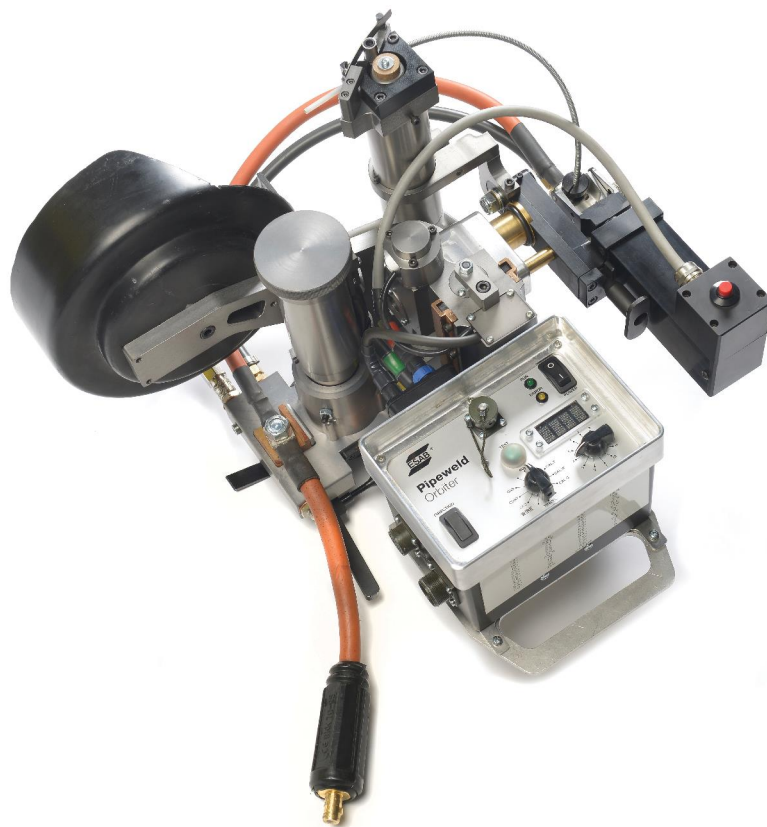




Pipeweld Orbiter



Instruction manual



EU DECLARATION OF CONFORMITY

According to
The Machinery Directive 2006/42/EU, entering into force 29 December 2009
The Low Voltage Directive 2015/35/EU, entering into force
The EMC Directive 2014/30/EU, entering into force 20 April 2016
The RoHS Directive 2011/65/EU, entering into force 2 January 2013

Type of equipment
Orbital welding head

Type designation
Pipeweld Orbiter

Brand name or trademark
ESAB

Manufacturer or his authorised representative established within the EEA

Name, address, and telephone No:

ESAB AB
Lindholmsallén 9, Box 8004, SE-402 77 Göteborg, Sweden
Phone: +46 31 50 90 00, www.esab.com

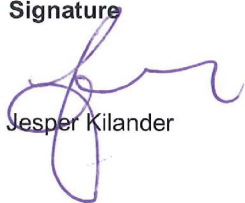
The following harmonised standard in force within the EEA has been used in the design:

| | |
|------------------|---|
| EN 12100:2010, | Safety of machinery - General principles for design. Risk assessment and risk reduction |
| EN 60974-5:2013 | Arc welding equipment. Part 5: Wire feeders |
| EN 60974-10:2014 | Arc welding equipment. Part 10: Electromagnetic compatibility (EMC) requirements |

Additional Information:

Restrictive use, Class A equipment, intended for use in location other than residential

By signing this document, the undersigned declares as manufacturer, or the manufacturer's authorised representative established within the EEA, that the equipment in question complies with the safety requirements stated above.

| Date | Signature | Position |
|------------|---|---------------------|
| Gothenburg |  | |
| 2018-10-30 | Jesper Kilander | Director Automation |

CE 2018

| | | |
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1 SAFETY

1.1 Meaning of symbols

As used throughout this manual: Means Attention! Be Alert!

**DANGER!**

Means immediate hazards which, if not avoided, will result in immediate, serious personal injury or loss of life.

**WARNING!**

Means potential hazards which could result in personal injury or loss of life.

**CAUTION!**

Means hazards which could result in minor personal injury.

**WARNING!**

Before use, read and understand the instruction manual and follow all labels, employer's safety practices and Safety Data Sheets (SDSs).

**NOTE!**

For product operation instructions please refer to the supplied USB memory stick.

1.2 Safety precautions

Users of ESAB equipment have the ultimate responsibility for ensuring that anyone who works on or near the equipment observes all the relevant safety precautions. Safety precautions must meet the requirements that apply to this type of equipment. The following recommendations should be observed in addition to the standard regulations that apply to the workplace.

All work must be carried out by trained personnel well-acquainted with the operation of the equipment. Incorrect operation of the equipment may lead to hazardous situations which can result in injury to the operator and damage to the equipment.

1. Anyone who uses the equipment must be familiar with:
 - its operation
 - location of emergency stops
 - its function
 - relevant safety precautions
 - welding and cutting or other applicable operation of the equipment
2. The operator must ensure that:
 - no unauthorised person is stationed within the working area of the equipment when it is started up
 - no-one is unprotected when the arc is struck or work is started with the equipment
3. The workplace must:
 - be suitable for the purpose
 - be free from drafts

4. Personal safety equipment:
 - Always wear recommended personal safety equipment, such as safety glasses, flame-proof clothing, safety gloves
 - Do not wear loose-fitting items, such as scarves, bracelets, rings, etc., which could become trapped or cause burns
5. General precautions:
 - Make sure the return cable is connected securely
 - Work on high voltage equipment **may only be carried out by a qualified electrician**
 - Appropriate fire extinguishing equipment must be clearly marked and close at hand
 - Lubrication and maintenance must **not** be carried out on the equipment during operation

**WARNING!**

Arc welding and cutting can be injurious to yourself and others. Take precautions when welding and cutting.

**ELECTRIC SHOCK - Can kill**

- Install and ground the unit in accordance with instruction manual.
- Do not touch live electrical parts or electrodes with bare skin, wet gloves or wet clothing.
- Insulate yourself from work and ground.
- Ensure your working position is safe

**ELECTRIC AND MAGNETIC FIELDS - Can be dangerous to health**

- Welders having pacemakers should consult their physician before welding. EMF may interfere with some pacemakers.
- Exposure to EMF may have other health effects which are unknown.
- Welders should use the following procedures to minimize exposure to EMF:
 - Route the electrode and work cables together on the same side of your body. Secure them with tape when possible. Do not place your body between the torch and work cables. Never coil the torch or work cable around your body. Keep welding power source and cables as far away from your body as possible.
 - Connect the work cable to the workpiece as close as possible to the area being welded.

**FUMES AND GASES - Can be dangerous to health**

- Keep your head out of the fumes.
- Use ventilation, extraction at the arc, or both, to take fumes and gases away from your breathing zone and the general area.

**ARC RAYS - Can injure eyes and burn skin**

- Protect your eyes and body. Use the correct welding screen and filter lens and wear protective clothing.
- Protect bystanders with suitable screens or curtains.

**NOISE - Excessive noise can damage hearing**

Protect your ears. Use earmuffs or other hearing protection.

MOVING PARTS - Can cause injuries



- Keep all doors, panels and covers closed and securely in place. Have only qualified people remove covers for maintenance and troubleshooting as necessary. Reinstall panels or covers and close doors when service is finished and before starting engine.



- Stop engine before installing or connecting unit.
- Keep hands, hair, loose clothing and tools away from moving parts.

FIRE HAZARD



- Sparks (spatter) can cause fire. Make sure that there are no inflammable materials nearby.
- Do not use on closed containers.

MALFUNCTION - Call for expert assistance in the event of malfunction.

PROTECT YOURSELF AND OTHERS!



CAUTION!

This product is solely intended for arc welding.



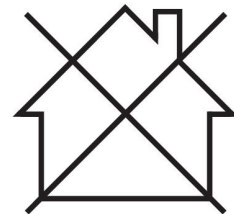
WARNING!

Do not use the power source for thawing frozen pipes.



CAUTION!

Class A equipment is not intended for use in residential locations where the electrical power is provided by the public low-voltage supply system. There may be potential difficulties in ensuring electromagnetic compatibility of class A equipment in those locations, due to conducted as well as radiated disturbances.



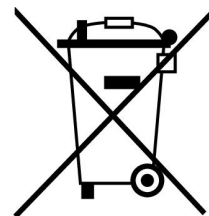
NOTE!

Dispose of electronic equipment at the recycling facility!

In observance of European Directive 2012/19/EC on Waste Electrical and Electronic Equipment and its implementation in accordance with national law, electrical and/or electronic equipment that has reached the end of its life must be disposed of at a recycling facility.

As the person responsible for the equipment, it is your responsibility to obtain information on approved collection stations.

For further information contact the nearest ESAB dealer.



ESAB has an assortment of welding accessories and personal protection equipment for purchase. For ordering information contact your local ESAB dealer or visit us on our website.

2 INTRODUCTION

The Pipeweld Orbiter is a light weight bug for orbital welding of pipe and pipelines allowing the use of 1 system for outside diameters of 200 mm (8 in.) pipe and above without the need to swap the drivetrain. The Pipeweld Orbiter is not sided and the same unit can weld both sides of the joint. The unit has its own wire feed system and torch eliminating the need for secondary feeders, torch hose packs and cables. The only supplies required are control, power and gas resulting in accurate and precise electrode positioning and unrestricted orbital travel.

- The machine is of lightweight construction to ensure ease of handling by the operator.
- Ability to go in either direction and 360° enables one machine to complete a weld joint, welding direction (up or down) is changed via a rocker switch.
- The on board control box enables a wide range of welding parameters to be stored which are programmed and downloaded from hand held programming unit (HHPU).
- The motor, gearboxes, lead screws, and bearings are designed for long life even in heavy duty.
- All of the software for the HHPU with the required data transfer box and controller can be upgraded on-site or in-house via e-mail.
- Two systems can be used on the same band from 16" pipe and above.

For more information, visit esab.com.

3 TECHNICAL DATA

| Pipeweld Orbiter | |
|--|---|
| Pipe diameters | 200 mm (8 in.) to flat plate |
| Wire diameter solid wire | 0.8–1.2 mm (0.031–0.047 in.) |
| Wire diameter flux cored | 1.2 mm (0.047 in.) |
| Max spool diameter | 200 mm (8 in.) |
| Wire spool capacity | 2.7–5.0 kg (5.9–11.02 lb) |
| Travel speed | 0.15–15 m/min (6–59 in./min) |
| Wire speed | 5–15 m/min (196.85–590.55 in./min) |
| Oscillation width pendulum action, max | 26 mm (1.02 in.) |
| Oscillation dwell independent dwells | 0–250 ms |
| Burn back time | 0–5 s |
| Crater fill time | 0–2 s |
| Gas pre-flow | 0–20 s |
| Gas post-flow | 0–20 s |
| Welding torch control | Electronic 50 mm (1.97 in.) vertical, 55 mm (2.17 in.) horizontal |
| Weight (without wire and cables) | 16 kg (35.3 lb) |
| 60% duty cycle | 275 A |
| 100% duty cycle | 248 A |

4 INSTALLATION



CAUTION!

Read and understand the instruction manual before installing or operating.



The installation must be carried out by a professional.



WARNING!

Risk of electric shock! Before installation or maintenance, ensure that the control box is switched off and the positive welding cable is disconnected!

Before placing the device on the pipe band, it is necessary to adjust the device to suit the particular pipe diameters and band widths to be used.

4.1 Adjusting the pipe diameter

The Pipeweld Orbiter has to be adjusted to the pipe diameter before positioning the device on the pipe.

See the table below for pipe diameters to be used in in. and mm and the corresponding setting for each leg. Set the same value (Leg setting) on the setting plate for each leg.

| Ø Pipe in. | Ø Pipe mm | Leg setting | Ø Pipe in. | Ø Pipe mm | Leg setting |
|------------|-----------|-------------|------------|-----------|-------------|
| 12 | 31 | 36 | 40 | 102 | 14 |
| 14 | 36 | 33.5 | 42 | 107 | 13 |
| 16 | 41 | 31 | 44 | 112 | 12.5 |
| 18 | 46 | 28 | 48 | 122 | 11.5 |
| 20 | 51 | 26 | 52 | 132 | 10.5 |
| 22 | 56 | 24 | 56 | 142 | 10 |
| 24 | 61 | 22 | 60 | 152 | 9 |
| 26 | 66 | 20.5 | 64 | 163 | 8.5 |
| 28 | 71 | 19 | 68 | 173 | 8 |
| 30 | 76 | 18 | 72 | 183 | 7.5 |
| 32 | 81 | 17 | 76 | 183 | 7 |
| 34 | 86 | 16 | 80 | 203 | 7 |
| 36 | 91 | 15.5 | Straight | 0 | 0 |
| 38 | 97 | 14.5 | | | |

Adjusting the leg setting



1. Remove spatter guard that covers the legs and setting plates.
2. Loosen both the leg and setting screws (1) & (2).
3. Adjust leg to required scale on setting plate with the screw (2).
4. Tighten the leg and setting screws (1) & (2).
5. Repeat for other leg.

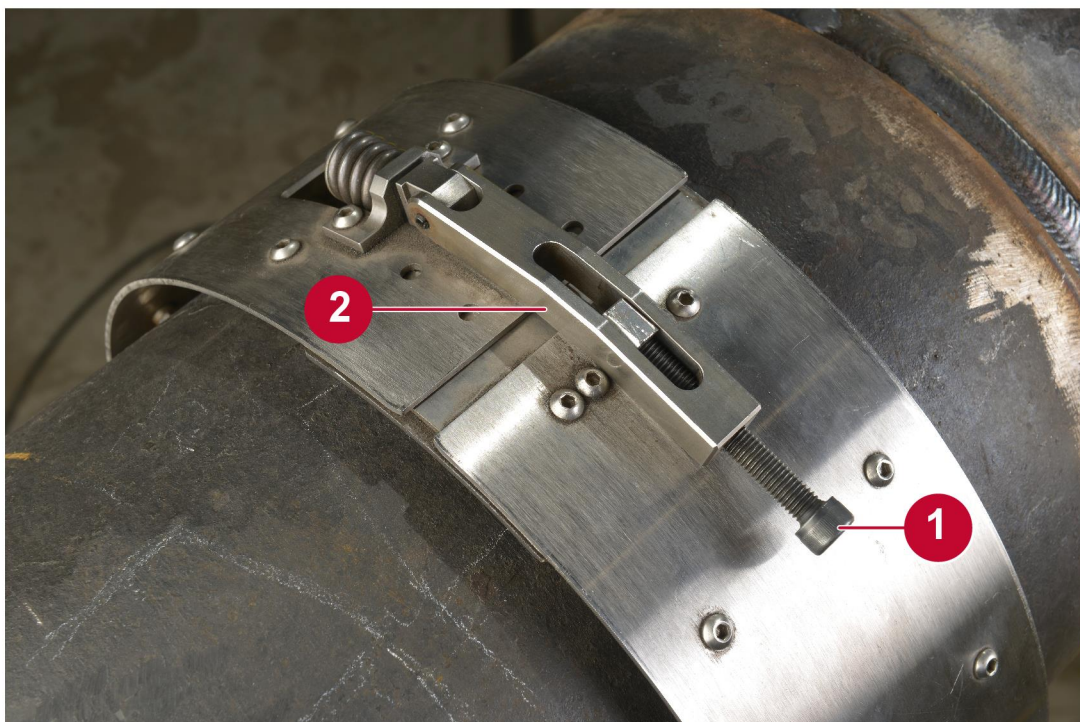
4.2 Installing the travel band



NOTE!

The Pipeweld Orbiter can be moved or slide down on the band when the power is off. To enable the motor brake, the power must be turned on.

The Pipeweld Orbiter moves around the pipe by travelling along a band. Follow these steps to install the travel band.



1. Loosen the tensions screw (1) on the travel band and open the latch (2).
2. Open the band and position it around the pipe, close to the weld joint.



NOTE!

Larger bands may require two people to install it on the pipe.

3. Tighten the band lightly by closing the latch (2).
4. Check the position of the band with the band spacing tool at 0°, 90°, 180° and 270° (12, 3, 6 and 9 o'clock).
5. Once the position is verified, tighten the tension screw (1) enough to compress the spring.

