Buddy™

Tig 160

Instruction manual

0463 267 001 GB 20150427

Valid for: serial no. 31311101199

DECLARATION OF CONFORMITY

According to

The Low Voltage Directive 2006/95/EC, entering into force 16 January 2007

The EMC Directive 2004//108/EC, entering into force 20 July 2007

The RoHS Directive 2011/65/EC, entering onto force 2 January 2013

Type of equipment
Welding power source

Type designation etc.
Buddy™ Tig 160, Stock code 0700 300 681, from serial number 31311101199

Brand name or trade mark
ESAB

Manufacturer or his authorised representative established within the EEA
Name, address, telephone No:

ESAB AB
Lindholmsallén 9,
Box 8004,
SE-402 77 Göteborg,
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The following harmonised standard in force within the EEA has been used in the design:
EN 60974-1, Arc Welding Equipment – Part 1: Welding Power Sources
EN 60974-3, Arc Welding Equipment – Part 3: Arc Starting & Stabilizing Devices
EN 60974-10, Arc Welding Equipment – Part 10: Electromagnetic Compatibility (EMC) requirements

Additional Information: Restrictive use, Class A equipment, intended for use in locations 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 2014-01-16
Gothenburg

Signature

Stephen Argo
Clarification

Position
Global Director
Equipment

1 SAFETY

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 extinquishing equipment must be clearly marked and close at hand
   - Lubrication and maintenance must **not** be carried out on the equipment during operation

WARNING!
Do not use the power source for thawing frozen pipes.

WARNING!

Arc welding and cutting can be injurious to yourself and others. Take precautions when welding and cutting. Ask for your employer's safety practices which should be based on manufacturers' hazard data.

ELECTRIC SHOCK - Can kill

- Install and earth the unit in accordance with applicable standards
- Do not touch live electrical parts or electrodes with bare skin, wet gloves or wet clothing
- Insulate yourself from earth and the workpiece
- Ensure your working stance is safe

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

FIRE HAZARD

- Sparks (spatter) can cause fire. Make sure therefore that there are no inflammable materials nearby

NOISE - Excessive noise can damage hearing

- Protect your ears. Use earmuffs or other hearing protection.
- Warn bystanders of the risk

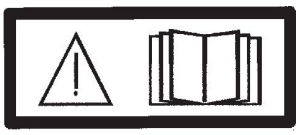
MALFUNCTION - Call for expert assistance in the event of malfunction.

Read and understand the instruction manual before installing or operating.

PROTECT YOURSELF AND OTHERS!

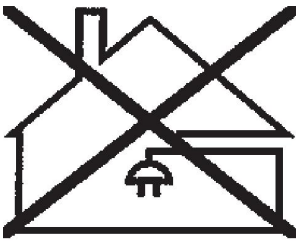
CAUTION!

Read and understand the instruction manual before installing or operating.



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.



CAUTION!

This product is solely intended for arc welding.

ESAB can provide you with all necessary welding protection and accessories.

DISMANTLING AND SCRAPPING

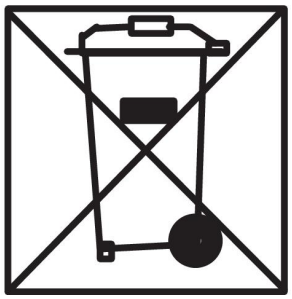
NOTE!

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.



Welding equipment primarily consists of steel, plastic and non-ferrous metals, and must be handled according to local environmental regulations.

Coolant must also be handled according to local environmental regulations.

2 INTRODUCTION

TIG 160 is a welding power source intended for TIG welding and for use with MMA welding (coated electrodes).

ESAB's accessories for the product can be found in the "ACCESSORIES" chapter of this manual.

2.1 Equipment

The power source is supplied with:

- 4 meter TIG welding torch
- 3 meter welding cable with electrode holder and return cable with return clamp
- Instruction manual

