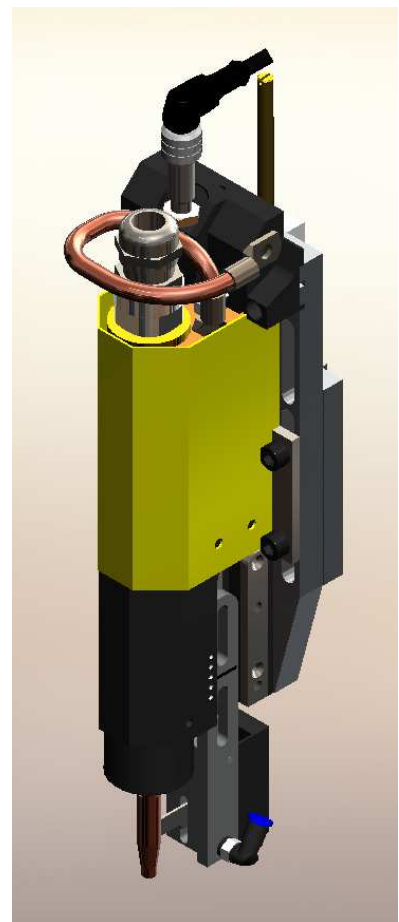


TAYLOR STUDWELDING SYSTEMS LIMITED.

OPERATING GUIDE

FOR

SIK2-H CAPACITOR DISCHARGE AUTOMATIC STUD WELDING HEAD



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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 3) 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 equipments. 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, an automatic weld head and the necessary interconnecting cables and.

THE PROCESS

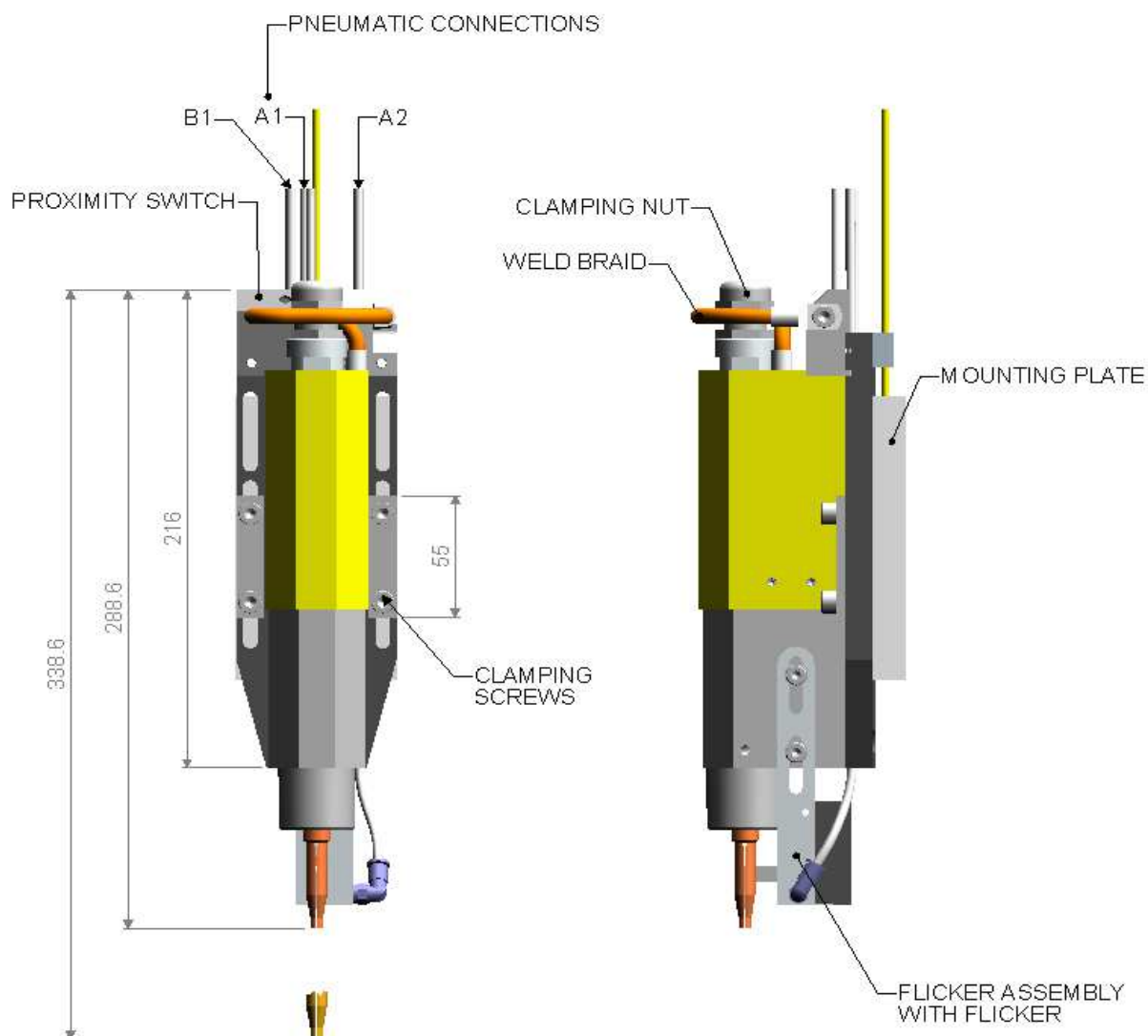
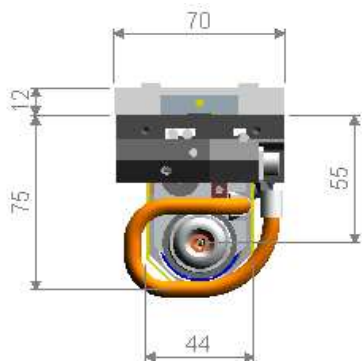
Capacitor Discharge stud welding is a form of welding in which the energy required for the welding process is derived from a bank of charged capacitors. This stored energy is discharged across the gap between the two surfaces to be welded as they are propelled towards each other. The arc produced heats 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.

Start	The weld stud is accelerated by the weld head to a speed of 0.5 to 1.0m/sec, at the same time the power from the capacitors is applied between the weld head and work piece.
0 - 1ms	The ignition tip touches the base material and the discharge current begins to flow. The tip is heated by the current and rapidly evaporates.
2 - 3ms	An arc is initiated between the stud and work piece, this lasts for 1 to 2 milliseconds and melts the face of the stud & work piece.
3ms	The weld stud contacts the molten pool.
4ms	The weld pool cools and solidifies, due to heat absorption by the work piece.

SIK 2 WELDING HEAD

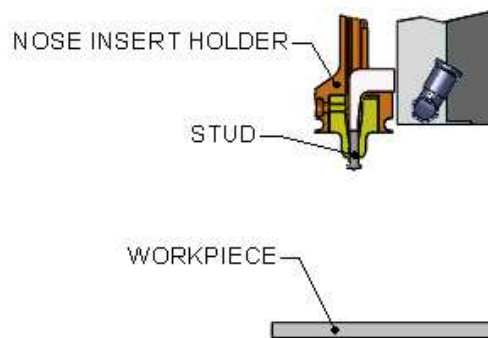
TECHNICAL DATA

Part number : 99-100-144
Weight : 1.5kg without welding cable
Drive : Pneumatic cylinder
Guide shaft : hardened & ground
Weld stroke : 50mm

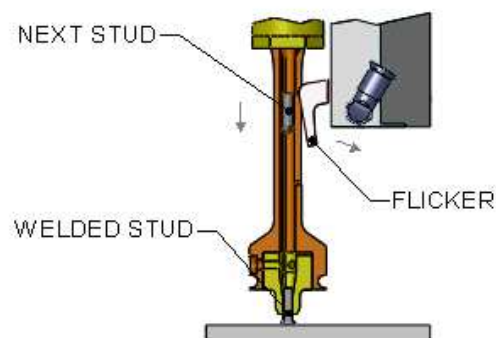


WELDING SEQUENCE

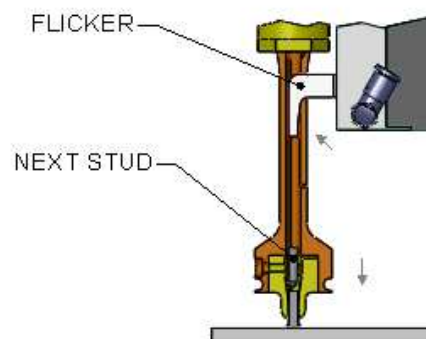
In the start position, the nose insert holder with a stud in place is positioned approx. 50mm above the workpiece.



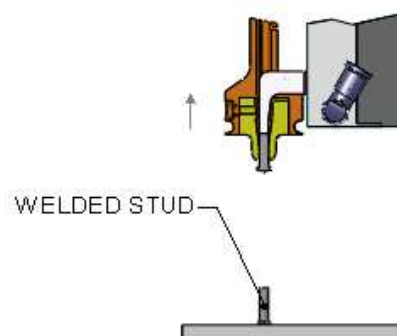
At the start of the welding process, the nose insert holder moves towards the workpiece. Welding begins when the stud touches the workpiece. The next stud is fed automatically at the same time. The flicker retracts out of the way, allowing the next stud to pass.



The flicker moves back into the nose insert holder. Welding has now been completed. The new stud is now located between the flicker and the nose inserts.



The nose insert holder moves back to the start position. The new stud is pressed back against the flicker and is pushed through the nose inserts. The head is now back in the start position.



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 21 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

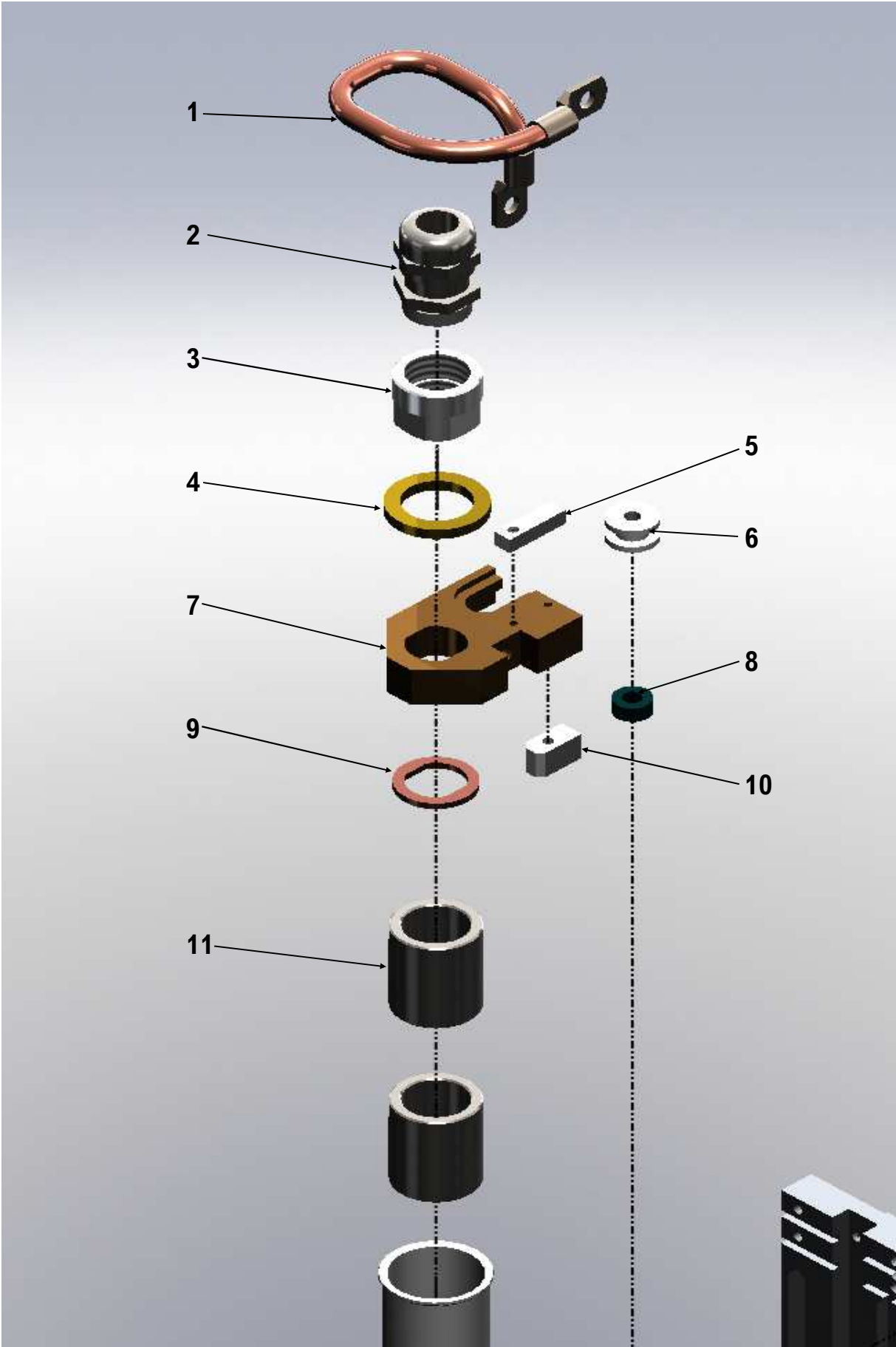
During welding operations, intense magnetic and electrical fields are unavoidably produced which may interfere with other sensitive Electronic equipment.

