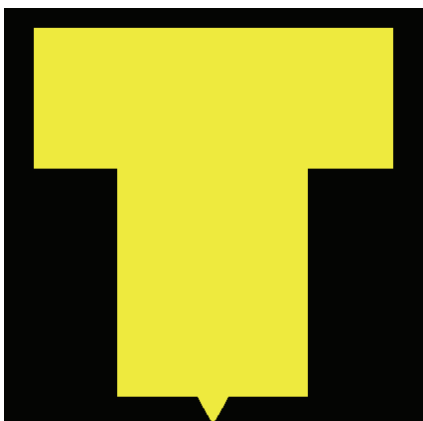


# TAYLOR STUDWELDING SYSTEMS LIMITED.

OPERATING MANUAL  
FOR  
SYSTEM CD200 SERIES  
COMPACT CAPACITOR DISCHARGE  
STUDWELDING EQUIPMENT



**TAYLOR**

**STUDWELDING**

**SYSTEMS LIMITED**



VERSION : 2F



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# GENERAL INFORMATION

## MANUFACTURERS DETAILS



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## PURPOSE AND CONTENT OF THIS MANUAL

This manual has been written for :

-  The operator of the welding machine.
-  The personnel of the final customer responsible for the installation and operation of the machine.

This manual contains information on :

-  Installation and connection
-  Operation.
-  Technical data.
-  Spare parts.
-  Accessories.

# **GENERAL INFORMATION**

## **FURTHER INFORMATION**

Should you require additional technical information, please contact us directly (details on page 1) or our local agent / distributor (details of agents etc. can be obtained from us).

This manual contains important information which is a pre-requisite for safe operation of the equipment. The operating personnel must be able to consult this manual. In the interests of safety, make this manual available to your personnel in good time.

If the equipment is sold / passed on, please hand over this manual to the new owner. Please immediately inform us of the name and address of the new owner, in case we need to contact him regarding the safety of the device.



***Please read this manual carefully before installation of the machine.***



***Please especially observe the safety instructions.***

# **INTRODUCTION**

## **INTRODUCTION**

The complete range of Taylor Studwelding Systems Capacitor Discharge units are compact, portable Stud Welding equipment's. The units are specifically designed to enable a small diameter range of ferrous and non-ferrous weld studs to be welded to light gauge, self-finish or pre-coated materials, in most cases with little or no reverse marking.

The equipment consists of a control unit, a welding pistol and the necessary interconnecting cables and accessories (see page 4 for the equipment schedule).

## **THE PROCESS**

Capacitor Discharge stud welding is a form of welding in which the energy required for the welding process is derived from a bank of charged capacitors. This stored energy is discharged across the gap between the two surfaces to be welded as they are propelled towards each other. The arc produced heats the two surfaces, melting a thin film of metal on each surface and the propelling force closes the gap between the two faces, thus forming a weld.

In contact welding the stud to be welded is forced by spring pressure on to the plate. At this point the arc gap between the two components is maintained by a small pip on the welding face of the stud. On initiation of the high current pulse from the capacitors, this pip vaporises and an arc is drawn between the work piece and the stud. The heat from this arc melts the base of the stud and the area of the work piece directly beneath the stud, whilst the spring pressure from the pistol accelerates the towards the work piece. Within 3 to 4 milliseconds the stud hits the work piece and the arc is extinguished. The kinetic energy contained in the moving stud and the remaining spring pressure, forge the molten parts together to form a weld.

# **EQUIPMENT SCHEDULE**

## **EQUIPMENT**

<b>No.</b>	<b>OFF DESCRIPTION</b>	<b>PART No.</b>
1	SYSTEM CD200 - 66 CONTACT COMPLETE	99-100-110
or	SYSTEM CD200 - 66 LIFT GAP COMPLETE	99-100-114
or	SYSTEM CD200 - 99 CONTACT COMPLETE	99-100-111
or	SYSTEM 200CD - 99 LIFT GAP COMPLETE	99-100-115
or	SYSTEM CD200 - 132 CONTACT COMPLETE	99-100-119
1	CD CONTACT PISTOL	99-100-020
or	CD LIFT GAP PISTOL	99-100-023
2	EARTH CABLE ASSEMBLY	99-100-031

## **ACCESSORIES (SUPPLIED WITH EQUIPMENT)**

<b>No.</b>	<b>OFF DESCRIPTION</b>	<b>PART No.</b>
1	CHUCK KEY	79-101-111

## **ACCESSORIES (NOT SUPPLIED WITH EQUIPMENT)**

See pages 38 to 44 of this manual for a selection of accessories available from either your local stockist or the manufacturer.

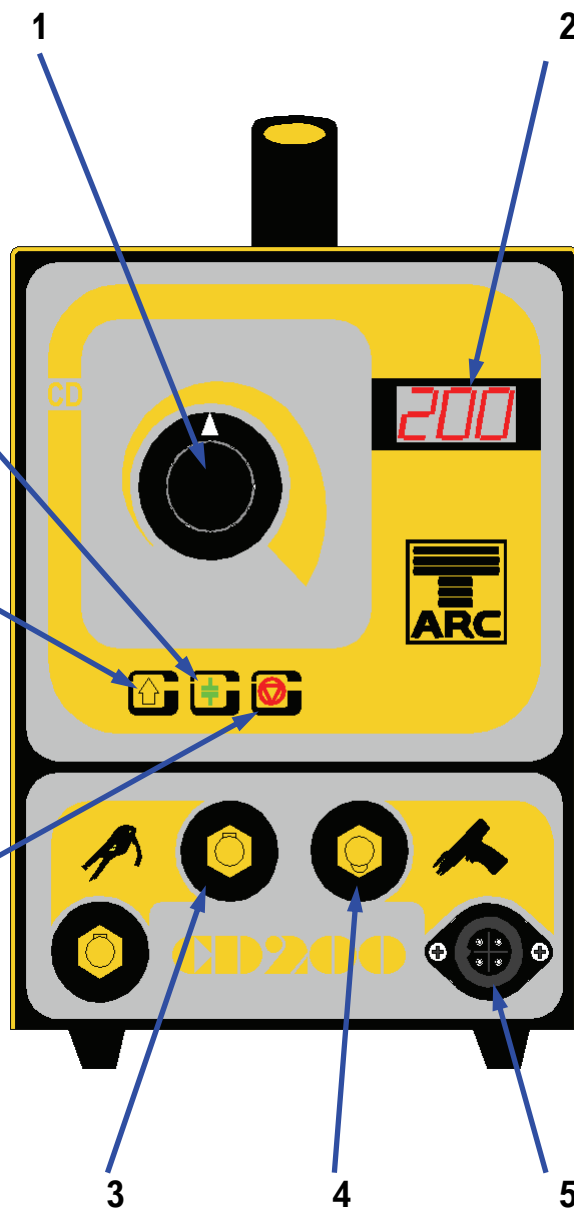
# EXTERNAL FEATURES

## FRONT PANEL

- 1 WELDING VOLTAGE SELECTOR KNOB
- 2 WELDING VOLTAGE DIGITAL DISPLAY
- 3 WELDING EARTH PANEL CONNECTIONS
- 4 WELDING PISTOL PANEL CONNECTION
- 5 WELDING PISTOL CONTROL SOCKET

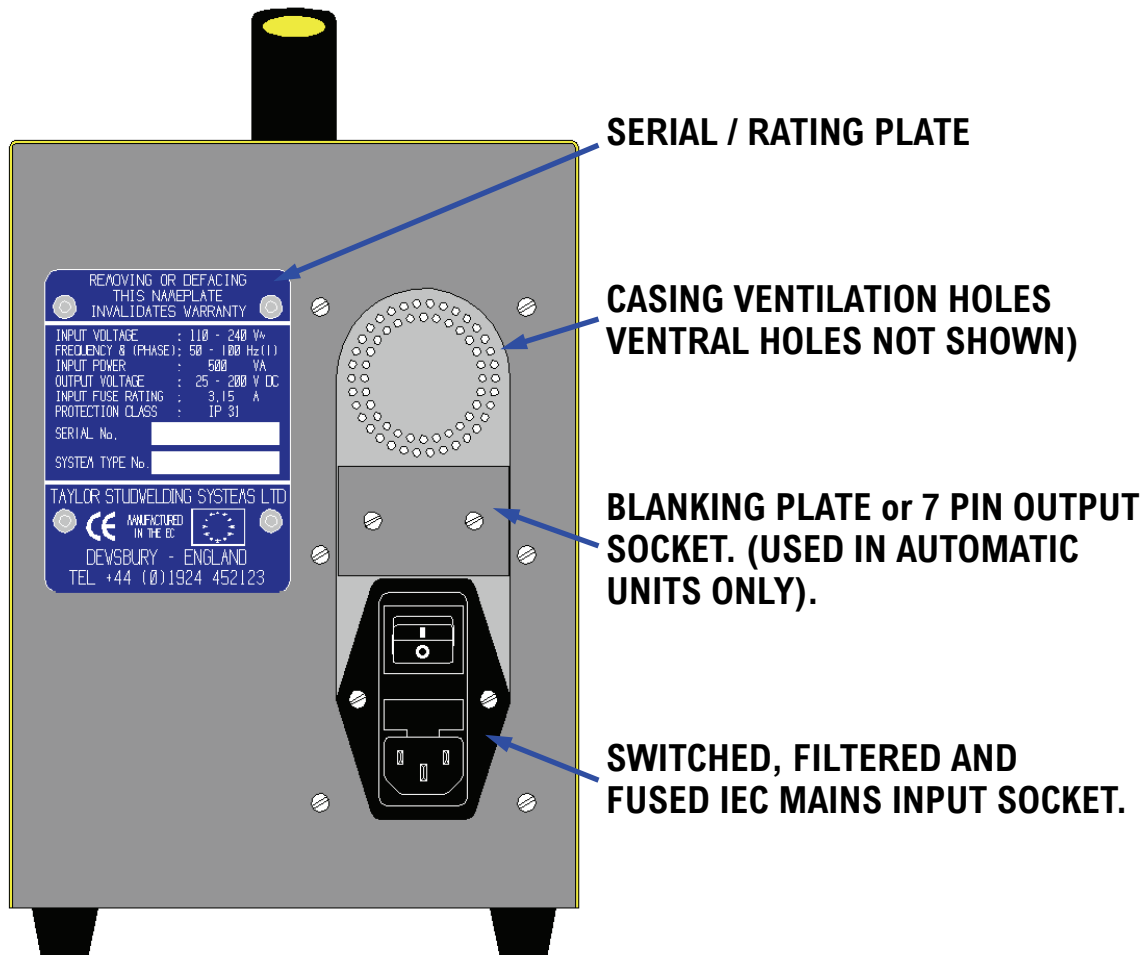
## INDICATOR LED'S

- 1 **READY (GREEN)** Indicates that the capacitor bank is charged to the pre-selected value and is ready to weld.
- 2 **CHARGING (YELLOW)** Indicates that the unit is in the process of charging the capacitors to the pre-selected voltage.
- 3 **RESET (RED)** Indicates that the unit safety circuit has tripped. To reset the unit, switch off the mains switch, wait between 5 and 30 seconds then switch back on.



# EXTERNAL FEATURES

## REAR PANEL



## IMPORTANT NOTES !



***Due to the power requirements and Electromagnetic emissions produced during normal use, this machine must only be operated in an industrial environment.***



***This machine will operate from any AC mains supply between 100 and 250 Volts at Frequencies from 50 to 100 Hertz.***



***Never obstruct the ventral or rear panel ventilation holes as this may cause the unit to overheat during operation.***



***Never remove any portion of the unit housing without first isolating the unit from the mains electrical supply.***



# SAFETY

## PROTECT YOURSELF AND OTHERS !

Read and understand these safety notices.

### 1. ELECTRICAL

No portion of the outer cover of the welding controller should be removed by anyone other than suitably qualified personnel and never whilst mains power is connected. **ALWAYS** disconnect the mains plug from the socket.