3 TECHNICAL DATA

	Tig 160
Mains voltage	230 V 1~ ±10%, 50/60 Hz
Primary current I_{max}	32.6 A
Setting range TIG	5 A / 10 V - 160 A / 16.4 V
Setting range MMA	5 A / 20.0 V - 160 A / 26.4 V
Permissible load at TIG	
20 % duty cycle	160 A / 16.4 V
60 % duty cycle	105 A / 14.2 V
100% duty cycle	85 A / 13.4 V
Permissible load at MMA	
20 % duty cycle	160 A / 26.4 V
60 % duty cycle	105 A / 24.2 V
100% duty cycle	85 A / 23.4 V
Power factor at maximum current	0.72
Efficiency at maximum current	> 80 %
Open-circuit voltage $U0_{max}$	60 V
Operating temperature	-10 to +40°C
Transportation temperature	-20 to +55°C
Sound pressure at no load	<70 db (A)
Dimensions l × w × h	310 × 140 × 230 mm
Weight	8 kg
Enclosure class	IP 23S
Application class	S

Duty cycle

The duty cycle refers to the time as a percentage of a ten-minute period that you can weld or cut at a certain load without overloading. The duty cycle is valid for 40°C / 104°F.

Enclosure class

The **IP** code indicates the enclosure class, i. e. the degree of protection against penetration by solid objects or water.

Equipment marked **IP23** is intended for indoor and outdoor use.

Application class

The symbol S indicates that the power source is designed for use in areas with increased electrical hazard.

4 INSTALLATION

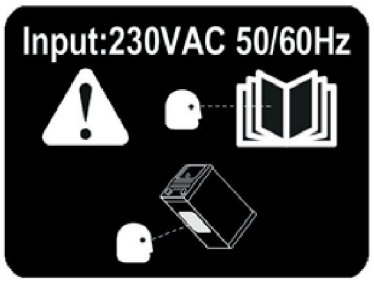
The installation must be carried out by a professional.

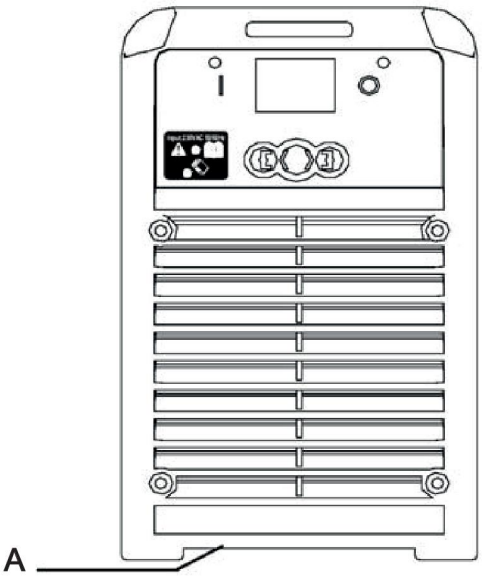
4.1 Location

Position the power source such that its cooling air inlets and outlets are not obstructed. Also position the power source so that the air inlet does not get clogged with unwanted material.

4.2 Mains power supply

Make sure that the welding power source is connected to the correct supply voltage and that it is protected by the correct fuse rating. The outlet shall have a protective earth connection.





