Capacitor Discharge Welding

Welding process by CDW

Pulse discharge electric welding generated from previously stored energy

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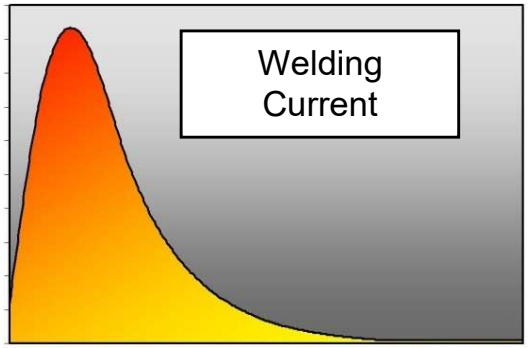
Properties of CDW system

1. High energy, concentrated on the welding area

-The overheating is limited to the welding area only
-Pieces do not undergo any deformations or significant oxidation
-Welding can be performed nearby to the thermally sensitive areas

COLD WELDING



2. High current and welding speed

-The current may reach up to 130 kA, in 10-15 ms
-The current impulse speed decreases the heating of the electrodes, increasing the duration

3. Simple welding parameters setting

4. Low power consumption

The energy is stored during the downtime, so as not to introduce any voltage fluctuation on the supply line

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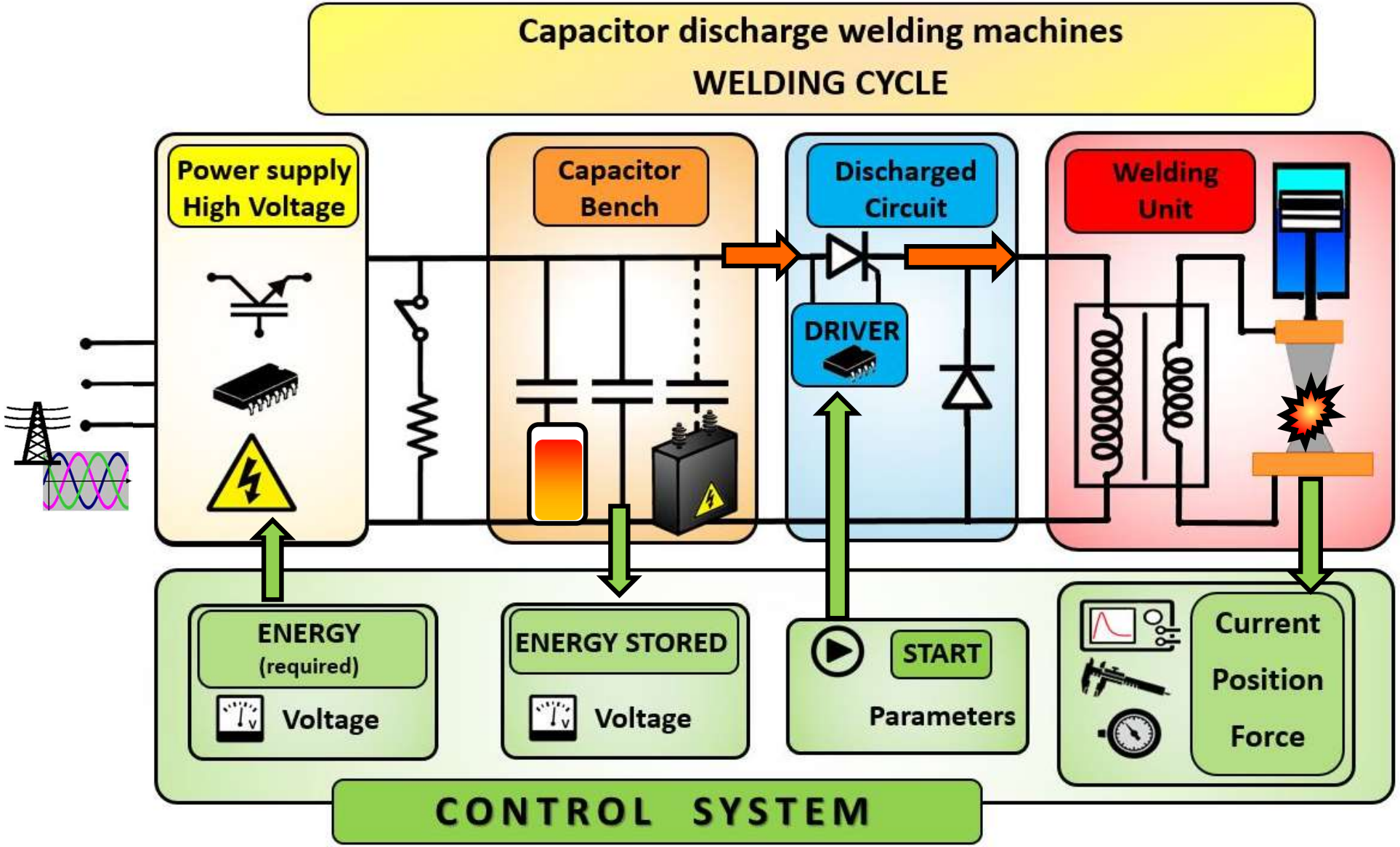
CAPACITOR DISCHARGE WELDING SYSTEM



