of automatic nut and bolt feed machines.
- Light guard and peripheral guarding systems.

PA2 projection welding machines are also available as inverter controlled medium frequency machines and offer the following added benefits:-

- Improved weld quality.
- Reduced Power consumption costs.
- Lower peak currents providing increased electrode life.
- 3-phase even load distribution.
- Ideal for welding coated materials.
- Weld times reduced through increased rate of heat input to work piece.
- Reduced weld splash owing to lower peak currents.
- Can be retrofitted to existing machines.



All measurements shown in mm unless otherwise indicated

Technical Specifications

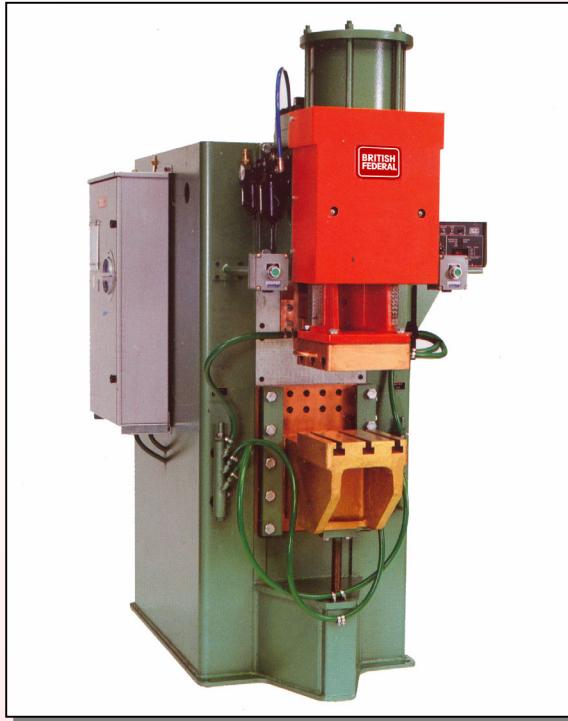
		150PA2	250PA2	300PA2	250KVA MFDC
Continuous power	S_p	kVA	80	135	135
Max short circuit power	S_{sc}	kVA	540	820	920
Max welding power	S_{max}	kVA	430	650	740
Nominal power @ 50% duty cycle	S_{50}	kVA	115	195	195
Nominal supply voltage	U_{1n}	V	380/440	380/440	380/440
Continuous primary current at 100% DC	I_{1p}	A	200	330	330
Supply frequency	Hz	50	50	50	50
Supply phases			2	2	2
Supply capacity		kVA	325	490	550
HRC fuse size to BS88		A	250	355	355
Feed cable c.s.a up to 30m. long		mm ²	95	185	185
Max. short circuit primary current	I_{1cc}	A	1,300	1,950	2,220
Max short circuit secondary current	I_{2cc}	A	52,000	64,000	72,000
Max welding current	I_{2max}	A	42,000	51,000	58,000
Duty cycle for max welding	X_{max}	%	3.6	4.4	3.5
Continuous secondary current at 100% DC	I_{2p}	A	8,300	11,200	9,900
Number of taps			6	6	6
Secondary open circuit volts	U_{20}	V	9.9-6	12.2-6.9	13.8-6.9
Weld cylinder diameter		mm	200	200	200
Weld force min/max with a 5.5 bar supply		kN	4.7/17.3	4.7/17.3	4.7/17.3
Weld force min./max. with an 80 psi supply		lbs	1,000-3,900	1,000-3,900	1,000-3,900
Weld cylinder stroke max		mm	100	100	100
Free air consumption for a 50mm stroke		dm ³	25.2	25.2	25.2
Air pressure normal		bar	5.5	5.5	5.5
Air pressure max operating		bar	7	7	7
Air connection/hose size		BSP/in	1/2"BSP/1/2"	1/2"BSP/1/2"	1/2"BSP/1/2"
Cooling water min operating pressure		bar	3	3	3
Cooling water consumption		Lit./min	30	30	30
Cooling water max inlet temp.		°C/°F	30/86	30/86	30/86
Cooling water connection/hose size		BSP/in	3/4"BSP/3/4"	3/4"BSP/3/4"	3/4"BSP/3/4"
Shipping specifications	machine weight machine size	kg mm	1,015 715W x 1,240D x 1,908H	1,165 715W x 1,240D x 1,908H	1,165 715W x 1,240D x 1,908H
					1,165 715 x 1,240D x 1,908H

Federal Resistance Welding Limited

 Castle Mill Works,
 Birmingham New Road, Dudley,
 DY1 4DA, England.

**BRITISH
FEDERAL**
www.britishfederal.co.uk

 Tel : +44 (0) 1384 455550
 Fax : +44 (0) 1384 455411
 Email : sales@britishfederal.co.uk



PA3 Heavy Duty Projection Welders are designed for high quality repetitive welding used in the mass production of component parts, where high production speeds and weld quality are important.

The fully automatic machine sequence combined with the use of custom-built tooling ensures accurate assembly of components is achieved even with unskilled operators.

The 400 and 600 transformers have water cooled, cast copper secondary windings and are fitted within a main frame. At the rear of the transformer an off load, 6-point link type tap change switch is provided for coarse adjustment of the welding heat.

The moving head of the PA3 is mounted in precision built slides on the head extension and is operated using either a 250mm or 300mm double acting air cylinder. The upper head incorporates a fast follow through facility. For more sophisticated applications, a low inertia, low friction upper head unit incorporating a light allow slide mounted on roller guides is available as an option extra.

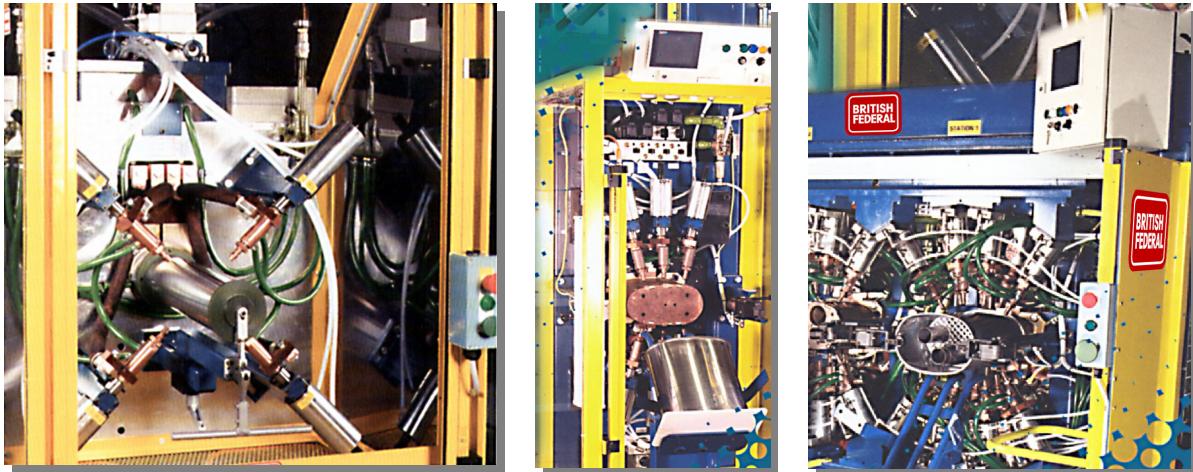
The lower knee comprises a heavy section high conductivity casting with 'T' slot platen on the face plate. Vertical adjustment is by means of a screw jack giving a platen gap of between 145mm and 350mm. The platen size is 254mm x 254mm.

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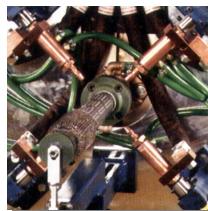


Federal Resistance Welding is a World leader in the design, manufacture and installation of resistance multi-welders and systems for the manufacture of exhaust systems.

British Federal products have a reputation for first class automobile production systems meeting critical welding specifications as well as producing consistent and continuous product quality.

Systems include equipment to weld the following:

- Baffles to round or oval mufflers.
- Muffler Tube Assemblies.
- Silencers.
- Catalytic Converters.



All in:

- Stainless Steel.
- Aluminised Steel.
- Zinc Coated Steel



Features of British Federal multi welders:

- Ability to weld both round or oval mufflers.
- Supplied with a range of guns, 4 on the basic models and up to 48 on more complex machines.
- Guns supplied with high-lift to assist maintenance and tip changing.
- Designed to meet customer specific cycle times.
- Parts can be manually unloaded or auto-ejected.
- All welds are fully monitored.
- Rotating turrets can be provided for ease of change between components.
- PLC controlled for easily selecting spot patterns via a screen display.
- Double skin welding on outer box.
- Full light guard protection.
- C.E. conformity.
- Full product training provided.
- Service contracts available.

Federal Resistance Welding Limited

Castle Mill Works,
Birmingham New Road, Dudley,
DY1 4DA, England.

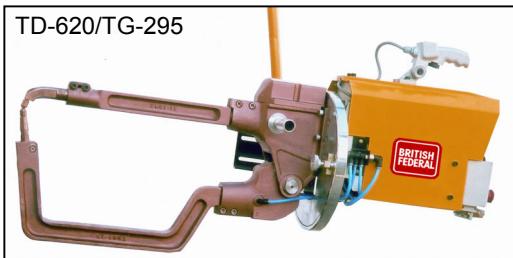
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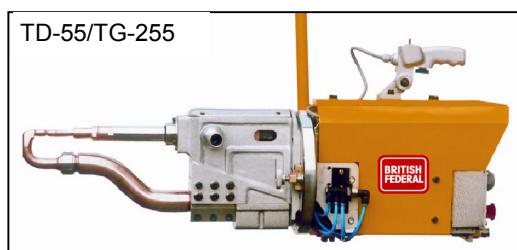
Tel : +44 (0) 1384 455550
Fax : +44 (0) 1384 455411
Email : sales@britishfederal.co.uk

PROVIDING TURN-KEY SOLUTIONS TO AUTOMOBILE INDUSTRY

X TYPE



IT GUNS



C TYPE

- ISO Transformers 23 KVA – 103 KVA.
- Medium frequency transformers 56 KVA – 250 KVA.
- Weld forces up to 600 kg.
- Hi-Lift facility on all guns.
- Gun locking facility in rotary and vertical plane.
- Easy maintenance as all guns are of modular construction.

- Constant current through primary and secondary.
- Thermostats on primary and secondary for total thermal protection.
- Emergency switch provided on gun (Optional).
- Selection switches on handle – 2 weld programs, weld on/off, Hi-Lift and initiation.
- Special automotive standard safety to give 30ms / 30mA tripping.

Resistance Welding Products & Non-IT Guns

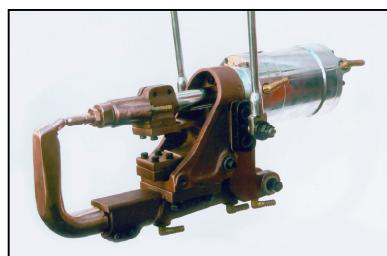
In addition to electrodes, holders, seam welding wheels, forgings, castings, guns and electrode materials, GBF offers diversity of special metals for resistance welding applications like Tungsten Copper and Molybdenum tipped electrodes. The experienced GBF team will provide best possible help in the design and production of standard or special electrodes for your application to ensure maximum efficiency.



