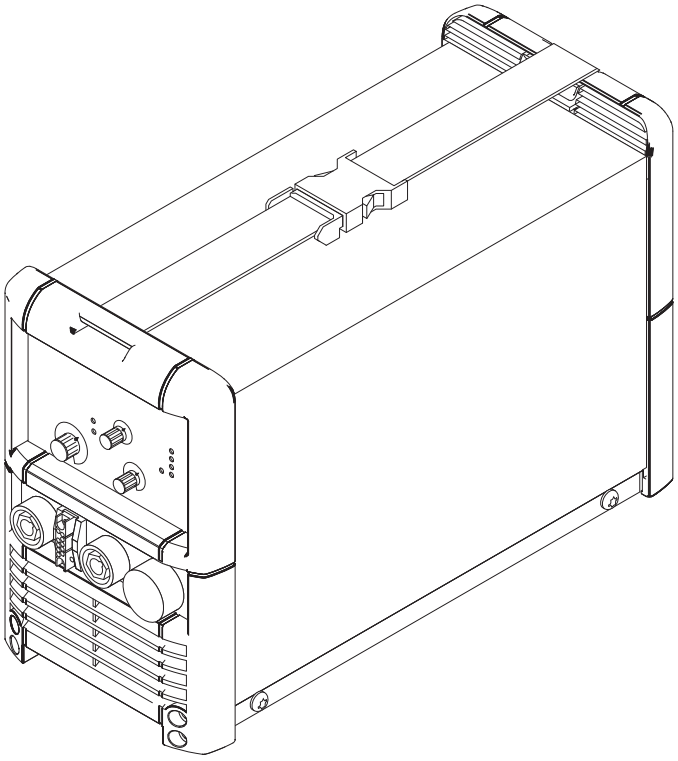
TransTig 1600
TransTig 1700

GB Operating Instructions
Spare Parts List

TIG power source



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Dear Reader

Introduction

Thank you for choosing Fronius - and congratulations on your new, technically high-grade Fronius product! This instruction manual will help you get to know your new machine. Read the manual carefully and you will soon be familiar with all the many great features of your new Fronius product. This really is the best way to get the most out of all the advantages that your machine has to offer.

Please also take special note of the safety rules - and observe them! In this way, you will help to ensure more safety at your product location. And of course, if you treat your product carefully, this definitely helps to prolong its enduring quality and reliability - things which are both essential prerequisites for getting outstanding results.

Safety rules

DANGER!

"DANGER!" indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations. This signal word is not used for property damage hazards unless personal injury risk appropriate to this level is also involved.

WARNING!

"WARNING!" indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. This signal word is not used for property damage hazards unless personal injury risk appropriate to this level is also involved.

CAUTION!

"CAUTION!" indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices that may cause property damage.

NOTE!

"NOTE!" indicates a situation which implies a risk of impaired welding result and damage to the equipment.

Important!

"Important!" indicates practical hints and other useful special-information. It is no signal word for a harmful or dangerous situation.

Whenever you see any of the symbols shown above, you must pay even closer attention to the contents of the manual!

General remarks

This equipment has been made in accordance with the state of the art and all recognised safety rules. Nevertheless, incorrect operation or misuse may still lead to danger for

- the life and well-being of the operator or of third parties,
- the equipment and other tangible assets belonging to the owner/ operator,
- efficient working with the equipment.

All persons involved in any way with starting up, operating, servicing and maintaining the equipment must

- be suitably qualified
- know about welding and
- read and follow exactly the instructions given in this manual.

The instruction manual must be kept at the machine location at all times. In addition to the instruction manual, copies of both the generally applicable and the local accident prevention and environmental protection rules must be kept on hand, and of course observed in practice.

All the safety instructions and danger warnings on the machine itself:

- must be kept in a legible condition
- must not be damaged, must not be removed
- must not be covered, pasted or painted over

For information about where the safety instructions and danger warnings are located on the machine, please see the section of your machine's instruction manual headed "General remarks".

General remarks
(continued)

Any malfunctions which might impair machine safety must be eliminated immediately - meaning before the equipment is next switched on.

It's your safety that's at stake!

Utilisation for intended purpose only

The machine may only be used for jobs as defined by the "Intended purpose".

The machine may ONLY be used for the welding processes stated on the rating plate.
Utilisation for any other purpose, or in any other manner, shall be deemed to be "not in accordance with the intended purpose". The manufacturer shall not be liable for any damage resulting from such improper use.

Utilisation in accordance with the "intended purpose" also comprises
- complete reading and following of all the instructions given in this manual
- complete reading and following of all the safety instructions and danger warnings
- performing all stipulated inspection and servicing work.

The appliance must never be used for the following:
- Thawing pipes
- Charging batteries/accumulators
- Starting engines

The machine is designed to be used in industrial and workshop environments. The manufacturer shall not be liable for any damage resulting from use of the machine in residential premises.

ikewise the manufacturer will accept no liability for defective or faulty work results.