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Constraints in CDW

- Provision of surfaces, creating projections that allow the efficient welding of the joint and the required mechanical strength

- Regular contact with welding areas in order to obtain an equal distribution of the applied force and of the electric resistivity

CAPACITOR DISCHARGE WELDING SYSTEM

panda

Application in AUTOMOTIVE branch

- Bonnet – rear boot, mudguard;
- Exposed printed metal sheet inside of the rear boot and fastening of the side;
- Joint support;
- Bush on USIBOR pillar

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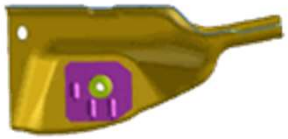
CAPACITOR DISCHARGE WELDING SYSTEM

Application in AUTOMOTIVE branch

***Aesthetic welding spots: Welding doesn't leave any trace on the metal sheet**

O.L.C.I. ENGINEERING	Aesthetic welding spots inside the seamer of the bonnet, rear boot and anterior mudguard	
COMAU	Aesthetic welding spots for the exposed printed metal sheet inside the boot and the fastening of the side on the shell	 
GRUPPO PROMA	Welding on fix machine of the joint support; particulars with different thicknesses (1.5 mm – 6 mm)	
CPA	Welding of bushes on a steel pillar, with high resistance and hot-stamped (USIBOR)	

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CAPACITOR DISCHARGE WELDING SYSTEM

Application in AUTOMOTIVE branch

- Bonnet – rear boot, mudguard;
- Exposed printed metal sheet inside of the rear boot and fastening of the side;
- Joint support;
- Vertical link (Welding of 3 pipes and of the third light)
- Podium particulars (inner or outer lateral crossbeam)
- Clamps for the drawer under the seat