4.3 Adjusting the unit to the band width



CAUTION!

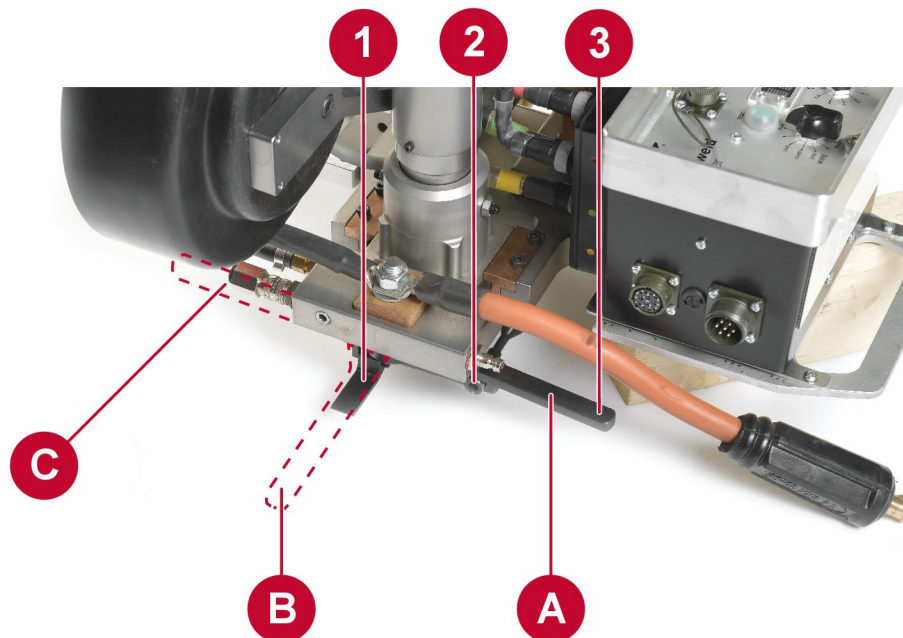
Do not let the Pipeweld Orbiter fall around the band when disengaging the unit.



CAUTION!

Excessive drive wheel pressure can result in damage to wheel.

Various band widths can be accommodated, the most common being 127 mm (5 in.) and 120 mm (4.7 in.). To adjust the bandwidth use the setting screw to increase or decrease the band width and the locking arm to check for adequate tension.



1. Safety lever

3. Locking arm

2. Adjustment screw

- Locking arm in position A: The drive wheel is fully extended allowing the device to be placed on the band.
- Locking arm in position B and travel motor lifted: The Pipeweld Orbiter can be moved around the band.
- Locking arm in position C and travel motor engaged: The Pipeweld Orbiter is locked and ready to weld.

**WARNING!**

The unit is attached to the band only when the lever is in position B or C. Ensure that all 3 wheels are positioned correctly on the band to avoid accidental dismounting.

To remove the Pipeweld Orbiter from the pipe, return the locking arm to position B, raise the safety lever and return the arm to position A.

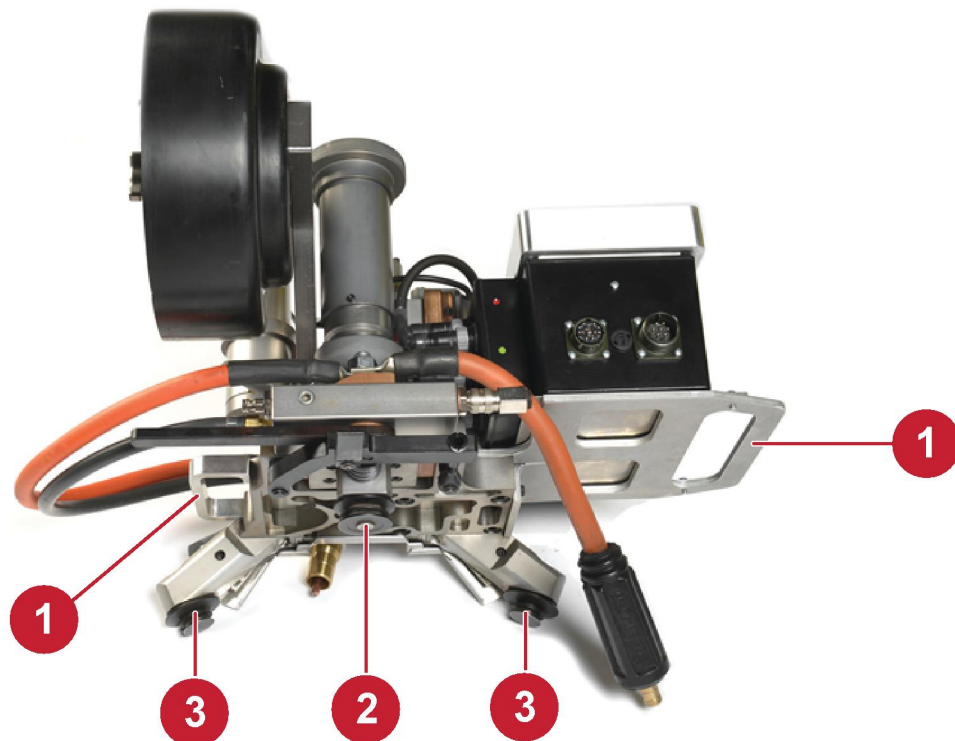
Once the unit is locked on the band, the drive motor can be disengaged from the drive wheel by pulling the end cap of the drive motor. The Pipeweld Orbiter can now be moved freely around the band for rapid repositioning.

4.4 Mounting the unit on the travel band

**WARNING!**

Care must be taken to ensure the unit is installed properly on the band to avoid it falling.

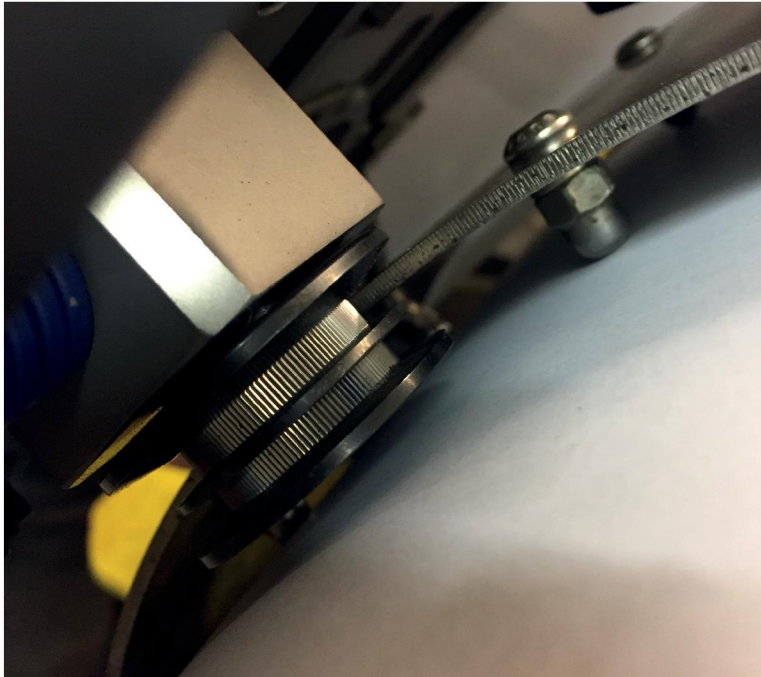
When installing the unit on to the travel band lift the unit using the two handles shown on the illustration below.



1. Handle
2. Drive roll

3. Idle roll

For ease of installation first position the drive roll to the band and follow with the two idle rolls. Once located lock in position with the safety lever shown in the last section.



Both the drive and idle wheels are dual type. When installing the unit onto the band the uppermost wheel must be mounted on the band. The lower wheel is now located on the latch plate allowing seamless travel over the joint in the band.

5 OPERATION

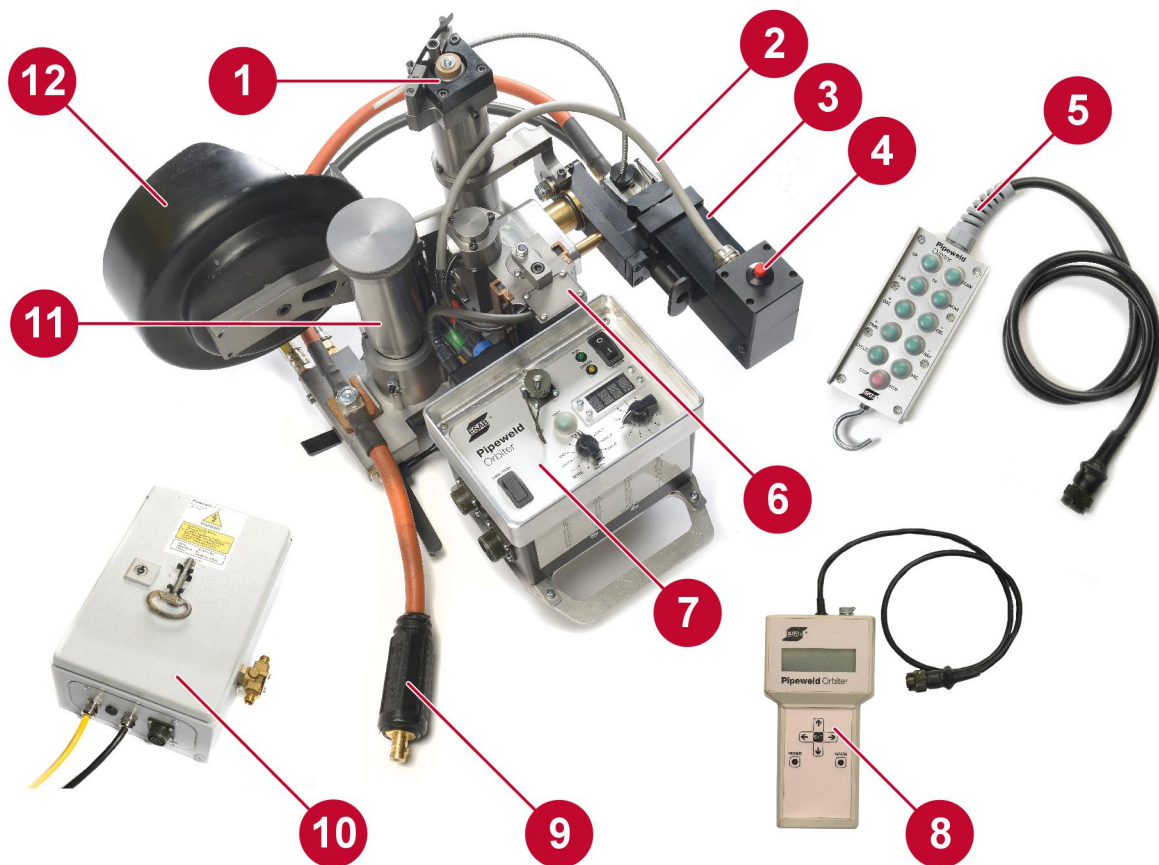
General safety regulations for handling the equipment can be found in the "SAFETY" chapter of this manual. Read it through before you start using the equipment!



WARNING!

Always wear recommended personal safety equipment, such as safety glasses, safety shoes and flame-proof clothing when operating the equipment. The torch, the unit and its handles may become hot during and after use, safety gloves should be worn at all times.

5.1 Overview



- | | |
|---|--------------------------------------|
| 1. Wire feed motor | 7. Control box |
| 2. Torch assembly | 8. Hand help programming unit (HHPU) |
| 3. Stepper motor | 9. Welding cable |
| 4. Button for manual torch adjustment (*) | 10. Power supply/Gas box |
| 5. Remote pendant box | 11. Drive motor |
| 6. Tip control motor | 12. Spool |

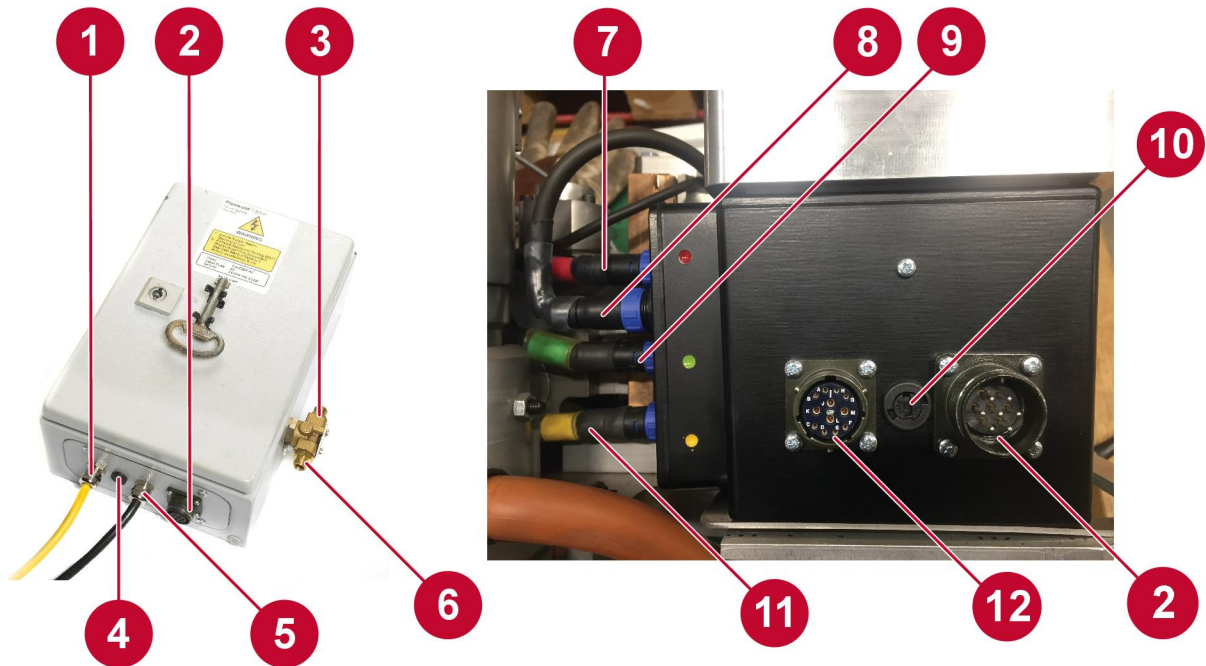
(*) When in run-idle mode, pressing this button enables manual adjustment of the torch position.



WARNING!

Care should be taken to ensure any power source being used is switched to Mig/Mag mode and has contactor control to avoid the unit becoming live when not welding.

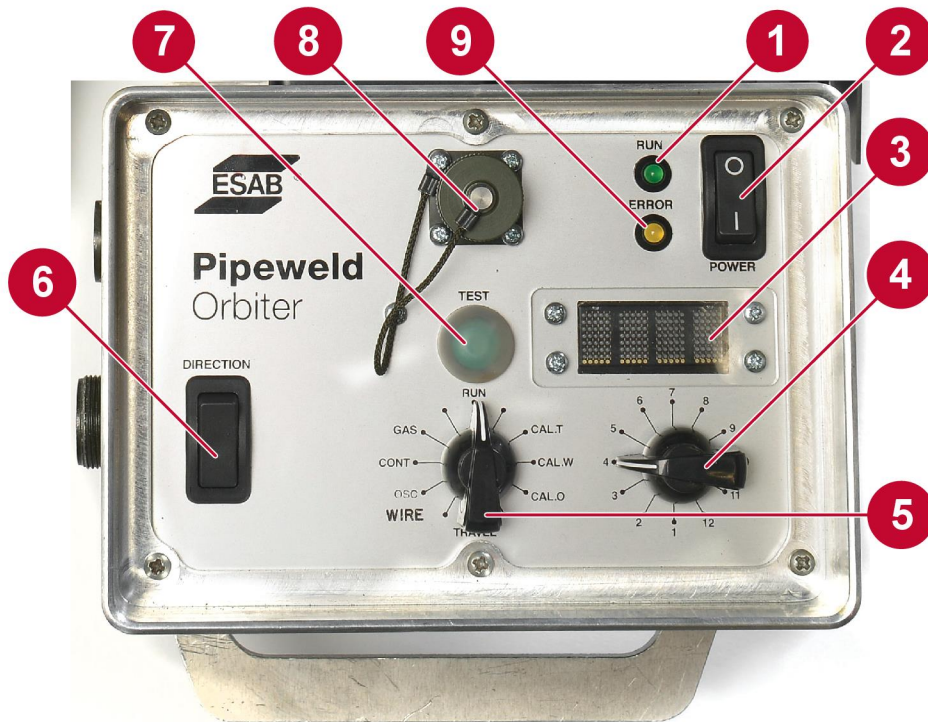
5.2 Connections and control devices



- | | |
|--|---|
| 1. Power input (110/230 V) | 7. Connection for stepper motor (red) |
| 2. DC power lead connection | 8. Connection to tip control motor (grey) |
| 3. Gas cylinder connection | 9. Connection for travel motor (green) |
| 4. Input fuse (4 A) | 10. Fuse (6.3 A) |
| 5. Power source contactor lead | 11. Connection for wire feed motor (yellow) |
| 6. Gas hose connection to Pipeweld Orbiter | 12. Connection for remote pendant |

Before starting the welding, it is necessary to connect the system to the power supply/gas box.