All Taylor Studwelding equipment is designed, manufactured and tested to conform 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

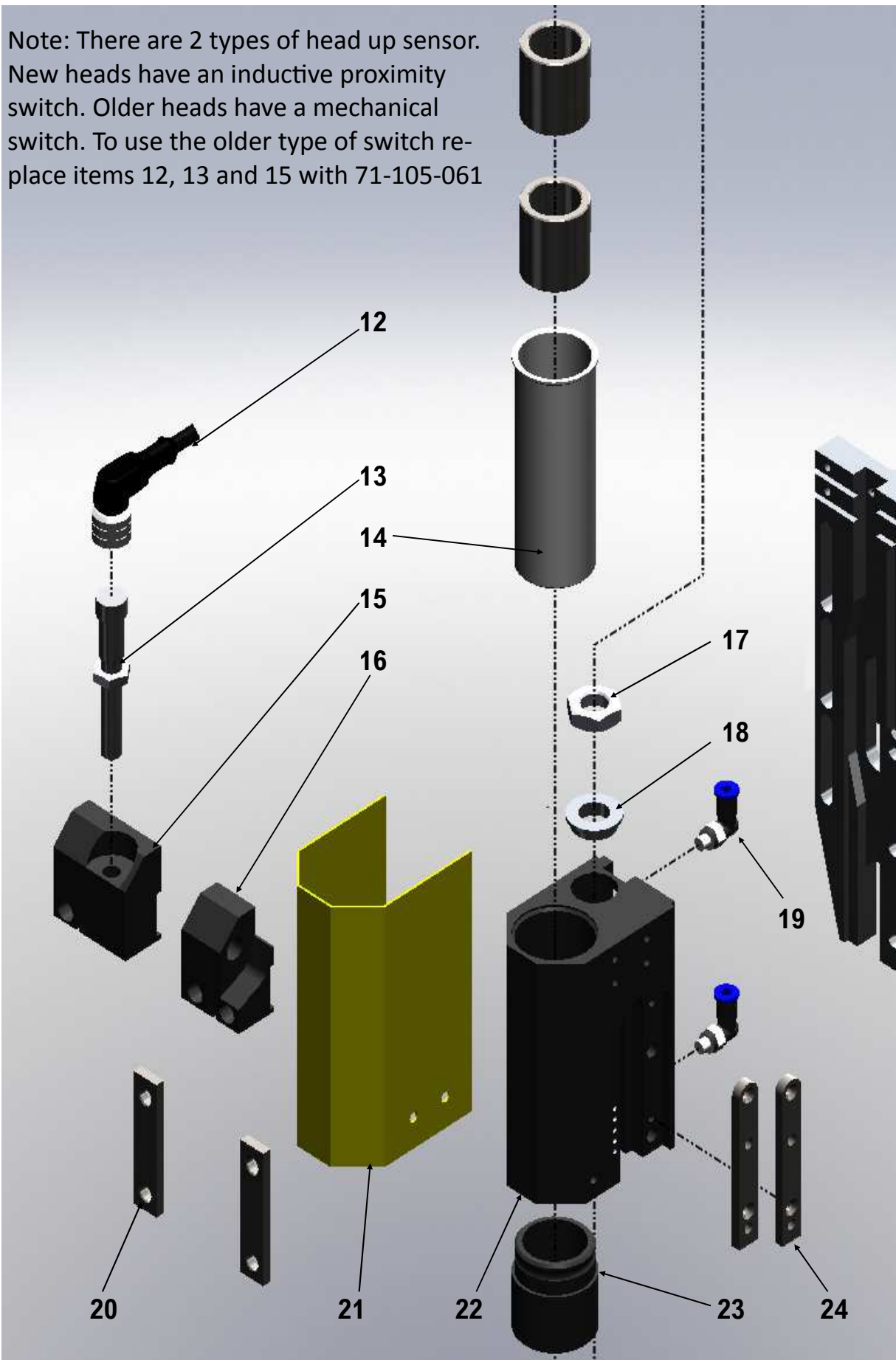
The equipment either wholly or any of its component parts may be disposed of as part of general industrial waste or passed to a scrap merchant. Non of the components used in the manufacture are toxic, carcinogenic or harmful to health.

WELD HEAD EXPLOSION & PARTS LIST

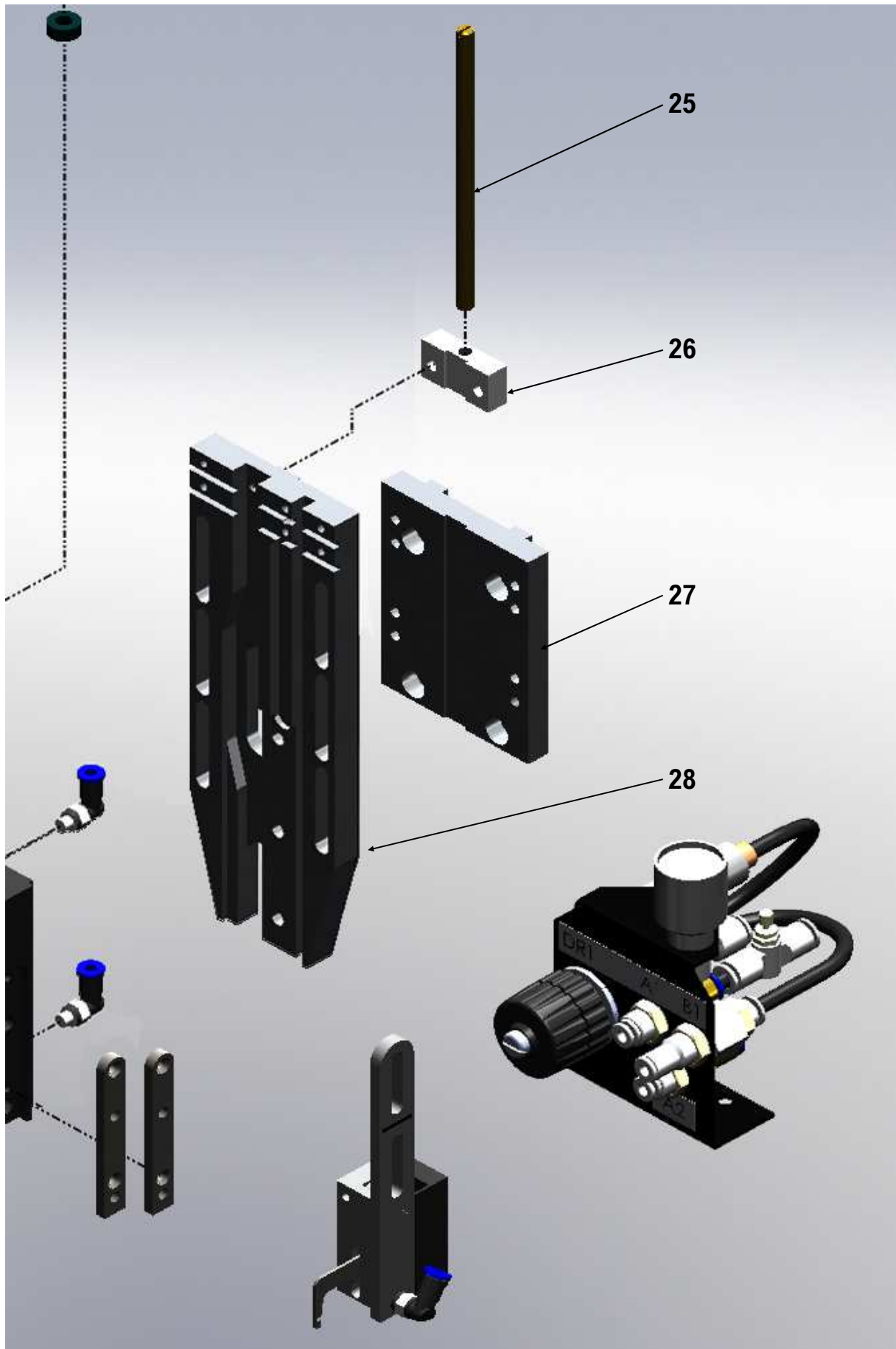


WELD HEAD EXPLOSION & PARTS LIST

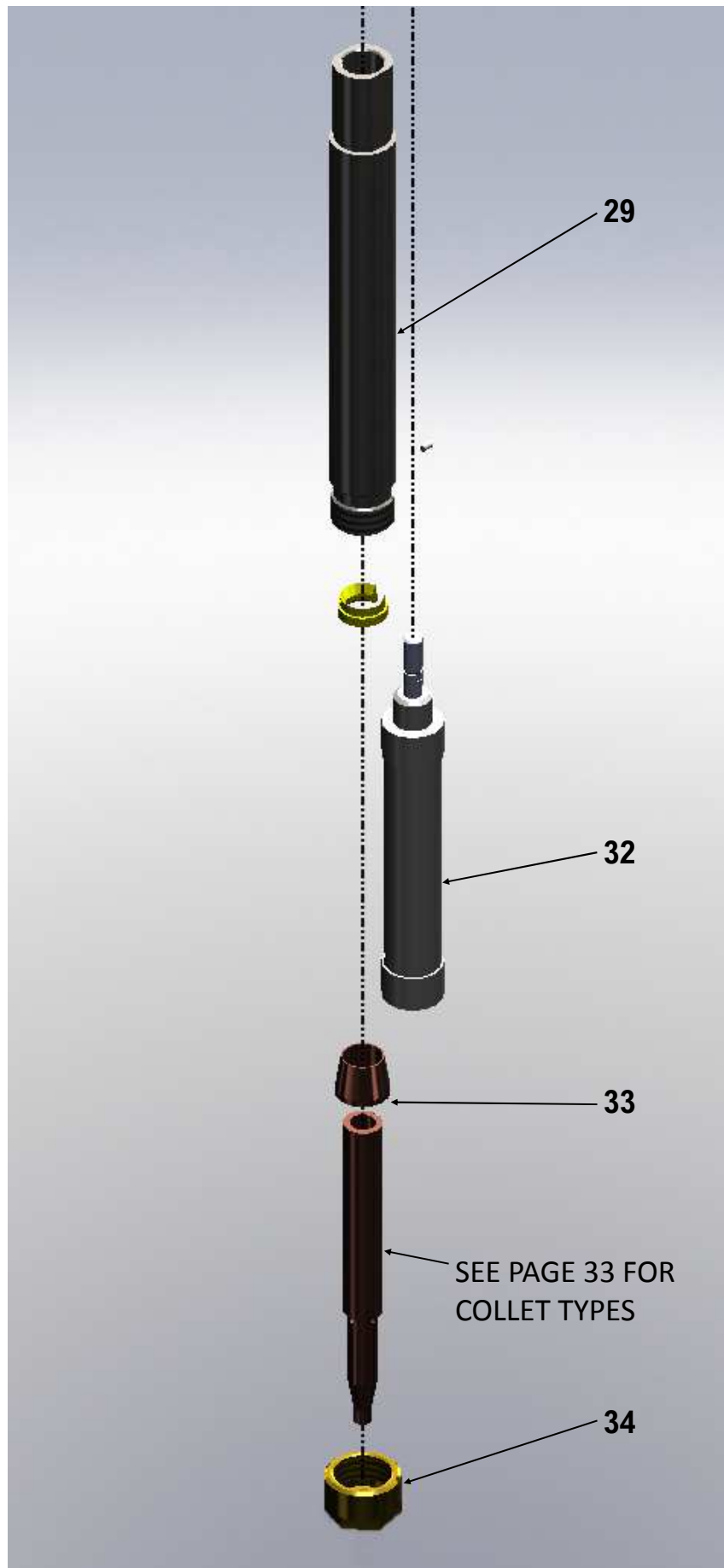
Note: There are 2 types of head up sensor. New heads have an inductive proximity switch. Older heads have a mechanical switch. To use the older type of switch replace items 12, 13 and 15 with 71-105-061