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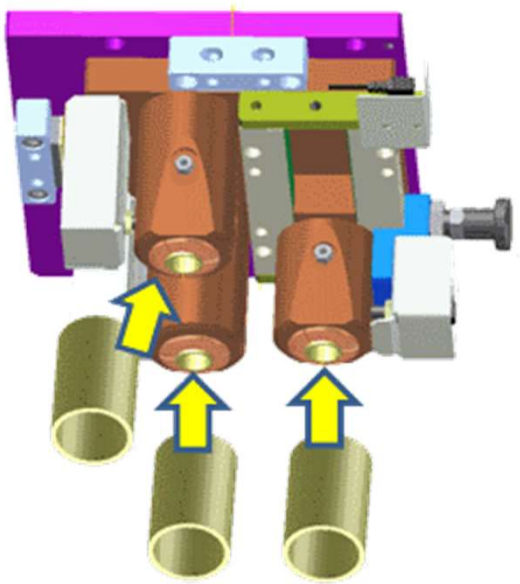
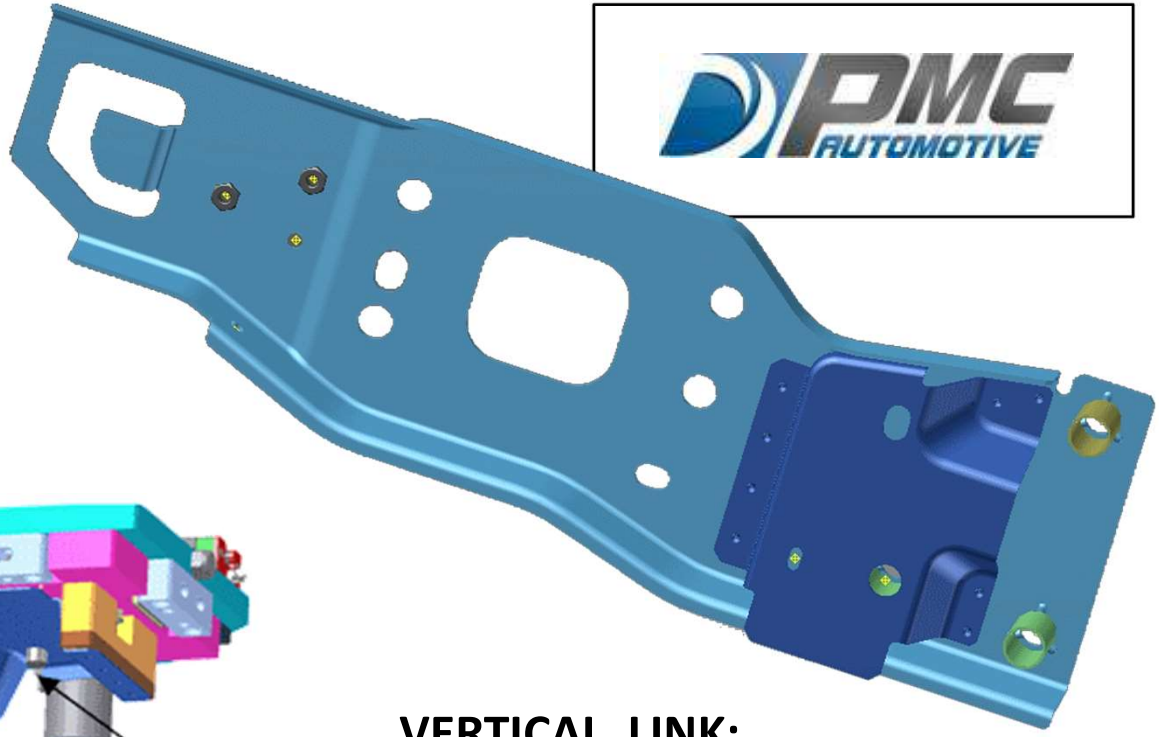
CAPACITOR DISCHARGE WELDING SYSTEM

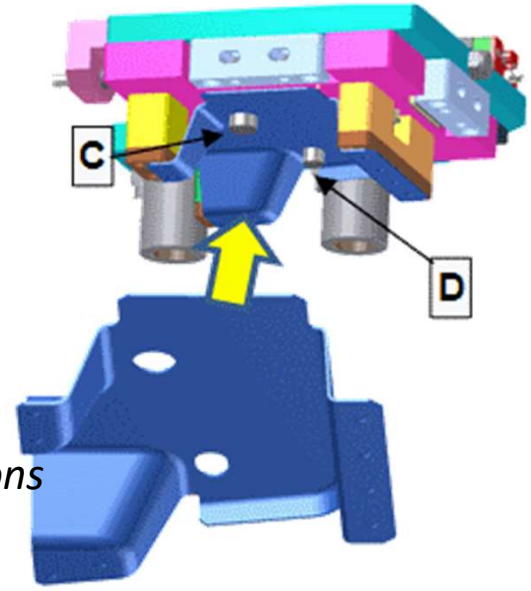


Welding of 3 pipes at the same time



VERTICAL LINK:

Ended particular Model for 500L



Welding of 8 projections at the same time

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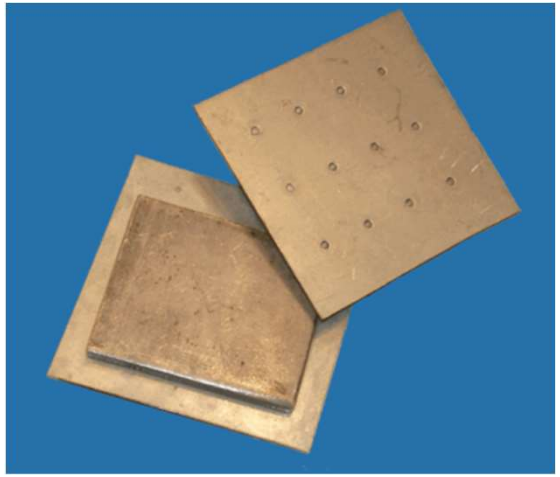
CAPACITOR DISCHARGE WELDING SYSTEM

Tubular radiator elements: 3 tubes welding in a single shot

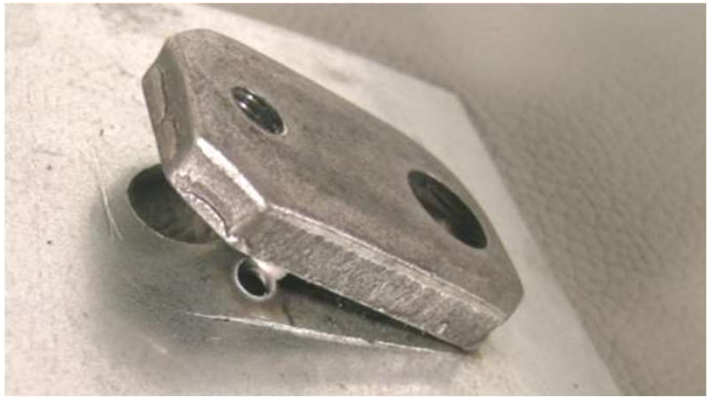


join parts of different thickness

MASERATI Part

INOX PUMP Part

Several welding points in a single shot (IVECO parts)