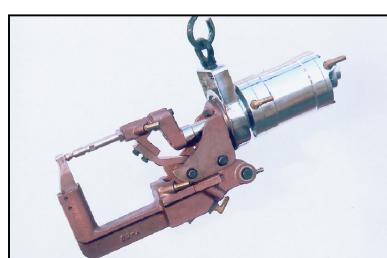
Electrodes, Shanks and holders



Wheels and rods



TD-130/TG-145



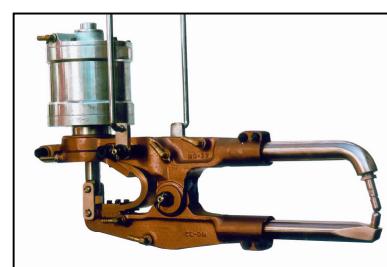
TD-150/TG-125



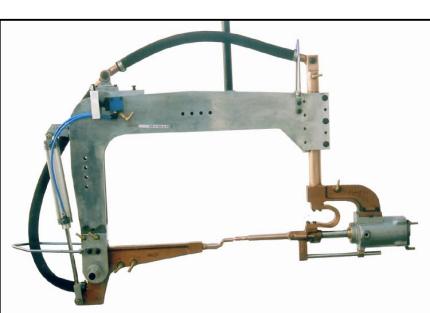
Cap Tips



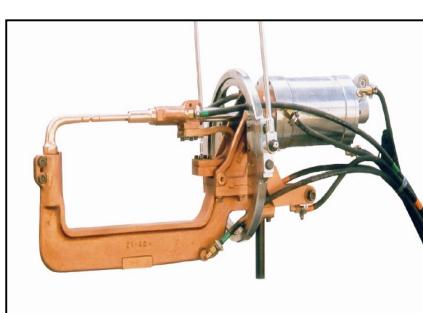
TD-200/TG-70 (Robotic Gun)



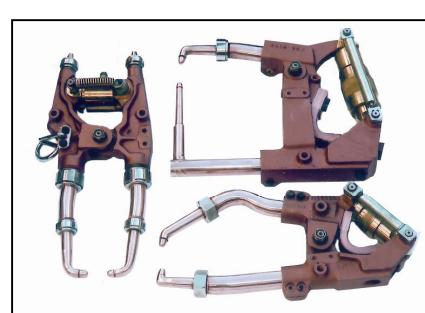
TD-380/TG-110



TD-415/TG-800



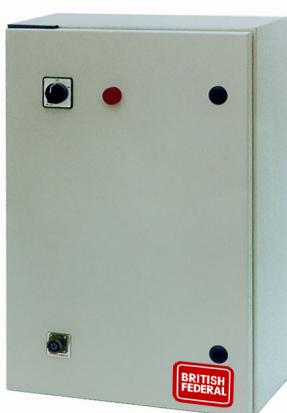
TD-165/TG-310



Hydro-Pneumatic Guns

MICROPROCESSOR BASED WELD TIMERS

BF 350 / BF 500 / BF 800



Programmer



Electronic Weld Monitor



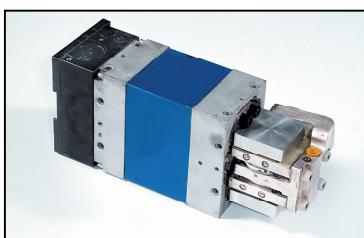
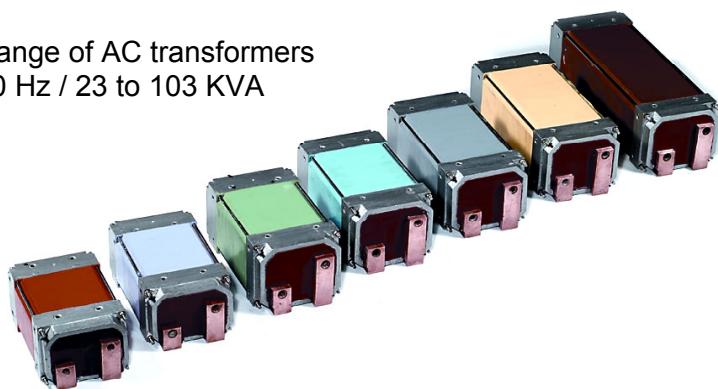
Capsule Module

- Constant current facility
- Option of Single Gun / Dual Gun
- Alphanumeric LCD backlit display
- Up to 128 weld programs
- Online programming
- Option of detachable or built in programmer
- Direct programming in KA
- Impulses
- Slopes
- Choice of electronic weld monitor or mechanical pendant
- Stepper
- Clock display
- Tip dress count
- Weld count
- Chain sequencing and batch count
- Error messages are displayed in description form
- Computer networking and serial communication facility
- SPC graphs printout
- Weld history
- ELR, MCCB optional.

ISO 10656 TRANSFORMERS FOR INTEGRAL TRANS GUNS

Manual or Robotic

Range of AC transformers
50 Hz / 23 to 103 KVA

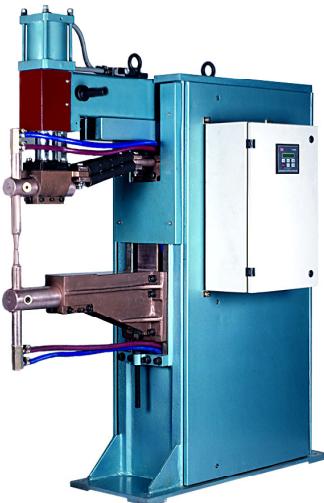


Medium frequency transformer
1000Hz / 56 to 250 KVA

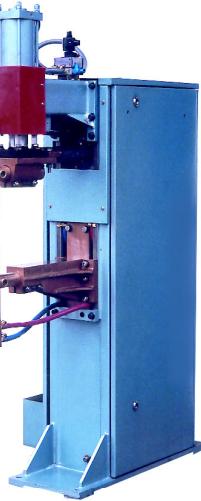


100/150KVA gun station

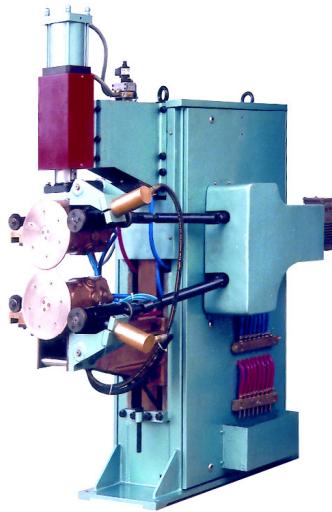
STATIONARY WELDING MACHINES



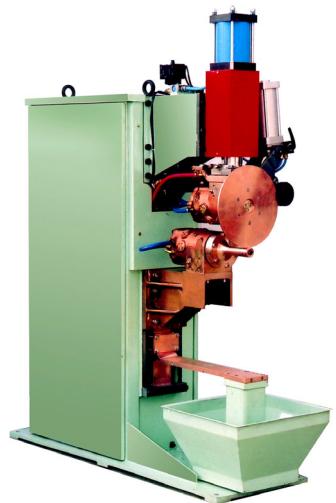
100 KVA
Spot Welding Machine



30 KVA
Spot Welding Machine



Fuel Tank
Seam Welding Machines



PORABLE GUN STATION FOR AUTO BODY REPAIR



MINIATURE SPOT WELDER



FEATURES

- 100% linear motion thru precision linear bearings.
- Low inertia moving parts for quick follow up.
- Adjustable electrode force 1-15 kg (1-30 kg. optional).
- Weld initiation only after achievement of preset electrode force.
- Universal electrode setting.
- Available in Manual and Pneumatic versions.
- Heads can be used for AC or Capacitor Discharge Welding.
- Capacity – 1.5 & 3.0 KVA Short Circuit Current – 3500A / 4500A

KICKLESS CABLES, JUMPER CABLES & SHUNTS



- Alternative polarity.
- Low reactance.
- Forged electrolytic copper terminals.
- Balanced positive and negative water cooling distribution.
- Low electrical resistance.
- Low impedance.
- Reduced operator fatigue.
- Reduced heat generation.
- Longer working life.



BF THYRO – μ P – 400

THYRISTORISED MIG/MAG
MICROPROCESSOR BASED
WELDING MACHINE



Features :

- Fully Digital CV Control.
- Latest high speed microprocessor controller.
- Digital Volt and Current display.
- Alphanumeric LCD backlit display.
- Feed wire detection facility.
- Gas overflow / underflow detection facility.

Also available MIG 251, MIG 401, TIG 400

BF 160

HF INVERTER



Features :

- Latest technology inverter based DG TIG / MMAW machine.
- Light weight portable.
- HF start for TIG applications.
- Hot start with down slope and post flow.



Weld Analyser
WA 1000 / WA 2000



Digital Force Gauge



GBF Toggle and Pneumatic Clamps
Holding force 100-3000 kgs.



Tip Remover & Tip Dresser
(Manual)



Force Gauge



Pneumatic Tip Dresser – PD-1, PD-2

SPECIAL PURPOSE MACHINES



- Transfer type dual welding heads.
- Auto indexing fixtures.
- Auto torch cleaning attachments.
- Fixtures with metallic tubings (spatter proof).
- JIB crane mounted with GBF section for lifting power sources.
- Interlocked safety guards.

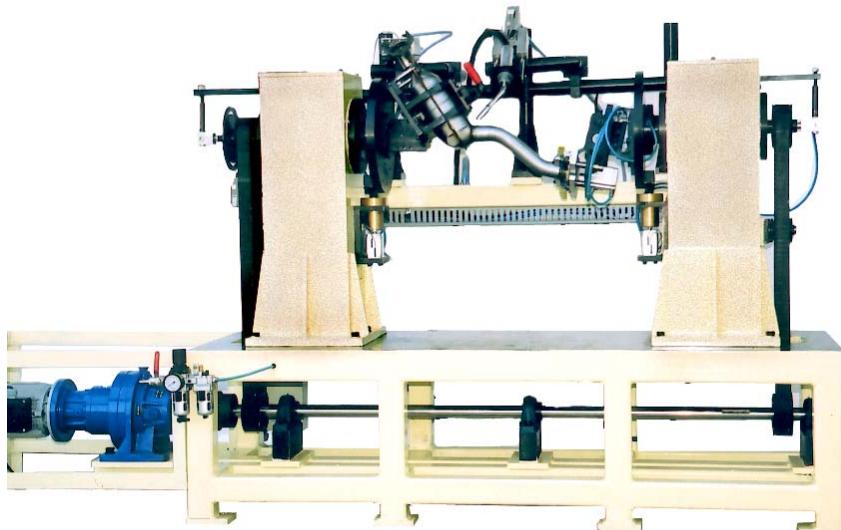
Servo motor driven three axis SPM with PLC control for motorcycle swing arm assembly.



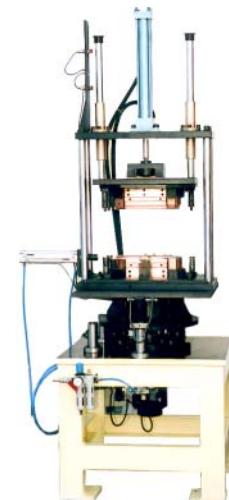
Deep Freezer Cabinet

SPECIAL PURPOSE SEAM WELDING MACHINE FOR DEEP FREEZER CABINET

EQUIPMENT FOR EXHAUST SYSTEMS



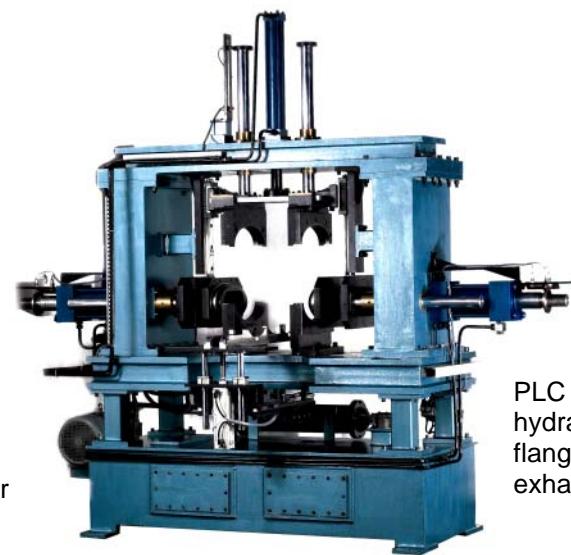
Horizontal SPM for circular welding of exhaust converter.