A. Rating plate with supply connection data

4.2.1 Recommended fuse sizes and minimum cable area

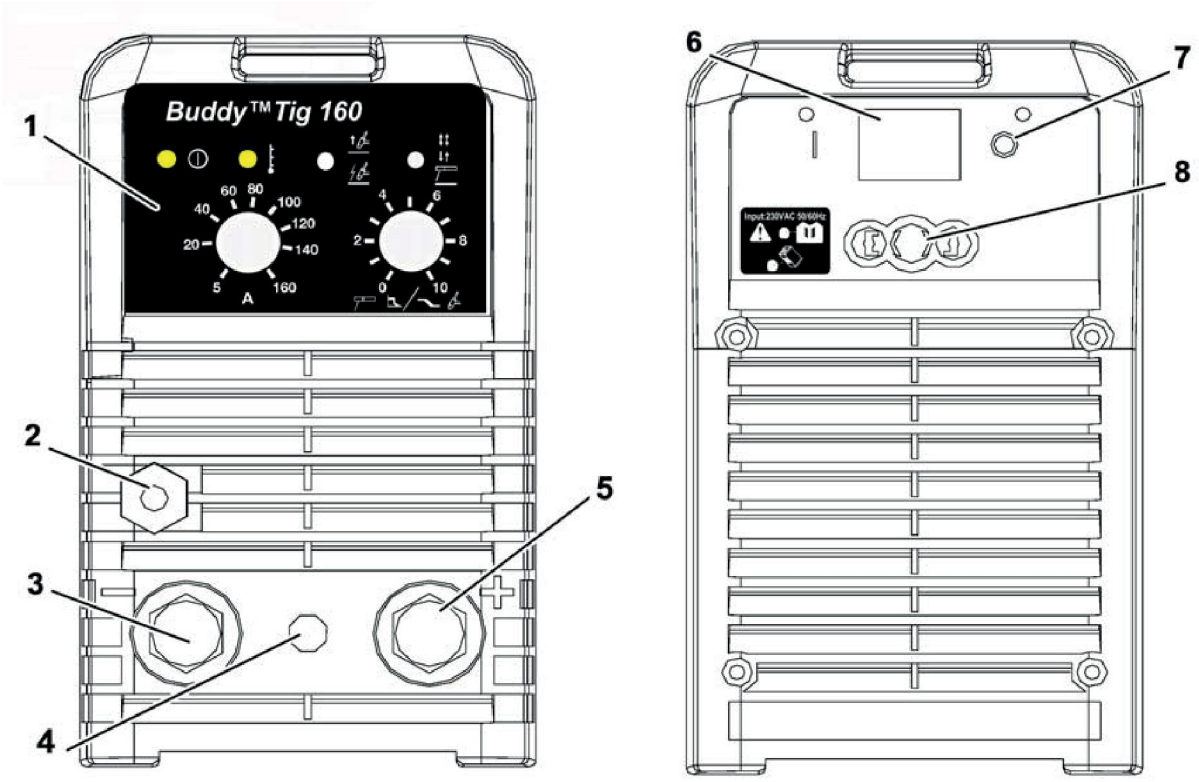
	TIG 160
Mains voltage	230 V 1~ ± 10%, 50/ 60 Hz
Mains cable area mm^2	3 G 2.5
Phase current I_{1eff} (TIG)	10.2 A
Phase current I_{1eff} (MMA)	14.6 A

NOTE!
Use the welding power source in accordance with the relevant national regulations.

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!

5.1 Connections



1. Control panel
2. Connection for TIG torch (shielding gas)
3. Connection (-) for return cable or welding cable
4. Connection to the TIG torch
5. Connection (+) for return cable or welding cable
6. Mains power supply switch 1/O
7. Connection for shielding gas
8. Connection for mains cable

5.2 Connection of welding and return cable

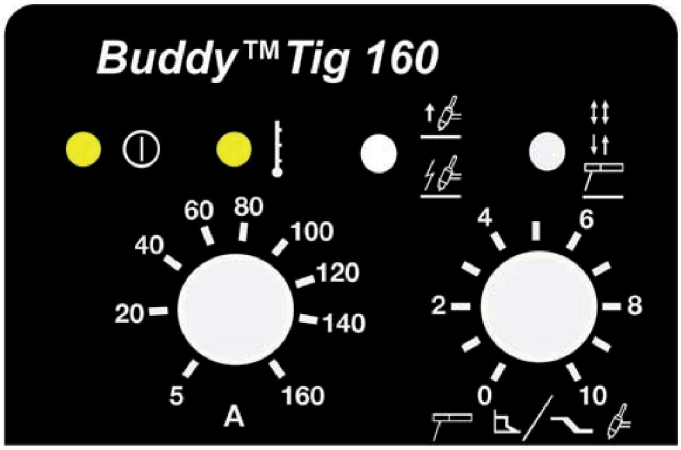
The power source has two outputs, a negative [-] terminal (2) and a positive [+] terminal (3), for connecting welding and return cables.

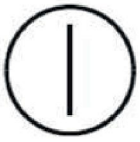
For optional TIG process, connect the TIG torch power cable to the negative [-] terminal (2). Connect gas inlet nut to a regulated shielding gas supply.

For MMA process the output to which the welding cable is connected depends on the type of electrode, please refer to electrode packaging for information relating to the correct electrode polarity.

Connect the return cable to the remaining welding terminal on the power source. Secure the return cable's contact clamp to the work piece and ensure that there is good contact.

5.3 Symbols and functions





Power ON

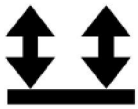
Indicating lamp, white, power supply ON

Overheating

Indicating lamp, yellow, overheating

Lift Arc

HF start



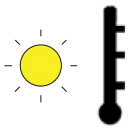
4-stroke

2-stroke

MMA welding

Arc force

Slope down



Overheating protection

The welding power source has a thermal overload trip which operates if the temperature becomes too high, interrupting the welding current and lighting a yellow indicating lamp on the front of the power source. The thermal overload trip resets automatically when the temperature has fallen.