## **RISK TO LIFE !!!**

**BE AWARE !** This equipment contains a sealed power supply module which operates on high frequency inverter principles. Due to the potentially fatal voltages in this module we do not recommend tampering with the module. It can be safely removed and replaced via our factory exchange system.

**BE AWARE !** Capacitors store electrical energy. Check for residual charge before carrying out any internal maintenance.

**DO NOT !** use any fluids to clean electrical components as these may penetrate into the electrical system

Installation must be according to the setting up procedure detailed on page 10 of this manual and must be in line with national, regional and local safety codes.

### 2. FIRE

During welding small particles of very hot metal are expelled. Ensure that no combustible materials can be ignited by these.

# **SAFETY**

## **3. PERSONNEL SAFETY**

Arc rays can burn your eyes and skin and noise can damage your hearing.

Operators and personnel working in close proximity must wear suitable eye, ear and body protection.

Fumes and gases can seriously harm your health. Use the equipment only in a suitably ventilated area. If ventilation is inadequate, then appropriate fume extraction equipment must be used.

Hot metal spatter can cause fire and burns. Appropriate clothing must be worn.

Clothing made from, or soiled with, combustible materials must NOT be worn. Have a fire extinguisher nearby and know how to use it.

Magnetic fields from high currents can affect heart pacemakers or other electronically controlled medical devices. It is imperative that all personnel likely to come into the vicinity of any welding plant are warned of the possible RISK TO LIFE before entering the area.

## **4. MAINTENANCE**

All cables must be inspected regularly to ensure that no danger exists from worn or damaged insulation or from unsound electrical connections. Special note should be made of the cables close to the pistol, where maximum wear occurs.

As well as producing inconsistent welds, worn cables can overheat or spark, giving rise to the risk of fire.

## **5. TRAINING**

Use of the equipment must be limited to authorised personnel only who must be suitably trained and must have read and understood this manual. This manual must be made available to all operators at all times. Further copies of this manual may be purchased from the manufacturer. Measures must be taken to prevent the use of this equipment by unauthorised personnel.

# **SAFETY**

## **6. INSTALLATION**

Ensure that the site chosen for the equipment is able to support the weight of the equipment and that it will not fall or cause a danger in the course of its normal operation. Do not hang connecting cables over sharp edges and do not install connecting cables near heat sources or via traffic routes where people may trip over them or they may be damaged by the passage of vehicles (forklifts etc.).

## **7. INTERFERENCE**

During welding operations, intense magnetic and electrical fields are unavoidably produced and these may interfere with other sensitive electronic equipment.

All Taylor Studwelding equipment is designed, manufactured and tested to conform to the current appropriate European standards and directives regarding electromagnetic emissions and immunity and as such is safe to use in any normal environment.

## **8. DISPOSAL**

The equipment either wholly or any of its component parts may be disposed of as part of general industrial waste or passed to a scrap merchant. Non of the components used in the manufacture are toxic, carcinogenic or harmful to health.

# SETTING UP & WELDING

## SETTING UP & WELDING

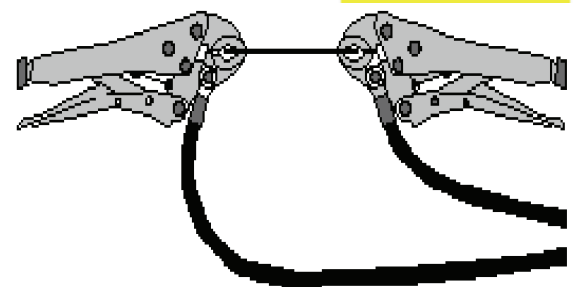
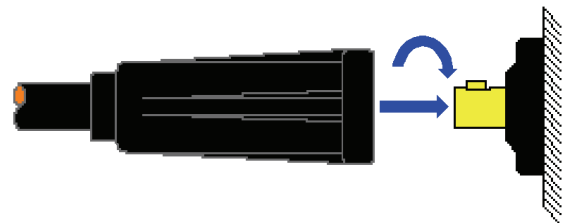
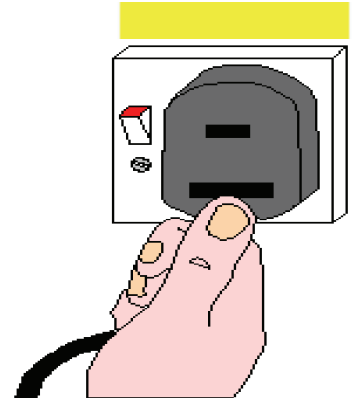
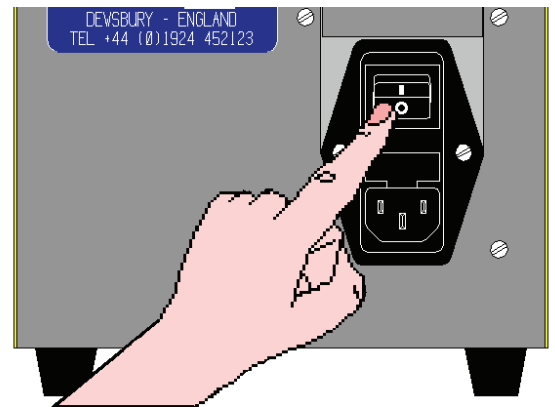
Set up the control unit at the place of work, ensuring that the mains switch is in the OFF position. Ensure that this is done in line with the notes and safety recommendations on pages 7 through 9 of this manual.

Plug the controller into the mains AC supply using the appropriate IEC lead. The controller can be plugged into any single phase AC supply ranging from 100 to 250 V AC between 50 and 100 Hertz frequency. This requires no internal changes to the controller. The IEC supply lead however, must be fitted with the appropriate connector.

Connect the welding earth cables to the controller. Note that the cable end sockets have a key slot to match with the peg on the panel mounted weld plugs.

**IMPORTANT !** Secure the connectors with a clockwise turn until they lock. Failure to do this will result in damage to the connectors during welding.

Attach the welding earth clamps to the work piece at approximately 180° to each other. This will help to prevent "Arc blow" when welding takes place. Prior to fitting the clamps, ensure that the contact area of the work piece is free from rust, paint, grease etc. As this will result in a poor welding connection and poor results.



# SETTING UP & WELDING

## SETTING UP & WELDING

Connect the welding pistol cable to the controller. Note that the cable end plug has a peg which mates with a key slot in the panel mounted socket.

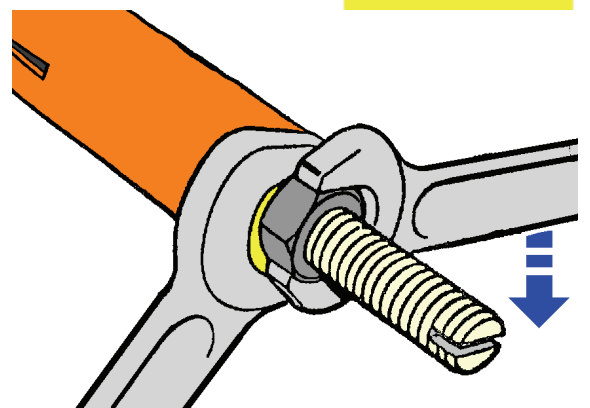
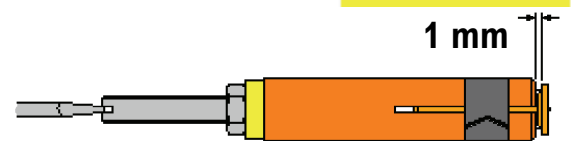
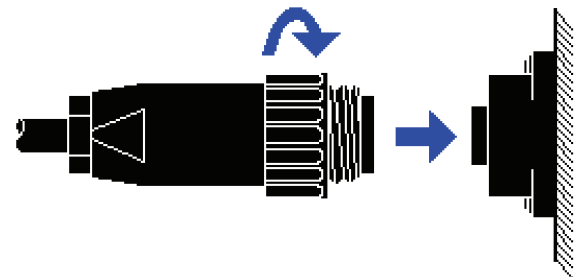
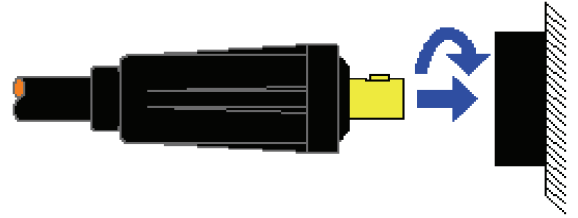
**IMPORTANT !** Secure the connector with a clockwise turn until it locks. Failure to do this will result in damage to the connector during welding.

Connect the welding pistol control cable to the controller. Note that the cable end plug and panel mounting socket are keyed to prevent incorrect fitting. Push the plug firmly home and twist the locking ring clockwise to secure the plug in position.

Select the required weld stud on the basis of diameter, length and material. See our separate catalogue entitled "Capacitor Discharge Stock list" which is available on request from your local sales representative.

Select the required CD chuck for the chosen weld stud and set the stud protrusion to the dimension shown in the accompanying diagram by adjusting the backstop screw as shown.

Securely tighten the chuck backstop locking nut to maintain the required protrusion.

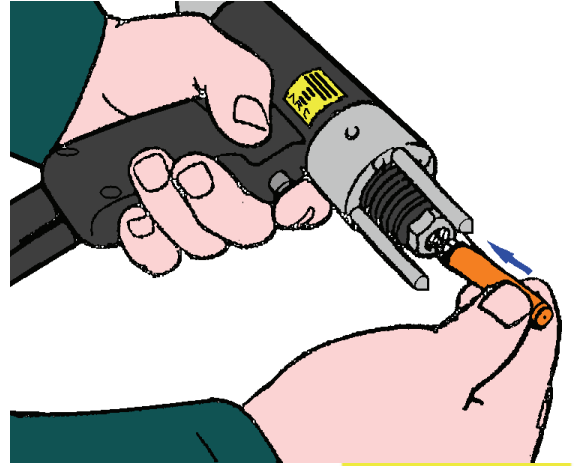


# SETTING UP & WELDING

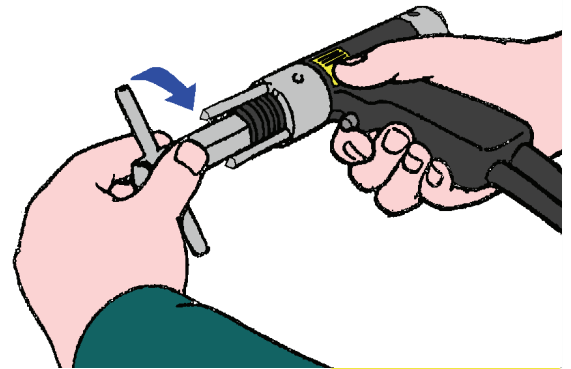
## SETTING UP & WELDING

After setting the chuck, insert it into the pistol chuck holder and push firmly home until it comes to a rest.

**NOTE!** When welding M10 studs or studs between 35 and 50 mm in length, the pistol will require longer tripod legs fitting (see page 34).



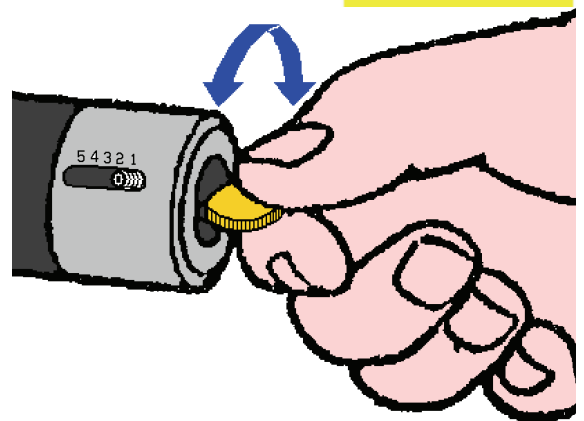
Tighten the chuck locking nut with the box spanner provided. A gentle pressure is all that is required. Over tightening may result in damage to your pistol.