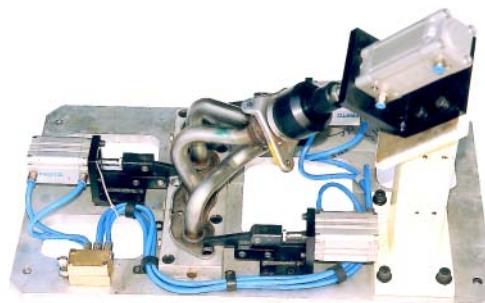
PLC controlled hydraulic canning press for catalytic converter assembly with robot interface.



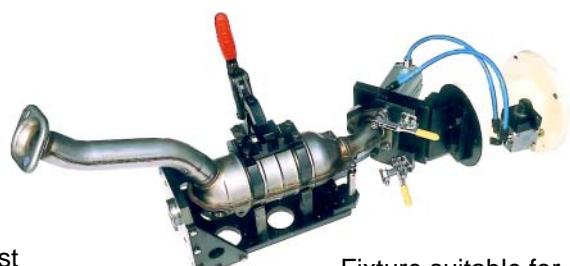
PLC controlled vertical circular SPM for catalytic converter sub components.



PLC controlled hydraulic press for flanging operation of exhaust muffler.



Leakage testing fixture for exhaust manifold.



Fixture suitable for horizontal SPM.



Fixture for flange with pipe welding suitable for horizontal SPM.



Sub components for catalytic converter.

GANTRY SYSTEMS**Turnkey installation of GBF Gantry Systems, IT Guns, Non-IT Guns, Transformers and Controllers.**

British Federal Gantry System is a proven system and efficient solution for variety of overhead material handling requirement for auto and engineering industry. BF Gantry system is used for handling and assembling of heavy material in three-dimensional workspace. The operator does not feel fatigue in handling heavy material that results in enhancement of production to great extent.

British Federal Sections are cold rolled sections with unique design features. The dead weight being very low and with extremely smooth running trolleys the cross tracker allows heavy and odd size goods to be moved quickly and effortlessly

BF rails are available in three different sizes. **BFGS-1 BFGS-2L, BFGS-2**

Federal Resistance Welding Limited

Castle Mill Works,
Birmingham New Road, Dudley,
DY1 4DA, England.

**BRITISH
FEDERAL**www.britishfederal.co.uk

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Fax : +44 (0) 1384 455411
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BF Gantry systems can be suspended from the building structure or a pillar type structure can be erected from the floor. Technical assistance is provided in designing this structure. We can also assist in providing other details like height of structure, height of gun station, working height of gun etc.

As sections are available in different sizes, wide variety of possible combinations can be adapted and any load handling problem can be solved.

If possible, please send us your shop layout to enable us to offer you the right solution for your requirement.

- Suspension Assembly for Suspending Runways:**

Suspension assemblies are mounted on I-beams for holding runways. The I-beam holder is provided with an adjustment clamp which can fit on all standard I-beams. The complete assembly consists of ball and socket joint with moulded plastic cups for noiseless operation, absorption of jerks and minimum maintenance. Uniqueness of the assembly allows pendulum movement that prevents bending stresses and minimises horizontal forces in the BF structure. The height of the runway can be easily and accurately adjusted by means of threaded extension rods.

- Runways:**

Runways are suspended on I-beams with the help of suspension assemblies. Runways are available in various lengths. The runway joining set enables the runways to be extended to any required lengths.

- Cross Tracker:**

The Cross Tracker has a two-axis movement. It is suspended on runways with the help of tracker suspension trolley.

- Smooth Running Trolleys:**

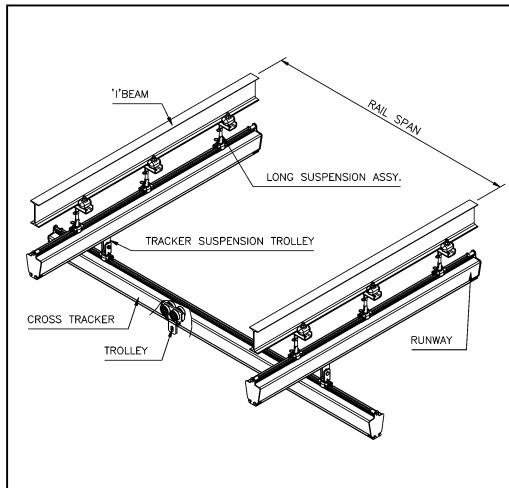
Trolleys are strong, fitted with self-lubricating polymer wheels, moulded with double Z bearings for maintenance free and long life operation. Trolley wheels are tapered to match the taper of the track thereby reducing rolling resistance.



Trolley BFGS-1
Trolley BFGS-2L, BFGS2
Dual Trolley CGS-1

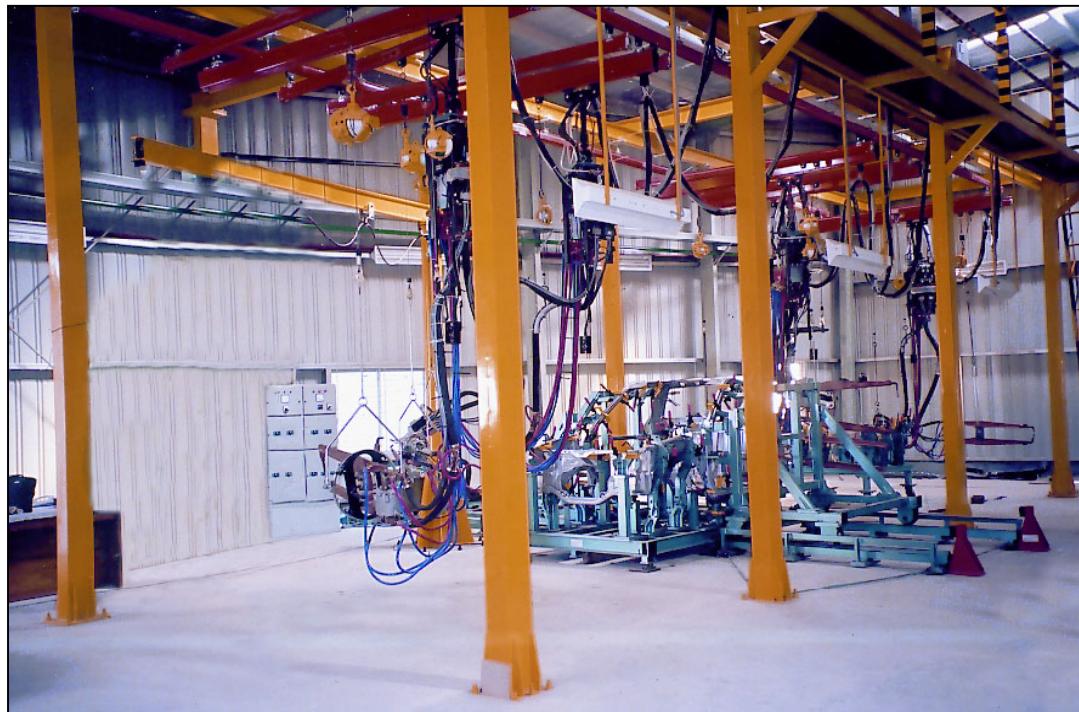


BF Section with End Caps
BFGS-1, BFGS-2L



Mobile Portal Crane

Runway Cross Tracker Suspension System



Turn-key installation of BF Gantry Systems, IT Guns, Non-IT Guns, Transformers, Controllers and BIW Fixtures for ISUZU Pickup Van.



BF Gantry System Installation at HCV Plant

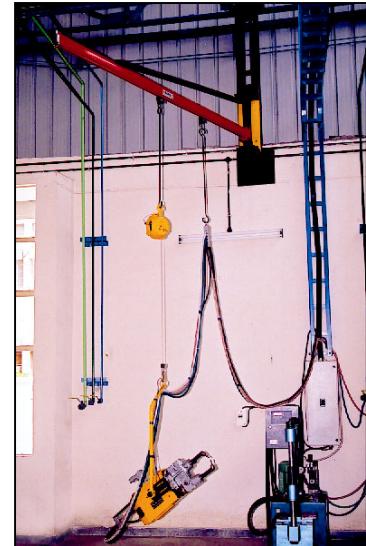
Federal Resistance Welding Limited

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**Column Mounted Slewing Crane****Column Mounted Slewing Crane**

Turnkey installation of BF Gantry System, IT Guns, and Controllers

Federal Resistance Welding Limited

Castle Mill Works,
Birmingham New Road, Dudley,
DY1 4DA, England.

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BRITISH FEDERAL

typical applications

Unipak replacement



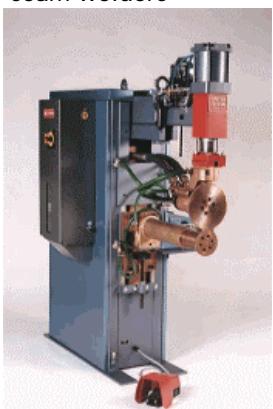
manual stations



multiwelders



seam welders



WS500 welding control

data sheet



Reliability from simplicity

The WS500 is a compact, robust unit providing basic control for resistance welding. The membrane front panel has a water-resistant finish and incorporates four push buttons and an LCD for simple programming and monitoring. Connections are via a plug-in connector block and four studs are provided for mounting. Alternatively, the WS500 can be supplied in a wide range of housings incorporating circuit breaker and thyristor units.