NOTE!

If the utilization of the power source is to high it might get overheated. See permissable load in the TECHNICAL DATA chapter in this manual.

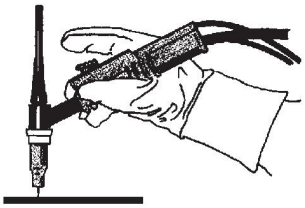
If the air inlet or outlet is blocked or get clogged with unwanted material the power source might get overheated. Make sure that the airflow through the power source is not blocked.

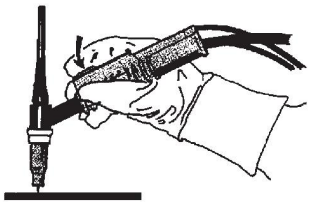
HF start

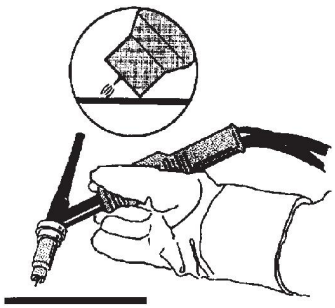
The HF start function strikes the arc by means of a spark from the electrode to the workpiece as the electrode is brought closer to the workpiece.

LiftArc™

The LiftArc™ function strikes the arc when the electrode is brought into contact with the workpiece and then lifted away from it.

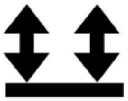






Striking the arc with the LiftArc™ function:

1. The electrode is touched on to the workpiece.
2. The trigger switch is pressed, and a low current starts to flow.
3. The welder lifts the electrode from the workpiece: the arc strikes, and the current rises automatically to the set value.



4-stroke

In the 4 stroke control mode, pressing the TIG torch trigger switch starts gas pre-flow (if used). At the end of the gas pre-flow time, the current rises to the pilot current (a few ampere), and the arc is struck. Releasing the trigger switch increases the current to the set value (with slope up, if in use). When the trigger switch is pressed in the current returns to the set pilot current (with ”slope down” if in use). When the trigger switch is released again the arc is extinguished and gas post flow occurs.

Gas post flow time is determined proportionately to the welding current level. e.g. low welding current=Short post flow time. High welding current = longer post flow gas time.

2-stroke

In the 2 stroke control mode, pressing the TIG torch trigger switch starts gas pre-flow (if used) and strikes the arc. The current rises to the set value (as controlled by the slope up function, if in operation). Releasing the trigger switch reduces the current (or starts slope down if in operation) and extinguishes the arc.

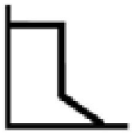
Gas post flow time is determined proportionately to the welding current level. e.g. low welding current=Short post flow time. High welding current = longer post flow gas time.

MMA welding

MMA welding may also be referred to as welding with coated electrodes. Striking the arc melts the electrode, and its coating forms protective slag.

Slope down

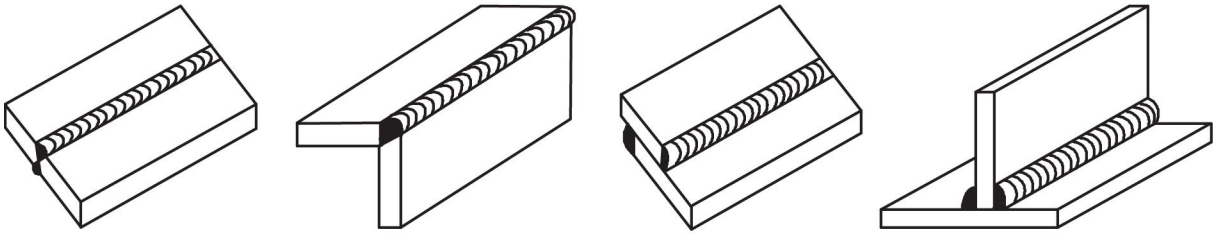
TIG welding uses “slope down”, by which the current falls 'slowly' over a controlled time, to avoid craters and/or cracks, when a weld is finished.



Arc force

The arc force is important in determining how the current changes in response to a change in the arc length. A lower value gives a calmer arc with less spatter.

Joint forms



Butt joint *Corner joint* *Lap joint* *T joint*

5.4 TIG welding

TIG welding melts the metal of the workpiece, using an arc struck from a tungsten electrode, which does not itself melt. The weld pool and the electrode are protected by shielding gas.