## SETTING THE PISTOL

### STANDARD CONTACT PISTOL

Set the pistol spring preload to the appropriate setting for the welding task to be performed. (See the tables on pages 16 - 26).

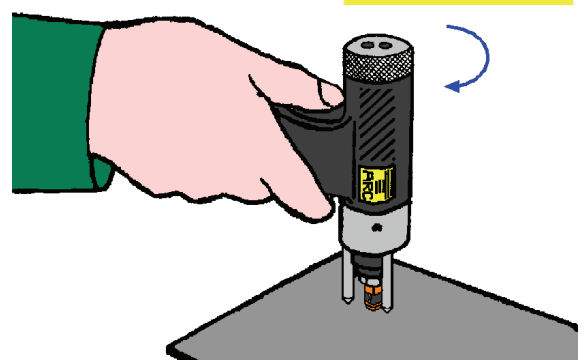


### MKV LIFT GAP PISTOL

Set the pistol lift to the appropriate setting for the welding to be performed (See the tables on pages 16 - 26.)

This is achieved by placing the pistol in the welding position thereby pushing the tip of the weld stud back level with the end of the tripod legs / nosecone.

Whilst the pistol is being held firmly in this position twist the rear end cap of the pistol clockwise until the motion becomes stiff.



# SETTING UP & WELDING

## SETTING UP & WELDING

### SETTING THE PISTOL

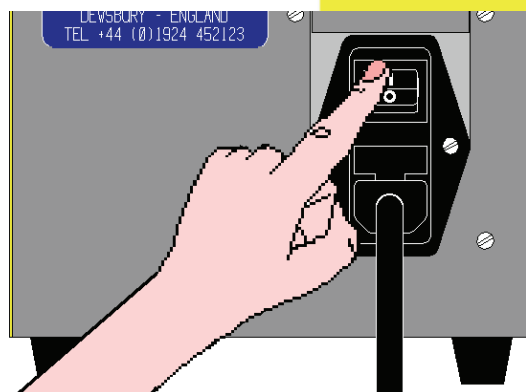
#### MKV LIFT GAP PISTOL (CONTINUED)

It is at this point that further twisting of the end cap begins to lift the tripod legs/nosecone away from the plate.

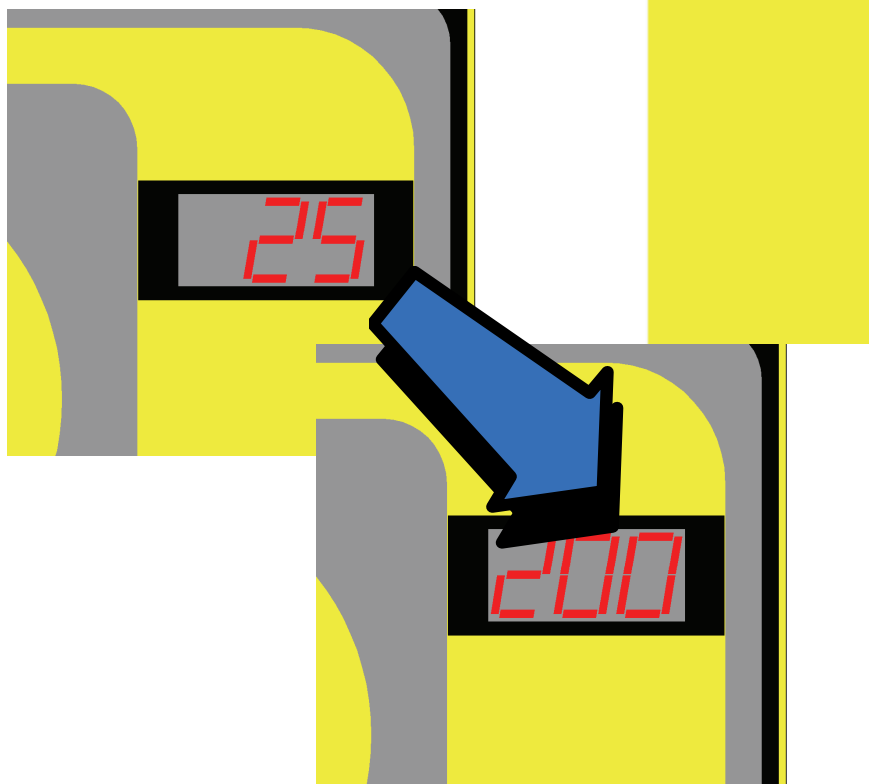
The pistol is now in the zero lift position and twisting the rear end cap anti-clockwise by one "click" at a time will increase the lift by 0.25 mm increments (see the tables on pages 16 - 22 for suggested settings).



Switch the controller ON.



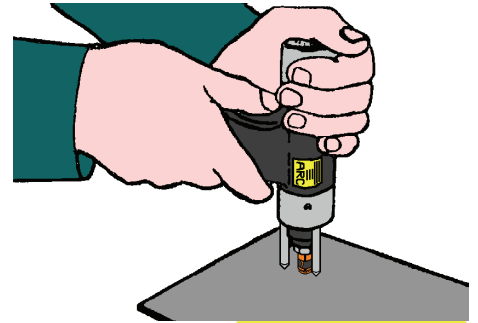
Select the required welding voltage by turning the selector knob. The voltage is adjustable between 25 and 200 volts in 1 volt steps.



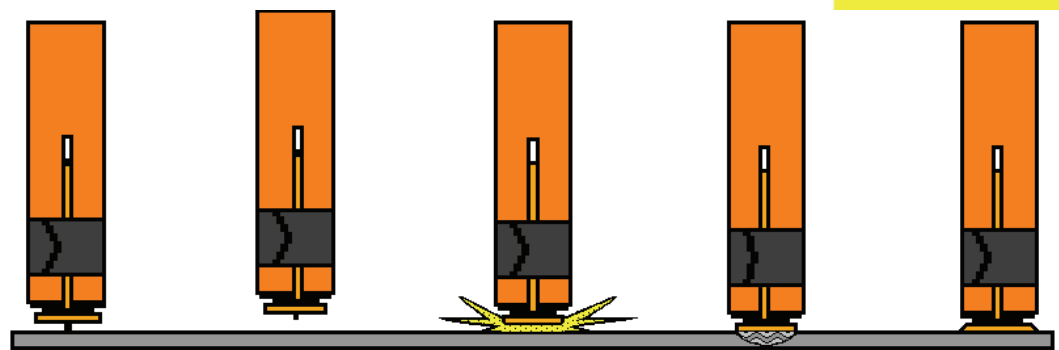
# SETTING UP & WELDING

## SETTING UP & WELDING

Place the pistol perpendicular to the work piece with the stud touching down at the desired location to be welded. Press down on the pistol until the legs come firmly into contact with the work piece. Press the trigger.

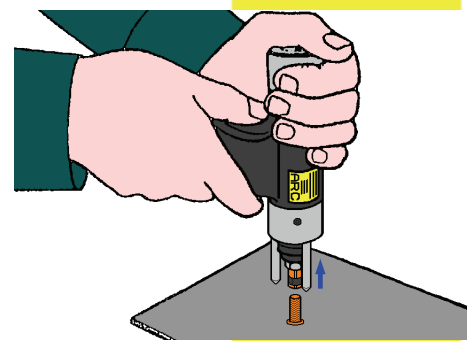


The welding process is as follows :-

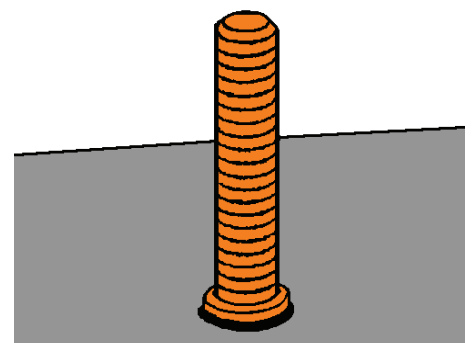


	INITIAL PRES-SURE	LIFT & RELEASE	STRIKE ARC	FUSION & IMMERSION	COMPLETED WELD
LIFT GAP PROCESS, TIME TAKEN (s)	0.000	0.0005	0.001	0.0015	0.002
CONTACT PROCESS, TIME TAKEN (s)	0.000	⇒	0.001	0.002	0.003

Always lift the welding pistol vertically from the welded stud. Failure to do this may cause the tines of the chuck to splay outwards, which will result in the chuck and stud arcing together during subsequent welds.



Visually inspect the weld. A good weld will result in an all round weld with a small visible witness of spatter surrounding the flange of the stud.





# SETTING UP & WELDING

## SETTING UP & WELDING

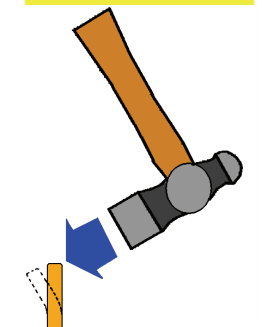
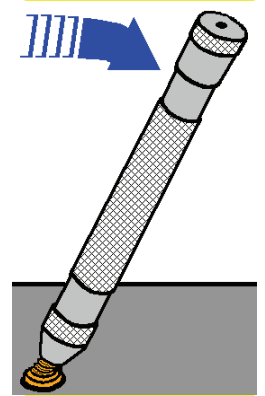
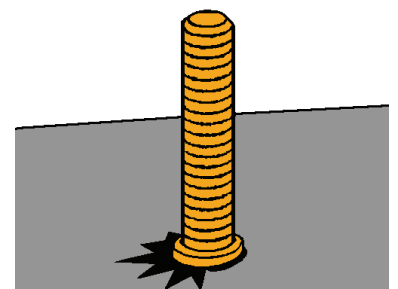
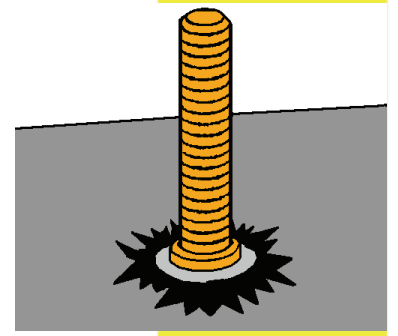
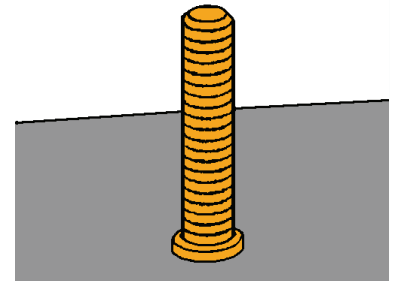
A cold stud weld is noticeable by undercutting of the flange and lack of / minimal formation of spatter. A cold weld is usually caused by too little energy and / or too high spring pressure.

A hot stud weld is noticeable by excessive spatter formation and partial melting of the flange. A hot weld is usually by too much energy and / or too little spring pressure.

A one sided stud weld (arc blow) is usually caused by incorrect earthing of the work piece. This may be corrected by placing the welding earths opposite each other across the area where the weld is to occur.

Finished studs may be subjected to a bending test to ascertain the strength of the weld. This may be achieved by placing a bending bar assembly, fitted with the correct nozzle, over the stud and bending the stud through 30° and then back to the vertical. This test follows the specification of DVS 0905 part 2.

A simpler test may be achieved by bending the stud over 30° using a hide mallet.



# **WELD SETTINGS**

The following pages (17 to 22) detail the suggested settings for the following CD200 models :

**66, 99 & 132 both Contact & Lift Gap**

The setting charts were established with the performance of repetitive weld tests using the standard equipment's specified above, studs manufactured to the BS EN ISO 13918 standard, in the following materials :

**Mild Steel, Grade St37-3  
Stainless Steel, Grade 1.4303  
Aluminium Alloy, Grade AlMg3**

and sheet materials of the following types :

**1.6 mm Thick, Mild Steel, Grade CR4  
1.6 mm Thick, Stainless Steel, Type S304  
1 mm Thick, ZINTEC Coated Mild Steel, Grade CR4  
1.6 mm Thick, Aluminium Alloy, Grade HE3, Half Hard**

The settings are given **only as a general guide** and it is recommended that sample welds be carried out on your own material, as quality of materials and site conditions may vary from user to user.