features	benefits
single/repeat/half-cycle/roll-spot/seam modes	versatile
dual heat weld + pulsation	can be used for coated materials
integral programmer	always available
50/60 Hz operation	international
up to 8 user-defined programs	store settings for different material and thicknesses
retract control	suitable for most types of gun operation
counter with optional lock-out	can be used for electrode maintenance
24 V dc supply	simple installation
cross-interlock	safety and load-sharing

options

ELR/1 earth-leakage relay - 2-hand start unit
8-position remote program select unit #90-80-06-02
3PA/2 3-phase adapter
dual gun adapter (does not include retract function)

configurations

W6, Monopak, Unipak housings

WS500 welding control

data sheet

welding parameters x 8		configuration (continued)	
mode	single/repeat	retract	none, simple, high-lift +/-
heat1	0..99%	frequency	50/60 Hz
heat2	0..99%	interlock	on/off
presqueeze	0..99 cycles	heat range	high/low
squeeze	0..99 cycles	cross-interlock	external/ring
weld1	0..99 cycles		
cool1	0..99 cycles		
weld2	0..99 cycles		
cool2	0..99 cycles		
pulses	1..9		
hold	0..99 cycles		
balance	0..60% (seam mode only)		
off	0..99 cycles		
counter (configuration types 3,5,6,7 and 10 only)		environmental	
actual count	0..9999	temperature	
end count	0..9999	- operating	0° to +50°C
at end of count	stop/continue	- storage	-25° to +70°C
		humidity	
		- operating	up to 80% (relative)
		- storage	10% to 90%
configuration		dimensions	
type		height	160 mm
- 00 spot/repeat	simple spot welding with no other functions	width	122 mm
- 01 spot/repeat with cross-interlock	spot welding with an output that can be used to prevent other machines from welding	depth	35 mm + 15 mm for connector
- 02 spot/repeat with retract	spot welding with an input and output for controlling the gun position	weight	0.62 kg
- 03 spot/repeat with counter	spot welding with an output that activates when the count is reached		
- 04 spot/repeat with cross-interlock and retract	a combination of types 01 and 02		
- 05 spot/repeat with counter and retract	a combination of types 02 and 03		
- 06 spot/repeat with counter and cross-interlock	a combination of types 01 and 03		
- 07 spot/repeat with counter, cross-interlock and retract	a combination of types 01, 02 and 03		
- 08 half cycle	spot welding using only one half-cycle weld duration		
- 09 half cycle with cross interlock	a combination of types 08 and 01		
- 10 half cycle with counter	a combination of types 08 and 03		
- 11 roll-spot	spot welding with an output to operate motor-driven welding wheels during the OFF time between sequences		
- 12 seam	uses seam wheels, a motor drive and continuous or modulated current to provide a seam weld		
		power requirements	
		voltage	24 V dc
		sync. frequency	50/60 Hz
		current	< 500 mA (all outputs off)
		i/o ratings	
		inputs	< 10 mA @ 24 V dc
		outputs	< 500 mA @ 24 V dc
		SCR drive	5 kHz; 1:10 mark/space; first pulse 24 V; subsequent pulses > 15 V

Information in the document is subject to change without notice.
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WS700 welding control

data sheet



typical applications

projection welders



Value-priced features and flexibility

The WS700 has been designed as an easy to use welding control timer intended for the customer who requires monitoring and quality welds. This timer has spot/pulsation/seam and roll-spot sequences with selectable phase angle or constant current control. A simple to use 4-line LCD and keypad allows up to 64 programs of weld settings to be entered. The timer can be supplied in a combination cabinet with circuit breaker and SCR to suit all machine kVA sizes.

features	benefits
easy to use	ready to go
phase angle/constant current	quality welds
integral programmer	always available
250 statement sequencer	reduce additional hardware
64 user-defined programs with program linking	store settings for different material and thicknesses
retract control	suitable for most types of gun operation
counter function	can be used for electrode maintenance
weld current/pressure monitoring	quality welds
proportional valve control	control the welding force
50 or 60 Hz operation	international
printer output	record weld quality

configurations

WS700, cabinet and SCR combinations are shown in document 91-10-00-00-16

WS700 welding control

data sheet

program parameters x 64		environmental	
presqueeze	0..99 cycles	temperature	0° to +50°C
squeeze	0..99 cycles	- operating	-25° to +70°C
weld1 and 2, cool1 and 2	0..99 cycles	- storage	
pulses	0..9	humidity	
hold	0..99 cycles	- operating	up to 80% (relative)
off	0..99 cycles	- storage	10% to 90%
pressure	0..10 V	dimensions	
heat1 and heat2	0..99 %	height	292 mm
current1 and current 2	0..60 kA	width	172 mm
		depth	38 mm
I/o control		mounting	
4 events per program synchronised to the weld sequence	full-feature 250 statement logic sequencer	cut-out dimensions	
16 programmable inputs	16 programmable outputs	4x Ø 19mm	
monitoring parameters x 64		power/synchronisation requirements	
current monitor	on/off	maximum input current	1 A @ 24 V dc ±20%
weld1 and 2 high/pre/low limit	0..99 %	line frequency	50/60 Hz ± 1Hz
pre-limit count	0..99		
pressure monitor	on/off		
pressure high/low limit	0..99 %		
configuration parameters		I/o ratings	
sequence	spot/roll-spot/ seam standard/hi/lift+/t	2 outputs	500 mA @ 24 V dc each
retract	50/60 Hz	6 outputs	100 mA @ 24 V dc each
frequency	0..200 s	12 inputs	10 mA @ 24 V dc each (max)
contactor time	on/off		
blanking	on/off		
await pressure	on/off		
toroid test	toroid/CT		
sensor	high/low		
heat range			
calibration parameters		secondary monitoring options	
toroid sensitivity	100..2000 mV/kA	description	part number
CT sec:pri ratio	1:1..199:1	3" flexible toroid	296545
CT sec:pri offset	-1 kA...+1 kA	12" flexible toroid	296546
pressure	2 points, kN/V	5 m extension lead (calibrated toroid)	90-90-02-09
options		5 m extension lead (uncalibrated toroid)	90-90-02-10
WS98-700 PC software for programming and monitoring #03-20-03-29			
ELR/1 earth-leakage relay - 2-hand start unit			
16 position remote program select unit #90-80-28			
3PA/2 3-phase adapter			

Information in the document is subject to change without notice.

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BRITISH FEDERAL

typical systems

WS4000 combination



WS4010 combination



WS4002 cabinet on stand



WS40xx series welding controls

data sheet



Evolution from automation

The demanding environment of the automotive industry has brought about a wide range of innovations in resistance welding control. Many of the features found in the WS40xx series have evolved from high-level automation installations, and this has produced a control system which is flexible and versatile, lending itself to most resistance welding applications. The WS40xx series has an extensive range of welding features and a number of communication networks can be supported through options and accessory adapters. Programming is via a network system, pendant programmer or notebook computer, and flash memory technology allows easy firmware upgrades.

features	benefits
independent control of one or two welding guns	flexible
welding programs can be arranged as 1x192 or 2x64	versatile
three-interval welding sequence	suitable for coated materials
constant current or phase angle control modes	quality welding
compatible with BF ENTRON medium frequency inverter	reduced weld times, smaller transformers
24 electrode programs with stepping and counting + 8 tip dress programs	quality welding
network or local programming	for large or small installations
proportional valve control	can be calibrated in kN or lbf
hardwired/fieldbus I/O	compatible with your plant standard
extensive monitoring and diagnostics	pinpoint most welding problems
options	
WS98-4000 PC software for programming and monitoring	
Profibus FMS/DP, ControlNet, Ethernet, DeviceNet, Interbus network adapters	
configurations	
WS40xx, cabinet and SCR combinations are shown in document 91-10-00-00-16	

WS40xx series welding controls

data sheet

WS40xx series

All WS40xx controls have an RS232 communications port and hardwired inputs and outputs. WS401x controls do not have a built-in programming pendant.

the following features are plug-in upgrades unless stated otherwise

feature	WS40x0	WS40x2	WS40x4
proportional valve i/o	✓ ²	✓ ²	✓ ¹
Profibus FMS adapter	✓		
Interbus S adapter	✓	✓ ¹	
Profibus DP adapter	✓ ²	✓	✓
DeviceNet adapter	✓	✓	✓ ¹
ControlNet adapter	✓	✓	✓
Ethernet adapter	✓	✓	✓ ¹
Interbus PCP	✓	✓	✓

¹ standard

² build option

welding programs

1 x 192 (single gun) or 2 x 64 (dual gun)
 3-interval weld sequence with phase angle/constant current control
 spot/repeat and standard/extended weld sequences
 enhanced gun/retract timing
 slope control
 inhibit function
 load balancing
 proportional valve control
 current/force offsets

monitoring programs

1 x 192 (single gun) or 2 x 64 (dual gun)
 low/pre/high limits for each weld interval
 heat/force limit
 fail counter

electrode programs

1 x 24 (single gun) or 2 x 8 (dual gun)
 phase angle/constant current curves for each interval + force
 secondary/primary feedback
 SCR allocation
 stepping, dressing and counting
 proportional valve/toroid calibration

tip dressing programs

8
 electrode/duration/force

status

40-program datalog, electrode status, body cycle log, i/o status

configuration program

hardwired/bus inputs and outputs
 standard/medium frequency/multiweld operation
 retract mode/gun control
 end-of-sequence and contactor timing
 network addressing
 gun options
 sequence blocking

environmental

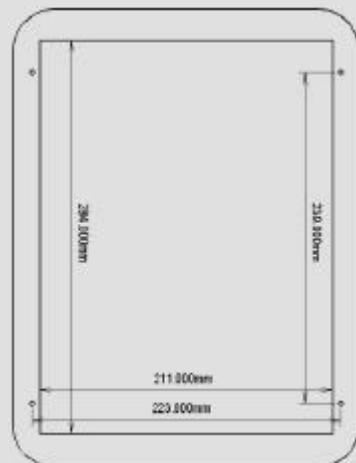
temperature
 - operating 0° to +60°C
 - storage -25° to +70°C
 humidity
 - operating up to 80% (relative)
 - storage 10% to 90%

dimensions WS400x/WS401x

height 330/318 mm
 width 250/208 mm
 depth 38/40 mm or 56/58 mm expanded

mounting WS400x

aperture and fixing centres



power/synchronisation requirements

maximum input current 1A @ 24 V dc ±20%
 line frequency 50/60 Hz ±1Hz

i/o ratings

2 outputs	500 mA @ 24 V dc each
6 outputs	100 mA @ 24 V dc each
12 inputs	10 mA @ 24 V dc each (max)

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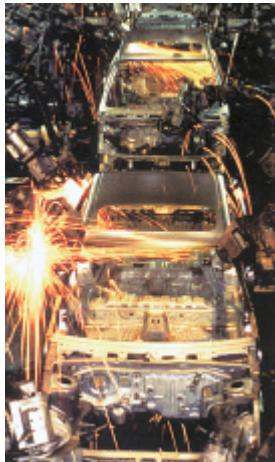
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typical applications

automotive



manual stations



WS2003 custom case



WS2003 welding control

data sheet



Proven features and flexibility

The WS2003 is a direct plug-in replacement for the popular WS2000. It will fit into existing cabinets and uses the existing power supply and P1/2/3/4 connections. The WS2003 has a new programming pendant with a larger display and simplified keypad. A host of additional features, such as a 250-statement logic sequencer, Ethernet and fieldbus cards are available for new installations.

features	benefits
single/dual gun	flexible
64 welding programs + linking	versatile
dual-interval welding sequence	suitable for coated materials
constant current or phase angle control modes	quality welding
machine sequencer	reduce additional hardware
programmable digital i/o	easy to interface with other equipment
network or local programming	for large or small installations
analogue pressure control	can be used with proportional valves
retract/high-lift control	suitable for most types of gun operation
extensive monitoring and diagnostics	pinpoint most welding problems
options	