Fiat Punto parts

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INOX PUMP Part

INOX PUMP Part

Exhaust systems parts

Heaters parts

Exhaust systems parts

Exhaust systems parts

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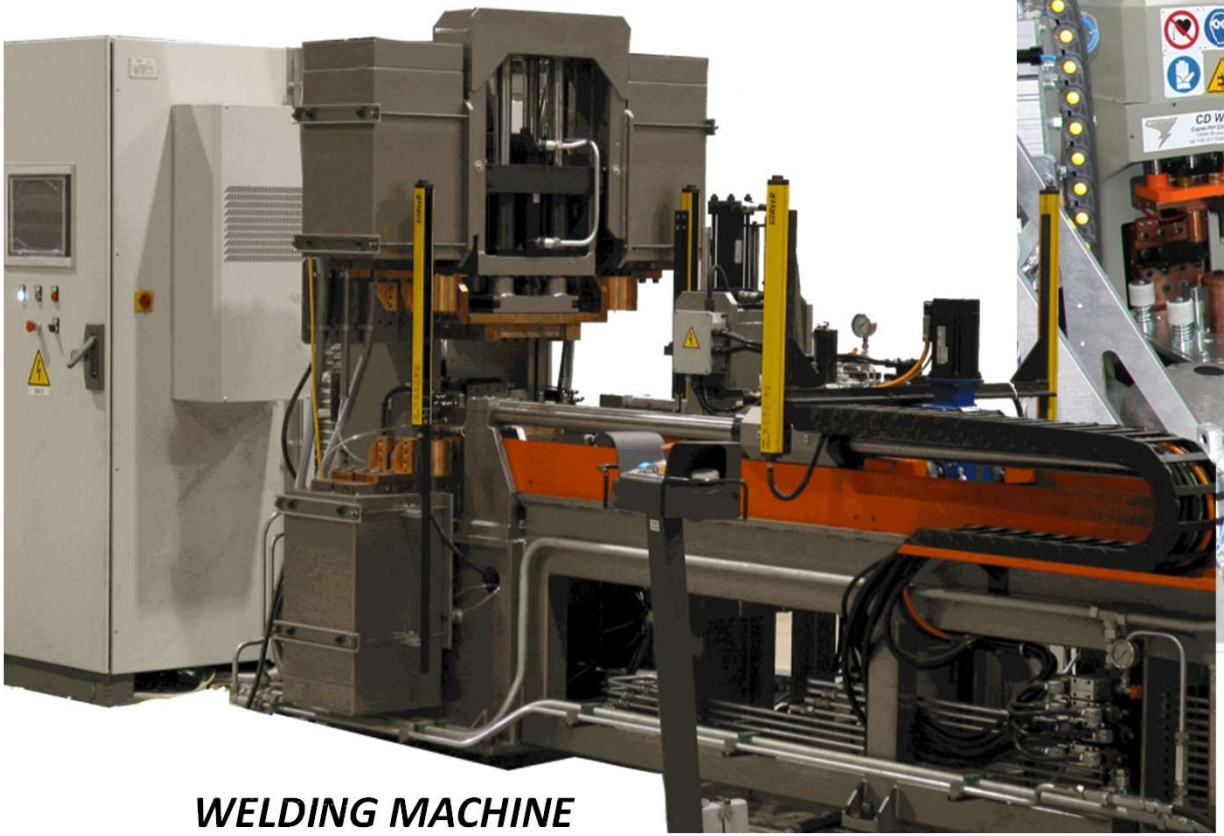
CAPACITOR DISCHARGE WELDING SYSTEM

Special Machines



WELDING MACHINE
Steel tubular radiator

Welding cell counter flange and sleeves

(Cycle time 8 sec)

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CAPACITOR DISCHARGE WELDING SYSTEM

Standard Machine

Standard Machine mod. “C”

Discharge Energy 40 kJ

Standard Machine mod. “A”

Discharge Energy 80 kJ

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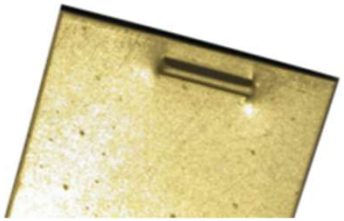
CAPACITOR DISCHARGE WELDING SYSTEM

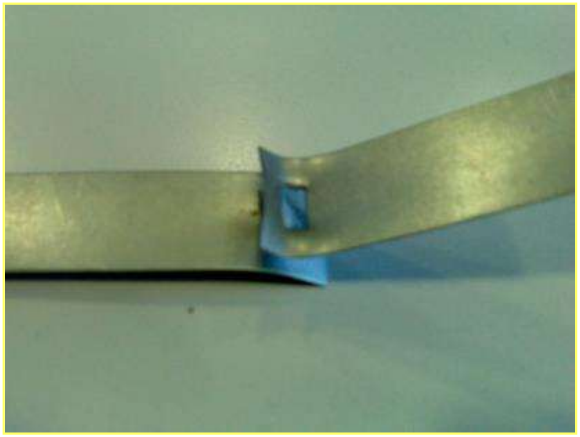
(Aesthetic welding spots)