# WELD SETTINGS CD200-66

## CD200-66 CONTACT

## CD200-66 GAP

STUD DIAMETER	STUD MATERIAL	SHEET MATERIAL	VOLTAGE SETTING	SPRING SETTING	VOLTAGE SETTING	LIFT SETTING
<b>M2.5</b>	St37-3	CR4	60	2½	65	2½
		S304	60	2½	65	2½
		ZINTEC	80	2½	90	2
<b>M3</b>	St37-3	CR4	75	2½	80	2½
		S304	75	2½	80	2½
		ZINTEC	100	2½	110	2
	1.4303	CR4	75	2½	80	2½
		S304	75	2½	80	2½
		ZINTEC	100	2½	110	2
		AlMg3	HE3	80	3½	90
<b>M4</b>	St37-3	CR4	85	2½	90	2½
		S304	85	2½	90	2½
		ZINTEC	120	2½	130	2
	1.4303	CR4	90	2½	95	2½
		S304	90	2½	95	2½
		ZINTEC	120	2½	130	2
		AlMg3	HE3	90	3½	100
<b>M5</b>	St37-3	CR4	105	2½	110	2½
		S304	105	2½	110	2½
		ZINTEC	135	2½	145	2
	1.4303	CR4	110	2½	115	2½
		S304	110	2½	115	2½
		ZINTEC	135	2½	145	2
AlMg3	HE3	105	3½	110	3	

# WELD SETTINGS CD200-66

## CD200-66 CONTACT

## CD200-66 GAP

STUD DIAMETER	STUD MATERIAL	SHEET MATERIAL	VOLTAGE SETTING	SPRING SETTING	VOLTAGE SETTING	LIFT SETTING	
<b>M6</b>	St37-3	CR4	125	2½	135	2½	
		S304	125	2½	135	2½	
		ZINTEC	160	2½	175	2	
	1.4303	CR4	135	2½	145	2½	
		S304	135	2½	145	2½	
		ZINTEC	175	2½	180	2	
	AlMg3	HE3	180	4	135	4	
	<b>M8</b>	St37-3	CR4	180	2½		
			S304	180	2½		
ZINTEC			200	2½			
1.4303		CR4	190	2½			
		S304	190	2½			
		ZINTEC	200	2½			
AlMg3		HE3			195	4	
<b>M10</b>		St37-3	CR4				
			S304				
	ZINTEC						
<b>EARTH TAG</b>	St37-3	CR4	90	2½	85	2½	
		S304	95	2½	95	2½	
		ZINTEC					
	AlMg3	HE3	80	3½	80	3	
<b>LARGE BRACKET</b>	St37-3	CR4	110	2½	130	2½	
		S304	130	2½	135	2½	
		ZINTEC					

# WELD SETTINGS CD200-99

## CD200-99 CONTACT

## CD200-99 GAP

STUD DIAMETER	STUD MATERIAL	SHEET MATERIAL	VOLTAGE SETTING	SPRING SETTING	VOLTAGE SETTING	LIFT SETTING
<b>M2.5</b>	St37-3	CR4	40	2½	45	2½
		S304	40	2½	45	2½
		ZINTEC	60	2½	70	2
<b>M3</b>	St37-3	CR4	45	2½	50	2½
		S304	45	2½	50	2½
		ZINTEC	75	2½	85	2
	1.4303	CR4	45	2½	50	2½
		S304	45	2½	50	2½
		ZINTEC	90	2½	100	2
	AlMg3	HE3	50	3½	55	3
<b>M4</b>	St37-3	CR4	60	2½	65	2½
		S304	60	2½	65	2½
		ZINTEC	100	2½	110	2
	1.4303	CR4	60	2½	65	2½
		S304	60	2½	65	2½
		ZINTEC	100	2½	110	2
	AlMg3	HE3	65	3½	70	3
<b>M5</b>	St37-3	CR4	75	2½	90	2½
		S304	75	2½	90	2½
		ZINTEC	110	2½	125	2
	1.4303	CR4	85	2½	95	2½
		S304	85	2½	95	2½
		ZINTEC	110	2½	125	2
	AlMg3	HE3	80	3½	90	3

# WELD SETTINGS CD200-99

## CD200-99 CONTACT

## CD200-99 GAP

STUD DIAMETER	STUD MATERIAL	SHEET MATERIAL	VOLTAGE SETTING	SPRING SETTING	VOLTAGE SETTING	LIFT SETTING	
<b>M6</b>	St37-3	CR4	90	2½	120	2½	
		S304	90	2½	120	2½	
		ZINTEC	140	2½	160	2	
	1.4303	CR4	110	2½	120	2½	
		S304	110	2½	120	2½	
		ZINTEC	140	2½	160	2	
	AlMg3	HE3	120	4	140	4	
	<b>M8</b>	St37-3	CR4	130	2½	175	2½
			S304	130	2½	175	2½
ZINTEC			180	2½			
1.4303		CR4	160	2½			
		S304	160	2½			
		ZINTEC	180	2½			
AlMg3		HE3	150	4	190	4	
<b>M10</b>		St37-3	CR4	185	2½		
			S304	200	2½		
	ZINTEC		200	2½			
<b>EARTH TAG</b>	St37-3	CR4	80	2½	70	2½	
		S304	80	2½	70	2½	
		ZINTEC	95	2½	85	2½	
	AlMg3	HE3	85	3½	75	3	
<b>LARGE BRACKET</b>	St37-3	CR4	95	2½	85	2½	
		S304	95	2½	85	2½	
		ZINTEC	110	2½	95	2½	

# WELD SETTINGS CD200-132

## CD200-132 CONTACT

## CD200-132 GAP

STUD DIAMETER	STUD MATERIAL	SHEET MATERIAL	VOLTAGE SETTING	SPRING SETTING	VOLTAGE SETTING	LIFT SETTING
<b>M2.5</b>	St37-3	CR4	25	2½	25	2½
		S304	25	2½	25	2½
		ZINTEC	40	2½	50	2
<b>M3</b>	St37-3	CR4	25	2½	30	2½
		S304	25	2½	30	2½
		ZINTEC	55	2½	65	2
	1.4303	CR4	25	2½	30	2½
		S304	25	2½	30	2½
		ZINTEC	70	2½	80	2
	AlMg3	HE3	30	3½	35	3
<b>M4</b>	St37-3	CR4	40	2½	45	2½
		S304	40	2½	45	2½
		ZINTEC	80	2½	90	2
	1.4303	CR4	40	2½	65	2½
		S304	40	2½	65	2½
		ZINTEC	80	2½	90	2
	AlMg3	HE3	45	3½	50	3
<b>M5</b>	St37-3	CR4	65	2½	75	2½
		S304	65	2½	75	2½
		ZINTEC	90	2½	105	2
	1.4303	CR4	65	2½	75	2½
		S304	65	2½	75	2½
		ZINTEC	90	2½	105	2
AlMg3	HE3	70	3½	80	3	

# WELD SETTINGS CD200-132

## CD200-132 CONTACT

## CD200-132 GAP

STUD DIAMETER	STUD MATERIAL	SHEET MATERIAL	VOLTAGE SETTING	SPRING SETTING	VOLTAGE SETTING	LIFT SETTING	
<b>M6</b>	St37-3	CR4	80	2½	90	2½	
		S304	80	2½	90	2½	
		ZINTEC	110	2½	130	2	
	1.4303	CR4	80	2½	90	2½	
		S304	80	2½	90	2½	
		ZINTEC	110	2½	130	2	
	AlMg3	HE3	120	4	120	4	
<b>M8</b>	St37-3	CR4	130	2½	145	2½	
		S304	130	2½	145	2½	
		ZINTEC	150	2½	185	3	
	1.4303	CR4	130	2½	175	3	
		S304	130	2½	175	3	
		ZINTEC	150	2½	185	3	
	AlMg3	HE3	160	4	195	4	
<b>M10</b>	St37-3	CR4	155	2½	175	3	
		S304	170	2½	175	3	
		ZINTEC	170	2½	195	3	
<b>EARTH TAG</b>	St37-3	CR4	65	2½	55	2½	
		S304	65	2½	55	2½	
		ZINTEC	80	2½	70	2½	
	AlMg3	HE3	70	3½	60	3	
<b>LARGE BRACKET</b>	St37-3	CR4	80	2½	70	2½	
		S304	80	2½	70	2½	
		ZINTEC	95	2½	80	2½	



# METHODS OF STUD LOCATION

Economic stud location may be obtained using any one of the following methods, depending on the type of work involved :-

- ❶ Tripod leg assembly.
- ❷ Nose cone assembly.
- ❸ Extended leg assembly.

## **❶ TRIPOD LEG ASSEMBLY.**

This is generally used for low volume production and one off components. The spacing of the tripod legs allow for ease of stud placement onto a scribed or pencilled mark. Centre punch indentations must not be used.

## **❷ NOSE CONE ASSEMBLY.**

This is generally used for high volume and repetitive work, or where a greater level of accuracy is required. Simple jigs made from Tufnol (a thermo-setting plastic) or sheet metal can easily be made, allowing for speedy and accurate production. Advice on jig manufacture can be obtained from your sales representative.

## **❸ EXTENDED LEG ASSEMBLY.**

This is used where a requirement for welding very long studs is necessary. The extended leg assembly allows studs up to 200 mm long to be welded.



### **IMPORTANT NOTE !**

*Manual centre punch indentations must NOT be used for stud location as this will have the same effect as shortening the pip on the weld stud and could adversely affect the weld quality.*

If practical considerations compel the use of indentations, then we would suggest the use of either an automatic centre punch or a punch press set only to produce the shallowest of indents consistent with the ease of stud location.

The setting chart parameters may have to be altered to achieve the optimum conditions detailed in the setting up and welding procedure.

If in any doubt, please seek the advice of your local technical representative.

# WELD ASSESSMENT / TESTING

Visual examination of weld quality can, even with limited experience, provide a useful quality assessment. In such a check the presence of a small even witness of weld material around the base of the stud flange after welding should be ensured. Poor welds are indicated by excess metal on one side of the welded flange and / or the presence of an undercut or non-fused area between the stud flange and the parent sheet or plate. Incorrect settings, adverse magnetic effects etc. such as those at edge welding positions or with unbalanced earths and studs welded to the work piece at an angle, the controller and pistol should be examined with a view to correcting such defects.

## MECHANICAL TESTS :

### ① BENDING.

The most easily applied method of testing the quality of welded fasteners considered here, involves the use of a bending bar. This bending bar (available from your supplier, see the accessories section of this manual) fitted with the correct size of nozzle for the stud to be tested is used to bend over the stud in accordance with the DVS0905 (German Welding Society Spec') specification .