WS98-2003 PC software for programming and monitoring

10Base-T Ethernet adapter

two-hand start

ELR/1 earth-leakage relay

3-phase drive card

proportional valve power supply

configurations

SCRs from 63 A to 250 A • circuit breakers from 63 A to 600 A • ELR

WS2003 welding control

data sheet

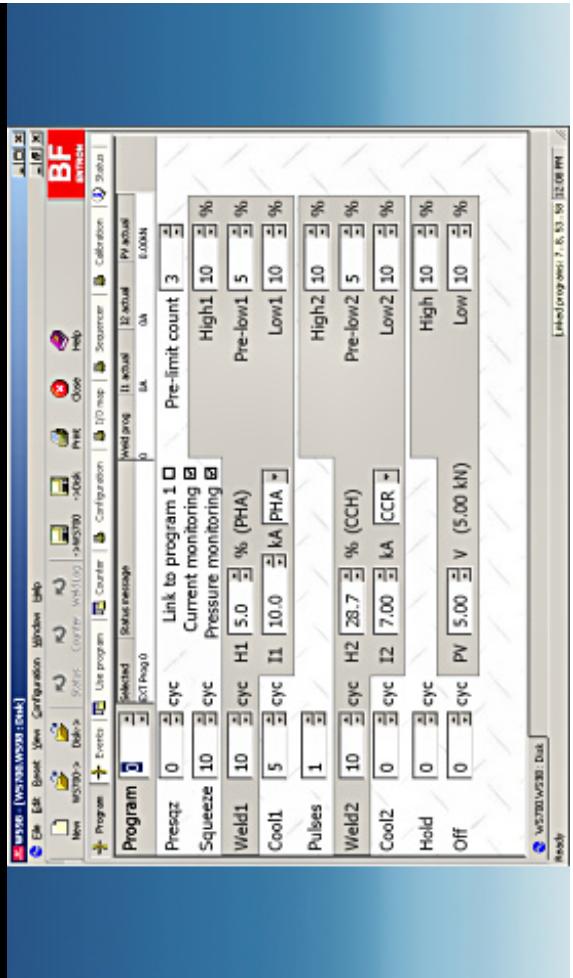
welding programs	x 64 with linking 2-interval weld sequence with phase angle/constant current control spot/repeat/roll-spot/seam dual heat/seam pre-heat single/dual gun pulsation analogue pressure control, 0..10 V or 4..20 mA balance control for seam welding	SCR options SCR type kVA TC50/1WS 50 TC150/1WS 150 TC500/1WS 500 all SCRs are water cooled
monitoring programs	x 64 low/pre/high current limits for each weld interval pre-limit counter monitoring on/off	circuit breakers type rating breaking capacity 63AS 63 A 25 kA 63AH 63 A 45 kA 125AS 125 A 25 kA 125AH 125 A 45 kA 225AS 225 A 25 kA 225AH 225 A 45 kA 400AS 400 A 25 kA 400AH 400 A 45 kA 600AS 600 A 25 kA 600AH 600 A 45 kA all circuit breakers are available with an optional ELR
I/O control	4 events per program synchronised to the weld sequence full-feature 250 statement logic sequencer 14 programmable inputs 12 programmable outputs	environmental temperature - operating -5° to +60°C - storage -25° to +70°C humidity - operating up to 90% (relative) - storage up to 90%
counters x 2	optional stop at end of count optional output at end of count reset via input/programmer/WS98	power/synchronisation requirements voltage 50VA @ 380/400/420/440 V ac line frequency 50/60 Hz ±1Hz
configurable options	retract/hi-lift control for each gun low-force approach contactor timer 50/60 Hz frequency blanking toroid test high/low heat range	
i/o ratings	4 outputs 1 A @ 24 V dc or 110 V ac each 8 outputs 500 mA @ 24 V dc or 110 V ac each 14 inputs 10 mA @ 24 V dc each (max)	
programming pendant	4-line LCD with backlight data backup/restore function RS-232 communications	

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WS98-700 PC software

data sheet



Take control of your welding data

Using all the features of Microsoft® Windows®, WS98-700 allows you to program, monitor and archive the data in your WS700 welding control. Connection to the timer is via a fast but simple RS-232 link (cable supplied) and the settings are displayed in tabbed windows, with each window showing only the parameters relevant to your application. For any number of WS700s, WS98 is an essential partner.

features	benefits
easy to use	helps you get your work done
programming, configuration and status windows	parameters arranged in functional groups
intelligent displays	reduce on-screen clutter
enhanced tooltips	detailed explanation of all parameters
built-in printing and archiving	record and store all of your settings
multi-document interface	check the settings from several locations
context-sensitive HTML help	explains all features

options
none



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typical applications



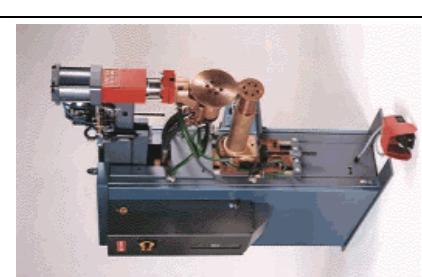
robot stations



spot/seam welders



spot/seam welders



WS98-700 PC software

data sheet

program and limits display	
status information	✓
selected program	✓
results of the last weld	✗
CT, toroid and pressure calibration parameters	✓
intelligent layout	✓
printing	✓
disk access	✓
status/counter/log reset	✗
context-sensitive help	✓

status display	
status information	✓
selected program	✓
results of the last weld	✓
force output and force feedback	✓
counter status	✓
i/o status	✓
printing	✓
disk access	✓
status/counter/log reset	✓
context-sensitive help	✓

use program display	
status information	✗
selected program	✗
results of the last weld	✗
intelligent layout	✓
printing	✓
disk access	✓
status/counter/log reset	✗
context-sensitive help	✓

counter display	
status information	✗
selected program	✗
results of the last weld	✗
intelligent layout	✓
printing	✓
disk access	✓
status/counter/log reset	✗
context-sensitive help	✓

configuration & printing display	
status information	✗
selected program	✗
results of the last weld	✗
application-specific parameters	✓
intelligent layout	✓
printing	✓
disk access	✓
status/counter/log reset	✗
context-sensitive help	✓

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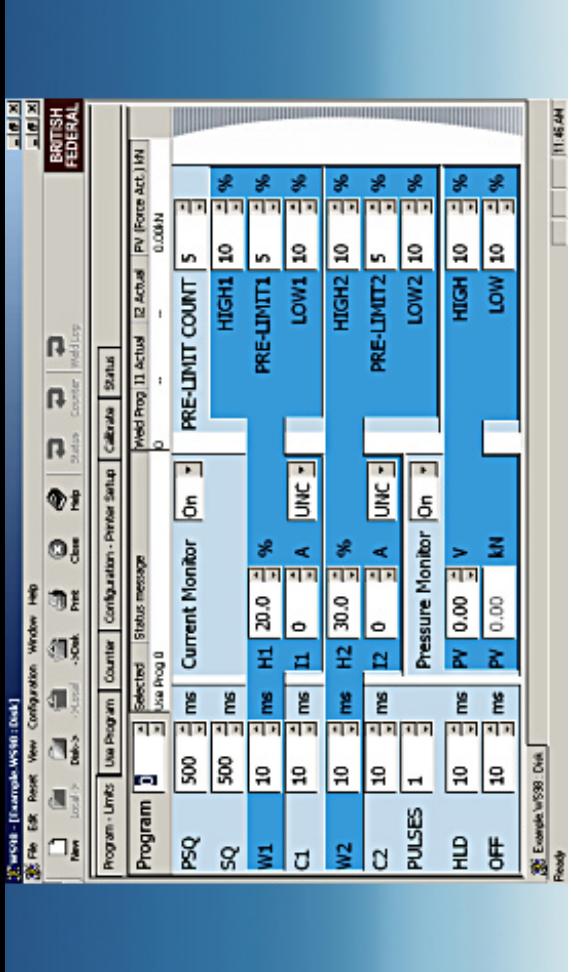
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WS98-700ms PC software

ata sheet



WS98-700ms PC software

data sheet

program and limits display	
status information	✓
selected program	✓
results of the last weld	✓
sequence parameters	✓
monitoring parameters	✓
intelligent layout	✓
printing	✓
disk access	✓
status/counter/log reset	✓
context-sensitive help	✓

use program display	
status information	✗
selected program	✓
results of the last weld	✗
intelligent layout	✓
printing	✓
disk access	✓
status/counter/log reset	✗
context-sensitive help	✓

counter display	
status information	✗
selected program	✗
results of the last weld	✗
intelligent layout	✓
printing	✓
disk access	✓
status/counter/log reset	✗
context-sensitive help	✓

configuration & printing display	
status information	✗
selected program	✗
results of the last weld	✗
application-specific parameters	✓
intelligent layout	✓
printing	✓
disk access	✗
status/counter/log reset	✗
context-sensitive help	✓

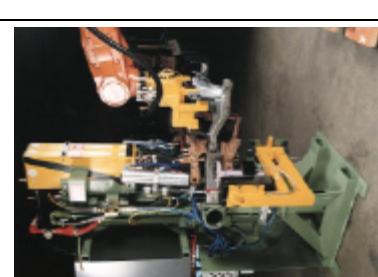
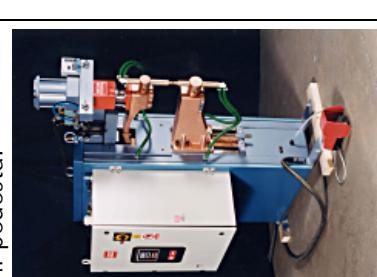
Take control of your welding data

Using all the features of Microsoft® Windows®, WS98-700ms allows you to program, monitor and archive the data in your WS700ms welding control. Connection to the timer is via a fast but simple RS-232 link (cable supplied) and the settings are displayed in tabbed windows, with each window showing only the parameters relevant to your application. For the WS700ms, WS98 is an essential partner.

features	benefits
easy to use	helps you get your work done
programming, configuration and status windows	parameters arranged in functional groups
millisecond-specific parameters	accurate
intelligent displays	reduce on-screen clutter
enhanced tooltips	detailed explanation of all parameters
built-in printing and archiving	record and store all of your settings
multi-document interface	check the settings from several locations
context-sensitive HTML help	explains all features



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DEFINITION

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AIRCRAFT JET ENGINE & AEROSPACE WELDING

AIRCRAFT, JET ENGINE & AEROSPACE WELDING

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AIRCRAFT, JET ENGINE & AEROSPACE WELDING

SP & SM 3-phase Secondary Rectified DC Welding machines are designed to meet the highest standards of resistance welding in the Aircraft & Aerospace industries.

Spot and Seam welding machines from 75kVA up to 600kVA are available.

3 phase machines offer numerous advantages over less efficient single phase machines:

- Fully balanced loading over the incoming mains supply
- Power Factor approaching .95
- Reduced load on mains supply
- No inductive losses
- Improved electrode life
- Quality welds using both steel and non-ferrous materials
- Less heat influence on components - less deformation
- Higher seam welding speeds

1 THE FORCE SYSTEM

The low inertia weld force system uses double acting frictionless diaphragm cylinders ranging from 20kN or 30kN.

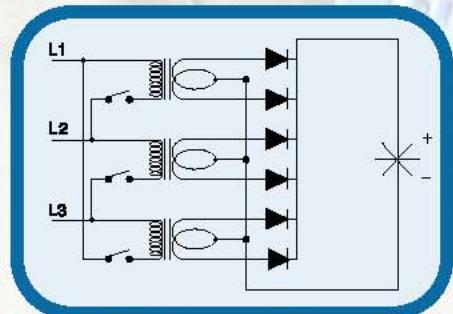
2 THE MACHINE FRAME

All frames comprise a robust fabricated structure, containing integral reinforcing elements to absorb loads, whilst minimising deflection, which is vital for precision welding.

3 THE TRANSFORMER POWER UNIT

This has 3 matched single phase transformers arranged to provide a non-magnetically interlinked system and primary winding in a delta connection.