WELD HEAD EXPLOSION & PARTS LIST



WELD HEAD EXPLOSION & PARTS LIST



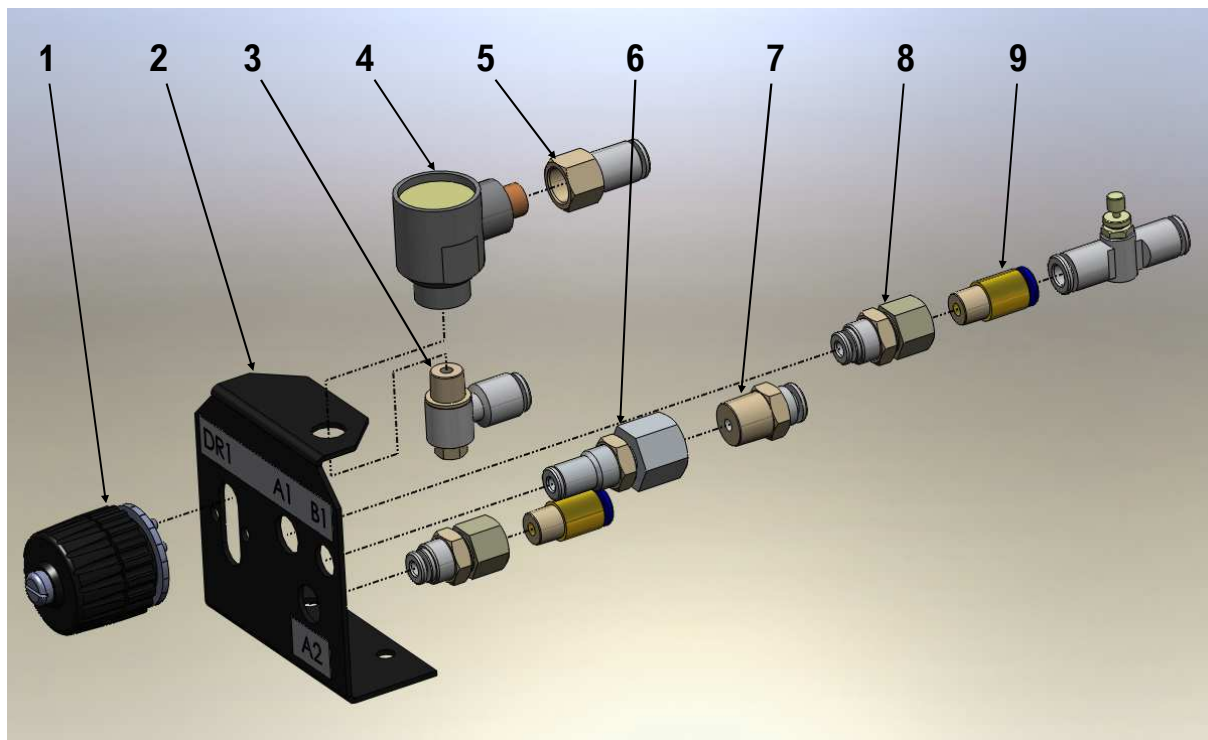
WELD HEAD EXPLOSION & PARTS LIST

ITEM No	QTY	PART No	DESCRIPTION
1	1	71-105-056	WELD BRAID
2 ³	1	71-103-081	FEED HOSE CLAMP
3	1	71-105-054	TOP NUT
4	1	71-105-028	SHAFT LOCKWASHER
5	1	71-105-047	BUMP STOP
6	1	71-105-050	ROD END
7	1	71-105-046	DRIVE PLATE
8	1	71-105-051	BUMP STOP
9	1	71-105-049	SHAFT WASHER
10	1	71-105-048	ALIGNMENT BLOCK
11	2	71-105-043	BEARING
12	1	75-101-718	HEAD UP SWITCH CABLE
13	1	71-105-087	HEAD UP SWITCH
14	1	71-105-042	BEARING TUBE
15	1	71-105-098	SWITCH HOUSING
16	1	71-105-044	CABLE MOUNT
17 ¹	1	71-105-251	CYLINDER LOCKNUT
18 ²	1	71-105-094	CYLINDER SPACER
19	2	PFE-P04-M5M	PNEUMATIC FITTING
20	2	71-105-055	CLAMP PLATE
21	1	71-105-053	MAIN COVER
22	1	71-105-041	MAIN BLOCK
23	1	71-105-052	SLEEVE
24	2	71-105-095	FLICKER MOUNTING PLATE
25	1	71-105-057	SCREW ADJUSTER
26	1	71-105-045	ADJUSTMENT BLOCK
27	1	75-100-814	HEAD MOUNTING PLATE
28	1	71-105-040	BACKPLATE
29	1	71-105-252	WELD SHAFT
32	1	PCR-025-050-001	DRIVE CYLINDER
33	1	71-105-002	TAPERED OLIVE
34	1	71-105-058	COLLET NUT

¹ Replace with 71-105-102 if Festo cylinder is fitted. ² Obsolete part , only fit when using Festo drive cylinder

³ When using feed hose <8mm diameter fit Hose clamp 73-100-450 & Adapter 71-105-269

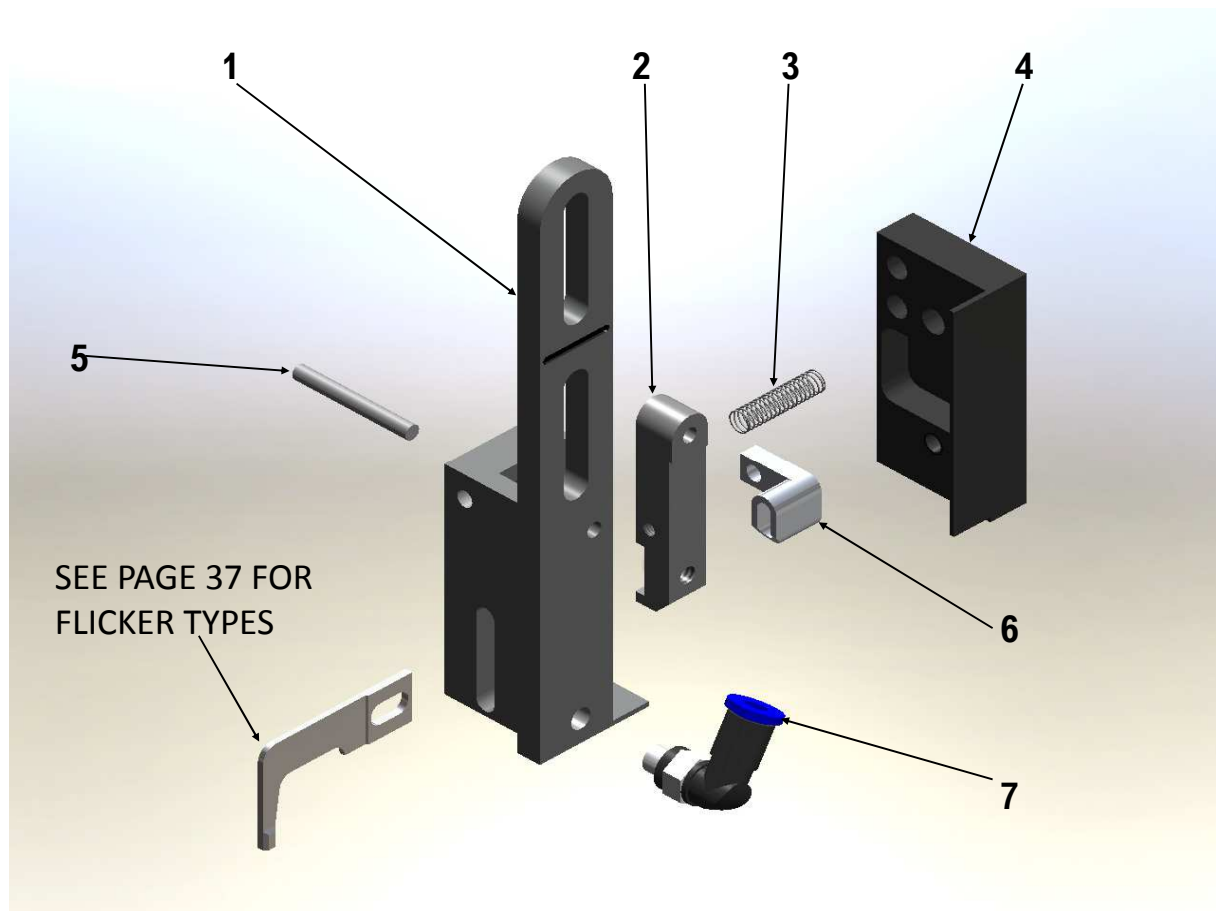
WELD HEAD EXPLOSION & PARTS LIST



ITEM No	QTY	PART No	DESCRIPTION
1	1	PRC-B06-B06-F00	PRECISION SPEED CONTROL
2	1	71-105-060	PNEUMATIC BRACKET
3	1	PFE-P06-U1M	DIA 6, 1/8 BSP ELBOW
4	1	PVM-F32-M3F	QUICK EXHAUST VALVE
5	1	PFS-P06-U1F	DIA 6, 1/8 BSP FEMALE UNION
6	1	PFX-SSS-P04-U2F	DIA 4 SELF SEAL BULKHEAD UNION
7	1	PFS-P06-U2M-EXT	DIA 6, 1/4 BSP STRAIGHT UNION
8	2	PFS-P04-BUL	DIA 4 BULKHEAD UNION
9	2	PFS-P06-U1M-INT	DIA 6, 1/8 BSP STRAIGHT UNION

FLICKER HOUSING EXPLOSION & PARTS LIST

MK1 ASSEMBLY (FITTED AS STANDARD BEFORE NOVEMBER 2012)



A COMPLETE ASSEMBLY IS AVAILABLE UNDER PART NUMBER 71-105-069

ITEM No	QTY	PART No	DESCRIPTION
1	1	71-105-062	HOUSING
2	1	71-105-063	ARM
3	1	71-105-068	SPRING
4	1	71-105-065	COVER
5	1	Z800-03-024	PIN
6	1	71-105-064	PISTON
7	1	PFE-P06-M5M	PNEUMATIC FITTING

NOTE: FOR SIK100 VERSION REPLACE ITEM 4 WITH 71-105-084

FLICKER HOUSING EXPLOSION & PARTS LIST

MK2 ASSEMBLY (FITTED AS STANDARD FROM NOVEMBER 2012)



ITEM No	QTY	PART No	DESCRIPTION
1	1	Z800-03-024	PIVOT PIN
2	1	Z400-04-008	SOCKET SET SCREW
3	1	71-105-199	MK2 FLICKER HOUSING
4	1	Z100-04-008	SOCKET HEAD SCREW
5	1	Z615-04-000	SPRING WASHER
6	1	71-105-063	FLICKER ARM
7	1	71-105-064	FLICKER PISTON
8	1	Z105-03-010	SOCKET HEAD SCREW
9	1	71-105-068	FLICKER SPRING
10	1	71-105-201	MK2 FLICKER COVER
11	1	Z100-04-010	SOCKET HEAD SCREW
12	1	71-105-198	MK2 FLICKER SUPPORT BRACKET
13	2	Z115-04-020	SOCKET BUTTON HEAD SCREW
14	1	Z115-04-030	SOCKET BUTTON HEAD SCREW
15	1	Z420-03-004	SOCKET SET SCREW
16	1	PFE-P06-M5M	PNEUMATIC ELBOW FITTING

NOTE: FOR SIK100 VERSION REPLACE ITEM 10 WITH 71-105-240

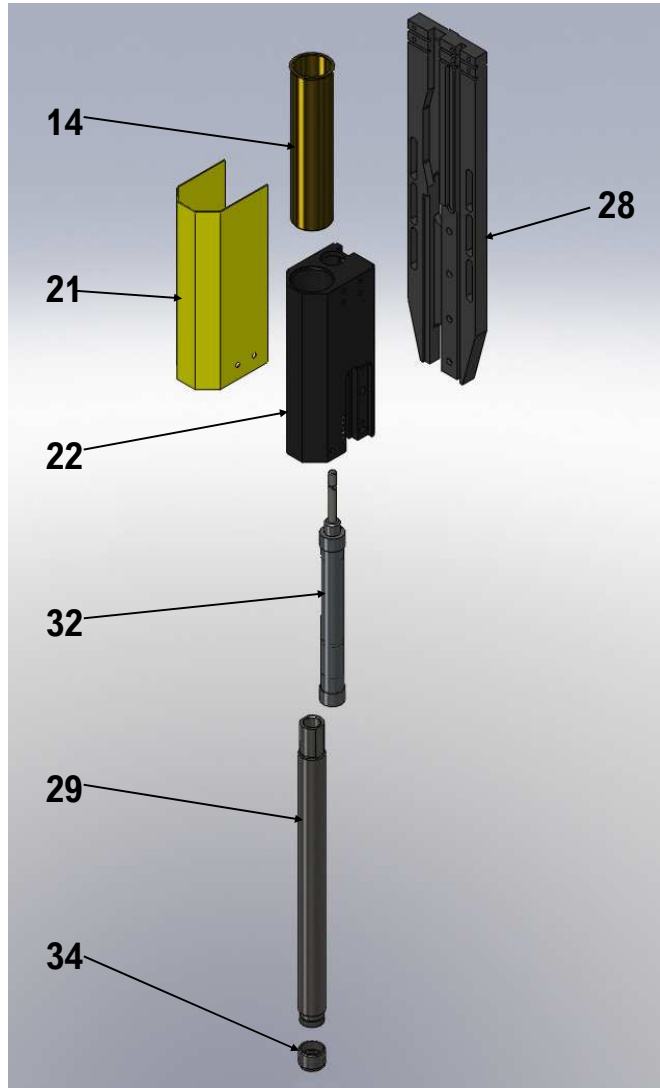
A COMPLETE ASSEMBLY IS AVAILABLE UNDER PART NUMBER 71-105-200

SIK100 - LONG STROKE VERSION

The SIK100 has an extended travel of 100mm compared to the standard SIK2 which has a travel of 50mm. This is useful when welding into the bottom of a box, etc.