TIG welding is particularly useful where high quality is demanded and for welding thin plate. The power sources also have good characteristics for TIG welding.

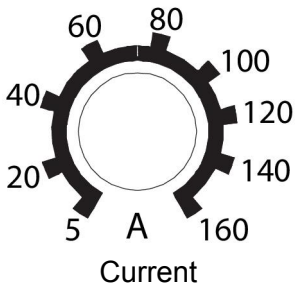
In order to TIG weld, the power source must be equipped with:

- a welding gas cylinder (a suitable welding gas)
- a welding gas regulator (suitable gas regulator)
- tungsten electrode
- suitable auxiliary material, if necessary.

Move process selector switch to desired welding process. NOTE: Power source output is enabled. Check welding cable and TIG torch polarity matches electrode requirements. Select desired welding current level.

5.4.1 Welding current setting

The power source has an adjustable welding current from 5 to 160 Amps.



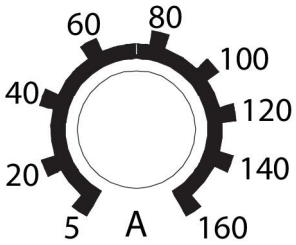
5.5 MMA welding

Move process selector switch to desired welding process.

NOTE!
Power source output is enabled. Check welding cable polarity selection matches electrode requirements. Select desired welding current level.

5.5.1 Welding current setting

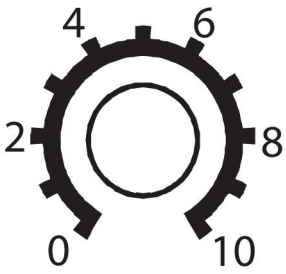
The power source has an adjustable welding current from 5 to 160 Amps.



Current

5.5.2 Arc force

This knob is used to adjust the arc force.



ARC FORCE(MMA)

SLOPE DOWN (TIG)

5.5.3 Striking the arc

MMA welding may also be referred to as welding with coated electrodes. Striking the arc melts the electrode, and its coating forms protective slag.

If, when striking the arc, the tip of the electrode is pressed against the metal, it immediately melts and sticks to the metal, rendering continued welding impossible. Therefore, the arc has to be struck in the same way that you would light a match.

Quickly strike the electrode against the metal and then raise it to give an appropriate arc length (approx. 2 mm). If the arc is too long, it will crackle and split before finally going out completely. Once the arc has been struck, move the electrode from left to right. The electrode should be at an angle of 60° to the metal.

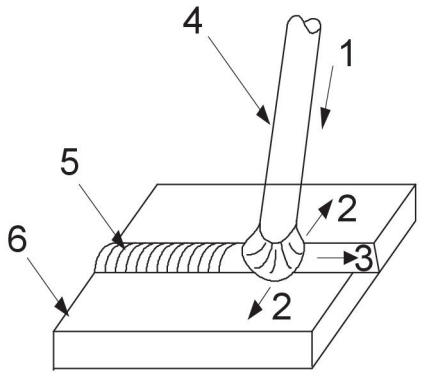
5.5.4 Manipulation of electrode

In MMA welding, there are three motions to being matched in the end of electrode: the electrode moving to the molten pool along axes [1];

a small oscillation maybe neccessary to achieve the desired width of the melt pool [2];

the electrode moving along welding way [3].

The operator can choose the manipulation of electrode based on welding joint sharp, welding position, electrode spec, welding current and operation skill, etc.



1. electrode moving
2. the electrode oscilliation (right and left)
3. the electrode move along weld
4. electrode
5. weld
6. workpiece

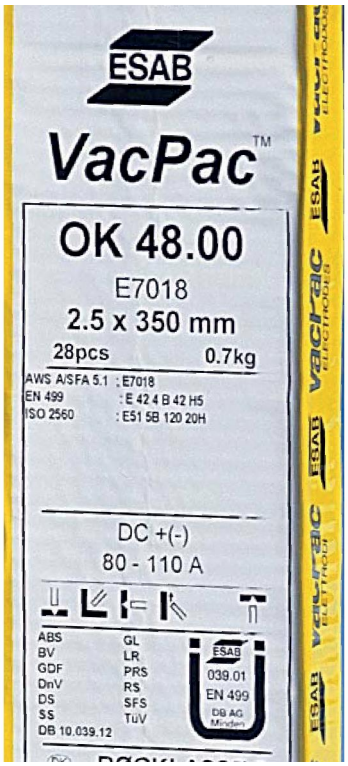
5.5.5 Anti-electrode pick-up

If, during welding, the tungsten electrode would get in direct contact (touching) with the work piece to form a short circuit the welding current will drop to a minimum to prolong the life of the electrode.