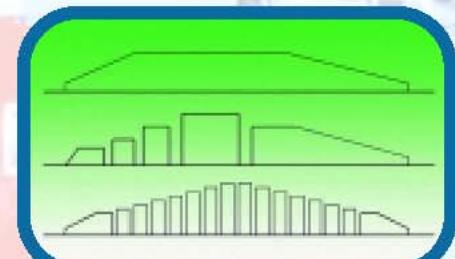
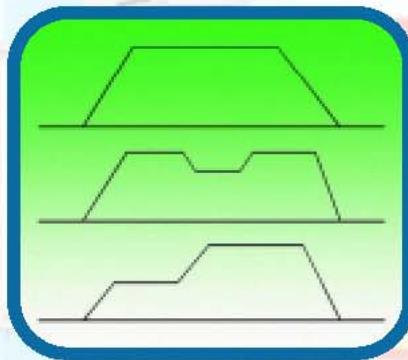
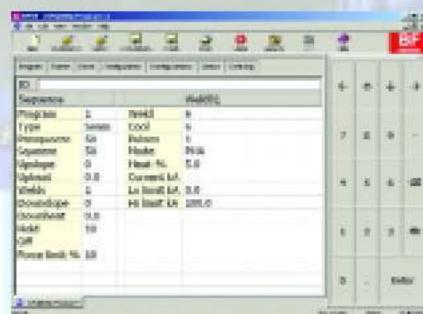
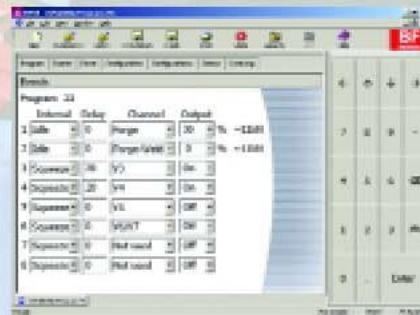
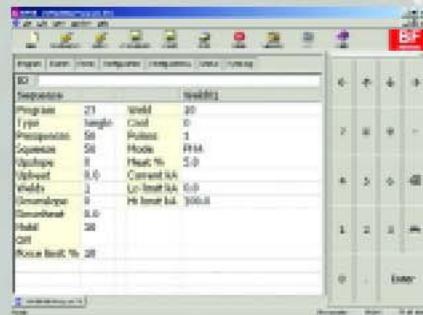
- Standard Power units are available from 75Kva - 600Kva
- Other power units to meet other applications can be designed and manufactured.



3 phase transformer with 6 phase rectifier bank

4 WELDING CONTROL

Microprocessor Control developed specifically to meet the growing demand for welding special materials within the aircraft and aerospace industries. These materials require a fully flexible weld program, as well as full monitoring of the weld procedure.



Typical advanced programmable weld and force settings

Program Configuration.

50 Weld Programs:

Single/Repeat/Seam/Roll-spot

Time units in cycles

16 weld periods per program

Presqueeze	(0..999 units)
Squeeze	(0..999 units)
Upslope	(0..999 units)
Weld Periods	(1..16)
Weld	
Downslope	(0..999 units)
Hold	(0..999 units)
Off	(0..999 units)

Each Weld period consists of:

Duration	(0..999 units)
Cool	(0..999 units)
Pulsations	(1..99)
Current	(0..100kA)
Heat	(0..99%)
Low current limit	(0..100kA)
High current limit	(0..100kA)
Mode	PHA, CCR, AVC



Other features:

- Secondary Current Feedback
- 50/60Hz operation
- Detailed weld log
- 8 digital outputs linked to event timing, 8 per program
- Motor drive
- 2-Channel analogue pressure control
- Programming via PC

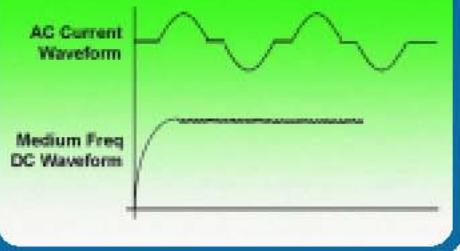
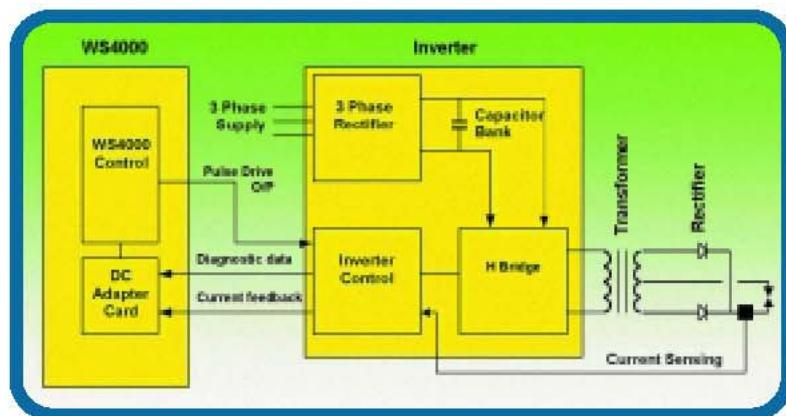
MEDIUM FREQUENCY INVERTER WELDING

In addition to Secondary Rectified machines, Federal can offer a 'Medium Frequency Inverter/DC Welding System' which can be installed on any of our DC range of machines.

MF-PAK Medium Frequency controls range from 600A to 2500A and are ideal for spot, projection and seam welding machines up to 500kVA.

The MF-PAK system can be used with advanced weld timers.

The MF-PAK system can be supplied as a complete package for wall or floor mounting or can be custom designed to fit almost any proprietary machine.



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Federal Resistance Welding Limited

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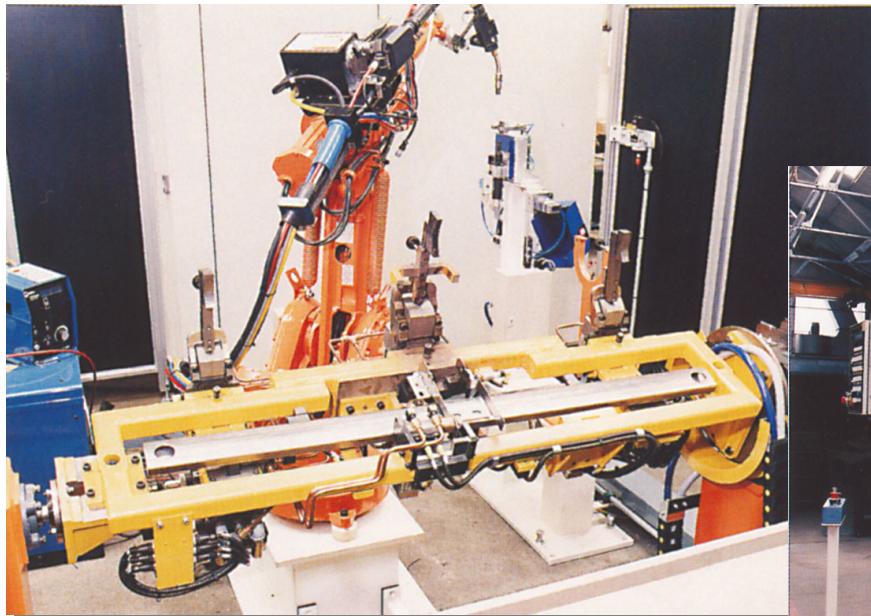
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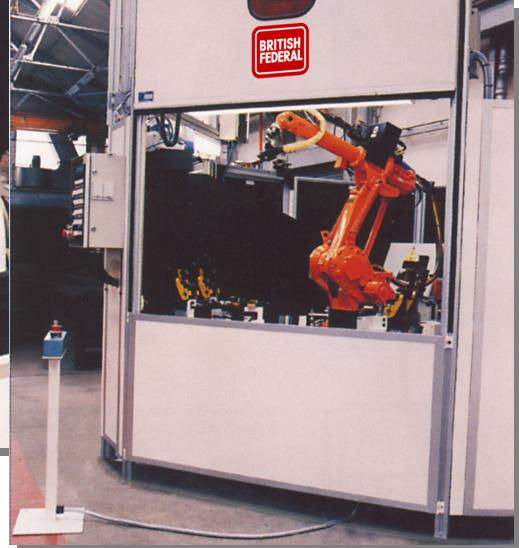
Advantages of using medium frequency

- **Reduced transformer size** - Less iron required at higher frequencies
- **True 3 phase load distribution** - Balanced mains loading
- **Very good power factor** - Typically 0.9 PLUS
- **Capacitive mains loading** - Will improve overall factory power factor
- **High rate of heat input** - Allows reduced weld times
- **Lower peak currents** - "Splashing" less likely
- **Very high secondary current capability** - Secondary current is uni-directional and load is purely resistive
- **Natural current upslope at start of weld** - Improves cosmetic appearance
- **High speed constant current response** - Each half cycle of the 1KHz is allowed to conduct until the target is obtained. The current is then switched off until the next half cycle begins
- **Longer electrode life** - Due to the absence of high peak currents and minimal splashing.

All details and descriptions shown are correct at time of going to print, but maybe subject to change due to policy of continuous improvement.

FEDARC SERIES

Robot Welding Cell Model FA2s.



Robot Welding Cell Model FA1

British Federal robot welding cells are designed and built by Engineers, who understand and are fully experienced in both the principles and engineering of welding and robotics to ensure maximum productivity is always attained.

Features for profitable welding:

- **Proven arc welding equipment based on modular designs.**
- **All cells are mounted on a single base plate for ease of installation.**
- **Supplied with two fixed tables for fixture mounting with a maximum component width of 1.5m (FA1 type) or manipulators (FA2 type).**
- **Provides excellent weld quality combined with flexibility.**
- **Manually closed and powered open doors at load and unload stations.**
- **Ideal for small to medium sized fabrication businesses.**
- **FedArc welding cells improve productivity - reduce costs.**

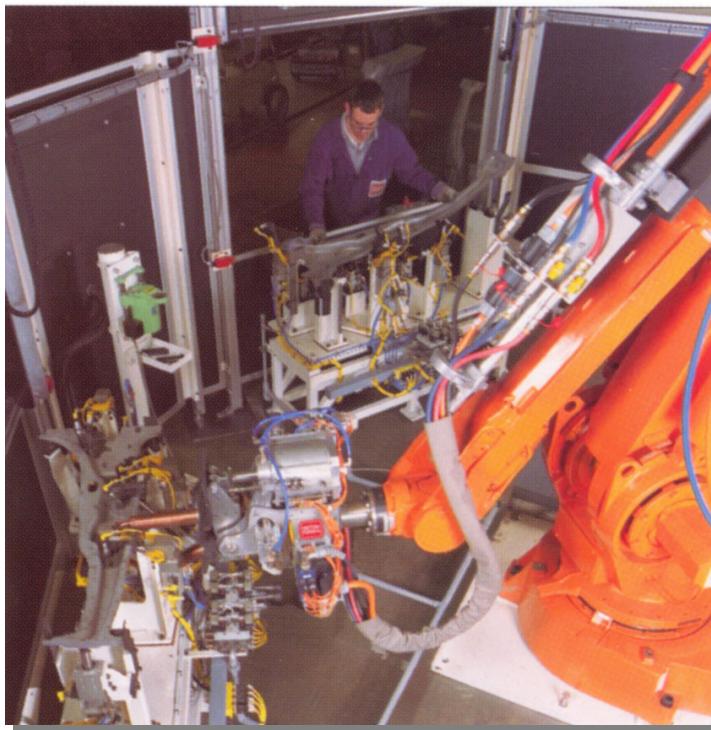
Welding equipment includes:
Air cooled torch
Torch cleaner
Inverter welding package

Federal Resistance Welding Limited

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FEDSPOT – FS1

British Federal robot welding cells are designed and built by Engineers, who understand and are fully experienced in both the principles and engineering of welding and robotics to ensure maximum productivity is always attained.