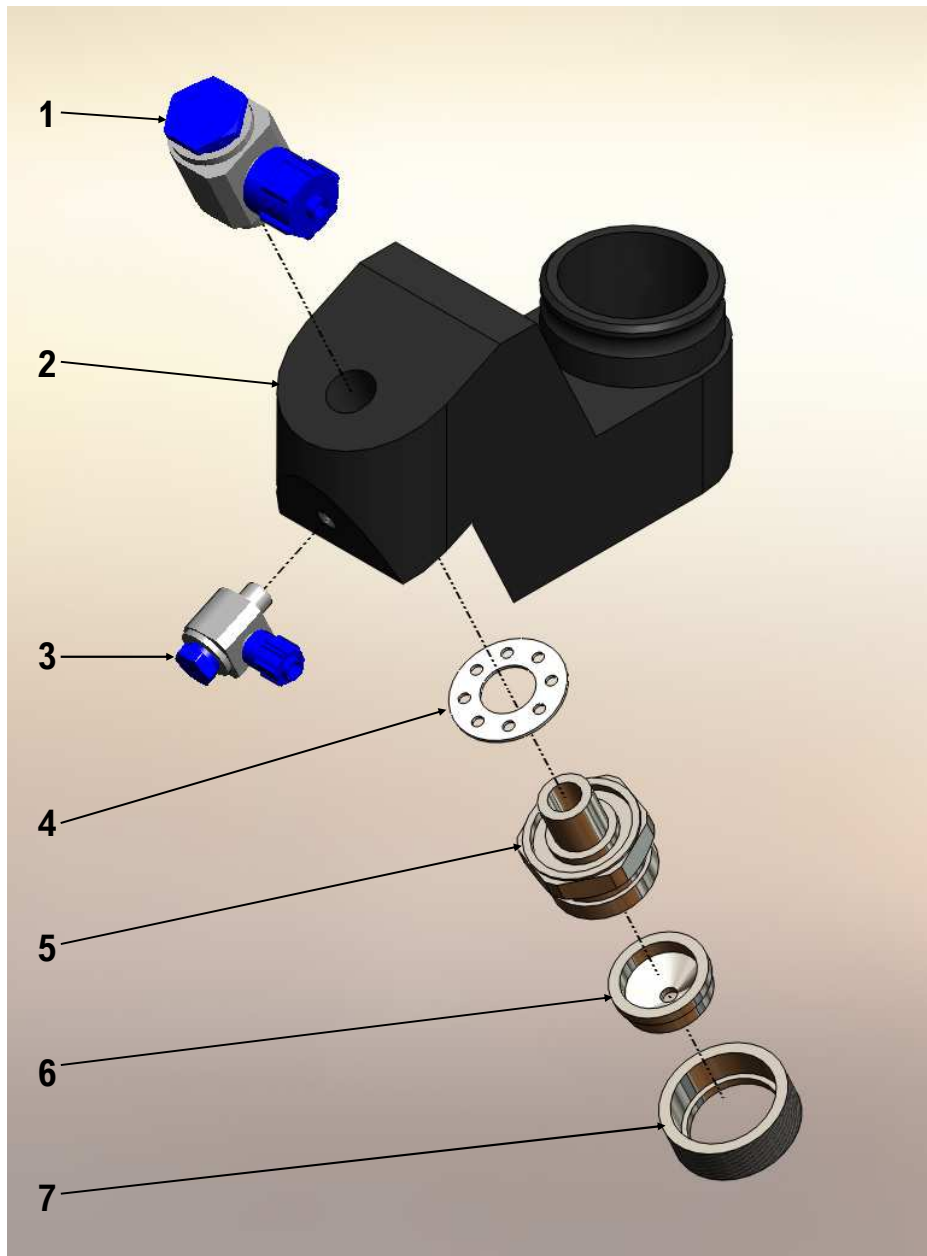
A complete assembly is available under part number 99-100-159

The parts list for the SIK100 is the same as the SIK2, apart from the following items:



ITEM No	QTY	PART No	DESCRIPTION
14	1	71-105-079	BEARING TUBE
21	1	71-105-082	HEAD COVER
22	1	71-105-078	MAIN BODY
28	1	71-105-081	BACKPLATE
29	1	71-105-080	WELD SHAFT
32	1	71-105-083	DRIVE CYLINDER
34	1	71-105-024	COLLET NUT

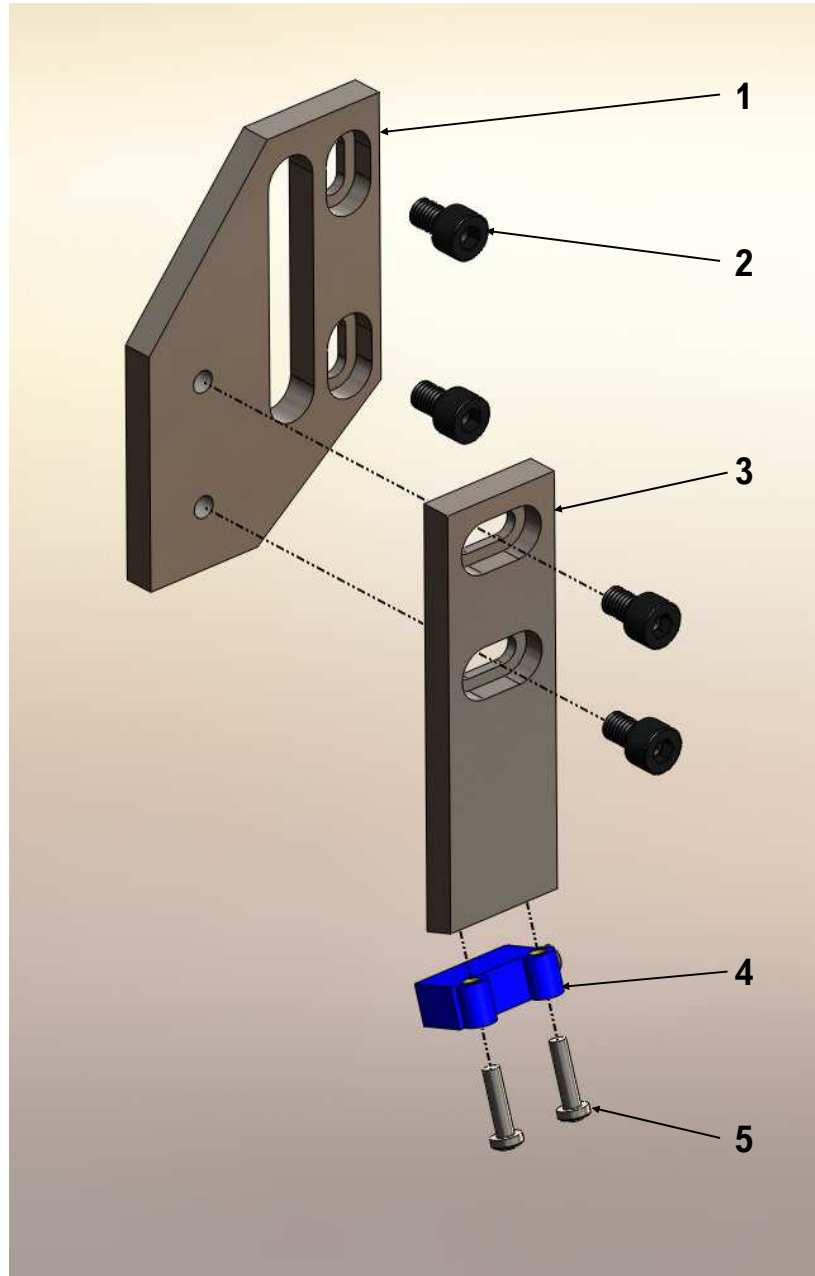
SPRAY HEAD EXPLOSION & PARTS LIST (OPTIONAL)



A COMPLETE ASSEMBLY IS AVAILABLE UNDER PART NUMBER 71-105-093

ITEM No	QTY	PART No	DESCRIPTION
1	1	71-200-019	1/8 BSP ELBOW
2	1	71-105-092	SPRAY HEAD BODY
3	1	71-200-239	M5 ELBOW
4	1	75-100-045	GASKET
5	1	75-100-046	FLIUD CAP
6	1	75-100-047	AIR CAP
7	1	75-100-053	RETAINER RING

STUD SENSOR EXPLOSION & PARTS LIST (OPTIONAL)



A COMPLETE ASSEMBLY IS AVAILABLE UNDER PART NUMBER 71-105-100

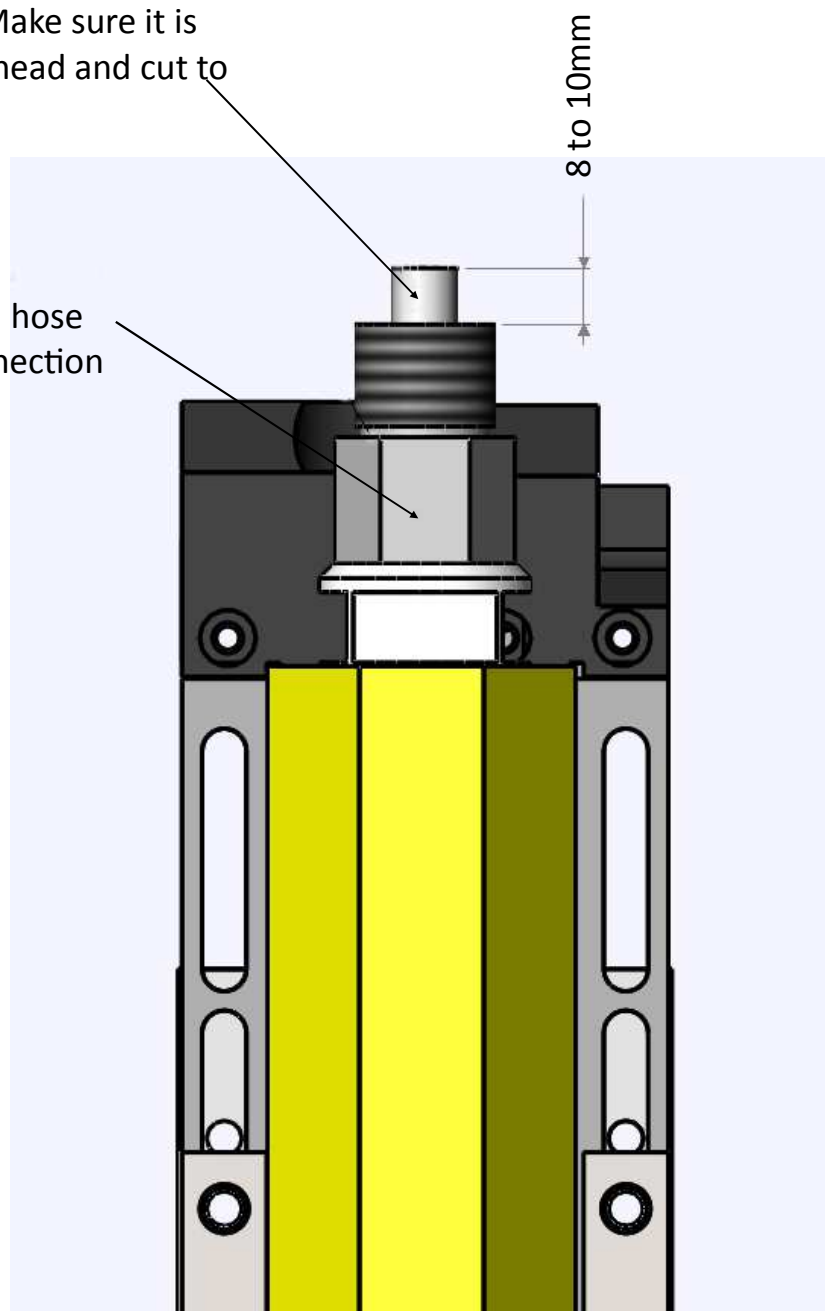
ITEM No	QTY	PART No	DESCRIPTION
1	1	71-105-089	MOUNTING PLATE - A
2	4	Z100-05-008	M5 x 8 LONG SKT HD SCREW
3	1	71-105-090	MOUNTING PLATE - B
4	1	75-101-786	STUD SENSOR
5	2	Z200-03-012	M3 x 12 LONG POZIDRIVE SCREW

STUD GATE (OPTIONAL)

The stud gate is used to prevent damage to the stud's pip during feeding. Instead of the stud being fed directly into the weld head it is first fed into the gate and then from here into the head. Without the stud gate the speed at which the stud is blown over into the head has to be restricted, otherwise the pip is damaged when the new stud lands on the one just welded. This can result in slow feed times to ensure there is no damage, or poor welds if the speed is set too fast. With the stud gate the blow over speed does not need to be restricted allowing faster feed times without compromising weld quality.