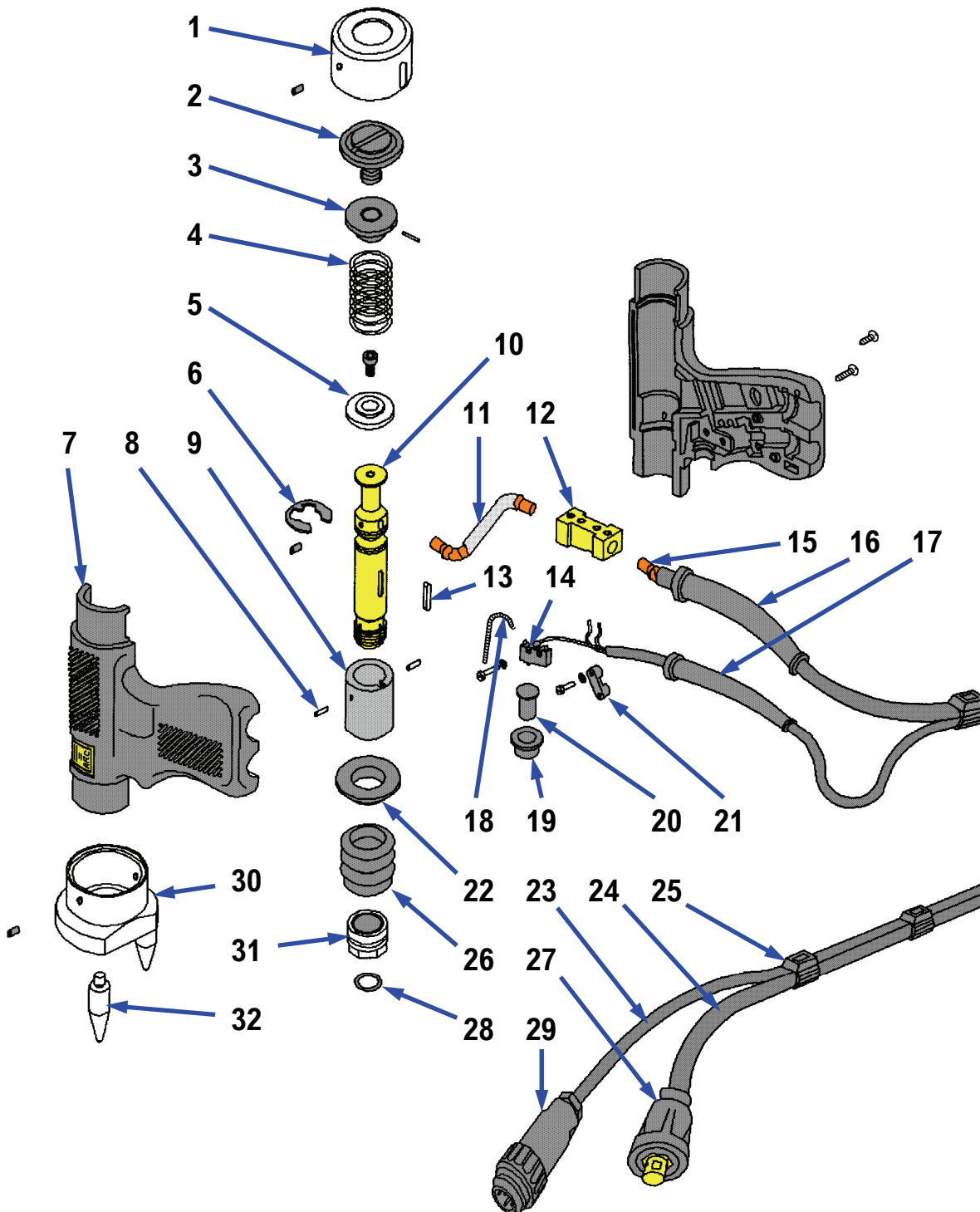
### ② TORSION.

A torsion test provides useful information for threaded fasteners. This involves tightening a nut on the stud against a spacer, suitably relieved to cater for the flange and weld spatter. For quantitative assessments a suitably calibrated torque wrench may be used, but at its simplest, a spanner will suffice.

In the above tests the performance of the welded joint should be considered in relation to the thickness of the material to which the stud is welded. On thicker materials, a full strength weld is denoted by deformation or failure of the stud shank. On lighter gauge material, severe "dimpling" or "dishing" at the reverse to the weld side normally indicates sufficient strength, whilst in most cases, the tearing of a slug of material from the parent sheet will occur.

# COMPONENT EXPLOSION

## STANDARD CONTACT PISTOL.



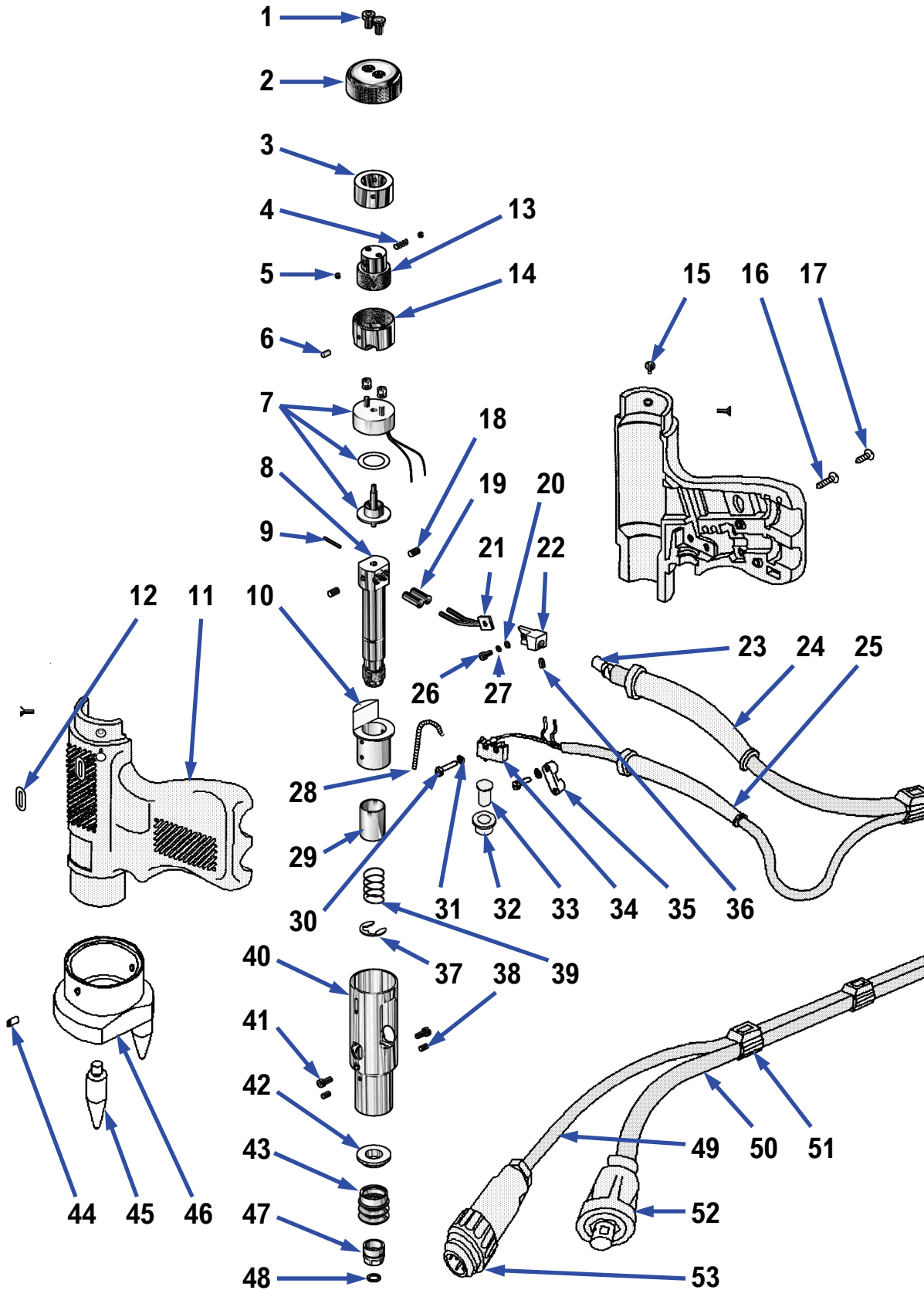
# PARTS LIST

## STANDARD CONTACT PISTOL.

ITEM	QTY	PART No.	DESCRIPTION
1	1	71-101-018	REAR END CAP
2	1	71-101-017	SPRING PRELOAD ADJUSTOR
3	1	71-101-016	ADJUSTABLE SPRING SEAT
4	1	71-101-014	SPRING
5	1	71-101-012	FIXED SPRING SEAT
6	1	71-101-011	SHAFT CIRCLIP
7	1	71-101-005	PISTOL BODY MOULDING (2 PARTS)
8	2	Z800-03-008	DOWEL PIN
9	1	71-101-006	BEARING BUSH
10	1	71-101-008	WELDSHAFT
11	1	71-101-029	FLEXIBLE BRAID ASSEMBLY
12	1	71-101-038	CABLE SPLICING BLOCK
13	1	71-101-024	SHAFT KEY
14	1	71-101-028	TRIGGER MICRO SWITCH
15	1	71-101-046	FERRULE
16	1	71-101-034	WELD CABLE SUPPORT SLEEVE
17	1	71-101-033	CONTROL CABLE SUPPORT SLEEVE
18	1	71-101-009	SPRING CONTACT
19	1	71-101-036	TRIGGER BEZEL
20	1	71-101-035	TRIGGER PUSH BUTTON
21	1	71-101-027	CABLE SECURING CLIP
22	1	71-101-004	BELLOWS RETAINING RING
23	3.5	71-300-010	CONTROL CABLE (m)
24	3	71-300-002	WELD CABLE (m)
25	6	71-101-032	CABLE TIE CLIP
26	1	71-101-003	DUST PROTECTION BELLOWS
27	1	71-101-031	CABLE END WELD PLUG
28	1	71-101-001	"O" RING
29	1	71-101-030	CABLE END CONTROL PLUG
30	1	79-101-051	FRONT END CAP
31	1	71-101-002	CHUCK/COLLET NUT
32	3	79-101-052	TRIPOD LEG

# COMPONENT EXPLOSION

## MARK V LIFT GAP PISTOL.



# PARTS LIST

## MARK V LIFT GAP PISTOL.

ITEM	QTY	PART No.	DESCRIPTION
1	2	Z115-04-010	END CAP SCREW
2	1	71-102-067	REAR END CAP
3	1	71-102-066	REAR BUSH
4	1	71-102-073	DETENT SPRING
5	2	71-102-090	DETENT BALL
6	1	71-102-075	INDICATOR PIN
7	1	71-102-056	SOLENOID COIL COMPLETE
8	1	71-102-061	WELDSHAFT
9	1	71-102-015	SPIROL PIN
10	1	71-102-062	SHAFT BUSH
11	1	71-102-069	PISTOL BODY MOULDING (2 PARTS)
12	1	71-102-070	LIFT INDICATION DECAL
13	1	71-102-065	COIL ADJUSTOR
14	1	71-102-064	COIL MOUNTING CUP
15	4	Z205-03-006	BUSH RETAINING SCREW
16	2	Z230-06-958	PISTOL BODY SCREW (LONG)
17	1	Z230-06-912	PISTOL BODY SCREW (SHORT)
18	2	Z400-05-006	GRUB SCREW
19	2	71-101-041	FERRULE (SMALL)
20	1	Z600-04-000	WASHER
21	1	71-102-058	FLEXIBLE BRAID ASSEMBLY
22	1	71-102-030	CABLE TERMINATOR
23	1	71-101-046	FERRULE (LARGE)
24	1	71-101-034	WELD CABLE SUPPORT SLEEVE
25	1	71-101-033	CONTROL CABLE SUPPORT SLEEVE
26	1	Z100-04-010	SCREW
27	1	Z615-04-000	LOCK WASHER