Features for profitable welding:

- **Proven resistance welding equipment based on modular designs.**
- **All cells are mounted on a single base plate for ease of installation.**
- **Supplied with two fixed tables for fixture mounting with a maximum component width of 1.5m.**
- **Provides excellent weld quality combined with flexibility.**
- **Welding parameters control by British Federal Electronic timers.**
- **Manually closed and powered open doors at load and unload stations.**
- **Ideal for small to medium sized fabrication businesses.**
- **FedSpot welding cells improve productivity - reduce costs.**

Federal Resistance Welding Limited

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ROBOSPOT



RoboSpot is a spot welding gun and service stand designed as a modular assembly to form part of a welding cell and is ideal for any system integrator employing robots in manufacturing. The robot offers the part to be welded to the gun stand, a hollow centre column from which services can be attached from above or below.

A unique system of clamps allows a variety of components such as welding controls and service panels to be fitted to the centre column. Assembled without transformers or welding gun the RoboSpot stand offers an efficient and robust robot service stand to supply services to integrated robot guns.

RoboSpot provides the ideal solution when robots are used to handle components with equalising weld guns or as a service stand where integrated robot guns are used.

- Electric or conventional pneumatic integrated equalising guns or with remote transformers.
- Single or dual equalising spot welding guns with gun configurations to suit customer's applications.
- Air panels with solenoid and proportional valves, dual pressure, programmable speed and other options.
- Micropak 2000, WS2000, WS3000, WS4000, WS9000 or WS2020 microprocessor controls.
- Multiple transformer choice - 32KVA to 250KVA.
- Service panels with circuit breakers, air and water management systems to suit customer's balcony sets.
- Automatic tip dressing and changing modules available.
- Automatic tip change.
- Height, angle and orientation adjustment of all major components.
- Service boom for robot installations mounts directly on top of centre column.
- Indexing units and manipulators.

ISO 10656 (1996)

- Quality.
- Low operating cost.
- Performance.
- Long service life.
- Efficiency.

British Federal integrated Transformers (F.I.T) are designed to be built directly into robot and manual welding guns. The mounting surfaces are precision machined to close tolerances complete with dowel holes, allowing installation into any gun designed for these standard transformers.

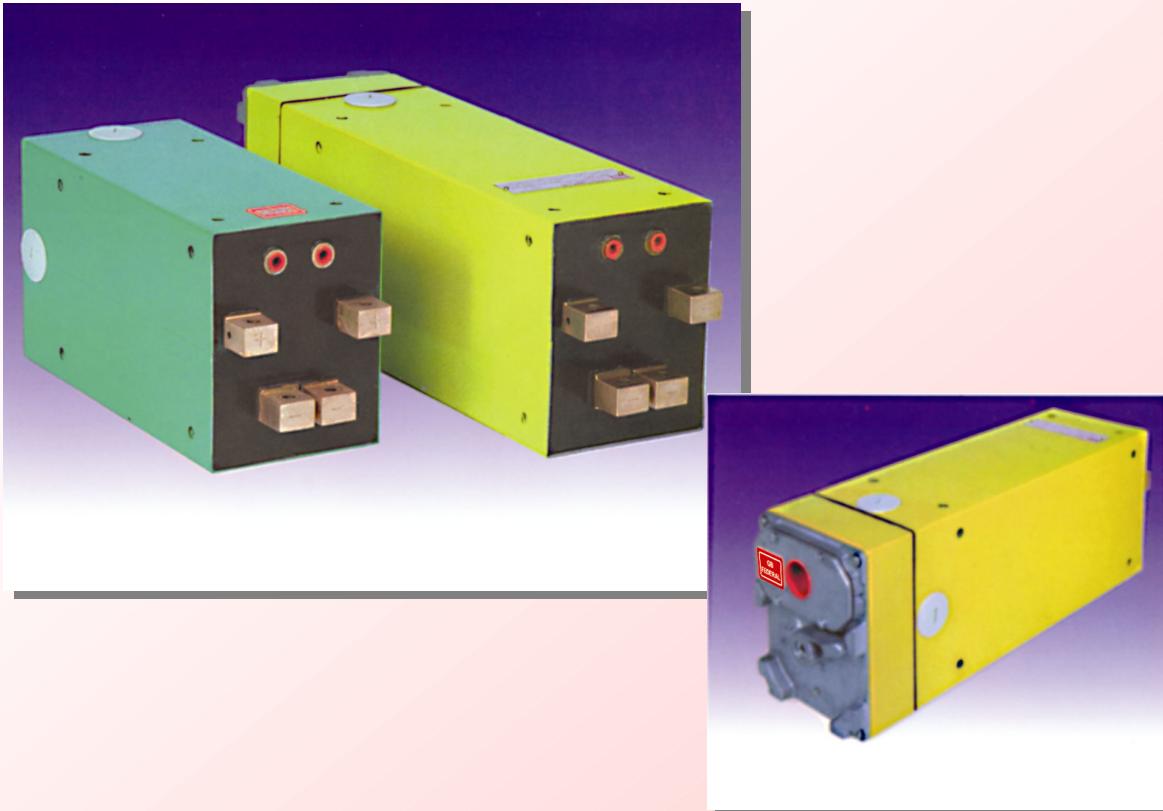
British Federal welding gun transformers provide exceptional efficiency and reliability with optimum weight and performance. Secondary current measurement coil and primary and secondary thermostats are fitted as standard. The transformer size is identified by secondary voltage and continuous secondary current rating.

Features include:

- Dimensions to ISO standard.
- Low weight.
- Water cooled - High flow.
- Vacuum epoxy potted.
- Protection IP55.
- Patented secondary coil design.
- Low operating temperatures.
- Earth to centre point of secondary.
- Primary and secondary thermostats.
- Integral measuring coil.
- Class F insulation.
- Optional primary boxes.
- 7 sizes are colour coded.
- Low impedance.

F.I.T model range.

5,6-4	6,3-4	6,3-5,4	7,1-5,4	8-5,4	10-5,4	13,5-5,4
Lilac	Blue	Blue	Green	Grey	Yellow	Brown



British Welding Transformers are designed and built to comply with ISO 7284, ISO 5826 and British Standard 4819, part 1, 1989. They meet the requirements of multispot welding machines as well as robot installations covering a wide range of resistance welding applications.

Features include:

- **Two separate secondary coils.**
- **Mounting dimensions to ISO 7284.**
- **Class F insulation.**
- **C cores & windings vacuum epoxy resin moulded.**
- **Water-cooled secondaries.**
- **4 secondary voltages.**
- **5 tap switch positions.**
- **Protection to IP55.**
- **Designs available for most primary supply voltages.**
- **Optional integral measuring coils.**
- **Optional thermostat.**

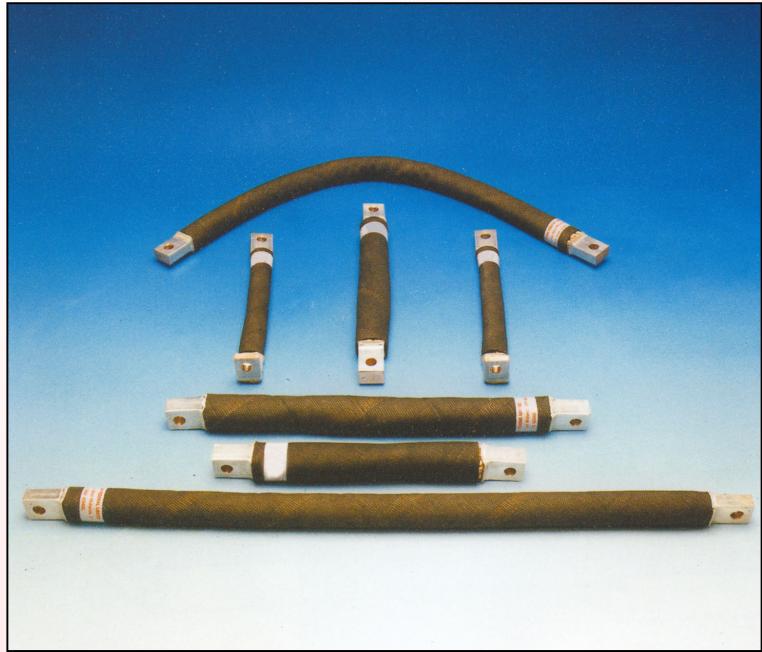
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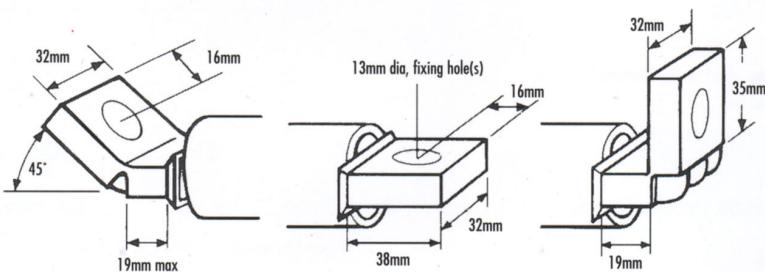
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British Federal Air Cooled Jumper Cables are manufactured from flexible copper wire rope with silver plated terminals, swaged formed to produce a flat contact face and minimum electrical resistance. The sheath protects the cable from external abrasion and minimises wear between strands.

STANDARD RANGE				
Size	External diameter	Terminal thickness	Length	
200mm ²	32mm	10mm	as required	
300mm ²	38mm	17mm	as required	
500mm ²	44mm	23mm	as required	

*Terminal fittings - standard dimensions throughout the range.
- are available in any combination as shown overleaf.*





British Federal Water Cooled Jumper Cables are made from very flexible copper wire rope soldered into high conductivity copper terminals. Alternate copper strands are sheathed in a perforated neoprene tube, minimising mechanical wear. An open wound spring runs the length of the cable, preventing the water flow from being restricted by bending of the cable that is sheathed with oil and abrasion resistant flexible reinforced neoprene hose.

British Federal Water Cooled Jumper Cables are available in 5 standard sizes.

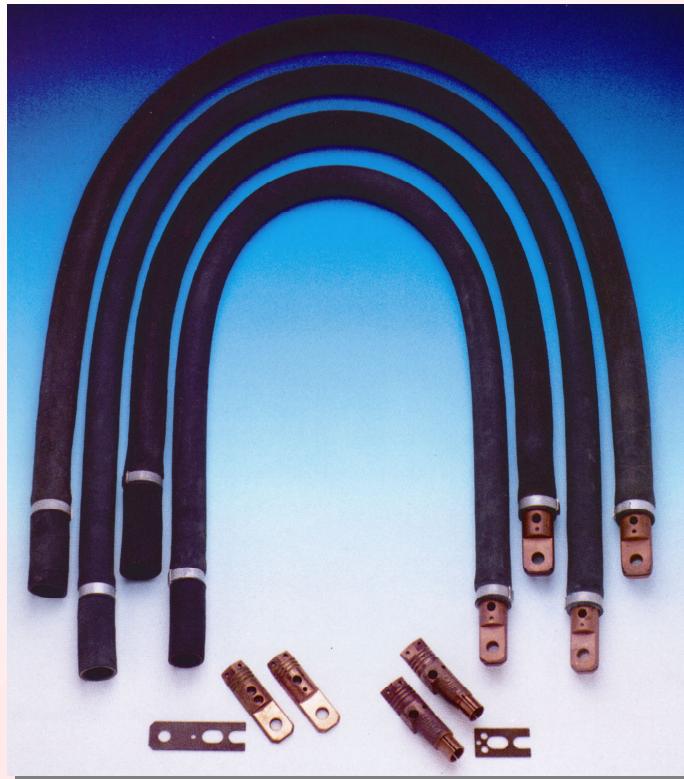
120mm ²	160mm ²	215mm ²	270mm ²	325mm ²
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Federal Resistance Welding Limited

Castle Mill Works,
Birmingham New Road, Dudley,
DY1 4DA, England.