2) Fit the correct size of feed pipe for stud being used. Make sure it is pushed fully into the head and cut to the length shown

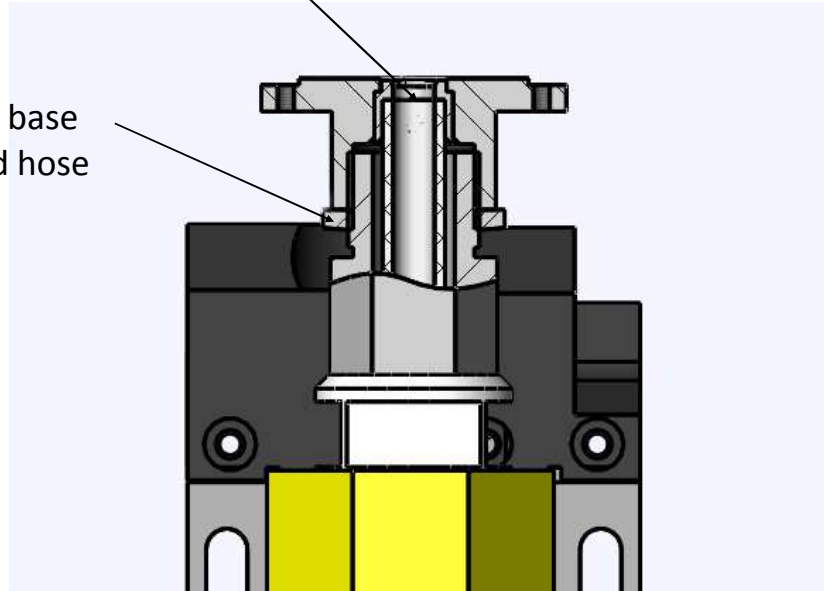
1) Remove the feed hose clamp and fit the connection tube



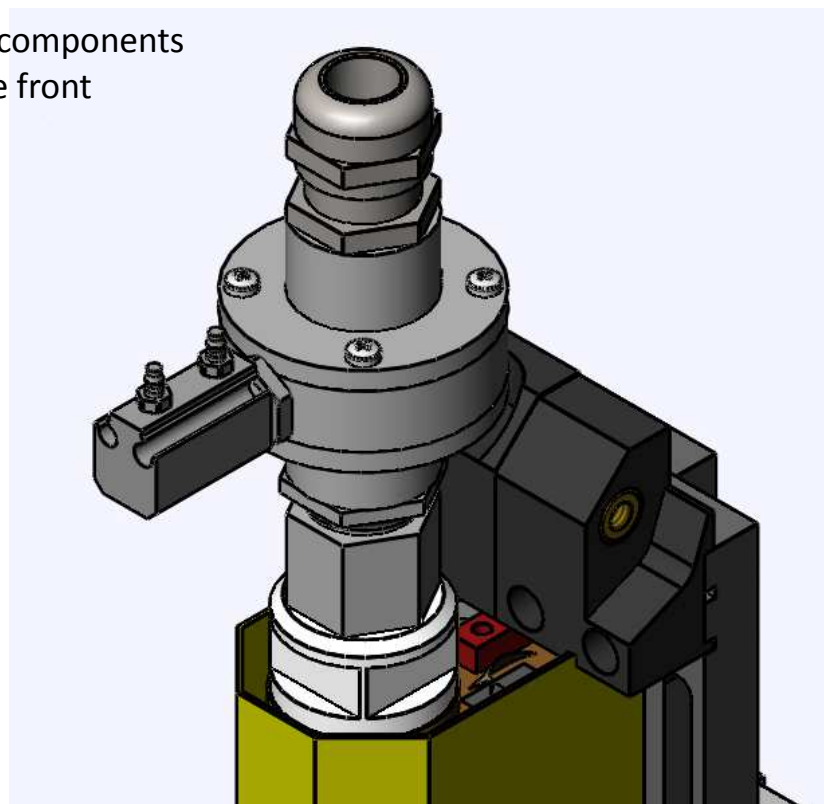
STUD GATE

3) Screw the housing base on-
to the connection tube until the
feed pipe is fully home

4) Lock the housing base
in place using the feed hose
clamp locknut

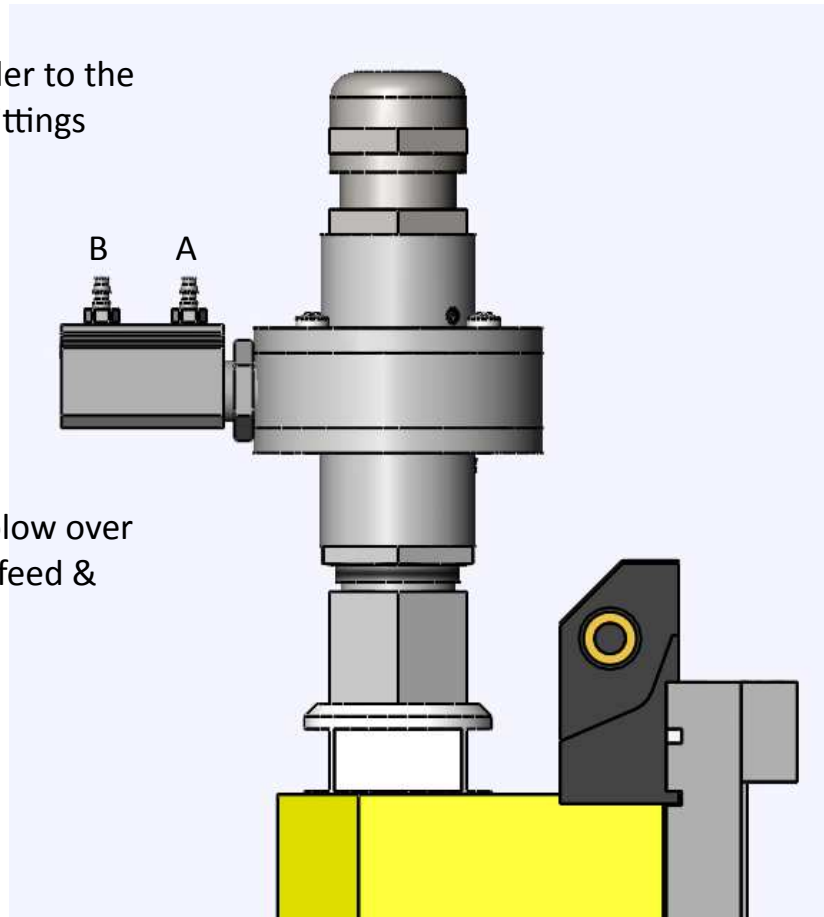


5) Fit the remaining components
with the cylinder to the front



STUD GATE

6) Connect the cylinder to the head solenoid using T fittings

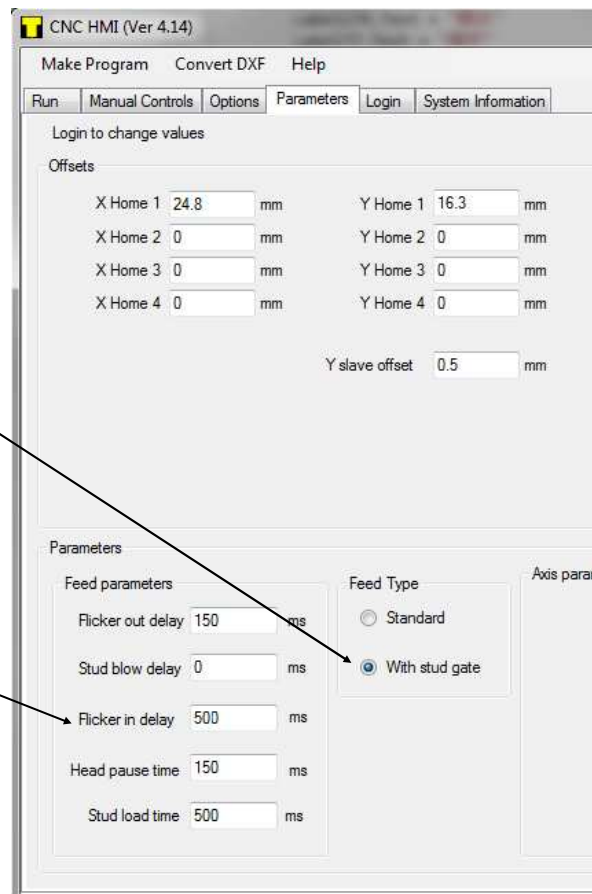


7) Adjust the stud blow over speed—see the Bowl feed & escapement manual

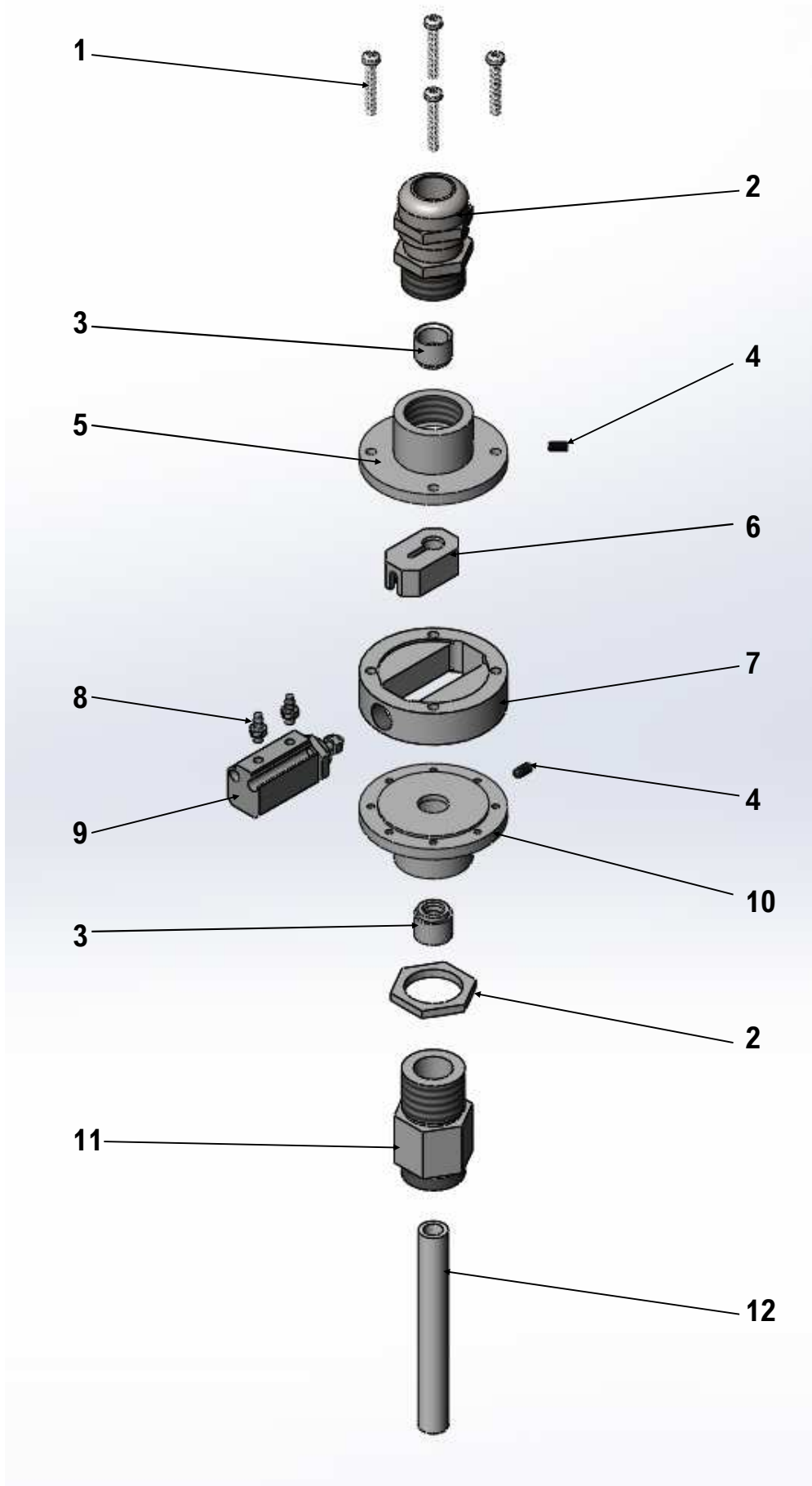
On CNC machines first logon then go to the parameters screen and make the following adjustments:

8) Change the feed type from **Standard** to **With stud gate**

9) Increase the **flicker in delay** to at least 500ms, further increase the time if the stud is getting trapped behind the flicker



STUD GATE EXPLOSION



STUD GATE PARTS LIST

ITEM No	QTY	PART No	DESCRIPTION
1	4	Z200-03-020	M3 x 20 POZIDRIVE PAN HD SCREW
2	1	71-103-081	FEED HOSE CLAMP
3	2	71-105-222	ADAPTOR SLEEVE—DIA 3 x 5 PIN
OR	1	71-105-223	ADAPTOR SLEEVE—M3
OR	2	71-105-224	ADAPTOR SLEEVE—M4
OR	2	71-105-225	ADAPTOR SLEEVE—M5
OR	2	71-105-226	ADAPTOR SLEEVE—M6
4	2	Z400-03-006	M3 x 6 HEX SKT GRUB SCREW
5	1	71-105-211	HOUSING TOP
6	1	71-105-212	STUD GATE—DIA 3 x 5 PIN
OR	1	71-105-213	STUD GATE—M3
OR	1	71-105-214	STUD GATE—M4
OR	1	71-105-215	STUD GATE—M5
OR	1	71-105-216	STUD GATE—M6
OR	1	71-105-218	STUD GATE—M8
7	1	71-105-220	HOUSING CENTRE
8	2	PFS-B04-M3M	DIA 4 x M3 STRAIGHT BARB FITTING
9	1	PCS-006-010-001	DOUBLE ACTING PIN CYLINDER
10	1	71-105-210	HOUSING BASE
11	1	71-105-209	CONNECTION TUBE
12	1	SEE PAGE 35	STUD SUPPLY TUBE
13	0.2m	71-200-043	DIA 6 PNEUMATIC TUBE (NOT SHOWN)
14	1m	71-200-194	DIA 4 PNEUMATIC TUBE (NOT SHOWN)
15	2	PFT-P06	DIA 6 UNION TEE (NOT SHOWN)
16	2	PFS-P04-T06	PLUG IN REDUCER (NOT SHOWN)