5.2.1 Control box operation



- | | |
|-------------------------------|-----------------------------|
| 1. Control lamp for operation | 6. Welding direction switch |
| 2. Power switch | 7. Test button |
| 3. Display | 8. HHPU socket |
| 4. Program selection switch | 9. Warning lamp for errors |
| 5. Control selection switch | |

Control switch operation

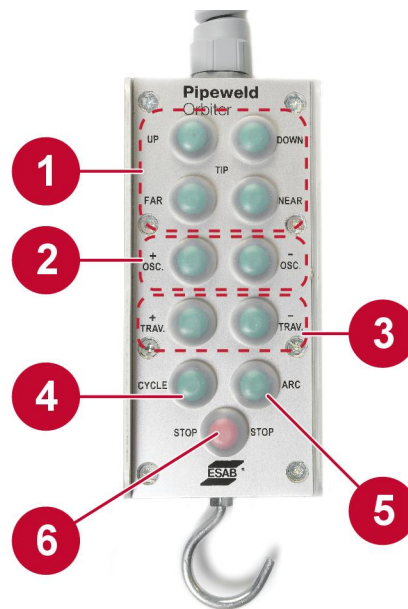
| Position | Display text | Test button pushed |
|----------|-----------------------|--|
| RUN | <i>Run</i> | Run mode enables remote pendant control |
| CAL.T | <i>CalT</i> | Runs travel motor for 12 s |
| CAL.W | <i>CalW</i> | Runs wire feed motor for 6 s |
| CAL.O | <i>CalW</i> | Runs oscillator for 15 s |
| TRAVEL | <i>Travel Speed</i> | Runs travel motor |
| WIRE | <i>Wire Speed</i> | Runs wire feed motor (used to run wire to torch) |
| OSC | <i>Osc Parameters</i> | Runs oscillator |
| CONT | <i>Cont</i> | Tests power source contactor circuits |
| GAS | <i>Gas</i> | Tests gas flow to torch |

Starting the control box

Operating the power switch illuminates the display LEDs to indicate the fuse is functioning and 24 V is present from the power supply unit.

The Run and error LEDs flash and the display scrolls through ESAB Pipeweld Orbiter, software version number and board number. After approximately 6 s the display is determined by the position of the control switch.

5.3 Remote pendant box



Button operation in idle mode

| | | |
|---|-----------------------|--|
| 1 | Tip up/down, far/near | Provides torch horizontal and vertical control. |
| 2 | + OSC / – OSC | Runs the oscillator at pre-set parameter settings. |
| 3 | + TRAV / – TRAV | Runs travel motor at high speed. |

Button operation in weld mode

| | | |
|---|-------|---|
| 4 | CYCLE | Initiates the welding sequence. |
| | | Enables gas flow and after the pre-purge delay starts the travel and oscillator motors. |
| | | Enables the travel and oscillator buttons to allow these motors to be varied within the pre-set limits. |
| 5 | ARC | Outputs the power source contactor signal and starts the wire feed motor. |
| 6 | STOP | Initiates the shut down sequence. |
| | | Stops travel motor. |
| | | Centralises and stops oscillator motor. |
| | | Starts crater fill delay, then stops wire motor. |
| | | Starts burn back delay and then removes contactor signal. |
| | | Starts post-purge delay then removes the gas signal. |



NOTE!

If the stop button is pressed for less than 2 s, the system stops but retains any modified travel speed or oscillator width variables.

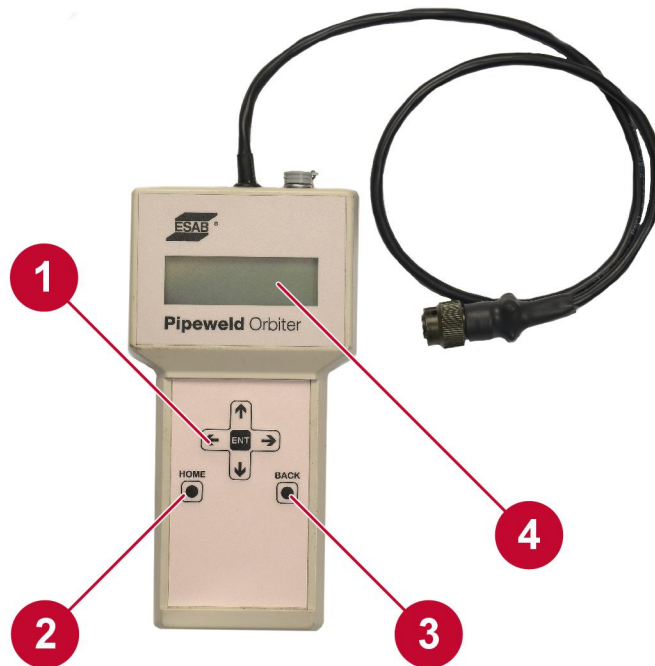
If held for longer than 2 s, the display shows LStp and the system reverts back to the stored parameter settings.

5.4 Programming unit - HHPU

The programming unit provides various system functions including:

- Input of welding parameters
- Input of system parameters
- Test diagnostic mode
- Program updates

The unit is menu driven by using a combination of the cursor control buttons together with ENT, BACK and HOME.



- | | |
|-----------------------|----------------|
| 1. Navigation buttons | 3. Back button |
| 2. Home button | 4. Display |

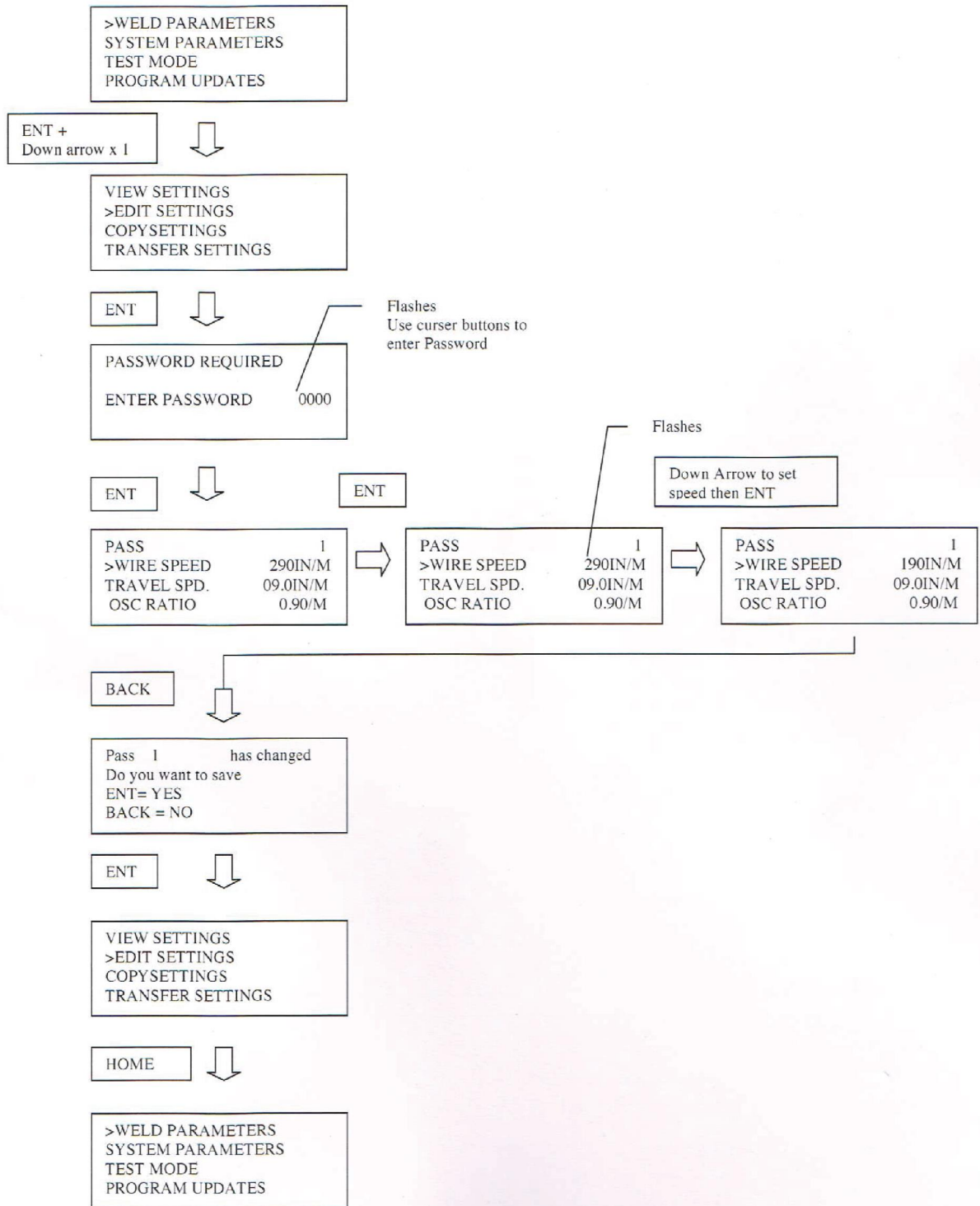
HHPU screen configurations

The following table shows menus for the configurations that can be made with the programming unit.

| 1.0 WELD PARAMETERS | | | |
|-----------------------------|---|------------------------|----------------------------------|
| | 1.1 MEASUREMENT UNITS | <i>INCHES</i> | |
| | | <i>CENTIMETERS</i> | |
| | 1.2 VIEW SETTINGS | | |
| | 1.3 EDIT SETTINGS (password protected) | <i>PASS</i> | 0–12 passes |
| | | <i>WIRE SPEED</i> | 0–14.99 m/min (0–590 in./min) |
| | | <i>TRAVEL SPEED</i> | 0–1.50 m/min (0–59 in./min) |
| | | <i>OSC. RATIO</i> | e.g. 10 (10 osc. per in.) |
| | | <i>OSC. SIZE NEAR</i> | |
| | | <i>OSC. SIZE FAR</i> | |
| | | <i>OSC. DWELL NEAR</i> | 0–250 ms |
| | | <i>OSC. DWELL FAR</i> | 0–250 ms |
| | 1.4 COPY SETTINGS (password protected) | <i>FROM PASS xx</i> | e.g. 01 |
| | | <i>TO PASS xx</i> | e.g. ALL |
| | 1.5 TRANSFER SETTINGS | <i>HHPU TO BUG</i> | |
| | | <i>BUG TO HHPU</i> | |
| 2.0 SYSTEM PARAMETRS | | | |

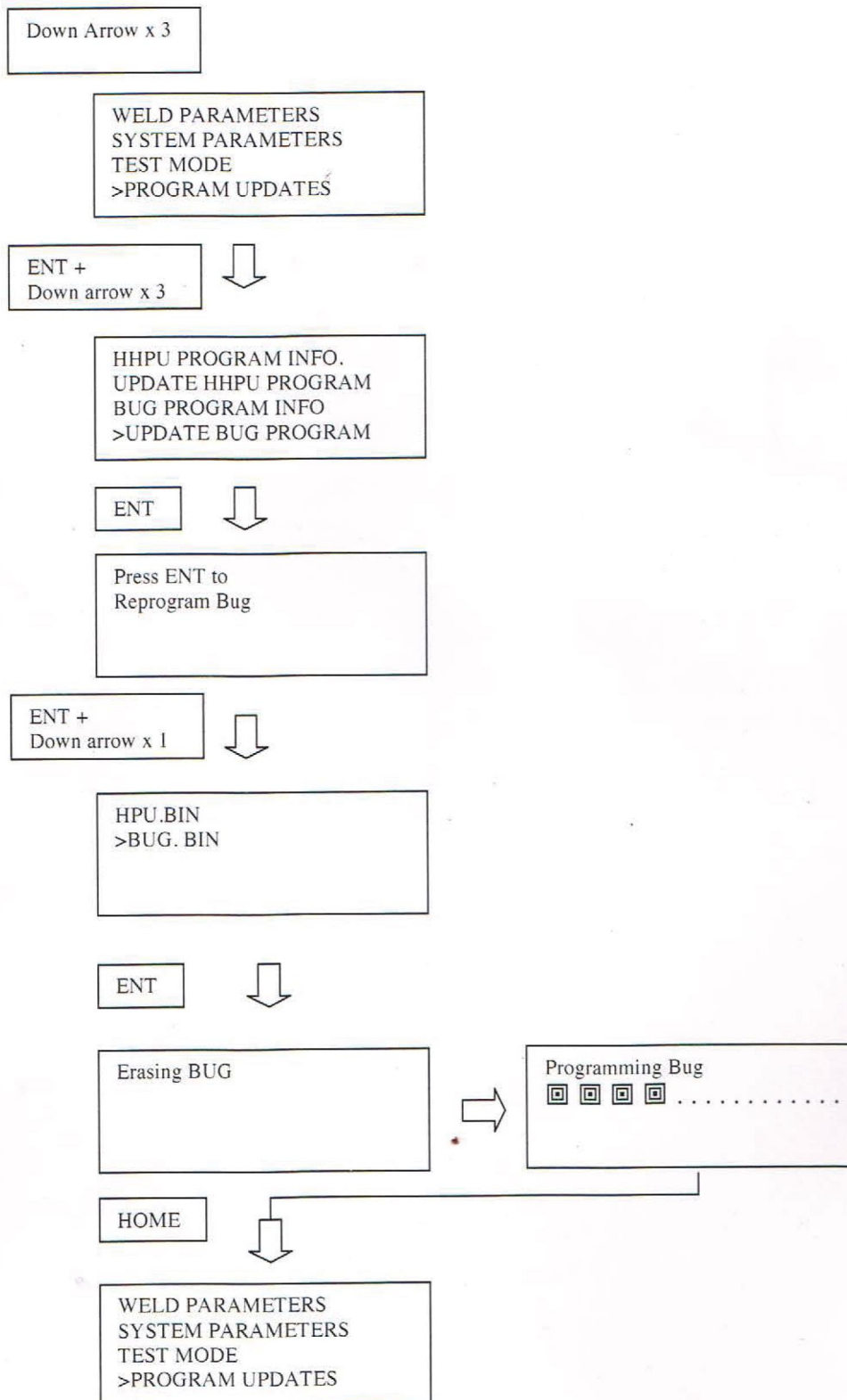
| | | | |
|--|------------------------------------|--------------------------|------|
| 2.1 MEASUREMENT UNITS | INCHES | | |
| | CENTIMETERS | | |
| 2.2 VARIATION % | NO TRV/OSC LOCK | 0=locked, 1=unlocked | |
| | TRAVEL MAX | e.g. 25% | |
| | TRAVEL BUTTON | e.g. 3% per button press | |
| | OSC WIDTH MAX | e.g. 25% | |
| | OSC WIDTH BUTTON | e.g. 3% per button press | |
| 2.3 SET MOTOR SPEED | FAST TRAVEL SPEED | e.g. 99% | |
| | TIP VERTICAL SPEED | e.g. 50% | |
| | TIP HORIZONTAL SPEED | e.g. 50% | |
| 2.4 DELAYS | BURN BACK | 0–4999 ms | 5 s |
| | CRATER FILL | 0–1999 ms | 2 s |
| | PRE PURGE | 0–19999 ms | 20 s |
| | POST PURGE | 0–19999 ms | 20 s |
| 2.5 SET TIME & DATE | | | |
| 2.6 TRAVEL & WIRE CALIBRATION | TRAVEL 356:1 GB 1 in. WHEEL | 17500 | |
| | WIRE 33:1 GB 1 in. WHEEL | 1750 | |
| 2.7 EDIT PASSWORD | | | |
| 3.0 TEST MODE | TEST MODE INPUTS | | |
| | TEST MODE MOTORS | | |
| 4.0 PROGRAM UPDATES | HHPU PROGRAM INFO | | |
| | UPDATE HHPU PROGRAM | | |
| | BUG PROGRAM INFO | | |
| | UPDATE BUG PROGRAM | | |
| | DEFAULT SETTINGS | | |
| 5.0 BUG LAST CHANGED | HHPU SERIAL No. | | |
| | DATE | | |

Example of setting wire speed



Example of reprogramming control box software

Connect the portable USB port to the programming unit and insert memory stick.