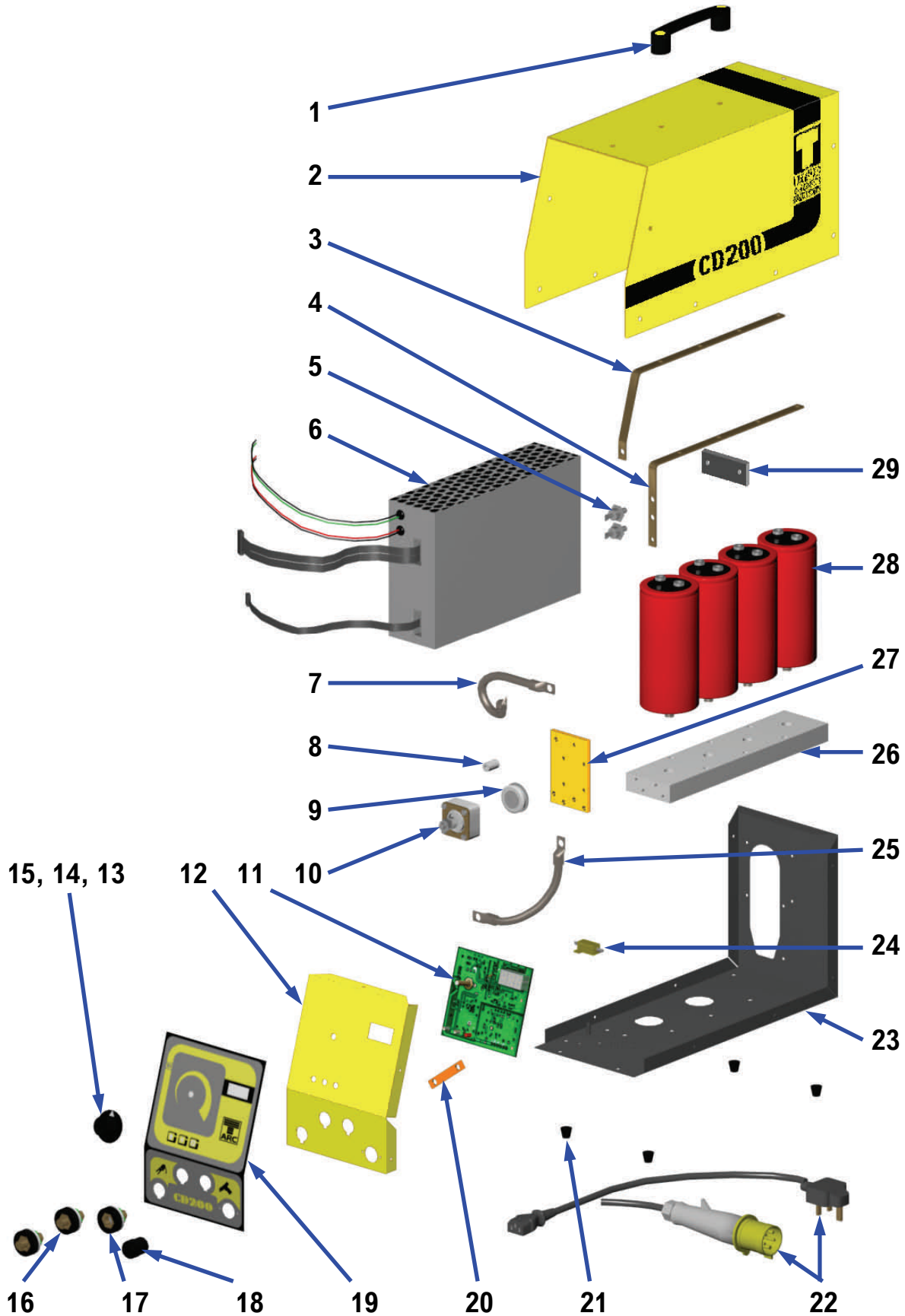
# PARTS LIST

## MARK V LIFT GAP PISTOL.

ITEM	QTY	PART No.	DESCRIPTION
28	1	71-101-009	CONTACT SPRING
29	1	71-102-071	SHAFT BEARING
30	4	Z210-02-010	SCREW (SWITCH / CABLE GRIP)
31	4	Z600-02-000	WASHER (SWITCH / CABLE GRIP)
32	1	71-101-036	TRIGGER BEZEL
33	1	71-101-035	TRIGGER PUSH BUTTON
34	1	71-101-028	TRIGGER MICRO SWITCH
35	1	71-101-027	CABLE GRIP
36	1	Z800-05-008	CABLE DOWEL
37	1	71-101-011	SHAFT CIRCLIP
38	2	Z800-03-006	LINER DOWEL
39	1	71-102-009	SPRING
40	1	71-102-068	LINER SLEEVE
41	2	ZZ100-03-004	SCREW
42	1	71-101-004	BELLOWS RETAINER
43	1	71-101-003	DUST PROTECTION BELLOWS
44	2	Z400-05-004	GRUB SCREW
45	3	79-101-052	TRIPOD LEG
46	1	79-101-051	FRONT END CAP
47	1	71-101-002	CHUCK / COLLET NUT
48	1	71-101-001	“O” RING
49	3.5	71-300-010	CONTROL CABLE (m)
50	3	71-300-002	WELD CABLE (m)
51	6	71-101-032	CABLE TIE CLIP
52	1	71-101-031	CABLE END WELD PLUG
53	1	71-101-030	CABLE END CONTROL PLUG

# COMPONENT EXPLOSION

## CD200 SERIES CONTROLLER





# **COMPONENT EXPLOSION**

## **CD200 SERIES CONTROLLER**

<b>ITEM</b>	<b>QTY</b>	<b>PART No.</b>	<b>DESCRIPTION</b>
<b>1</b>	<b>1</b>	<b>70-105-014</b>	<b>CARRYING HANDLE</b>
<b>2</b>	<b>1</b>	<b>70-105-001</b>	<b>HOUSING COVER</b>
<b>3</b>	<b>1</b>	<b>70-105-009</b>	<b>POSITIVE BUSBAR</b>
<b>4</b>	<b>1</b>	<b>70-105-008</b>	<b>NEGATIVE BUSBAR</b>
<b>5</b>	<b>2</b>	<b>70-102-131</b>	<b>FLYBACK DIODE (66 CONTACT ONLY)</b>
<b>or</b>	<b>3</b>	<b>70-102-131</b>	<b>FLYBACK DIODE (ALL OTHER MODELS)</b>
<b>6</b>	<b>1</b>	<b>70-105-021</b>	<b>POWER SUPPLY MODULE (CONTACT MODELS ONLY)</b>
<b>7</b>	<b>1</b>	<b>70-105-019</b>	<b>POSITIVE CONNECTION CABLE</b>
<b>8</b>	<b>1</b>	<b>70-105-018</b>	<b>MOUNTING PILLAR</b>
<b>9</b>	<b>1</b>	<b>70-102-046</b>	<b>WELDING THYRISTOR</b>
<b>10</b>	<b>1</b>	<b>70-102-047</b>	<b>THYRISTOR BOX CLAMP</b>
<b>11</b>	<b>1</b>	<b>70-105-022</b>	<b>CONTROL &amp; DISPLAY PCB</b>
<b>12</b>	<b>1</b>	<b>70-105-003</b>	<b>FASCIA PANEL</b>
<b>13</b>	<b>1</b>	<b>81-104-030</b>	<b>CONTROL KNOB</b>
<b>14</b>	<b>1</b>	<b>81-104-031</b>	<b>CONTROL KNOB POINTER</b>
<b>15</b>	<b>1</b>	<b>81-104-032</b>	<b>CONTROL KNOB CAP</b>
<b>16</b>	<b>2</b>	<b>70-102-027</b>	<b>PANEL MOUNTING WELD PLUG</b>
<b>17</b>	<b>1</b>	<b>70-102-026</b>	<b>PANEL MOUNTING WELD SOCKET</b>
<b>18</b>	<b>1</b>	<b>70-102-025</b>	<b>PANEL MOUNTING CONTROL SOCKET</b>

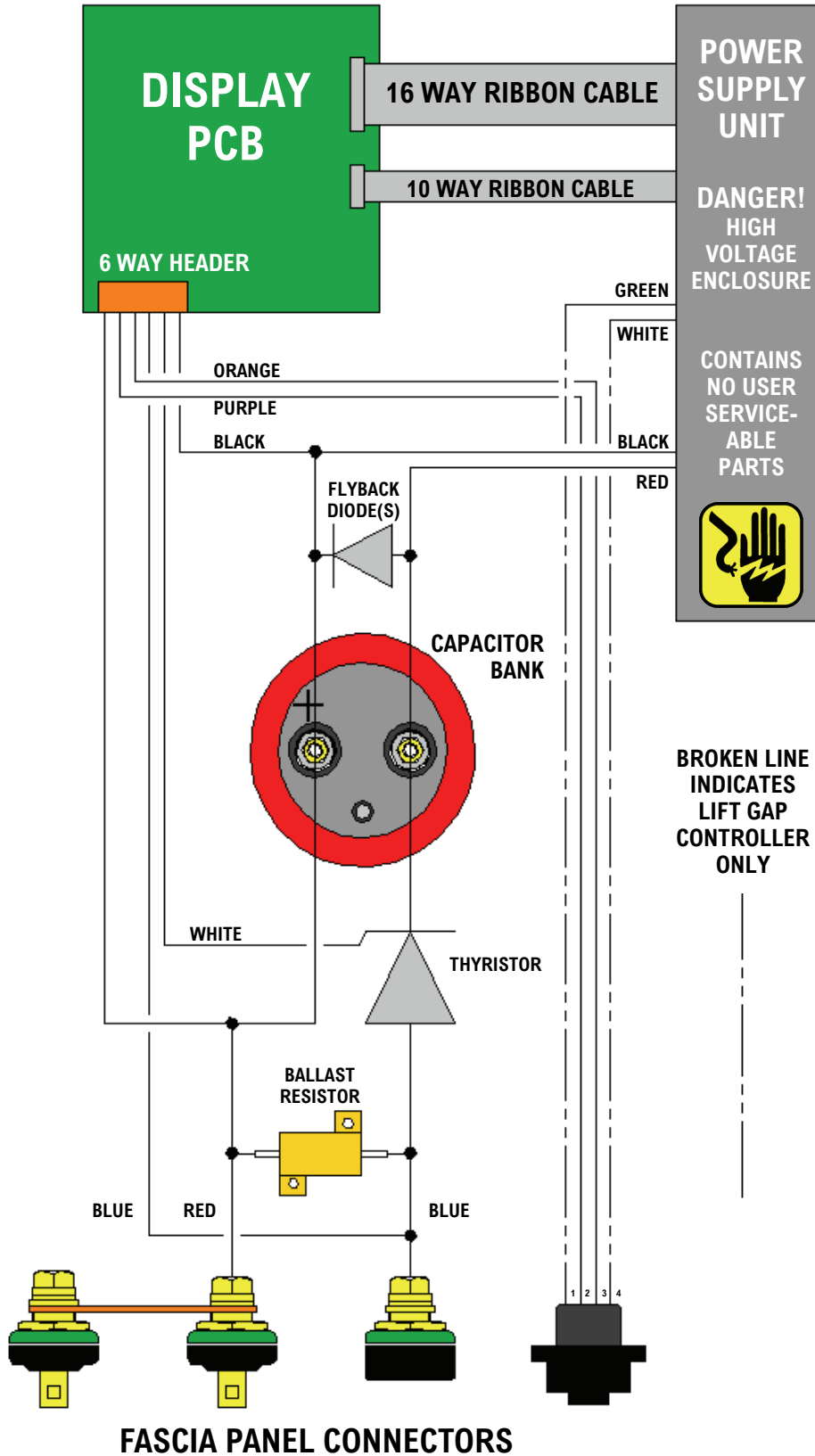
# COMPONENT EXPLOSION

## CD200 SERIES CONTROLLER

ITEM	QTY	PART No.	DESCRIPTION
19	1	70-105-015	CONTROL PANEL OVERLAY
20	1	70-105-007	PANEL PLUG LINK BAR
21	4	70-102-002	CASING FOOT
22	1	70-105-016	CORDSET (UK 230V - IEC)
or	1	70-105-017	CORDSET (SCHUKO 230V - IEC)
or	1	70-105-028	CORDSET (UK 110V - IEC)
23	1	70-105-002	HOUSING BASEPLATE
24	1	70-105-013	BALLAST RESISTOR
25	1	70-105-020	NEGATIVE CONNECTION CABLE
26	1	70-105-005	CAPACITOR MOUNTING BLOCK
27	1	70-105-006	THYRISTOR MOUNTING PLATE
28	2	70-105-040	33,000uF CAPACITOR (66 CONTACT & GAP MODELS)
or	3	70-105-040	33,000uF CAPACITOR (99 CONTACT & GAP MODELS)
or	4	70-105-040	33,000uF CAPACITOR (132 CONTACT & GAP MODELS)
29	1	70-105-026	BLANKING COVER
or	1	70-102-025	CONTROL SOCKET (AUTO UNITS ONLY)
	1	70-105-023	WIRING HARNESS (NOT SHOWN IN ILLUSTRATION)

# CIRCUIT SCHEMATIC

## CD200 SERIES CONTROLLER

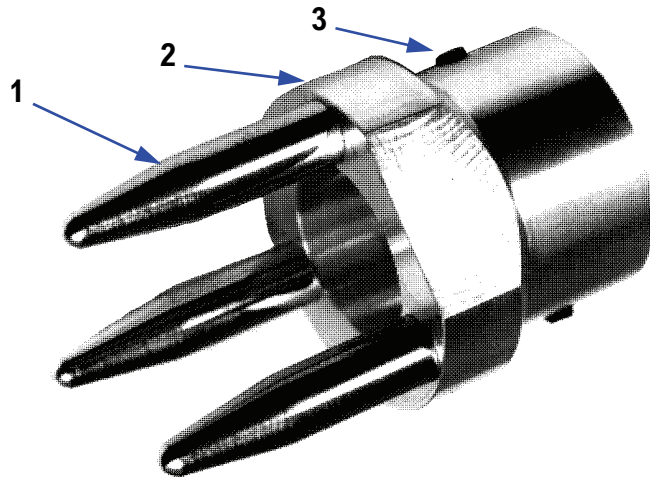


# ACCESSORIES

## ① STANDARD TRIPOD LEG ASSEMBLY.

COMPLETE ASSEMBLY  
AVAILABLE UNDER PART  
NUMBER : 79-101-050 (STANDARD)

NOTE #  
LONG LEGS ARE USED WHEN WELDING  
STUD LENGTHS BETWEEN 35 AND 50,  
OR WHEN WELDING M10 STUDS.