COMPLETE ASSEMBLIES ARE AVAILABLE UNDER PART NUMBERS:

DIA 3 x 5 PIN 71-105-242, M3 71-105-243, M4 71-105-244, M5 71-105-245
M6 71-105-246, M8 71-105-248

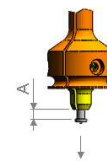
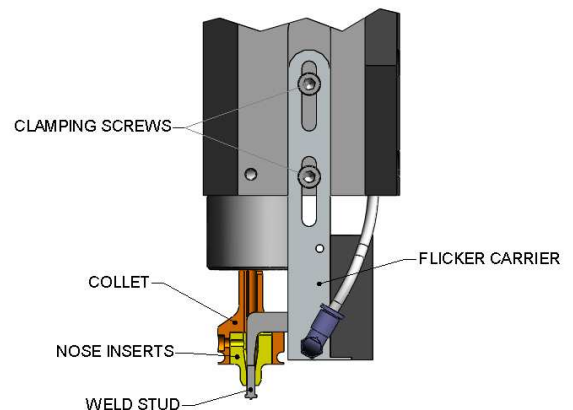
MAKING ADJUSTMENTS

ADJUSTING FOR DIFFERENT STUD LENGTHS

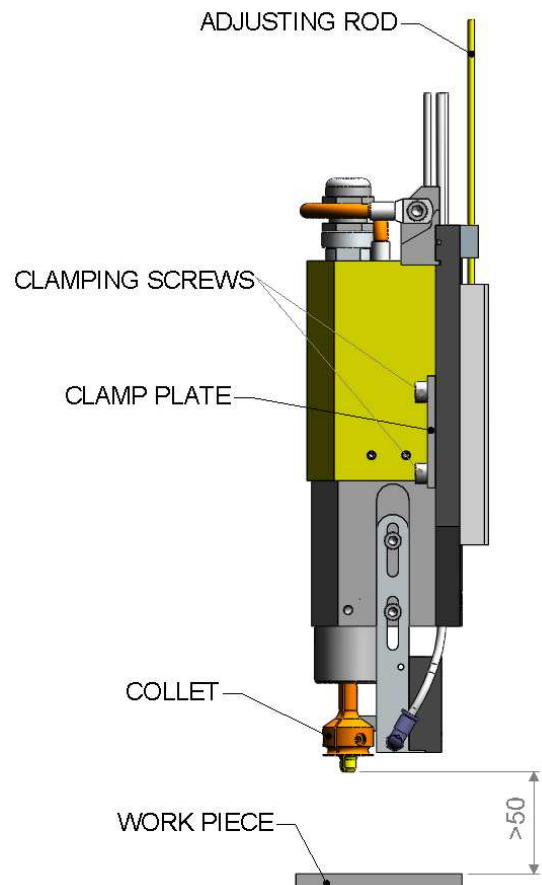
The weld head must be in the up position.
Load a stud into the collet.
Loosen the flicker housing clamp screws.
Move the flicker housing to its top position.
Press the stud fully up into the collet, so that the stud flange is in contact with the nose inserts.
Push the flicker housing down until the stud sticks out of the nose inserts by dimension A.
Lock the flicker housing clamp screws.

Values for dimension A:

Stud Length	Dimension A
6 to 8mm	1 to 2mm
10 to 30mm	1 to 4mm



ADJUSTING ROD



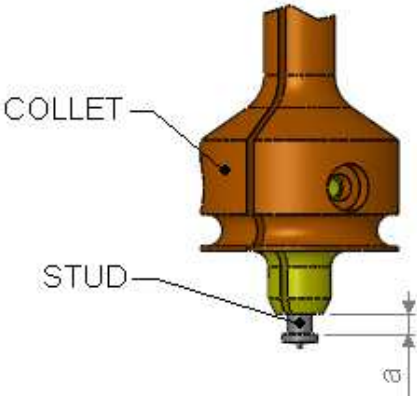
ADJUSTING HEAD HEIGHT

The stroke of the weld head is limited to approx 50mm.
Special heads with strokes up to 300mm are available.
The complete head is moved to set up the correct height.
Loosen the clamping screws.
Turn the adjusting rod clockwise to increase the distance between collet & workpiece.
Turn the adjusting rod anti clockwise to decrease the distance between collet & workpiece.
Once the head is at the correct height, tighten the clamping screws.

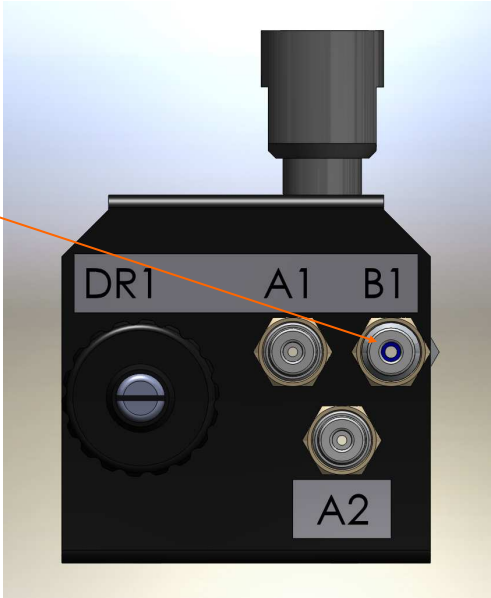
MAKING ADJUSTMENTS

ADJUSTING HEAD HEIGHT (cont.)

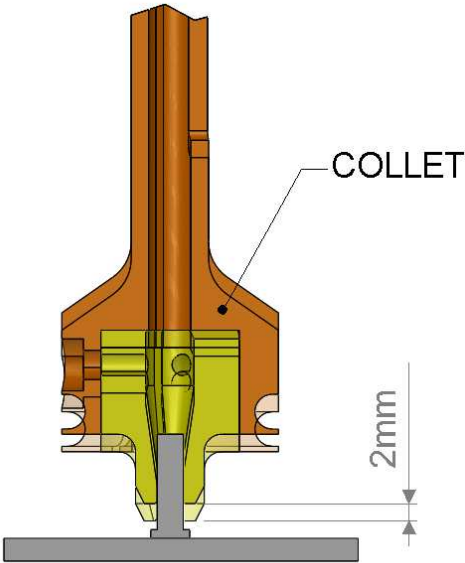
Fasten the workpiece into the jig.
Feed a stud into the collet.
Check the distance 'a' as shown on page 19



Turn off the air pressure, or pull tube B1 out of the pneumatic connection. This connection has a non-return valve.



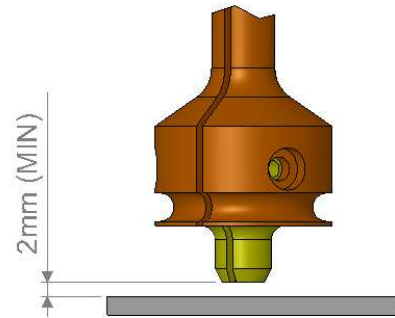
Drop the collet down, until the stud contacts the workpiece.
The head height is correct if the stud is pushed back into the collet by approx. 2mm before the collet reaches the limit of its travel.



MAKING ADJUSTMENTS

ADJUSTING HEAD HEIGHT (cont.)

For very short studs (6 - 8mm), adjust the welding head so that between the nose inserts and the workpiece is a gap of 2mm.



Note: It is very important that without a stud in the collet that the collet does not touch the workpiece. And that with a stud in place that the stud flange is not pushed into contact with the collet. Both of these situations will result in very high collet wear.

PLUNGE SPEED

To have good welding results, the stud must touch the workpiece and plunge into the molten pool at a precise speed.

This speed depends on the material being welded and the tip dimensions of the stud.

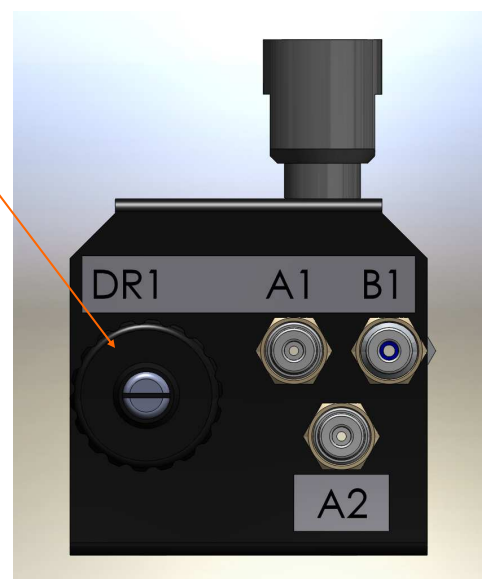
The best results are achieved after test welding with different settings.

ADJUSTING THE PLUNGE SPEED

To adjust the plunge speed, set the valve DR1 on the pneumatic connection bracket.

Actual speeds are shown below:

DR1 scale	Plunge speed (m/s)
1.5	1.0
2.2	0.9
2.5	0.8
3.0	0.7
3.4	0.6
3.8	0.5



CHANGING COLLETS

CHANGING STUD DIAMETER

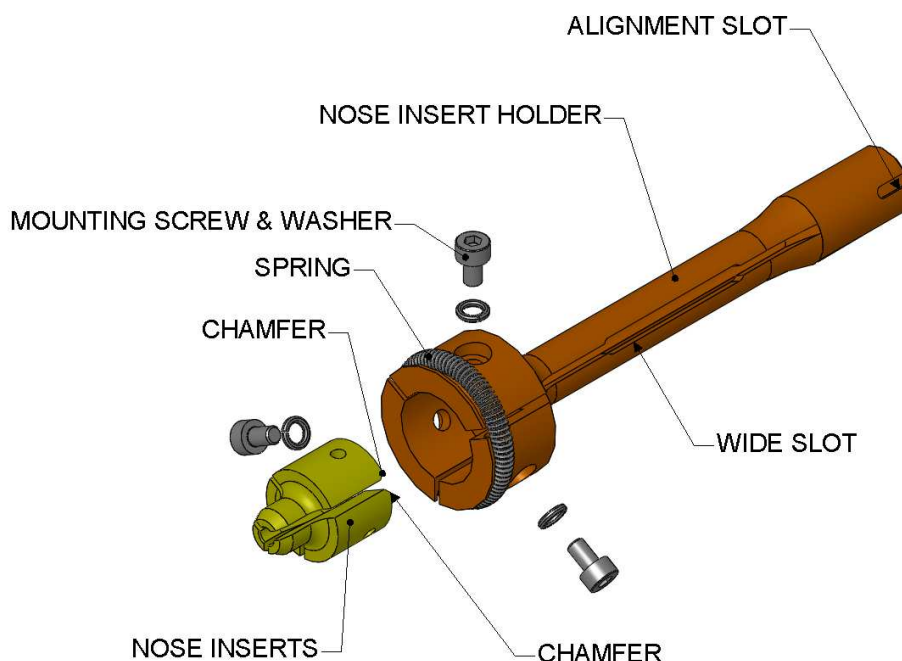
To change the stud diameter the following components have to be changed:

- 1 Collet holder (see page 33)
- 2 Flicker if needed (see page 37)
- 3 Feed tube if needed (see page 35)

COLLET

The standard collet is made up of three parts:

- 1: Holder
- 2: Nose inserts
- 3: Spring



CHANGING THE NOSE INSERTS

Note: the nose inserts are made from one piece.

They are sup-

plied together in a set. Do not mix single contact pieces from different sets. The nose inserts are all slightly different, when fitting them ensure that the two pieces with a chamfer are placed together and that these also align with the wide slot in the nose insert holder.

Fit the nose inserts into place and loosely fit the screws and lockwashers.

Push a stud into the nose inserts and press the flange against them.

Tighten the mounting screws.

The nose inserts are now centred.

Note: new heads and systems are supplied with one piece close centre Collets as standard.

CHANGING COLLETS

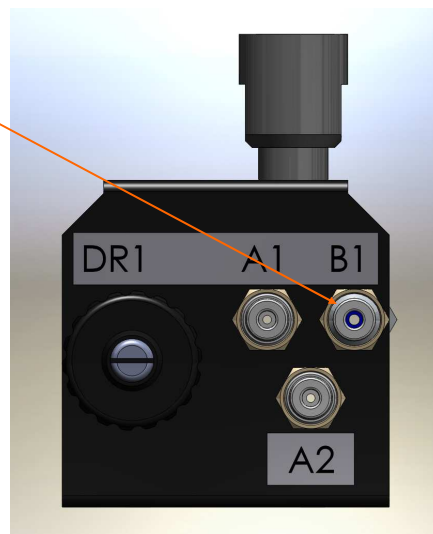
REMOVING THE COLLET

Switch off the air supply, or remove tube B1.

Push the guide shaft down.

Loosen the clamping nut with an open spanner.