5.5 Weld start



WARNING!

The unit and its handles may become hot during and after use, gloves should be worn at all times.

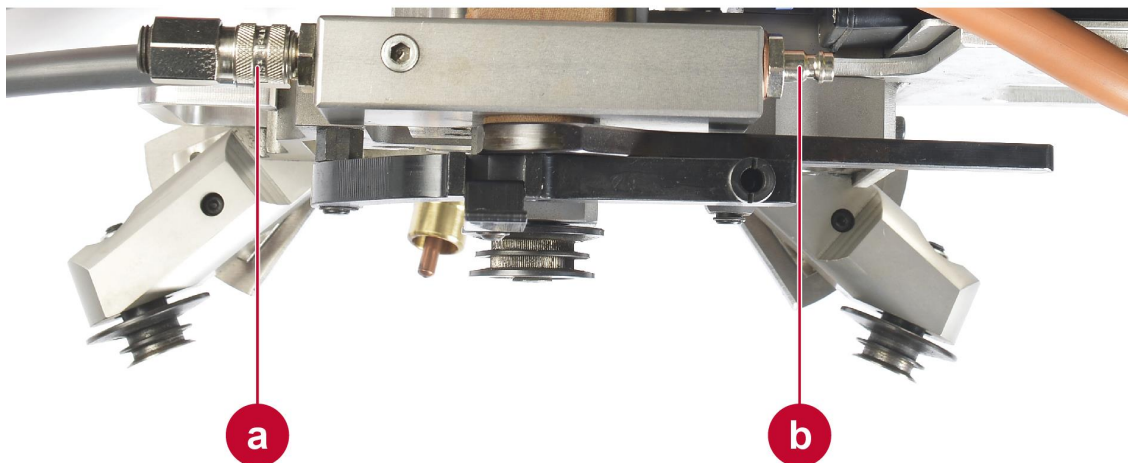
Before weld start, adjust the welding tip angle and set the welding direction.

- Set the welding parameters in the programming unit.
- Adjust the welding tip angle.

5.5.1 Setting the welding direction

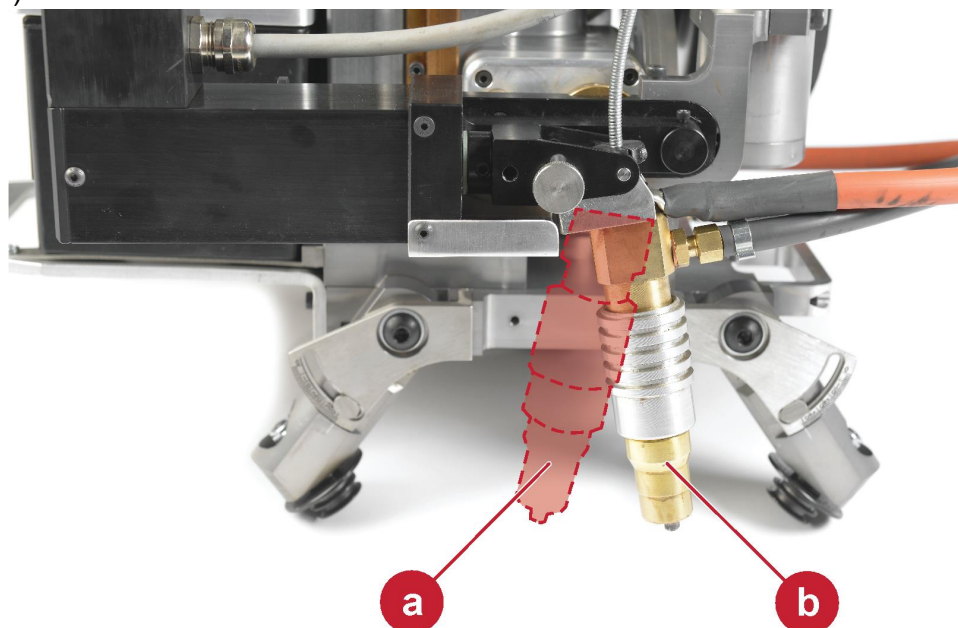
The Pipeweld Orbiter has to be set for the desired welding direction: clockwise or counterclockwise. The settings are made for the welding torch and the gas hose connection.

1.



Connect the gas hose with the connection for the welding direction to be used, (a) for clockwise operation (unit moves up), (b) for counterclockwise operation (unit moves down).

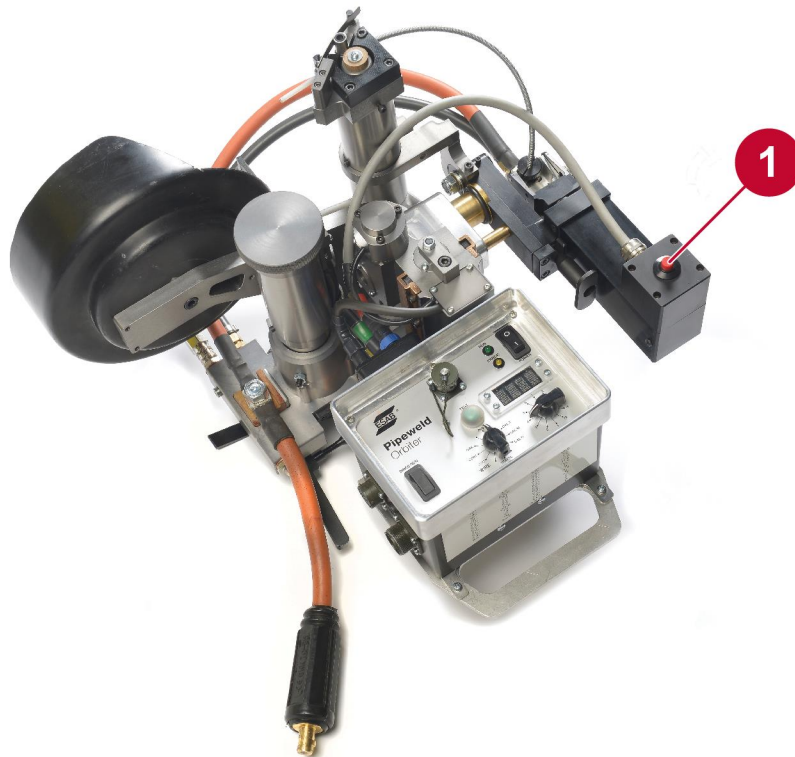
2.



Adjust the welding torch position for the welding direction to be used, (a) flux core counterclockwise torch position (unit moves down), (b) flux core clockwise torch position (unit moves up).

3. Set the welding direction to be used with the welding direction switch on the control box.
 - Switch to up: Clockwise, unit moves up.
 - Switch to down: Counterclockwise, unit moves down.

5.5.2 Adjusting the torch angle

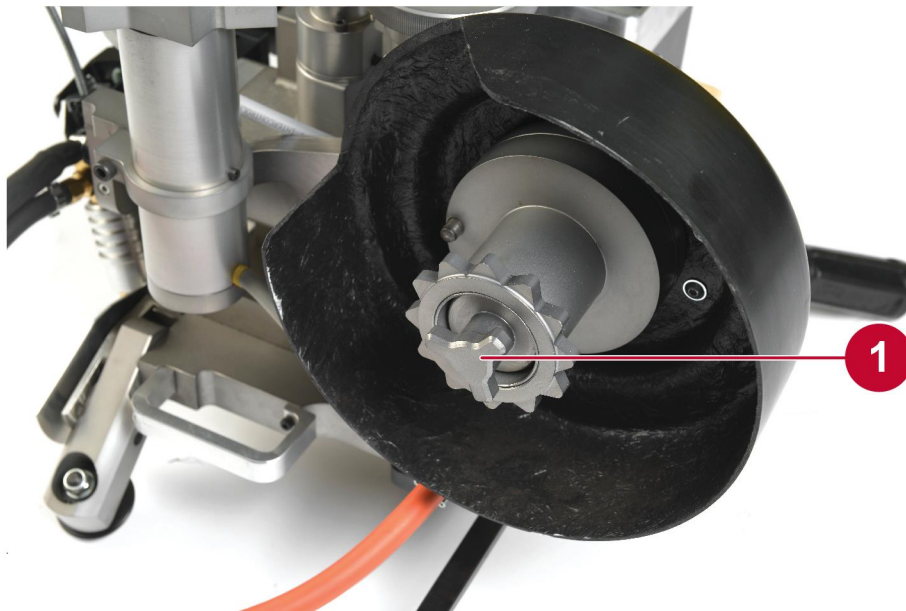


1. Button for manual torch adjustment

Press the red button to manually adjust the torch angle.

Use the release lever to rotate the torch away from the pipe e.g. for cleaning.

5.5.3 Adjusting the spool tension



1. Spool holder tension screw

Spool tension is controlled by adjusting the spool holder tension screw. Set the tension carefully so the spool does not slip when wire is fed.

6 MAINTENANCE



CAUTION!

All warranty undertakings from the supplier cease to apply if the customer attempts any work to rectify any faults in the product during the warranty period.



NOTE!

Regular maintenance is important for safe and reliable operation.

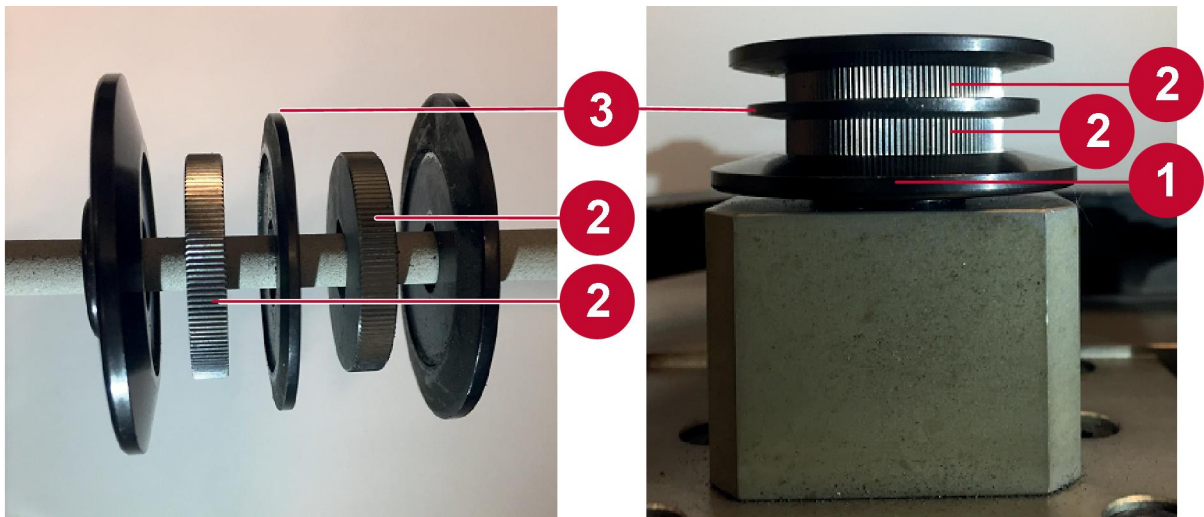
6.1 Routine maintenance

Daily maintenance during normal conditions:

- Remove splatter, excessive dirt and dust from all moving parts.
- Inspect components for wear and safe operation.

The motors and gearboxes are sealed units and require no routine maintenance.

6.2 Replacing the drive wheel



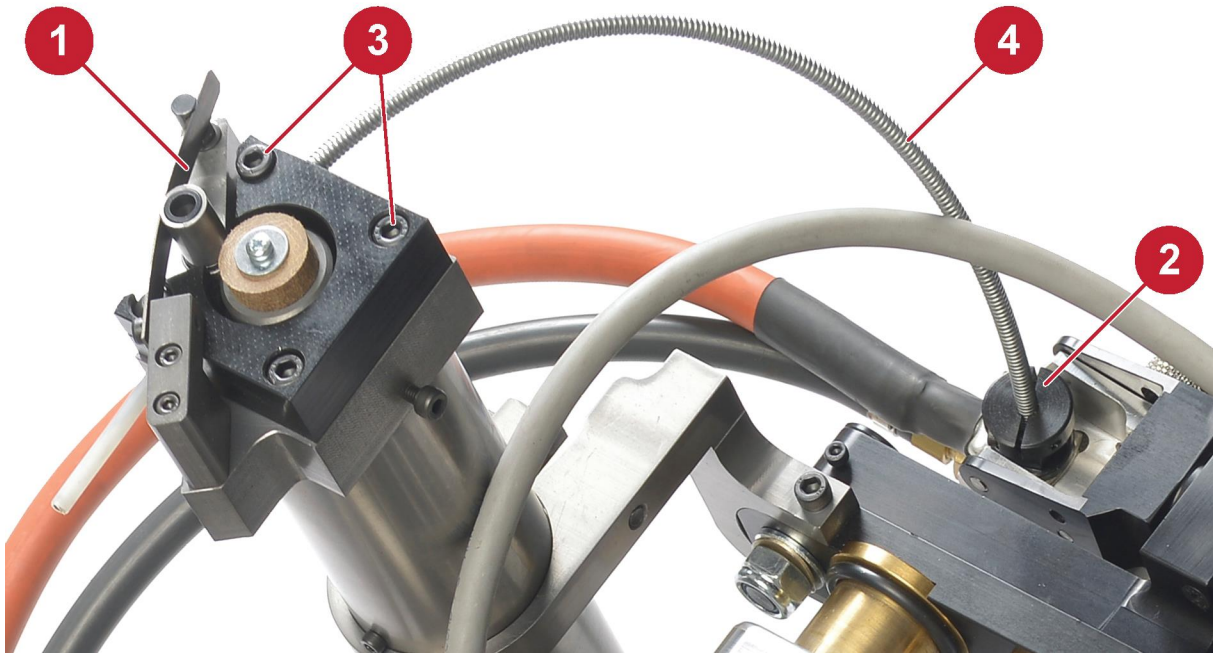
1. Shims
2. Drive wheels

3. Spacer

Follow these steps to replace the drive wheels on the underside of the unit.

1. Turn off the power on the control box.
2. Ensure that the drive motor is engaged.
3. Remove the retaining screw from the end of the shaft with an Allen key (4 mm).
4. Force the spacers (3), shims (1) and drive wheels (2) off the shaft.
Use two levers to ensure that the drive wheels (2) do not tip over on the shaft and cause damage.
5. Change the drive wheels (2).
6. Reinstall the drive wheels (2) in reverse order.
Use the shims (1) to clamp the middle spacer (3) properly.

6.3 Replacing the Bowden cable



- | | |
|----------------|----------------------|
| 1. Spring clip | 3. Clamp plate screw |
| 2. Collet nut | 4. Bowden cable |

Follow these steps to replace the Bowden cable.

1. Turn off the power on the control box.
2. Release the spring clip (1) and pull the welding wire back onto the spool.
3. Loosen the collet nut (2) on the torch and the clamp plate screws (3) on the wire feed block.
4. Remove the Bowden cable (4) and replace it.



NOTE!

Ensure the replacement Bowden cable (4) has the correct length (355 mm).