5.5.6 Electrode selection

The selection of the right electrode diameter should be based on the thickness of the work piece, the welding position, the type of joint etc. Please refer to the recommendations on the electrode package for further details.

- To ensure good quality weld, the electrode should always be dried or dry stored. This to avoid hydrogen inclusion, blowhols and cold cracks.
- In the welding process, the arc must not be too long; otherwise, it will cause unstable arc burning, large spatter, light penetration, undercut, blowhole, etc. If the arc is too short, it will cause electrode stick.



6 MAINTENANCE

NOTE!
Regular maintenance is important for safe, reliable operation.

CAUTION!
Only those persons who have appropriate electrical knowledge (authorized personnel) may remove the safety plates.

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.

6.1 Power source

Check regularly that the welding power source is not clogged with dirt.

How often and which cleaning methods apply depend on:

- welding process
- arc time
- placement
- surrounding environment.

It is normally sufficient to blow the power source with dry compressed air (reduced pressure) once a year.

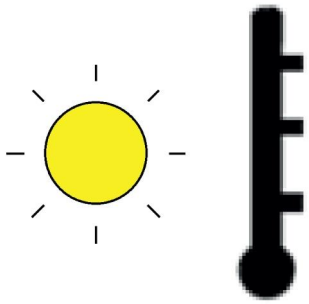
Clogged or blocked air inlets and outlets otherwise result in overheating.

6.2 Welding torch

Wear parts should be cleaned and replaced at regular intervals in order to achieve trouble-free welding.

7 FAULT-TRACING

Try these recommended checks and inspections before sending for an authorized service technician.

Type of fault	Corrective action
Poor Arc Starting; TIG Mode.	• Check Tig torch and ground cable connections. • Check Tig torch & Ground cable for correct Polarity. • Check Tungsten and regrind point as necessary. • Weak HF (High Frequency) Have Service Technician check spark gap assembly for correct setting.
No arc.	• Check that the mains power supply switch is turned on. • Check That the mains input Voltage is not too low or too high. The yellow LED will illuminate if the input is below or above the recommended levels and the machine is at normal working temperature. • Check that the welding current supply and return cables are correctly connected. • Check that the correct current value is set. • Check to see whether the MCB has tripped.
The welding current is interrupted during welding.	• Check whether the thermal cut-outs have tripped (indicated by the yellow lamp on the front panel). • Check the mains power supply fuses.
The thermal cut-out trips frequently. 	• Check to see whether the dust filter is clogged. • Make sure that you are not exceeding the rated data for the power source (i.e. that the unit is not being overloaded). See permissable load in the TECHNICAL DATA chapter in this manual. • Make sure that the positioning of the power source is such that its cooling air inlets and outlets are not obstructed.
Poor welding performance.	• Check that the welding current supply and return cables are correctly connected. • Check that the correct current value is set. • Check that the correct electrodes are being used. • Check the gas flow.

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.

Tig 160 is designed and tested in accordance with the international and European standards EN 60974-1, 60974-3 and EN 60974-10. It is the obligation of the service unit which has carried out the service or repair work to make sure that the product still conforms to the said standard.