Lightly tap the collet holder with the spanner until the holder comes free.



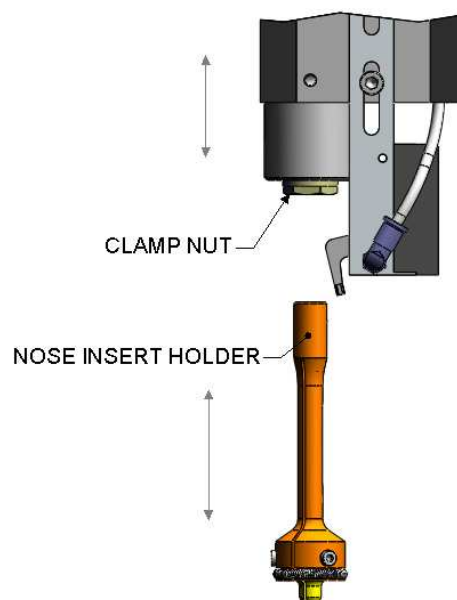
FITTING THE COLLET

Note that the wide slot in the collet holder is oriented towards the flicker.

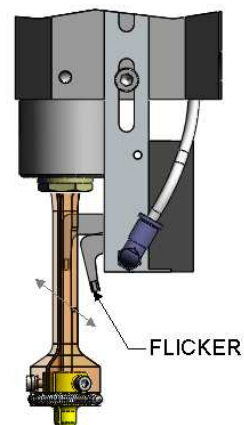
Push the collet holder into the guide shaft.

With the flicker out of the way, check that the slot on the collet holder is engaged onto the pin in the guide shaft. If it is in position the collet holder should not rotate.

Tighten the clamping nut.



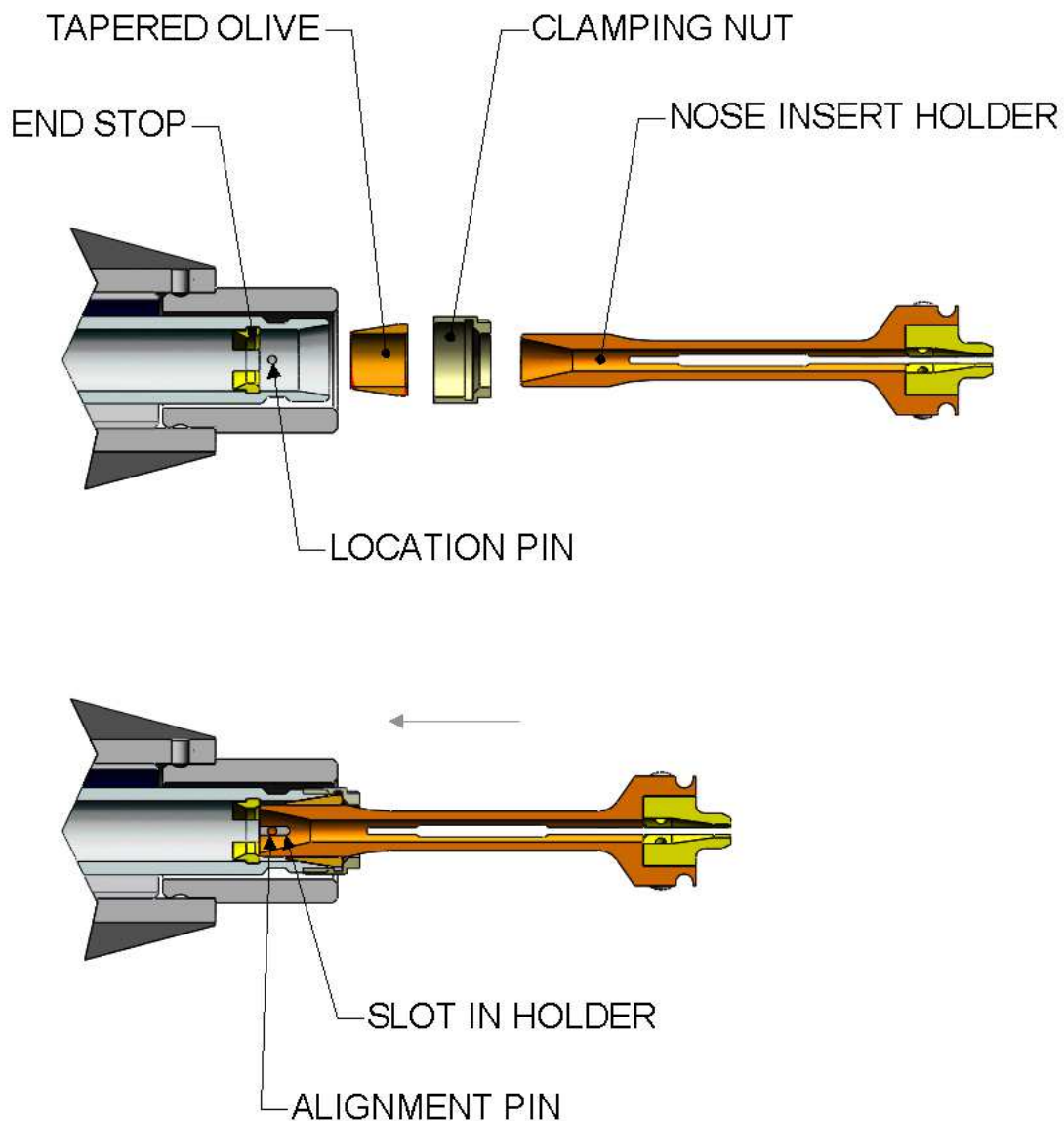
Move the flicker by hand, if the collet holder is fitted correctly, the flicker should move easily in and out of the slit in the collet.



CHANGING COLLETS

FITTING THE COLLET (cont.)

The collet is held into the guide shaft with a tapered olive, this makes sure that there is a good electrical and mechanical contact between the collet and guide shaft.



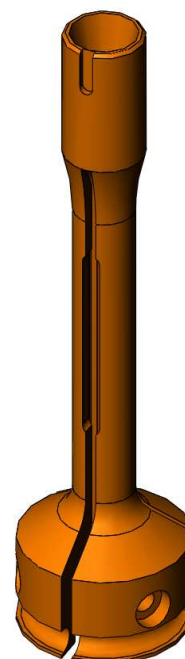
Push the collet into the guide shaft until it reaches the end stop.
Ensure that the slot in the collet holder, engages with the alignment pin in the guide shaft.
Tighten the collet holder in place with the clamping nut.

COLLET TYPES

COLLET PART No's

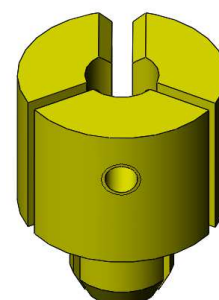
Collet holder - Note: This type of collet has generally been replaced by the close centre one piece type. Use this type of collet in conjunction with long nose inserts if the stud is not being welded vertically and the stud is $\geq 25\text{mm}$ long.

Stud \varnothing mm (inch)	Part No
M3	40-13077
M4 (6-32)	40-13085
M5 (3/16") (10-32)	40-13107
M6 (8-32) (1/4")	40-13166
M8	40-13174



Nose inserts - Note: these have generally been replaced by the close centre one piece collet. The short versions are for stud lengths 6mm to 20mm long, the long versions are for studs $\geq 25\text{mm}$ long.

Stud \varnothing	Part No
3 Short	40-14928
3 Long	40-14901
4 (8-32") Short	40-13522
4 (8-32") Long	40-15312
5 (3/16") Short	40-13409
5 (3/16") Long	40-15320
6 Short	40-15037
6 Long	40-15339
8 Short	40-15053
8 Long	40-15363



COLLET TYPES

COLLET PART No's

The collet spring and nose insert screws are available under part number 40-14111



Close centre one piece collet - Note: this is the standard type of collet fitted to all new weld heads and auto systems. Use a nose insert holder in conjunction with long nose inserts instead if the stud is not being welded vertically and the stud is $\geq 25\text{mm}$ long.

Stud \varnothing	Part No
3	79-103-203 ¹
4 (8-32")	79-103-204
5 (3/16")	79-103-205
6	79-103-206
7.1	79-103-207
8 (5-18")	79-103-208

¹ For dia 3 studs fit flicker 79-103-261, for all other sizes fit 79-103-262



STUD FEED HOSE

STUD FEED HOSE

The stud feed hose transports the stud into the welding head. The hose is made from a non-abrading polyamide. The tube diameter depends on the stud size:

Stud Size	Tube OD (mm)	Tube ID (mm)	Part No (per m)
M3 Flangeless	6	4	79-103-302
3mm Pin	6.35	4.8	79-103-312
M3	8	5	79-103-303
M4 Flangeless	8	5.5	79-103-313
M4	9.5	6	79-103-304
M5	10	7	79-103-305
M6	10	8	79-103-306
7.1mm & M8	12	10	79-103-308

TUBE REPLACEMENT

The stud supply tube goes straight through the guide shaft and is clamped at the top, by a hose clamp.

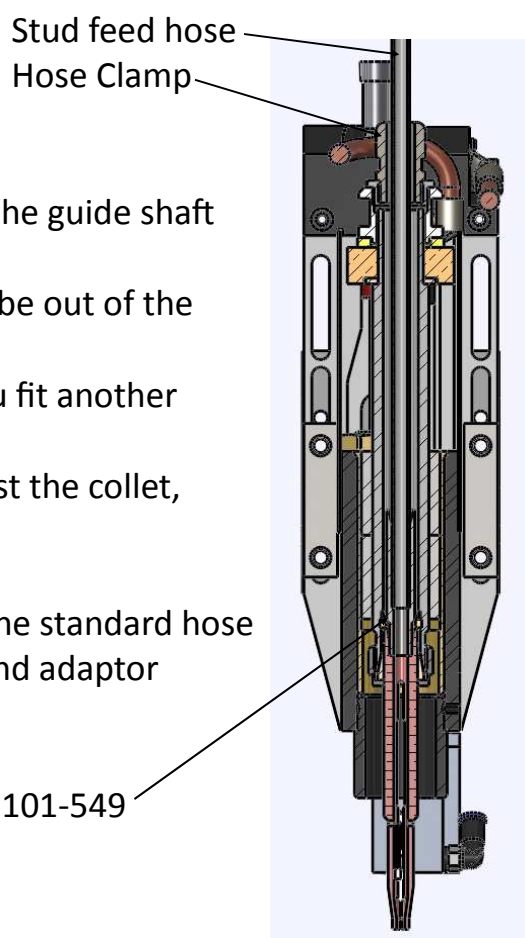
Loosen the clamp nut and pull the supply tube out of the guide shaft.

Make sure that a collet is in place before you fit another supply tube.

Push the new tube down until it stops against the collet, re-tighten the clamp nut.

For hose diameters less than 8mm replace the standard hose clamp 71-103-081 with clamp 73-100-450 and adaptor 71-105-269.

When feeding 3mm pins fit Pipe reducer 75-101-549



CHANGING FLICKERS

CHANGING THE FLICKER

In addition to the standard flicker, special flicker for different applications are available.

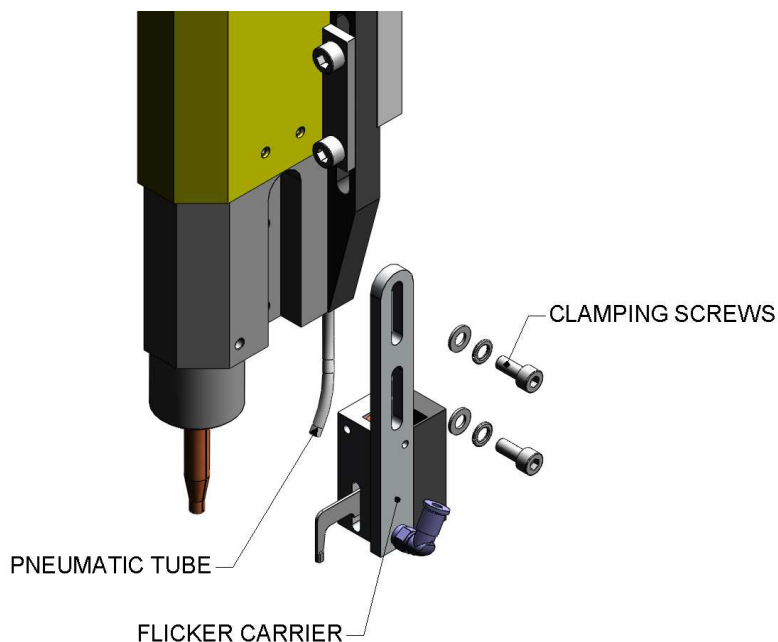
The table on page 35 shows the various types and their uses.

REPLACEMENT

The easiest way to replace the flicker is to remove the flicker carrier.

Remove the clamping screws.

Remove the pneumatic tube: press down on the blue flange of the tube fitting and pull out the pneumatic tube.