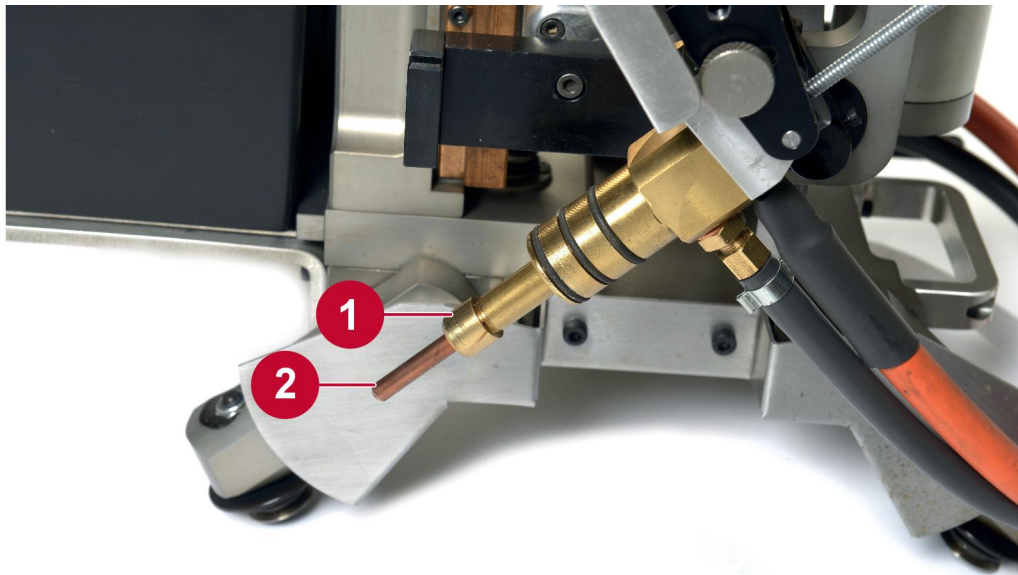
5. Insert the new Bowden cable into the torch and tighten collet nut (2).
6. Insert the Bowden cable into the wire feed block and tighten clamp plate screws (3).



CAUTION!

Ensure the Bowden cable does **not** touch the wire feed wheels.

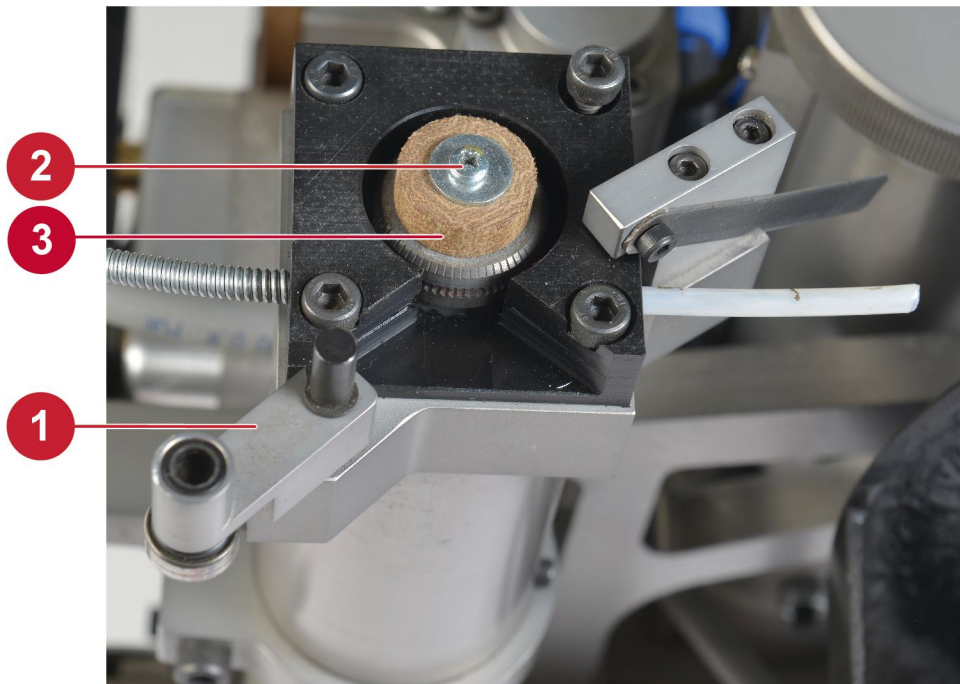
6.4 Replacing the welding tip



Follow these steps to replace the welding tip.

1. Remove gas nozzle from torch.
2. Loosen the collet nut (1) with pliers and withdraw the tip (2).
3. Replace the tip (2).
4. Tighten the collet nut (1) and put the cover into position.

6.5 Replacing the wire feed wheels



- 1. Spring clip
- 2. Central screw
- 3. Insulation bushing

Follow these steps to replace the wire feed wheels.

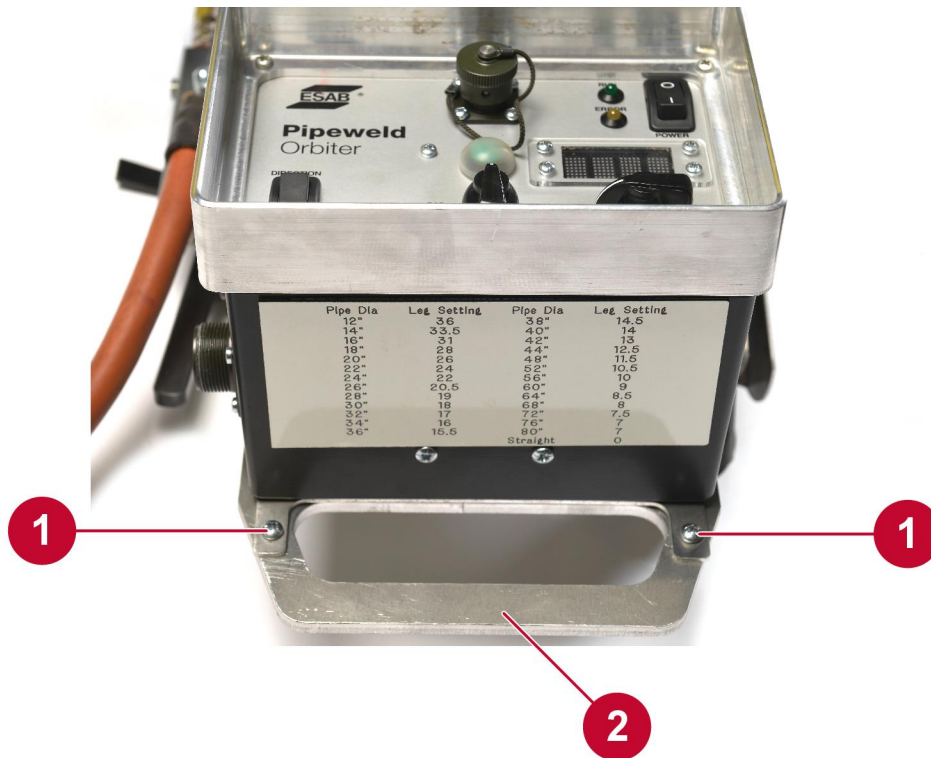
1. Turn off the power on the control box.
2. Release the spring clip (1).
3. Remove the central screw (2) and the cap.
4. Force the wire feed wheels and the insulation bushing (3) off the shaft.
5. Reinstall the wire feed wheels in reverse order.



NOTE!

Make sure the gears of the wire feed wheels are meshing.

6.6 Removing the control box



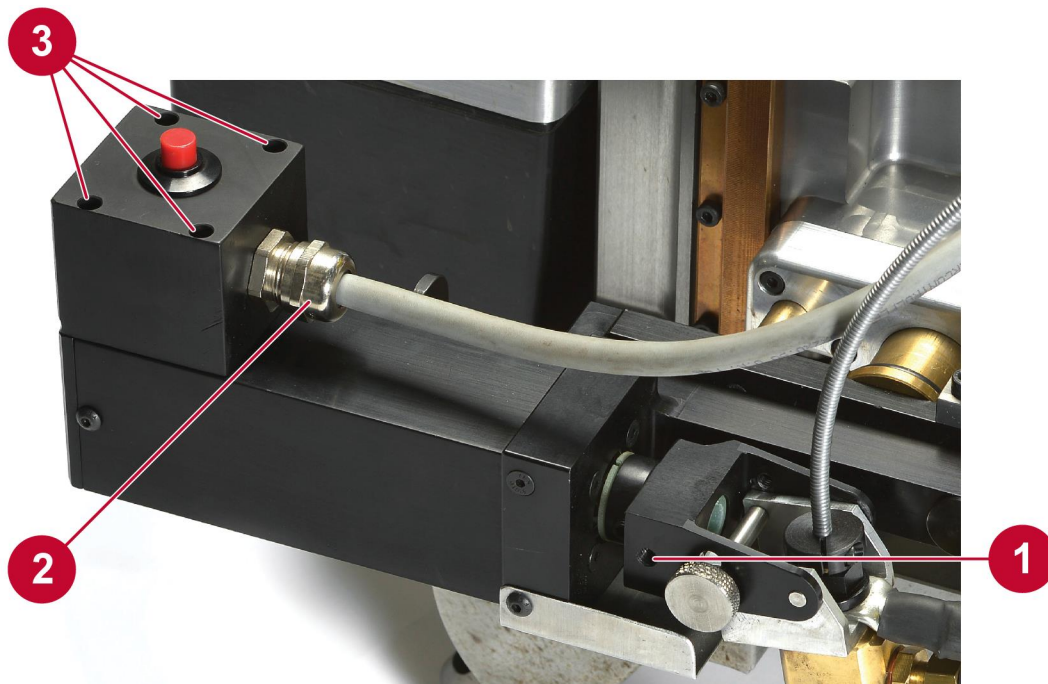
1. Screw

2. Sub-plate

Follow these steps to remove the control box.

1. Turn off the power on the control box.
2. Remove the two screws (1) from the sub-plate (2) and slide the control box away for access to the cable connections on the back.
3. Remove the four cables.
The control box can be removed.

6.7 Removing the stepper motor

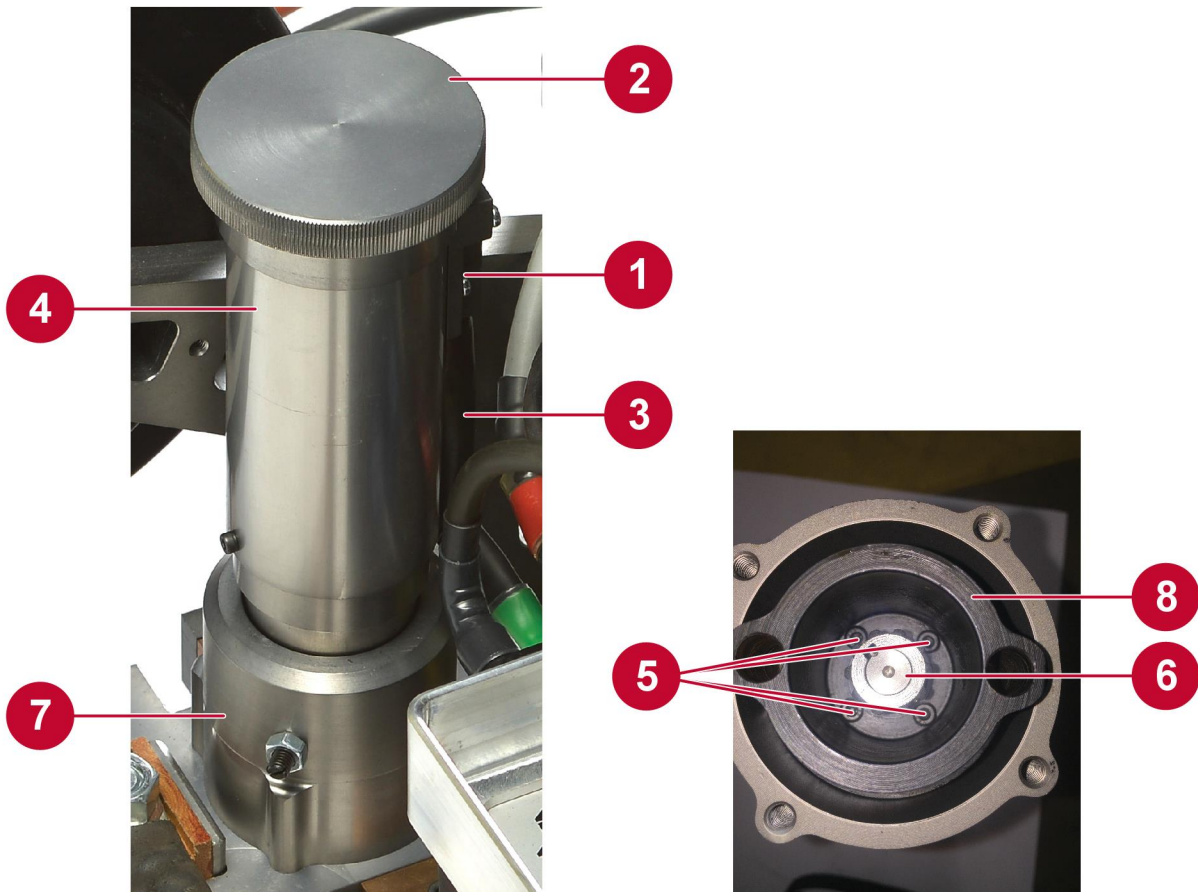


- 1. Pinch bolt
- 2. Cable gland
- 3. Screw

Follow these steps to remove the stepper motor.

1. Turn off the power on the control box.
2. Disconnect the stepper motor cable (red) from the connection box.
3. Loosen the pinch bolt (1) on the torch knuckle with an Allen key (3 mm). Pull out the torch assembly.
4. Remove the cable gland (2) from the case of the stepper motor.
5. Remove the two screws (3) on either side of the red release button. Remove the terminal cover.
6. Remove the four screws retaining the stepper motor to the case with an Allen key (2.5 mm).
7. Carefully withdraw the motor from the case to not damage the cables. Disconnect the cables from the connector block and the red release button.

6.8 Removing the drive motor



- | | |
|----------------|----------------------|
| 1. Cable cover | 5. Screws |
| 2. Top cap | 6. Motor |
| 3. Cable | 7. Engagement barrel |
| 4. Main barrel | 8. Bottom barrel |

Follow these steps to remove the drive motor.

1. Turn off the power on the control box.
2. Disconnect the drive motor cable (green) from the connection box.
3. From the underside of the base, remove the four screws retaining the motor assembly with an Allen key (4 mm).
4. Take off the motor assembly.
5. Remove the cable cover (1).
6. Unscrew the top cap (2) and reposition the cable (3) from the slot.
7. Unscrew the main barrel (4).



NOTE!

Ensure the cable (3) is not tangled up.

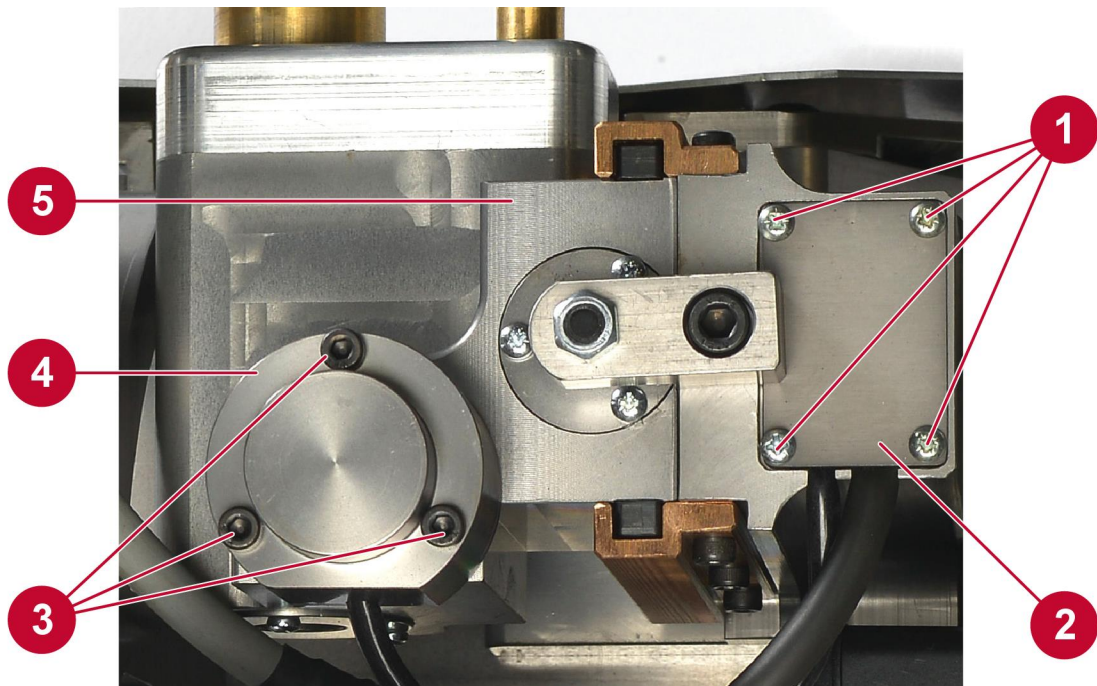
8. Disconnect the cable (3) from the motor encoder.
9. Remove the four screws (5) retaining the motor (6) to the engagement barrel (7) with an Allen key (2.5 mm) and pull it out of the bottom barrel (8).
10. Remove splined gear and spacer.
11. Reinstall in reverse order.