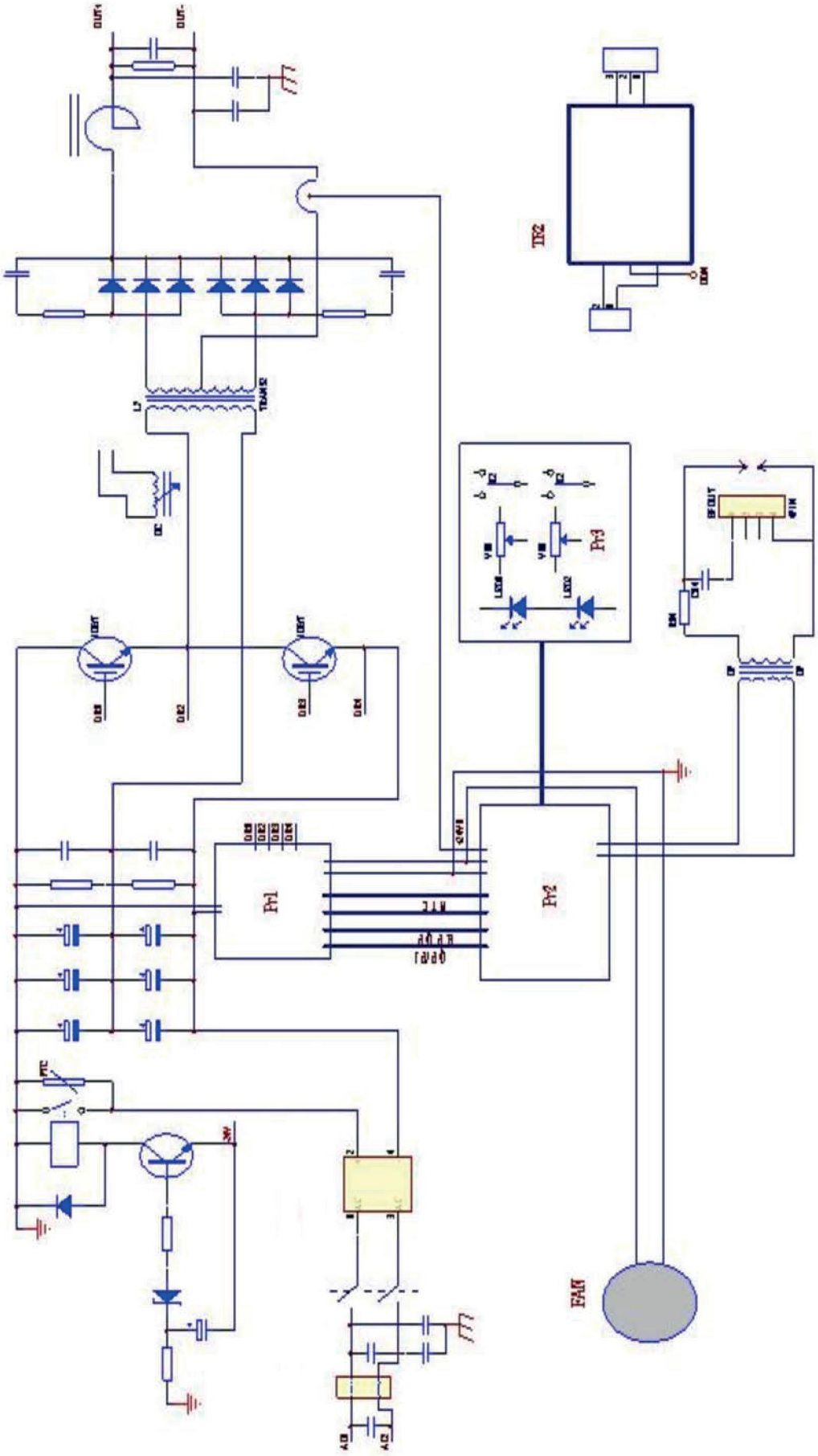
The spare parts list is published in a separate document that can be downloaded from the Internet: www.esab.com

ORDERING NUMBERS

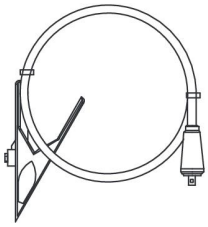
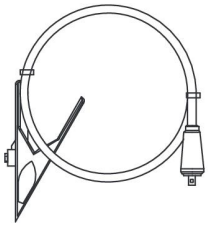
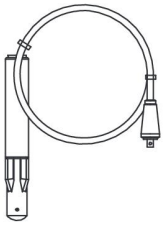
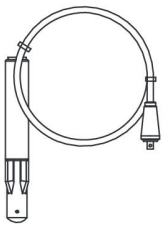
Ordering no.	Description	Type
0700 300 886	Welding power source	Buddy™ Tig 160
0459 839 067	Spare parts list	Buddy™ Tig 160

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

DIAGRAM



ACCESSORIES

0700 006 901	Return cable with clamp 200A, OKC 50, 3 m	
0700 006 885	Return cable with clamp 200A, OKC 50, 5 m	
0700 006 900	Welding cable 200A, OKC 50, 3 m	
0700 006 884	Welding cable 200A, OKC 50, 5 m	
0700 300 860	ET17 TIG torch, 4 m	

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