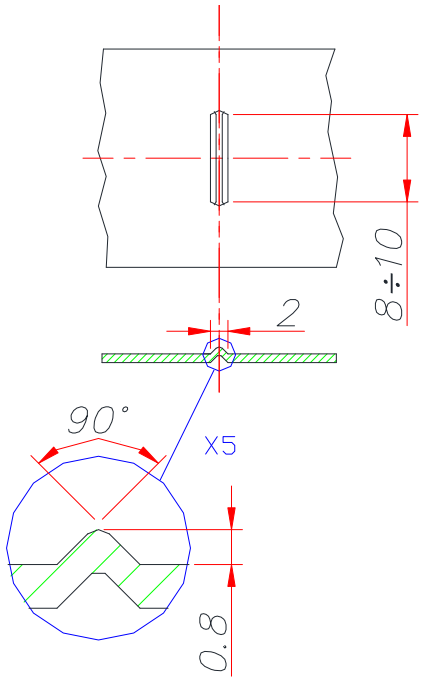
Aesthetic welding spots: Discharge welding on Robot



This an example of a particular welded with CDW and rectilinear projections

For a better results, it's important check the welding spots relief. In particular, it's really important the squareness between the electrode and the welding projections, to avoid deformations on material due to force before welding.





Rectilinear projection

L = 8÷10 mm H = 0,8 mm

Thickness= 1 mm

Resistant to *cut-traction*

Up to *3500 N*

Value required by the FIAT regulation 00920/02 about 2110N.

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CAPACITOR DISCHARGE WELDING SYSTEM

Power Generator Enclosure mod. SG5 R

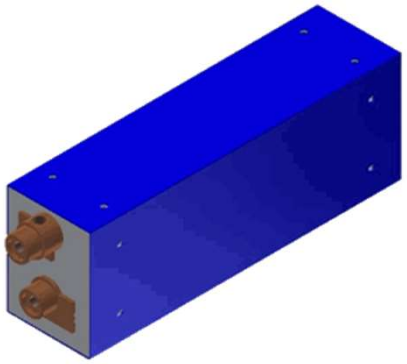
Technical data :

ENERGY : 5 kJ (setting throughout the control system)
Maximum charging voltage on the capacitors bank: max. 3.0 kV
Charging time ~ 1.5 seconds
Cabinet sizes 600x800xh1800mm.
Connection: 3 x 400 V + grounding / 15 kW

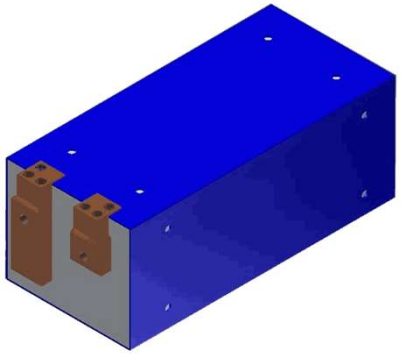
Supervision and control system made by PLC with the touch screen HMI.
Safety equipment included.

Special CDW transformer for robot welding gun:

mod. TX5 Versa



mod. TX5 ISO



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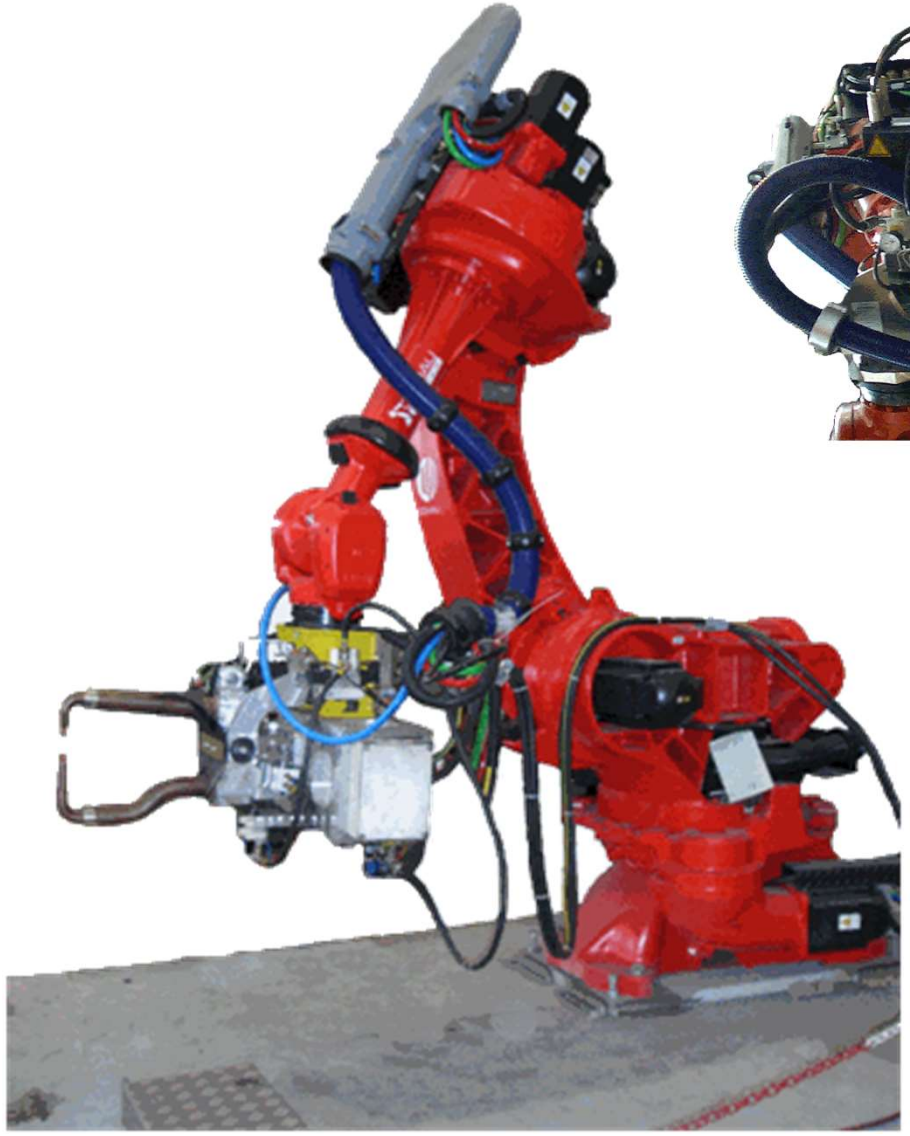
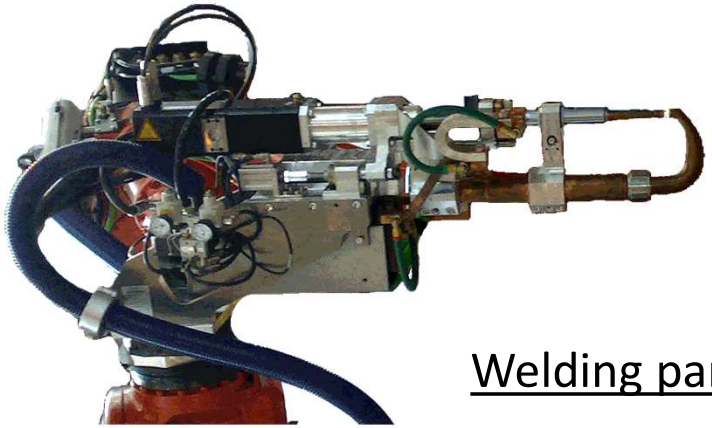
CAPACITOR DISCHARGE WELDING SYSTEM





Welding parameters :

ENERGY : 2,5 ÷ 3,5 kJ

FORCE : 200 ÷ 300 kg

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