NOTE!

Ensure the cable slot is facing the torch before fitting the assembly to the base.

6.9 Removing the tip control motor (near/far)



- | | |
|-------------------------|---------------------|
| 1. Screws | 4. Cover |
| 2. Terminal cover plate | 5. Tip control body |
| 3. Screws | |

Follow these steps to remove the tip control motor (near/far).

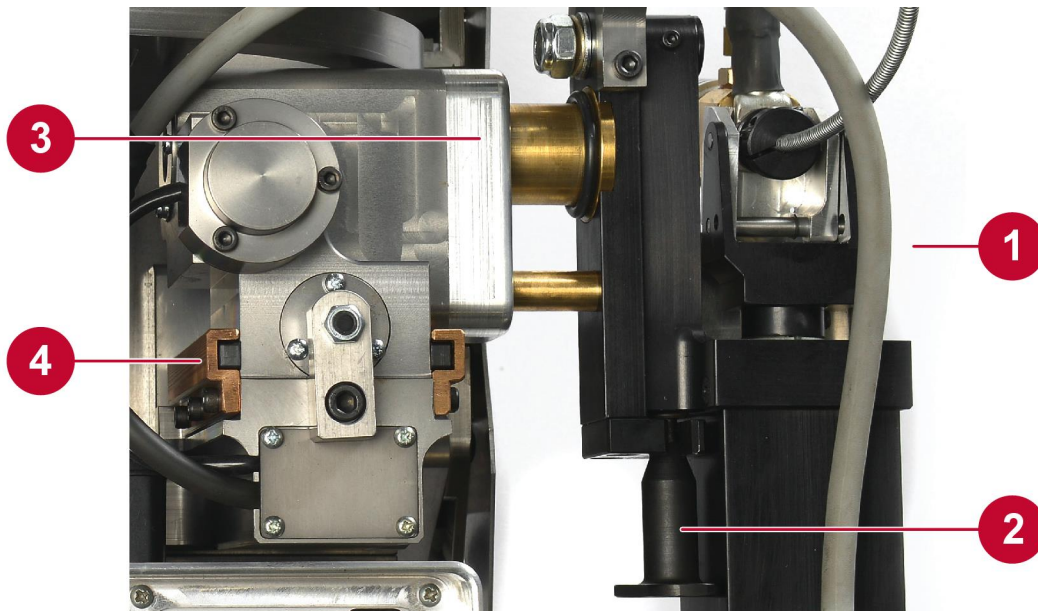
1. Turn off the power on the control box.
2. Remove the four screws (1) and take off the terminal cover plate (2) to gain access to the connector block.
Disconnect wires from connector block.
3. Remove the three screws (3) from the motor cover (4) and take the cover (4) off.
Take the assembly out of the tip control body (5).
4. Remove the gear.
5. Reinstall in reverse order.



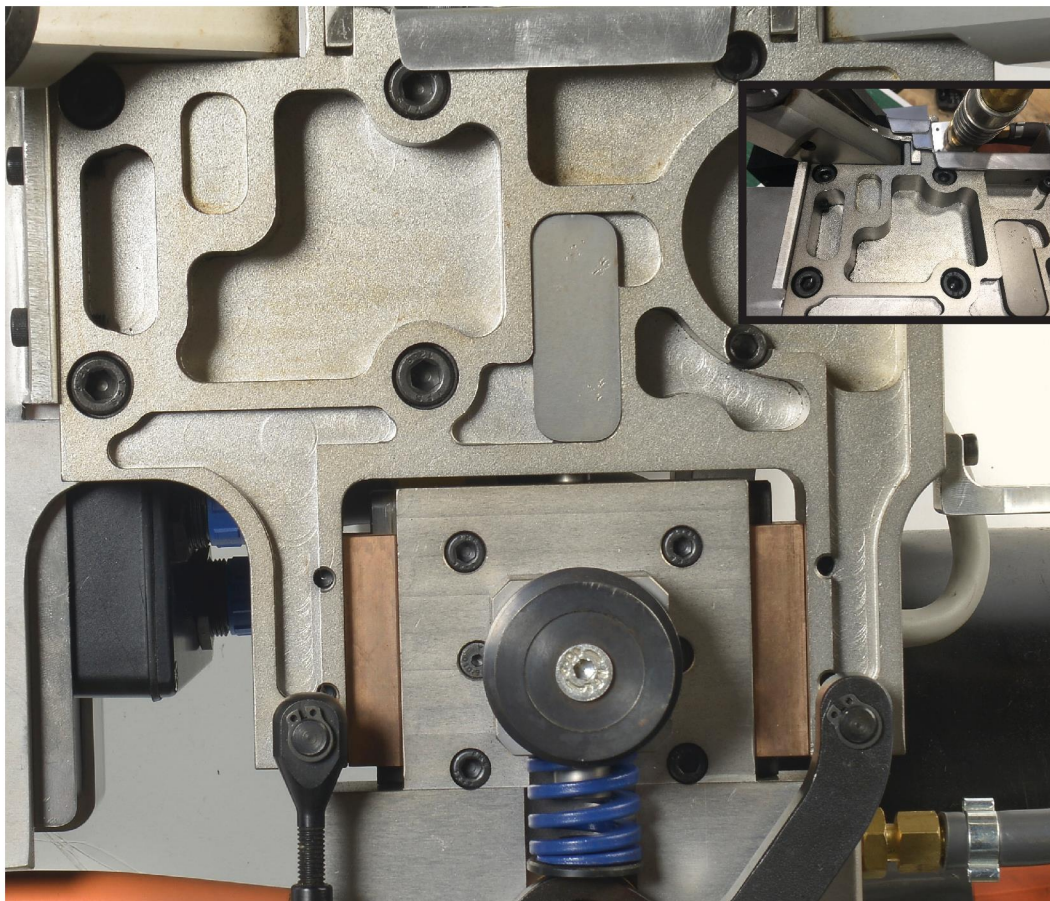
NOTE!

Ensure the distance between the carrier inner face and the middle of the gear is 65 mm (2.56 in).

6.10 Removing the tip control motor (up/down)



- | | |
|--------------------------|----------------|
| 1. Pivot bolt | 3. Body |
| 2. Quick release plunger | 4. Guide rails |

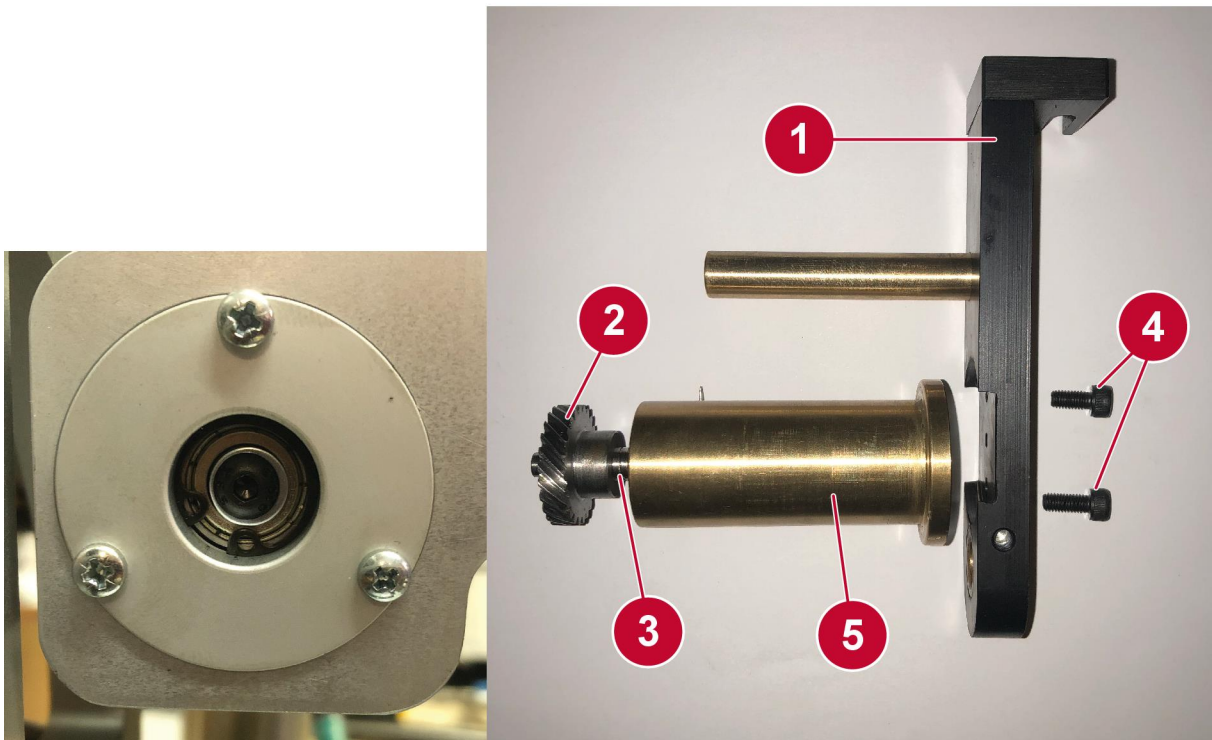


Follow these steps to remove the tip control motor (up/down).

1. Remove the top stop block and power the tip up to maximum position.
2. Turn off the power on the control box.
3. Remove the four screws and take off the terminal cover plate to gain access to the connector block (see figure in section "Removing the tip control motor (near/far)"). Disconnect wires from connector block.

4. Remove the torch pivot bolt (1) and pull back the quick release plunger (2). Remove the torch assembly.
5. Take the near/far body (3) off the guide rails (4).
6. From the underside of the base, remove the four screws retaining the tip control unit and take it off.
7. Remove the gear from the motor shaft.
8. Remove the three screws and take off the vertical body from tip control base.
9. Remove screws to take out the motor.

6.11 Removing the tip control lead screw and barrel (near/far)



- | | |
|--------------------|-----------|
| 1. Torch fixed arm | 4. Screws |
| 2. Helical gear | 5. Barrel |
| 3. Lead screw | |

Follow these steps to remove the tip control lead screw and barrel (near/far).

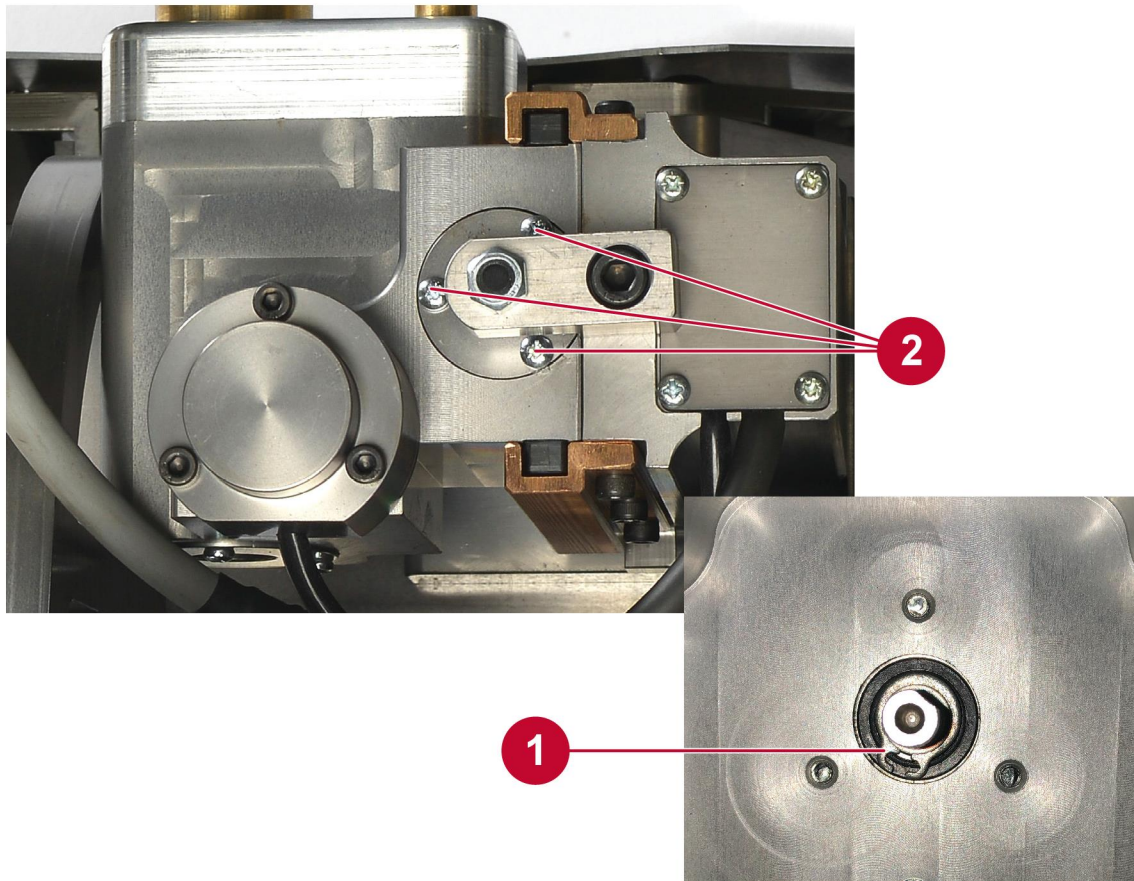
1. Turn off the power on the control box.
2. Take off the torch fixed arm (1) with the brass barrel guides (see section "Removal of bearing housing", step 2–5).
3. Remove the helical gear (2) from the lead screw (3).
4. Remove the two screws (4) and take off the torch fixed arm (1).
5. Unscrew the lead screw (3) from barrel (5).
6. Refit in reverse.



NOTE!

The helical gear (2) is secured to the lead screw (3) via a grub screw into a dimple on the shaft. This will give the correct position relative to the mating gear.

6.12 Removing the tip control lead screw and barrel (up/down)



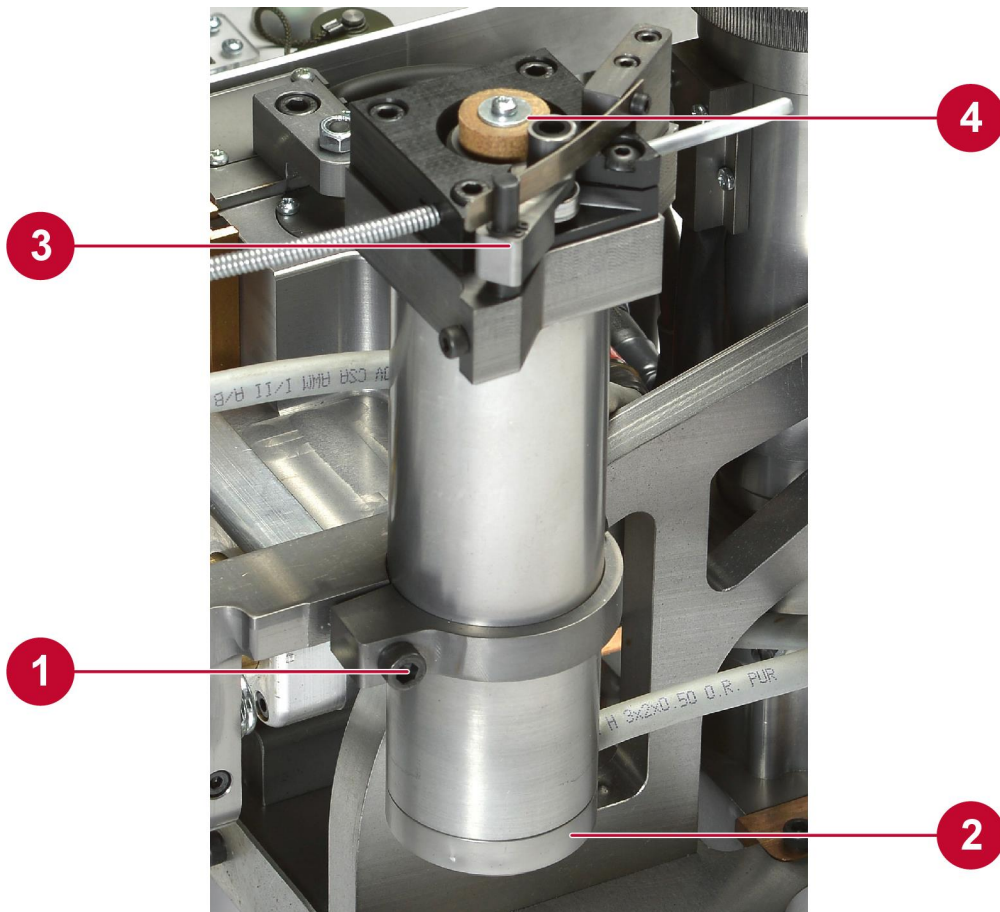
1. Circlip

2. Screws

Follow these steps to remove the tip control lead screw and barrel (up/down).