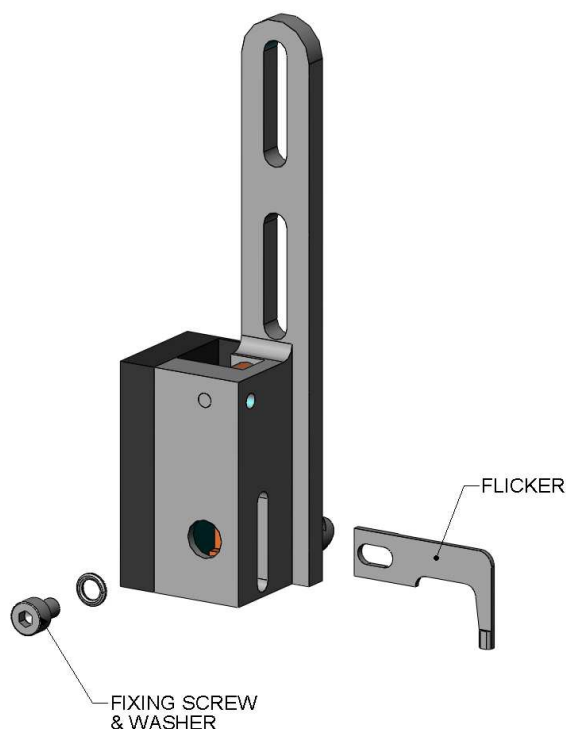
Take the flicker housing, remove the fixing screw and lockwasher.

Pull the flicker out of the housing.

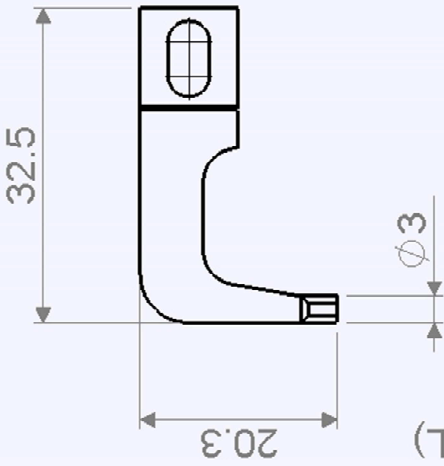
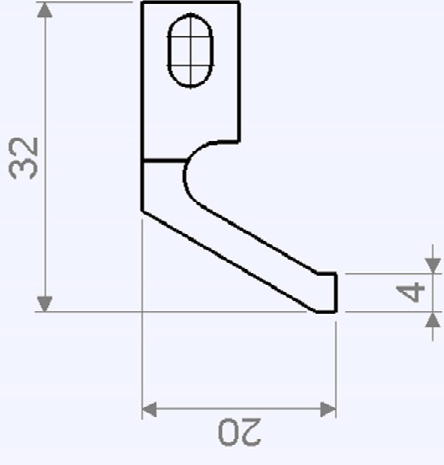
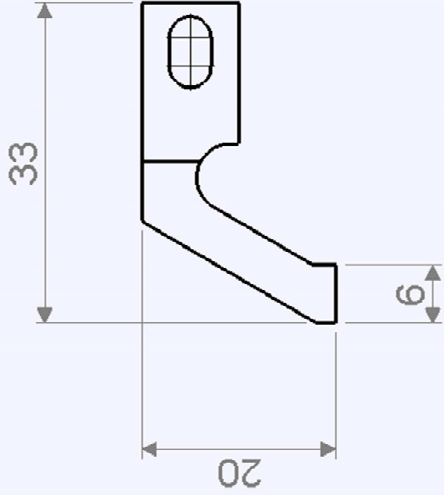
Fit a new flicker in reverse of the above procedure.

Once the flicker housing has been fastened back onto the head, loosen the flicker fixing screw and adjust the flicker in or out, until it is central in the collet holder.

Note: To prevent corrosion in humid environments periodically spray the flicker with WD40 or similar protective oil.



FLICKER TYPES

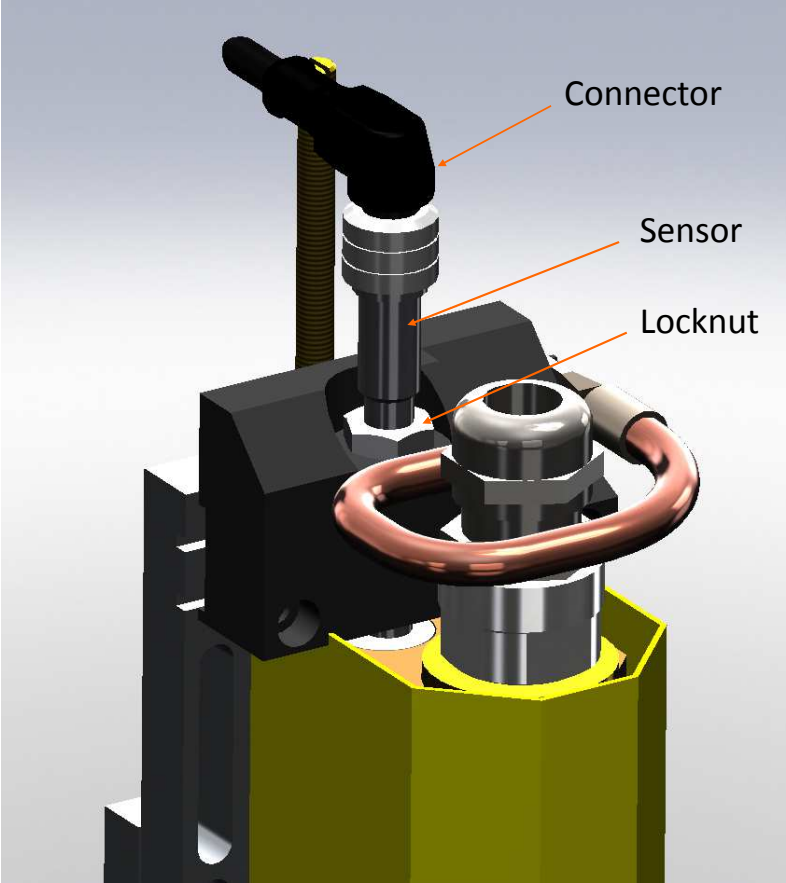
 <p>79-103-261 UNIVERSAL - FITTED AS STANDARD TO SIK2</p>	 <p>79-103-263 SPECIAL FOR M3 FEMALE THREAD STUDS</p>	 <p>79-103-264 SPECIAL FOR M4 & M5 FEMALE THREAD STUDS</p>
<p>NOTE: ONLY USE THE SPECIAL TYPES IF THE STANDARD FLICKER IS CAUSING FEED PROBLEMS</p>		

HEAD UP SENSOR

The weld head has a sensor to detect when the head is in the up position. There are 2 different types of sensor. New heads have an inductive proximity switch, older heads have a mechanical switch.

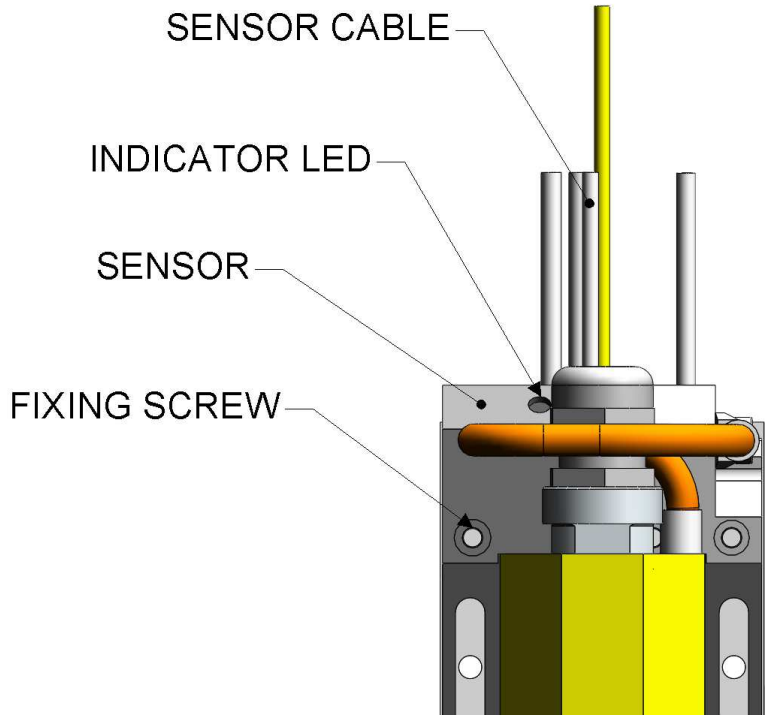
New Type

An LED turns on when the head is up.
To adjust the sensor
unscrew the Connector and
loosen the locknut,
Screw the sensor in if the
LED is not turning on and
screw it out if it is
contacting the weld head.



Old Type

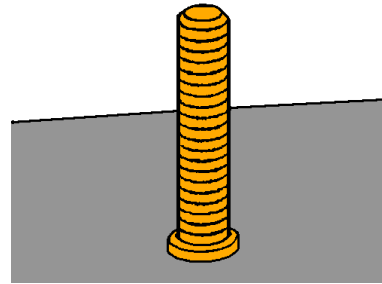
An LED shows the position:
Green = Head up
Red = Not in position.



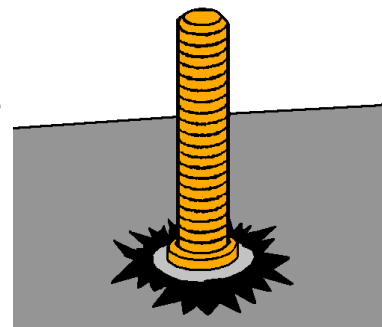
WELD QUALITY

VISUAL ASSESMENT OF WELD QUALITY

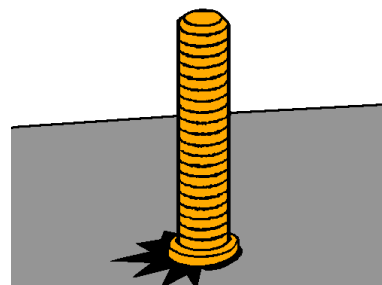
A cold stud weld is noticeable by undercutting of the flange and lack of / minimal formation of spatter. A cold weld is usually caused by too little energy and / or too fast a plunge speed.



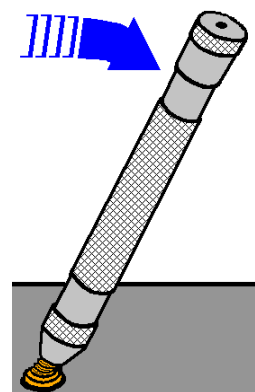
A hot stud weld is noticeable by excessive spatter formation and partial melting of the flange. A hot weld is usually by too much energy and / or too slow a plunge speed.



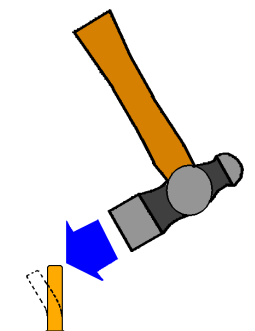
A one sided stud weld (arc blow) is usually caused by incorrect earthing of the work piece. This may be corrected by placing the welding earths opposite each other across the area where the weld is to occur.



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 BS EN ISO 14555:2006.



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



WELD QUALITY

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 standard BS EN ISO 14555:2006 .

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.

TROUBLE SHOOTING

Fault / Error	Cause	Remedy
Sudden decline in weld quality	Worn welding contacts	Check the contacts of the collet & earth clamps. Replace worn out parts
	Welding energy too high or too low	Too much spatter around the weld area: energy too high -decrease the weld voltage
		No spatter around the weld area: energy too low - increase the weld voltage
	Burnt welding cable plug and sockets. Welding cable damaged	Check the weld cables and replace as necessary
	Plunge speed of the weld head too fast or too slow	Check the plunge speed & change the setting of the valve DR1
	Weld head faulty	Check the bearings and guide shaft, replace if necessary
	Dimensions of the stud tip outside of tolerance	Check the dimensions of the stud tip. The size and tolerance must be to EN ISO 13918
	Wrong stud material	Check the material of the stud, it must be suitable for welding
	Wrong workpiece material	Check the material of the sheet, it must be suitable for welding
Workpiece surface contaminated	Check the surface of the sheet, it must be clean & free from oil or grease	

TROUBLE SHOOTING

Fault / Error	Cause	Remedy
Studs show material ejected to one side only	Arc blow effect. Earthing contacts not applied evenly	Apply earthing contacts symmetrically to the weld position
Burn marks on stud	Collet contact worn	Replace the contact inserts
No stud in the collet	Stud blockage in the stud feeder	Check the vibrator bowl and stud feeder
	Feed tube	Check that the feed tube is fully inserted into the head. If the feed hose is kinked, replace it
	Stud has not reached the collet	Check all the points through which the stud is guided, from the stud feeder down to the collet. Check the air pressure and air flow
	Several studs in the feed tube or the collet	Insufficient freedom of motion of the flicker. Remove the studs from the feed tube or collet. Check that the flicker is free to move, also check the air pulse for the flicker and the control signal for the stud separator
	Worn out collet	Replace the collet

EC DECLARATION OF CONFORMITY

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FAX : +44 (0)1924 430059**

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.

**DESCRIPTION OF MACHINE : SIK 2H Automatic CD weld head
PART NUMBER : 99-100-144**

Applicable EC directives and corresponding standards:

- Low voltage directive 2006/95/EC:
EN60204-1 Safety of machinery - Electrical equipment of machines.
- EMC directive 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**