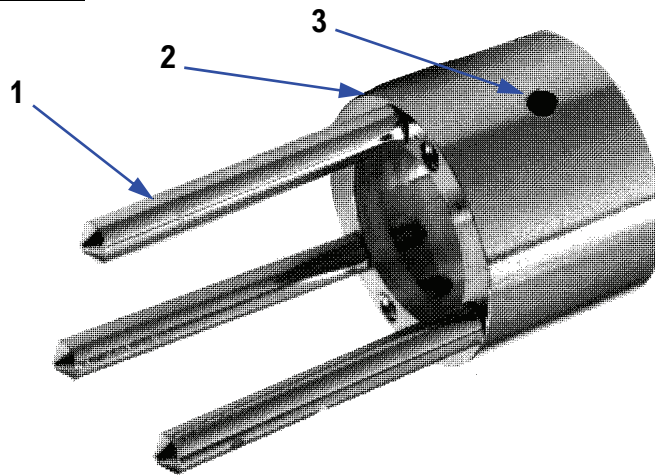


ITEM	QTY	DESCRIPTION	PART No.
1	3	TRIPOD LEG (STANDARD)	79-101-052
or	3	TRIPOD LEG (LONG. SEE NOTE #)	79-101-054
2	1	FRONT END CAP	79-101-051
3	2	GRUB SCREW	Z400-05-004

## ② SLIMLINE TRIPOD LEG ASSEMBLY.

COMPLETE ASSEMBLY  
AVAILABLE UNDER PART  
NUMBER : 79-101-060 (STANDARD)

NOTE #  
FIT CHUCKS WITH 12 mm LONG  
BACKSTOP 79-101-071



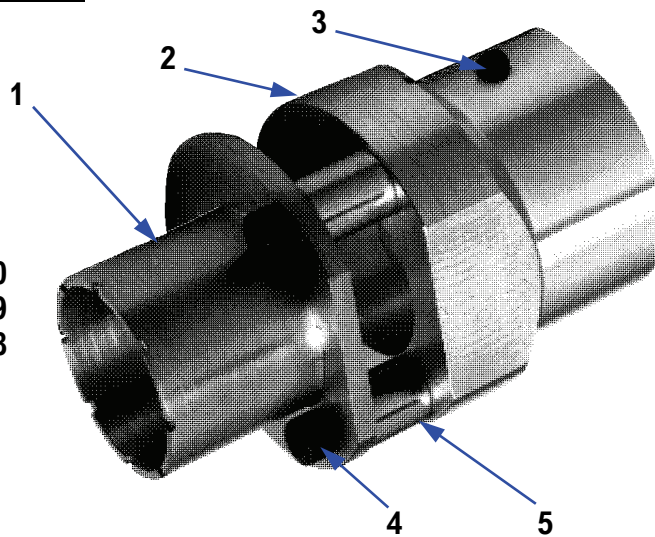
ITEM	QTY	DESCRIPTION	PART No.
1	3	TRIPOD LEG (STANDARD)	79-101-062
or	3	TRIPOD LEG (LONG. SEE NOTE #)	79-101-064
2	1	FRONT END CAP (SLIMLINE)	79-101-061
3	2	GRUB SCREW	Z400-05-004

# ACCESSORIES

## ③ STANDARD NOSE CONE ASSEMBLY.

COMPLETE ASSEMBLY  
AVAILABLE UNDER PART  
NUMBERS :

Ø30 mm ASSY : 79-101-070  
Ø25.4 mm (1") ASSY : 79-101-069  
Ø22 mm ASSY : 79-101-068



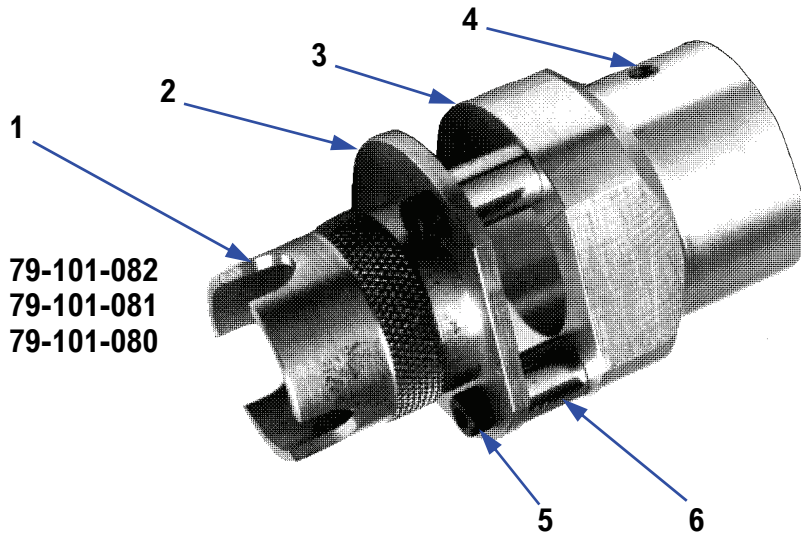
ITEM	QTY	DESCRIPTION	PART No.
1	1	Ø30 mm NOSE CONE	79-101-072
or	1	Ø22 mm NOSE CONE	79-101-078
or	1	Ø25.4 mm NOSE CONE	79-101-077
2	1	FRONT END CAP	79-101-051
3	2	GRUB SCREW	Z400-05-004
4	3	SOCKET CAP SCREW	Z100-04-010
5	3	12 mm SPACER (Ø30 NOSE CONE)	79-101-071
or	3	25 mm SPACER (Ø25.4 & Ø22 NOSE CONE)	79-101-076

# ACCESSORIES

## ④ STANDARD SCREW-IN NOSE CONE ASSEMBLY.

COMPLETE ASSEMBLY  
AVAILABLE UNDER PART  
NUMBERS :

Ø30 mm ASSY : 79-101-082  
Ø25.4 mm (1") ASSY : 79-101-081  
Ø22 mm ASSY : 79-101-080

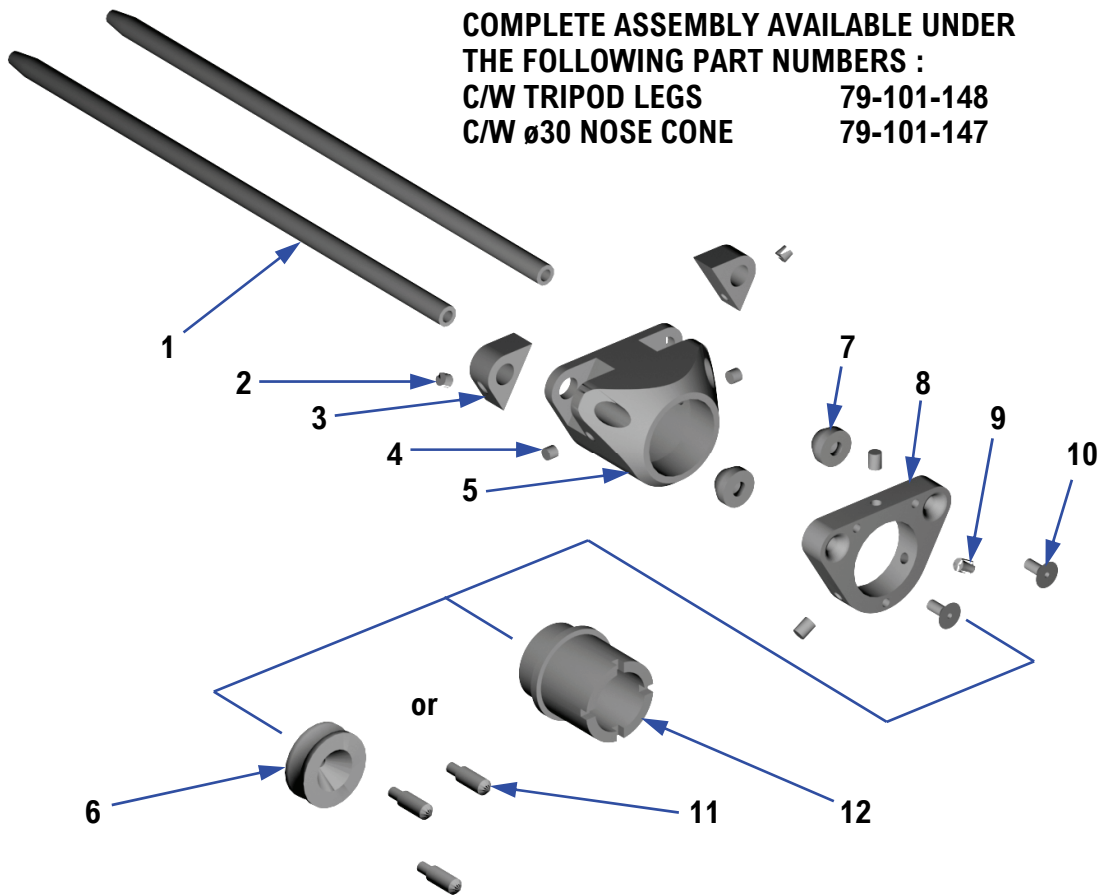


NOTE : FIT CHUCKS WITH 12 mm LONG BACKSTOP 79-101-090 & 2 LOCKING NUTS

ITEM	QTY	DESCRIPTION	PART No.
1	1	Ø30 mm SCREW-IN NOSE CONE	79-101-086
or	1	Ø22 mm SCREW-IN NOSE CONE	79-101-084
or	1	Ø25.4 mm SCREW-IN NOSE CONE	79-101-085
2	1	SCREW-IN BACKPLATE	79-101-083
3	1	FRONT END CAP	79-101-051
4	2	GRUB SCREW	Z400-05-004
5	3	SOCKET CAP SCREW	Z100-04-010
6	3	25 mm SPACER (Ø25.4 & Ø22 NOSE CONE)	79-101-076

# ACCESSORIES

## ⑤ EXTENDED LEG ASSEMBLY.



COMPLETE ASSEMBLY AVAILABLE UNDER  
THE FOLLOWING PART NUMBERS :  
C/W TRIPOD LEGS 79-101-148  
C/W Ø30 NOSE CONE 79-101-147