1. Remove the top stop block and power the tip up to maximum position.
2. Turn off the power on the control box.
3. Remove the near/far body and the tip control unit (see section "Removal of tip control motor (up/down)", steps 3–6).
4. Remove the gear from the lead screw.
5. Remove the circlip (1) from the lead screw and pull the lead screw out from the bearing.
6. On the near/far body, remove the three screws (2) and take off the cover and barrel nut.
7. Reinstall in reverse with new circlip.

6.13 Removing the wire feed motor

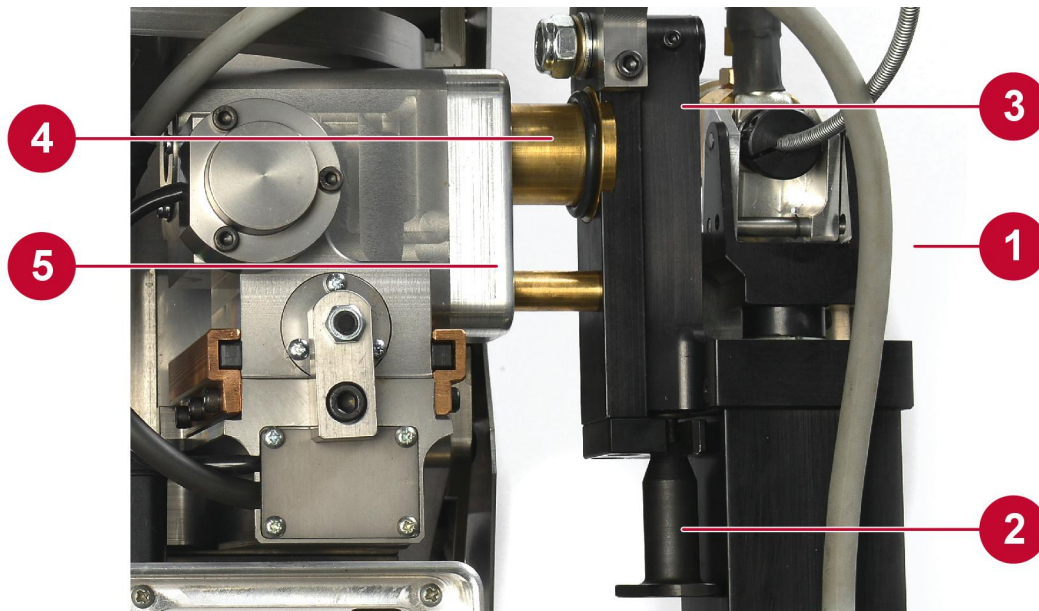


- | | |
|---------------|---------------------------------|
| 1. Pinch bolt | 3. Spring clip anchor |
| 2. Cap | 4. Wire straightening mechanism |

Follow these steps to remove the wire feed motor.

1. Turn off the power on the control box.
2. Disconnect the wire feed motor cable (yellow) from the connection box.
3. Remove the Bowden cable (see section "Replacing the Bowden cable").
4. Loosen the pinch bolt (1) on the bracket with an Allen key (5 mm).
5. Unscrew the cap (2) from the bottom of the barrel and remove the cable from the slot.
6. Lift the wire feed unit out of the bracket.
7. Remove the wire feed wheels and the spring clip anchor (3).
8. Remove the splatter guard and the wire straightening mechanism (4) together with the insulating strip.
9. Remove the wire feed insulation block.
10. Remove the four screws retaining the motor with an Allen key (2.5 mm). Disconnect the cables from the motor.

6.14 Removing the bearing housing



- | | |
|--------------------------|--------------------|
| 1. Pivot bolt | 4. Brass barrels |
| 2. Quick release plunger | 5. Bearing housing |
| 3. Fixed arm | |

Follow these steps to remove the bearing.

1. Turn off the power on the control box.
2. Remove the Bowden cable (see section "Replacing the Bowden cable").
3. Undo the three screws and remove the wire motor bracket assembly.
4. Remove the torch pivot bolt (1) and pull back the quick release plunger (2).
5. Remove the torch assembly.
6. Remove the lead screw retaining screw at the rear of the tip control.
7. Pull the torch fixed arm (3) with the brass barrel guides (4) away from the body.
8. Remove the four screws on the bearing housing (5) and take off the housing (5).
9. When refitting the bearing housing, tighten the four screws on the bearing housing (5) finger-tight only.
10. Insert both brass barrels (4) and check the brass barrels slide in and out freely to ensure correct alignment.
11. Tighten screws on the bearing housing (5) properly and recheck the brass barrels (4) still slide freely.

7 TROUBLESHOOTING

7.1 Error codes

| | |
|-----------|----------------------------|
| E001-T-OL | Travel motor overload |
| E002-T-EN | Travel motor encoder error |
| E003-W-OL | Wire motor O/L |
| E004-W-EN | Wire motor encoder error |
| E007-S-OL | Stepper O/L |
| E008-EPOM | Eprom error |

When the system detects any of the above errors, it initiates a control shut down and displays the appropriate error message on the display.

Pressing the test button resets the software and allows the system to be restarted. If the error persists, refer to the maintenance manual for corrective action.

| | |
|-----------|--------------|
| E005-V-OL | Up/Down O/L |
| E006-H-OL | Near/Far O/L |

Current overloads on the tip control motors are used to determine when the mechanisms reach the end of their travel limits. The corresponding error message is displayed until the appropriate push button is released. These errors do not initiate a control shut down.

Fuses

| | |
|-------------------|-------------|
| Control box 6.3 A | RS 537-1307 |
| Valve box 4 A | RS 563-542 |

7.2 Portable Appliance Testing (PAT)

In the event that you require to verify continued safe operation of the system insulation within the valve box, the test method shall be in accordance with BS E 60960–1:2006+A1:2010 para. 5.2.2 using a DC test voltage of 2121 V between the shorted input mains conductors and safety earth. The voltage applied to the insulation under test is gradually raised from zero to 2121 V DC and held at that value for 60 s maximum.

8 ORDERING SPARE PARTS



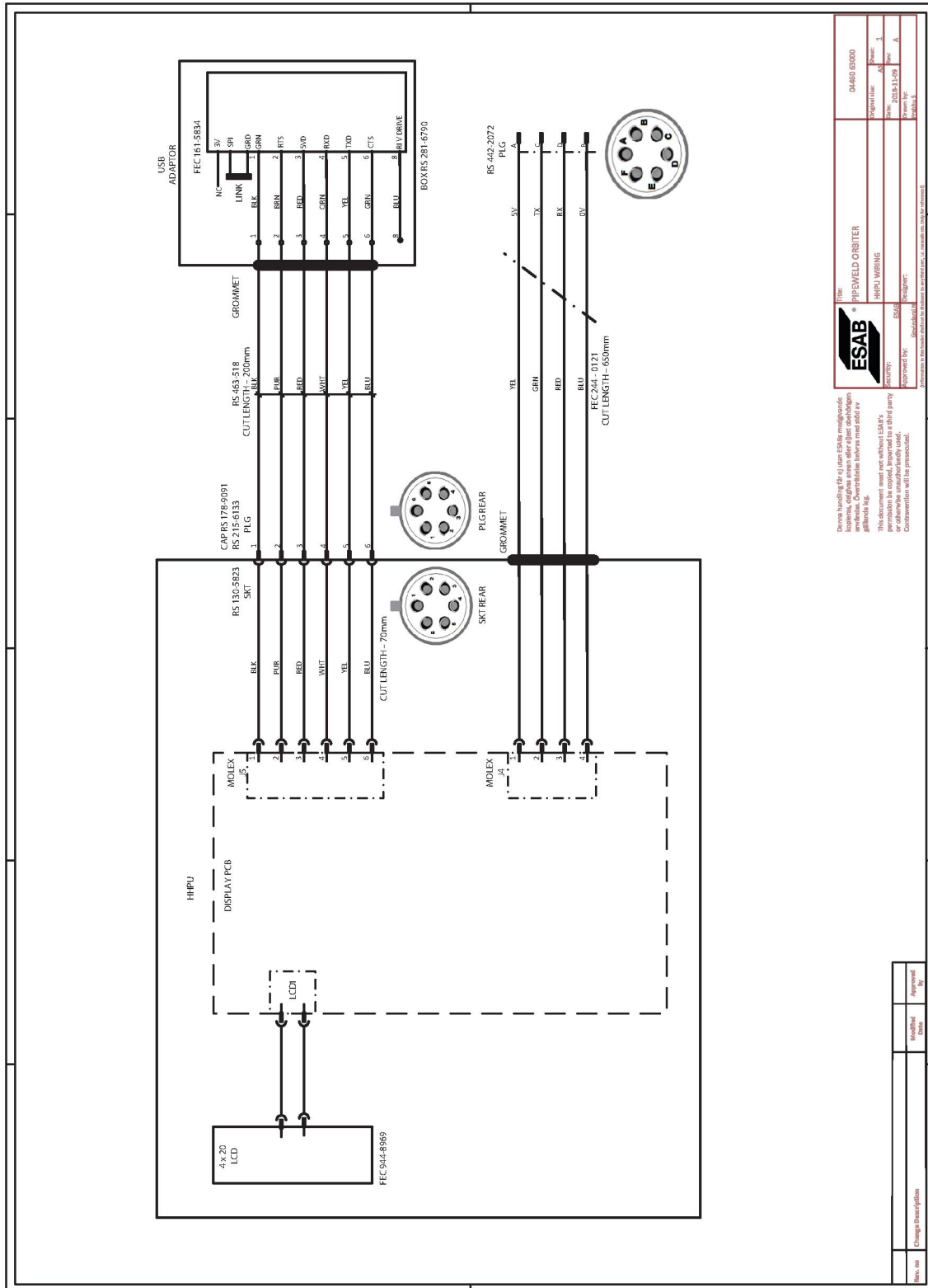
CAUTION!

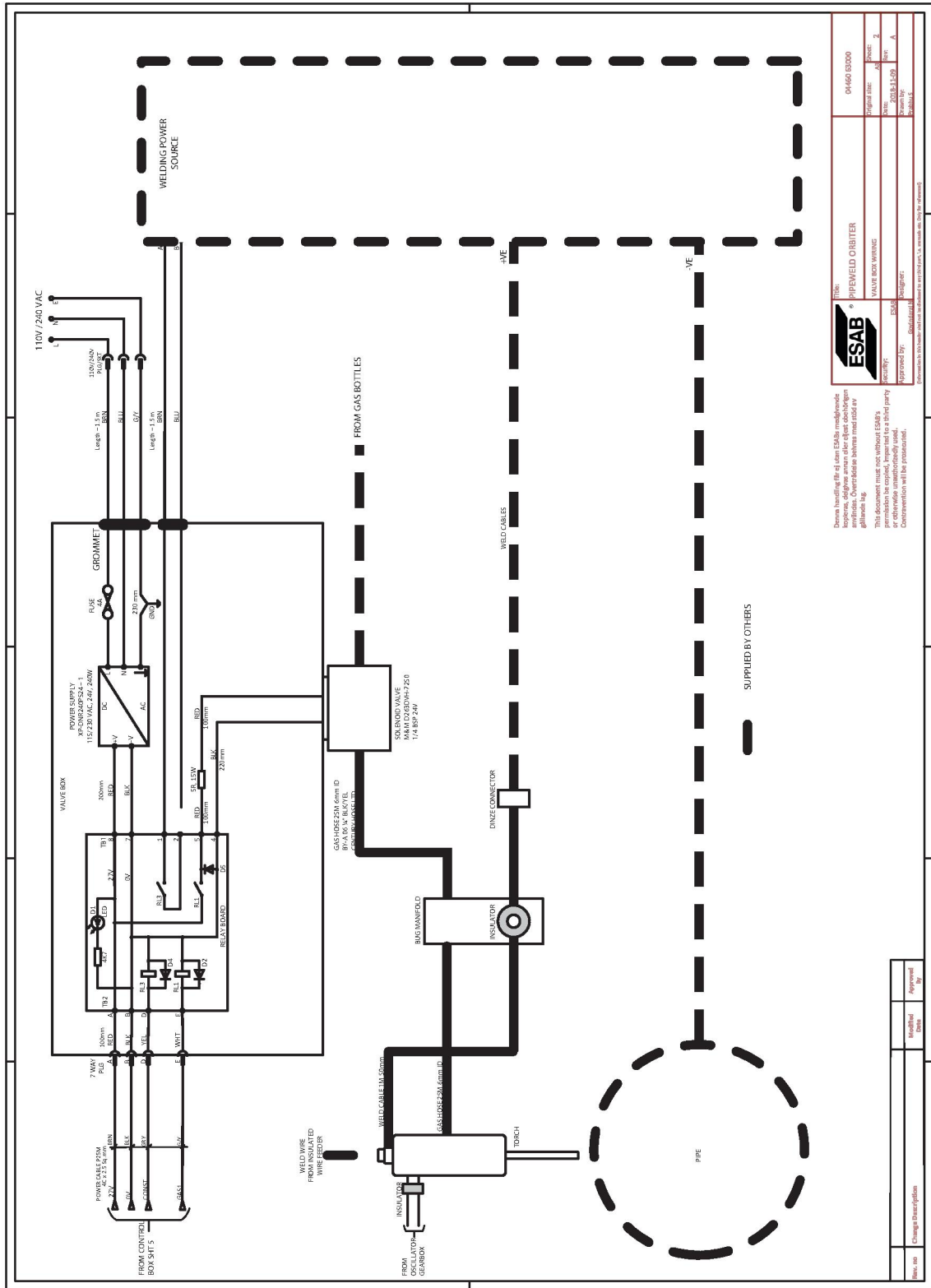
Repair and electrical work should be performed by an authorised ESAB service technician. Use only ESAB original spare and wear parts.