**BRITISH
FEDERAL**www.britishfederal.co.uk

Tel : +44 (0) 1384 455550
Fax : +44 (0) 1384 455411
Email : sales@britishfederal.co.uk

Flex-LO-6X

British Federal Flex-LO-6X kickless welding cables are designed and built to meet the requirements of today's robotic and manual spot welding applications.

Features and benefits are:

- **No noticeable pulsation or 'kick'.**
- **Improved flexibility.**
- **Terminals soldered and screwed.**
- **Low electrical resistance.**
- **Low impedance.**
- **Balanced positive and negative water-cooling distribution.**
- **Reduced operator fatigue.**
- **Wires cannot melt out during brief overload.**
- **Reduced heat generation.**
- **Longer working life.**
- **Reduced volts drop and lower transformer KVA/primary demand.**
- **Reduced cost per weld - a true measure of cable cost.**

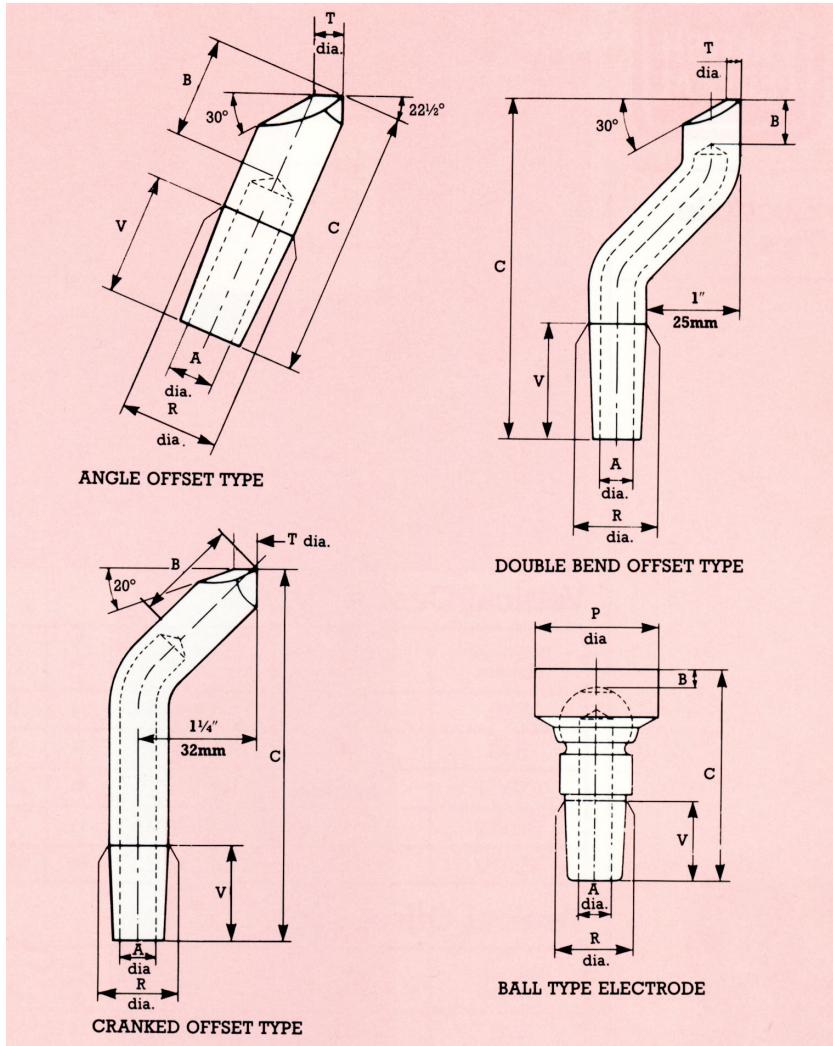
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Angle Offset Type

Reference Number	Stock Number	Taper	R Dia. in	C in	V in	A Dia. in	B in	TIP Dia. mm	Rake Angle α
6233	311119	3/4in BS 807	3/4	2 3/4	1 1/2	1 1/32	7/8	5	30°

Double Bend Offset Type

Reference Number	Stock Number	Taper	R Dia. in	C in	V in	A Dia. in	B in	TIP Dia. mm	Rake Angle α
6633 N5	311107	3/4in BS 807	3/4	4 1/4	1 1/2	1 1/32	5/8	5	30°

Cranked Offset Type

Reference Number	Stock Number	Taper	R Dia. in	C in	V in	A Dia. in	B in	TIP Dia. mm	Rake Angle α
6333	311120	3/4in BS 807	3/4	3 1/8	1 1/2	1 1/32	7/8	5	20°

Ball Type Electrode

Reference Number	Stock Number	Taper	P Dia. mm	R Dia. in	C in	V in	A in	B in	Rake Angle α
0660	311108	3/4in BS 807	32	3/4	2 1/4	1 5/16	3/8	3/16	—

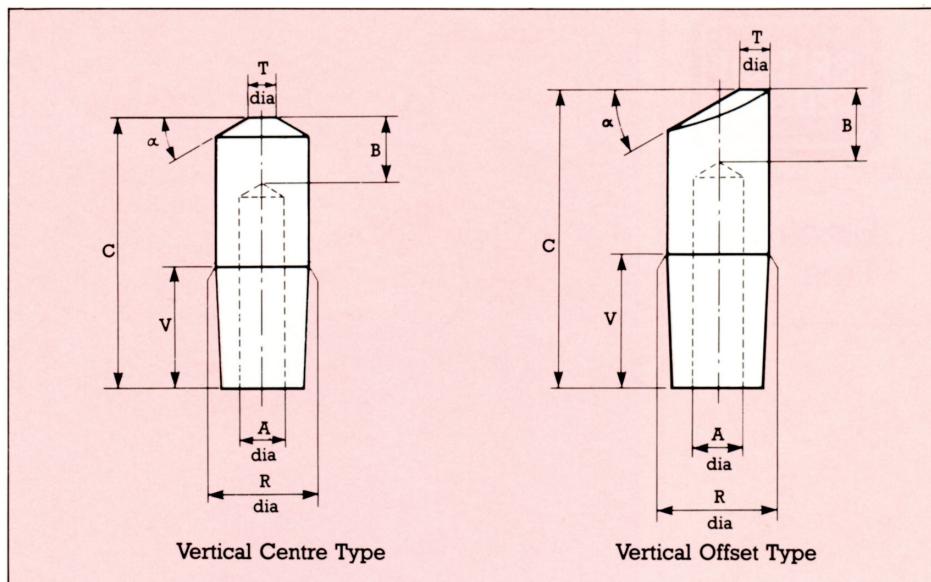
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Vertical Centre Type

Reference Number	Stock Number	Taper	R Dia. in	C in	V in	A Dia. in	B in	TIP Dia. mm	Rake Angle α
6000	311112	3/4in BS 807	3/4	2	15/16	13/32	5/8	FLAT	0°
6033	311102	3/4in BS 807	3/4	2	15/16	13/32	5/8	5	30°
6033/S1	311114	3/4in BS 807	3/4	2 1/2	15/16	13/32	5/8	5	30°
6033/S2	311115	3/4in BS 807	3/4	3	15/16	13/32	5/8	5	30°
6033/S3	311122	3/4in BS 807	3/4	3 1/2	15/16	13/32	5/8	5	40°

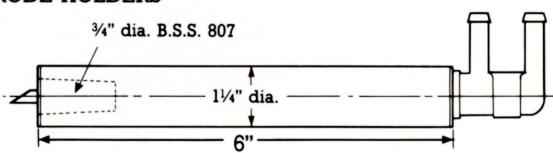
Vertical Offset Type

Reference Number	Stock Number	Taper	R Dia. in	C in	V in	A Dia. in	B in	TIP Dia. mm	Rake Angle α
6133	311116	3/4in BS 807	3/4	2 3/4	1 1/2	13/32	7/8	5	30°
6133/S2	311118	3/4in BS 807	3/4	3 3/4	1 1/2	13/32	7/8	5	30°
6533	311121	3/4in BS 807	3/4	2	15/16	13/32	7/8	5	30°

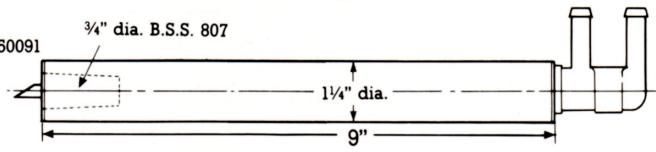
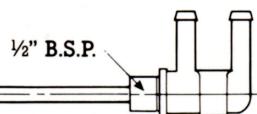
All electrodes are Mathey 328 material or equivalent

STANDARD ELECTRODE HOLDERS

Stock No. 050145



Stock No. 050091


COOLING WATER DISTRIBUTOR


For 9" holder DRG. No. D27763 D67156 Stock No. 312050 (cut to suit 6" holder)



Every automobile industry faces the problem of sharpening worn electrodes. Worn electrode tips produce either poor welds or no welds at all, limiting both quality and productivity.

Reconditioning worn tips with a British Federal electrode dresser is a convenient and economic solution that minimises downtime rather than replacing tips which is a costly and time consuming alternative.

British Federal pneumatic electrode dressers, automatically dress the electrode in seconds with precision, without removing the tip from the machine which gives uniform weld quality.

A properly shaped electrode tip reduces energy consumption during the welding process and greatly enhances electrode life.

Dressers can be employed on.

1. Spot welding machines in industries where resistance welding is carried out on manual installation.
2. Suitable for dressing welding guns.

Technical Specification

MODEL	CUTTER RPM	ELECTRODE CAPACITY (MM)	AIR INLET	RECOMMENDED HOSE SIZE	WEIGHT
PD 1	1100	Ø12 TO Ø16	3/8"	10mm	1.5 Kg
PD 2	1800	Ø12 TO Ø20	3/8"	10mm	2.5 Kg



Toggle Clamps

The basic toggle mechanism in a clamp is to multiply a hand force at the handle into a high clamping force to hold work.

Dimensions in BF clamps are carefully chosen to maximise clamping force while ensuring that the clamp locks closed even under vibration or intermittent loading. Hand force has been chosen which can be applied in frequent operation.

Other clamps like push-pull clamps, cam clamps, pneumatic clamps, horizontal clamps are also available.

BF has a dedicated design office which is available to modify a standard clamp or design a special clamp to suit customer requirements.

Pneumatic Power Clamps

BF Pneumatic clamps have been specially developed keeping in mind the demands of mass production within the automobile industry.

Because of toggle lever operation, large clamping force is achieved even at low air pressures and at economically air consumption rates.

Clamps have a compact construction, because of which stresses are borne inside the body of the clamp. Thus avoiding overloading of the clamp mountings.

BF clamps guarantees a long working life with operational security of the highest order.



Pneumatic Clamps PPC-SH series



Toggle Clamps



Accessories



Pneumatic Clamp CPC-S series



Vertical and Push-Pull Clamps

Federal Resistance Welding Limited

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