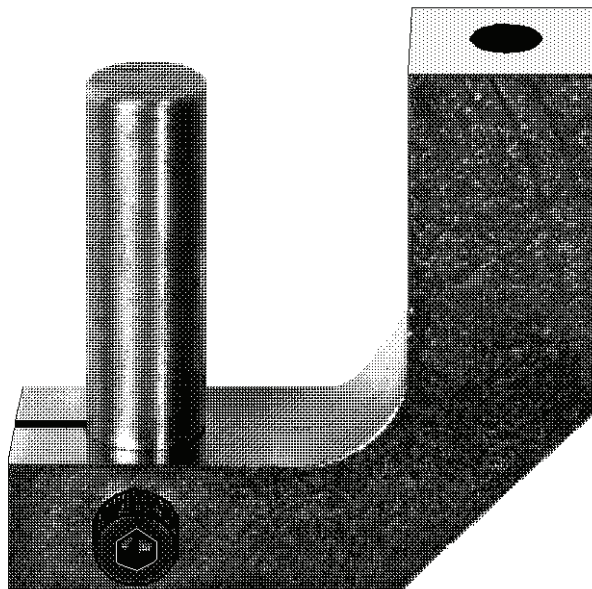
ITEM	QTY	DESCRIPTION	PART No.
1	2	EXTENDED LEG	81-101-004
2	2	GRUB SCREW	Z430-05-006
3	2	PIVOTAL GRIP INSERT	79-101-142
4	2	GRUB SCREW	Z400-05-004
5	1	FRONT END CAP	79-101-141
6	1	CENTRING GUIDE (3 mm +)	79-101-144
7	2	FOOT WASHER	81-101-001
8	1	FOOT ADAPTOR	79-101-143
9	3	GRUB SCREW	Z410-05-008
10	2	COUNTERSUNK SCREW	Z120-05-020
11	3	MINI TRIPOD LEG	79-101-106
12	1	Ø30 mm NOSE CONE	79-101-145



# ACCESSORIES

## ⑥ OFFSET CHUCK ADAPTOR

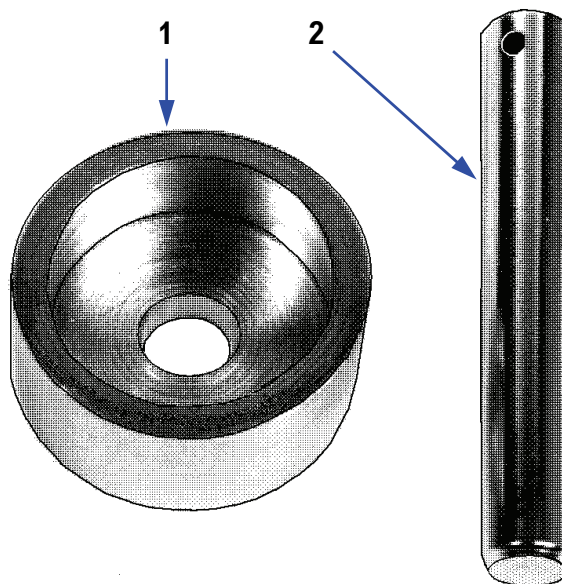
COMPLETE ASSEMBLY  
AVAILABLE UNDER PART  
NUMBER : 79-101-110



## ⑦ NOSE CONE CENTRING DEVICE

COMPLETE ASSEMBLIES  
AVAILABLE UNDER PART  
NUMBERS :

Ø22 CUP & ROD	79-101-112
Ø25.4 (1") CUP & ROD	79-101-113
Ø30 CUP & ROD	79-101-114



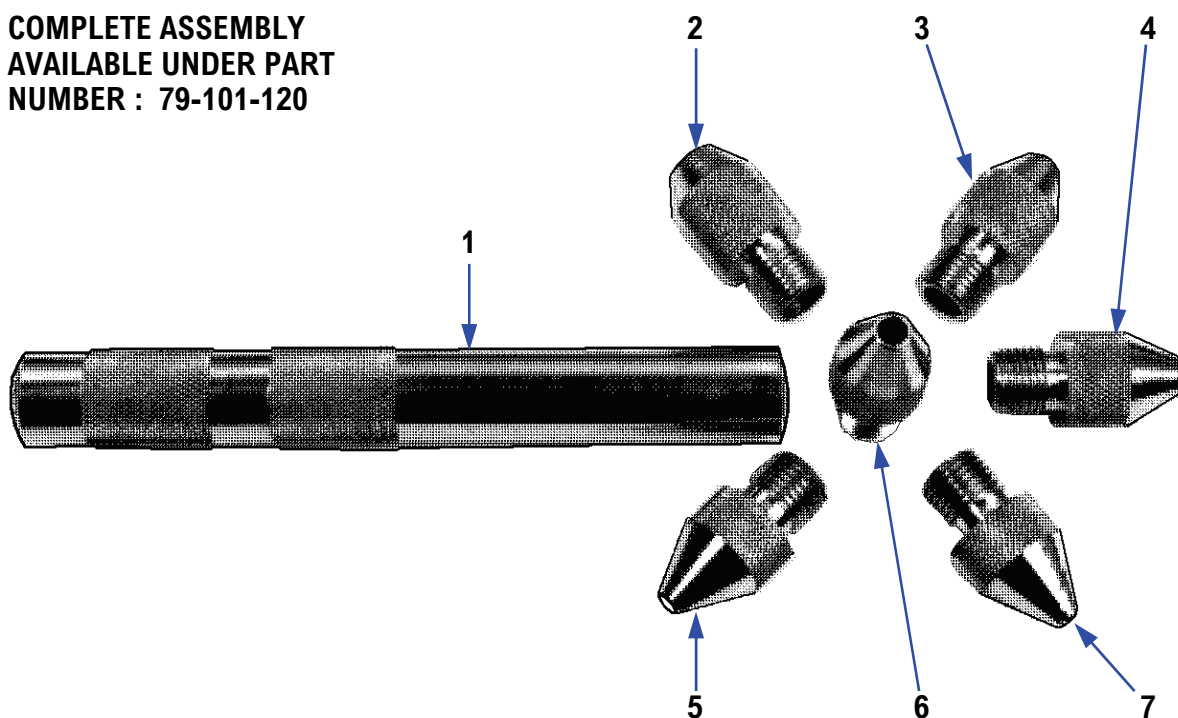
ITEM	QTY	DESCRIPTION	PART No.
1	1	Ø30 mm CENTRING CUP	79-101-118
or	1	Ø25.4 mm (1") CENTRING CUP	79-101-117
or	1	Ø22 mm CENTRING CUP	79-101-116
2	1	CENTRING ROD	79-101-115



# ACCESSORIES

## ⑧ BENDING BAR & NOZZLES

COMPLETE ASSEMBLY  
AVAILABLE UNDER PART  
NUMBER : 79-101-120



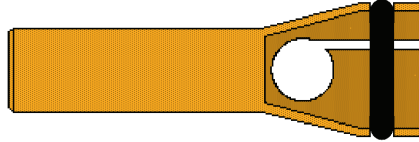
ITEM	QTY	DESCRIPTION	PART No.
1	1	BENDING BAR	79-101-121
2	1	M10 NOZZLE	79-101-128
3	1	M8 NOZZLE	79-101-127
4	1	M6 NOZZLE	79-101-126
5	1	M5 NOZZLE	79-101-125
6	1	M4 NOZZLE	79-101-124
7	1	M3 NOZZLE	79-101-123

# ACCESSORIES

## ⑨ CHUCKS / COLLETS

① EARTH TAG CHUCK

PART No. 79-101-019



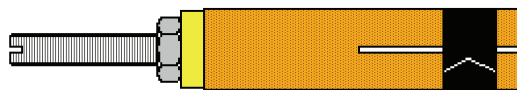
② LARGE BRACKET CHUCK (NOT ILLUSTRATED)

PART No. 79-101-022

③ STANDARD CD CHUCK WITH BACKSTOP

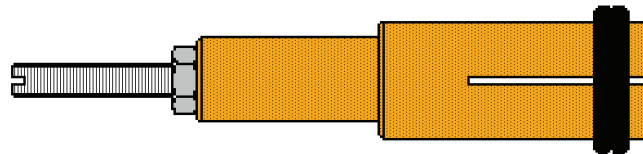
PART No. s :

M2.5	:	79-101-002
M3	:	79-101-003
M4	:	79-101-004
M5	:	79-101-005
M6	:	79-101-006
M7.1	:	79-101-007
M8	:	79-101-008



④ STANDARD M10 CHUCK WITH BACKSTOP

PART No. 79-101-010



**Note: to use an M10 chuck, replace the 3 standard tripod legs with 3 of the long legs part No 79-101-054**

# EC DECLARATION OF CONFORMITY

## TAYLOR STUDWELDING SYSTEMS LIMITED

COMMERCIAL ROAD  
DEWSBURY  
WEST YORKSHIRE  
ENGLAND  
WF13 2BD

TEL : +44 (0)1924 452123  
FAX : +44 (0)1924 430059  
EMAIL : sales@taylor-studwelding.com

**STATEMENT :** This is to certify that the machinery listed below is designed and manufactured in conformance with all applicable health and safety regulations.

This statement is invalid if any modifications are carried out on the machinery without the prior written approval of Taylor Studwelding Systems Ltd.

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**DESCRIPTION OF MACHINE :** Capacitor Discharge Studwelding Equipment  
**TYPE :** CD200  
**PART NUMBER :**

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### Applicable EC guidelines and corresponding standards:

- Low voltage guideline 2006/95/EC:  
EN60204-1 Safety of machinery - Electrical equipment of machines.
- EMC guidelines 2004/108/EC(electromagnetic compatibility):  
EN50081 Electromagnetic compatibility - Generic emission standard  
EN50082 Electromagnetic compatibility - Generic immunity standard  
EN50199 Electromagnetic compatibility (EMC) Product standard for Arc welding equipment
- Machine guidelines 2006/42/EC  
EN60974-1 Arc welding equipment : Electromagnetic compatibility (EMC) requirements

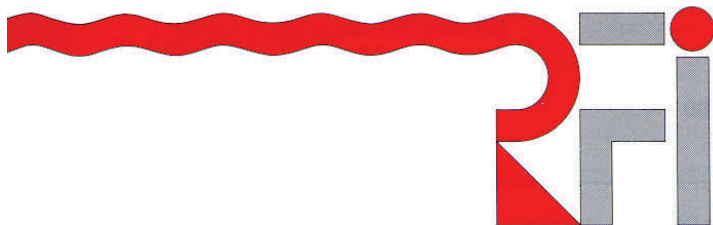
SIGNED



DAVID TAYLOR  
MANAGING DIRECTOR



# EMC CERTIFICATE



## RADIO FREQUENCY INVESTIGATION LTD

Dunlop House  
Dunlop  
Ayrshire  
Scotland  
KA3 4BD.


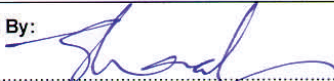

Switchboard Tel: +44 (0) 1560 483813  
Sales Tel: +44 (0) 1560 486550  
Fax: +44 (0) 1560 484408  
E-mail: sales@rfi.co.uk  
Web Site: www.rfi.co.uk

### TEST REPORT FROM RADIO FREQUENCY INVESTIGATION LTD.

Test Of: T-Arc System CD 200

To: EN 50199: 1995

Test Report Serial No:  
RFI/EMCB1EMCA1/RP11829B

This Test Report Is Issued Under The Authority Of Brian Watson, Technical Director:	
..... 	
Tested By: 	Checked By: 
Report Copy No: ..... 01	
Issue Date: 8 September 1998	Test Dates: 5 July 1998 to 12 August 1998

The T-Arc CD Studwelding Equipment was submitted to RFI for testing  
on behalf of Taylor Stud Welding Limited

#### Basingstoke

Ewhurst Park, Ramsdell, Basingstoke, Hampshire, England, RG26 5RQ  
Tel: +44 (0) 1256 851193 Fax: +44 (0) 1256 851192

Registered in England, No. 211 7901.

Registered Office: Ewhurst Park, Ramsdell, Basingstoke, Hampshire RG26 5RQ