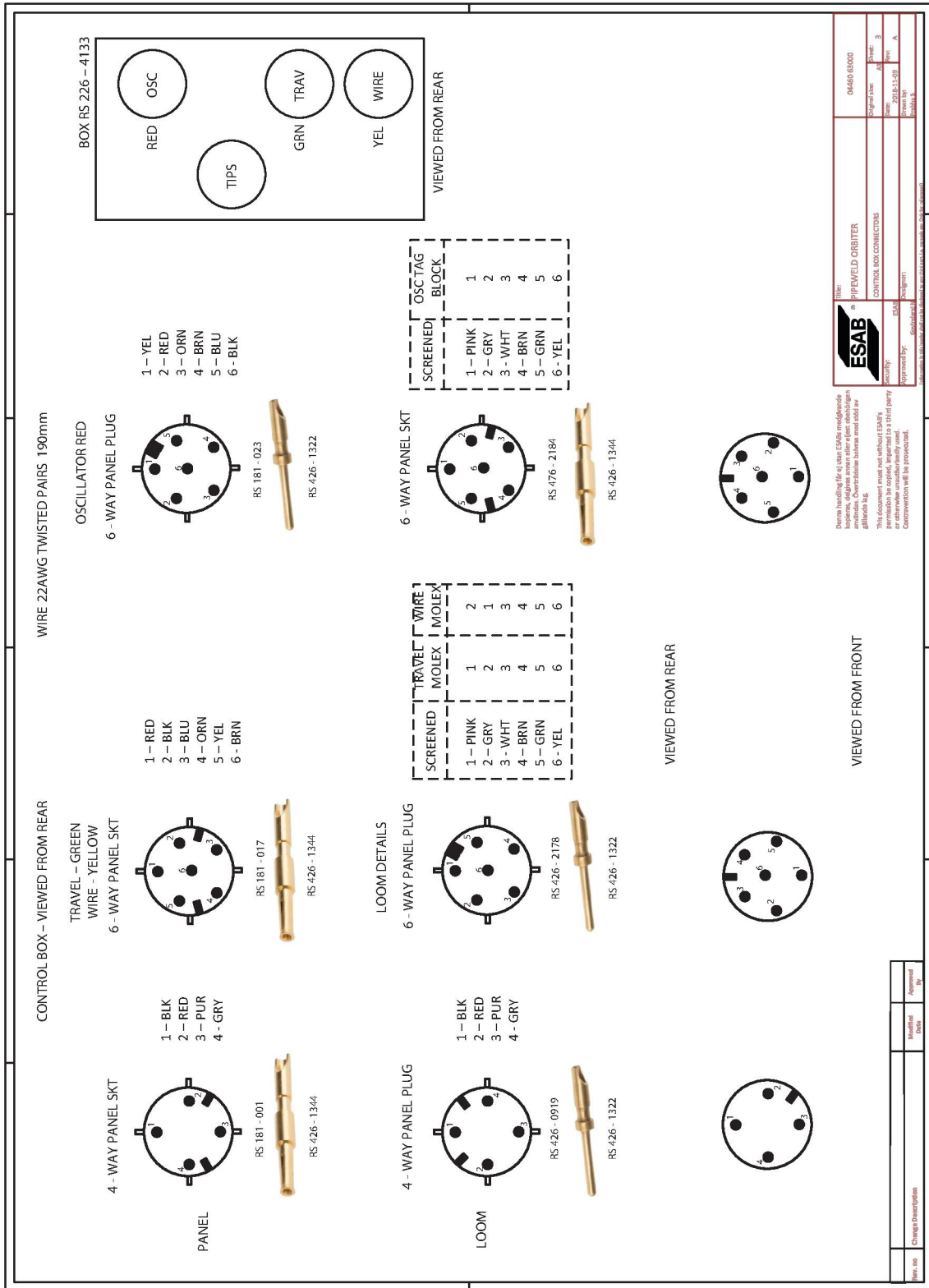
Pipeweld Orbiter is designed and tested in accordance with the international and European standards **EN 12100:2010**, **EN 60974-5** and **EN 60974-10**. On completion of service or repair work, it is the responsibility of the person(s) performing the work to ensure that the product still complies with the requirements of the above standards.

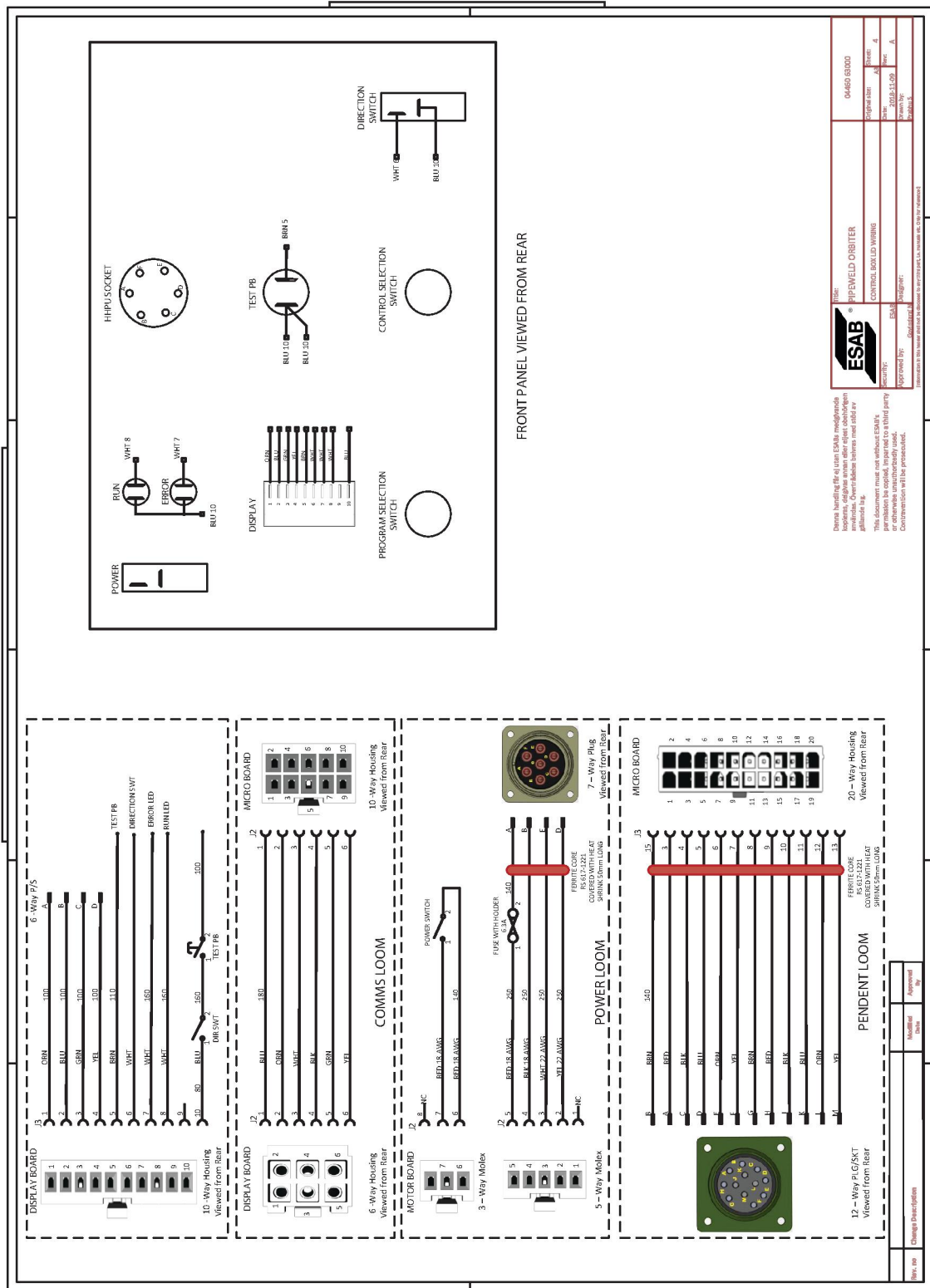
Spare parts and wear parts can be ordered through your nearest ESAB dealer, see esab.com. When ordering, please state product type, serial number, designation and spare part number in accordance with the spare parts list. This facilitates dispatch and ensures correct delivery.

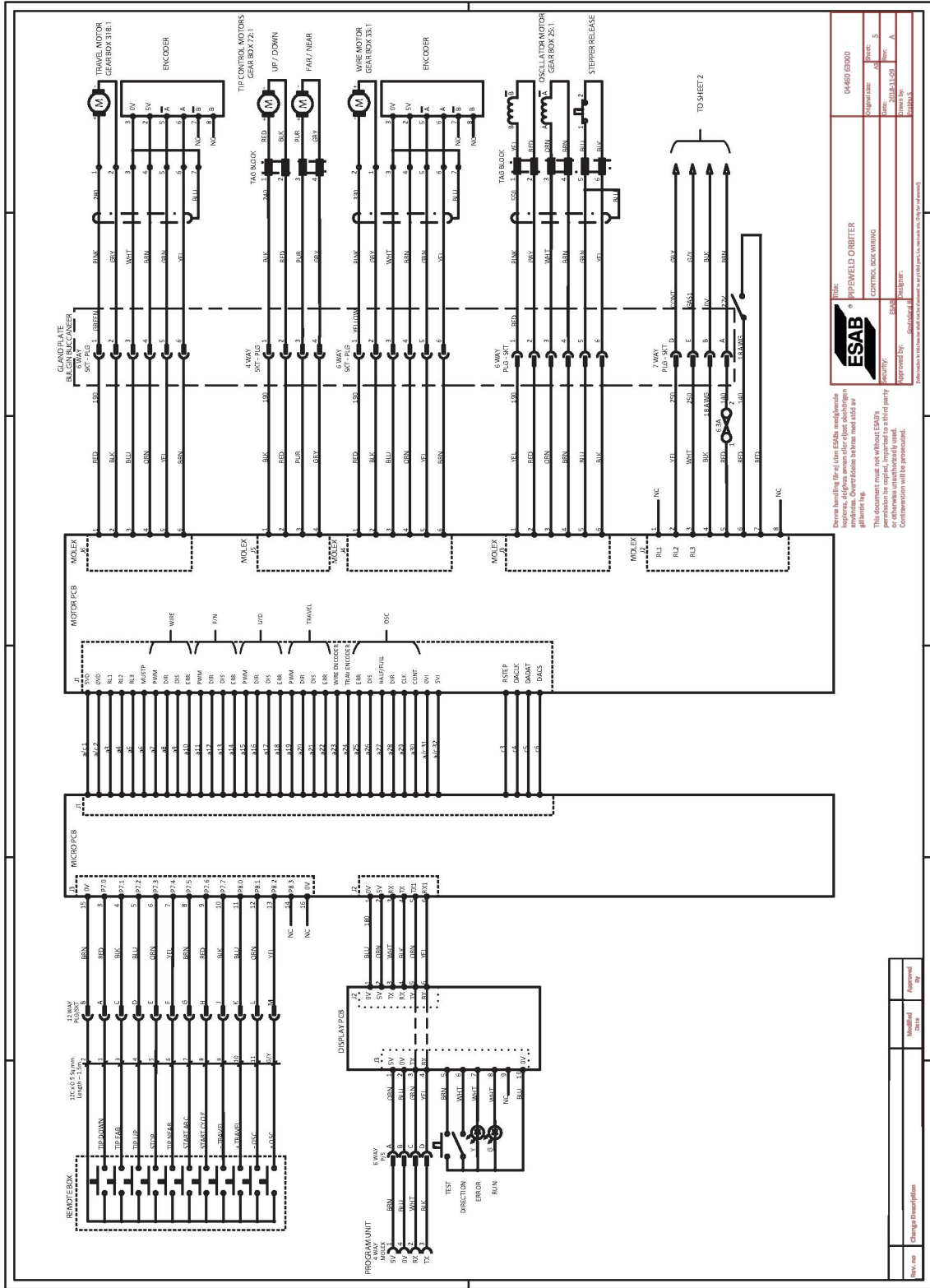
DIAGRAM









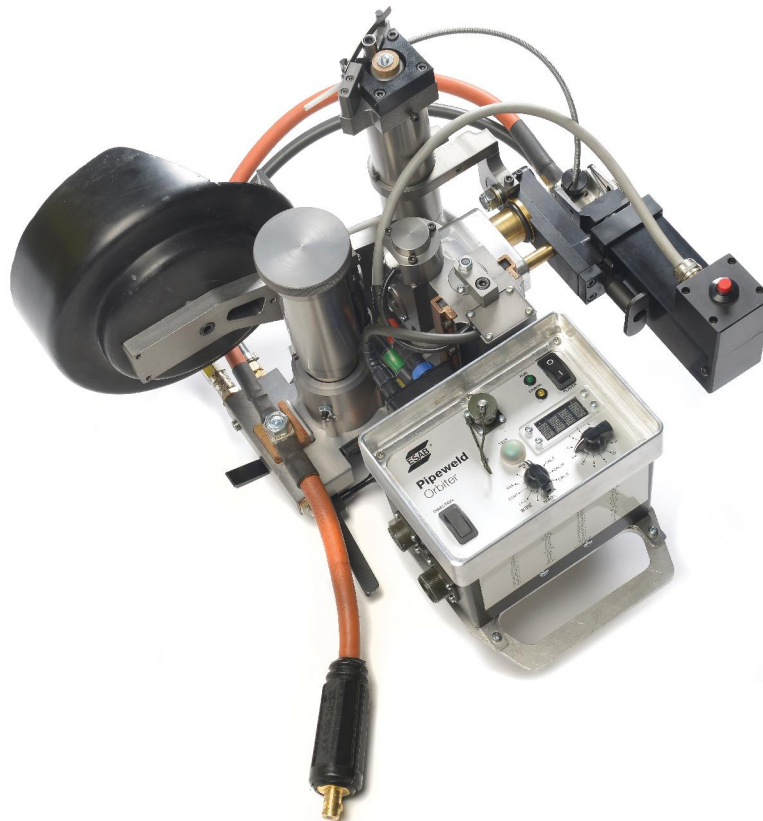


| | |
|--------------|------------|
| Part No | 0460 83000 |
| Original use | Part 5 |
| Drawn by | 0460 83000 |
| Checked by | 0460 83000 |
| Approved by | 0460 83000 |

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| | |
|--------------------|----------|
| Change Description | Approval |
| | |
| | |

ORDERING NUMBERS



| Ordering no. | Denomination | Type |
|--------------|--|------|
| 0459 990 708 | Pipeweld orbiter Bug | |
| 0459 990 380 | Pipeweld Orbiter Package incl. 30m Cable | |
| 0463 488 001 | Spare parts list | |

Technical documentation is available on the Internet at: www.esab.com

WEAR PARTS

Pipeweld Orbiter

| Item | Qty | Ordering no. | Denomination | Notes |
|-------------|------------|---------------------|---------------------------------------|--------------|
| | 1 | 0459990402 | PipeWeld Drive Wheel | |
| | 30 | 0459990403 | PipeWeld Bowden cable pack | |
| | 100 | 0459990404 | PipeWeld Welding Tips | |
| | 1 | 0459990405 | PipeWeld Shroud Assembly | |
| | 1 | 0459990406 | PipeWeld Wirefeed Ins Block | |
| | 1 | 0459990407 | PipeWeld Splatter Cover | |
| | 1 | 0459990408 | PipeWeld Wirefeed wheel set | |
| | 10 | 0459990410 | PipeWeld leaf spring | |
| | 10 | 0459990415 | PipeWeld torch body o-ring | |
| | 1 | 0459990519 | PipeWeld Orbiter Basic Consumable Kit | |

ACCESSORIES

| | | |
|--------------|--------------------------------------|--|
| 0459 990 381 | PipeWeld Orbiter Prog Kit | |
| 0459 990 382 | PipeWeld Orbiter Tool Kit | |
| 0459 990 700 | Travel Band 10.75" spaced to 6.625" | |
| 0459 990 525 | 8" ID Pipe 10.75"Orbiter Travel Band | |
| 0459 990 383 | 10.75"Orbiter Travel Band | |
| 0459 990 384 | 12.75"Orbiter Travel Band | |
| 0459 990 385 | 14"Orbiter Travel Band | |
| 0459 990 386 | 16"Orbiter Travel Band | |
| 0459 990 387 | 18"Orbiter Travel Band | |
| 0459 990 388 | 20"Orbiter Travel Band | |
| 0459 990 389 | 22"Orbiter Travel Band | |
| 0459 990 390 | 24"Orbiter Travel Band | |
| 0459 990 391 | 26"Orbiter Travel Band | |
| 0459 990 392 | 28"Orbiter Travel Band | |
| 0459 990 393 | 30"Orbiter Travel Band | |
| 0459 990 394 | 32"Orbiter Travel Band | |
| 0459 990 395 | 34"Orbiter Travel Band | |
| 0459 990 396 | 36"Orbiter Travel Band | |
| 0459 990 397 | 38"Orbiter Travel Band | |
| 0459 990 398 | 40"Orbiter Travel Band | |
| 0459 990 399 | 42"Orbiter Travel Band | |
| 0459 990 400 | 44"Orbiter Travel Band | |
| 0459 990 401 | 48"Orbiter Travel Band | |
| 0459 990 656 | 60" Travel band | |
| 0459 990 657 | 72" Travel band | |
| 0459 990 658 | 86" Travel band | |
| 0459 990 521 | PipeWeld Orbiter HHPU | |
| 0459 990 526 | Torch Extension Assemble | |
| 0464 562 880 | External feeder box - Warrior | |



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<http://manuals.esab.com>