Ambient conditions

Operation or storage of the power source outside the stipulated range is deemed to be "not in accordance with the intended use". The manufacturer shall not be liable for any damage resulting herefrom.

Temperature range of ambient air:
- when operating: - 10 °C to + 40 °C (14 °F to 104 °F)
- when being transported or stored: - 20 °C to + 55 °C (-4 °F to 131 °F)

Relative atmospheric humidity:
- up to 50 % at 40 °C (104 °F)
- up to 90 % at 20 °C (68 °F)

Ambient air: Free of dust, acids, corrosive gases or substances etc.

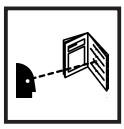
Elevation above sea level: Up to 2000 m (6500 ft)

Obligations of owner/operator

The owner/operator undertakes to ensure that the only persons allowed to work with the machine are persons who
- are familiar with the basic regulations on workplace safety and accident prevention and who have been instructed in how to operate the machine
- have read and understood this operating manual particulary the sections on "Safety rules", and have confirmed as much with their signatures
- be trained in such a way that meets with the requirements of the work results

Regular checks must be performed to ensure that personnel are still working in a safety-conscious manner.

Obligations of personnel



Before starting work, all persons to be entrusted with carrying out work with (or on) the machine shall undertake
- to observe the basic regulations on workplace safety and accident prevention
- to read this operating manual particulary the sections on “Safety rules” and to sign to confirm that they have understood these and will comply with them.

Before leaving the workplace, personnel must ensure that there is no risk of injury or damage being caused during their absence.

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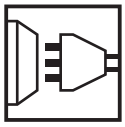
Mains connection



High-performance devices can affect the quality of the mains power due to their current-input.
This may affect a number of types of device in terms of:
- connection restrictions
- criteria with regard to maximum permissible mains impedance *)
- criteria with regard to minimum short-circuit power requirement *)

*) at the interface with the public mains network

see Technical Data

In this case, the plant operator or the person using the device should check whether or not the device is allowed to be connected, where appropriate through discussion with the power supply company.

NOTE! Ensure that the mains connection is earthed properly.

Protection for yourself and other persons

When welding, you are exposed to many different hazards such as:
- flying sparks and hot metal particles
- arc radiation which could damage your eyes and skin

- harmful electromagnetic fields which may put the lives of cardiac pacemaker users at risk

- electrical hazards from mains and welding current

- increased exposure to noise

- noxious welding fumes and gases.

Anybody working on the workpiece during welding must wear suitable protective clothing with the following characteristics:
- flame-retardant
- isolating and dry
- must cover whole body, be undamaged and in good condition
- protective helmet
- trousers with no turn-ups

Protection for yourself and other persons (continued)

"Protective clothing" also includes:
- protecting your eyes and face from UV rays, heat and flying sparks with an appropriate safety shield containing appropriate regulation filter glass
- wearing a pair of appropriate regulation goggles (with sideguards) behind the safety shield
- wearing stout footwear that will also insulate even in wet conditions
- protecting your hands by wearing appropriate gloves (electrically insulating, heat-proof)
- To lessen your exposure to noise and to protect your hearing against injury, wear ear-protectors!

Keep other people - especially children - well away from the equipment and the welding operation while this is in progress. If there are still any other persons nearby during welding, you must
- draw their attention to all the dangers (risk of being dazzled by the arc or injured by flying sparks, harmful welding fumes, high noise immission levels, possible hazards from mains or welding current ...)
- provide them with suitable protective equipment and/or
- erect suitable protective partitions or curtains.

Information on noise emission values

The device generates a maximum sound power level of <80 dB(A) (ref. 1pW) when idling and in the cooling phase following operation at the maximum permissible operating point under maximum rated load conditions according to EN 60974-1.

It is not possible to provide a workplace-related emission value during welding (or cutting) as this is influenced by both the process and the environment. All manner of different welding parameters come into play, including the welding process (MIG/MAG, TIG welding), the type of power selected (DC or AC), the power range, the type of weld metal, the resonance characteristics of the workpiece, the workplace environment, etc.

Hazards from noxious gases and vapours

The fumes given off during welding contain gases and vapors that are harmful to health.

Welding fumes contain substances which may cause birth defects and cancers.

Keep your head away from discharges of welding fumes and gases.

Do not inhale any fumes or noxious gases that are given off.
Extract all fumes and gases away from the workplace, using suitable means.

Ensure a sufficient supply of fresh air.

Where insufficient ventilation is available, use a respirator mask with an independent air supply.

If you are not sure whether your fume-extraction system is sufficiently powerful, compare the measured pollutant emission values with the permitted threshold limit values.

Close the shielding gas cylinder valve or central gas supply if no welding is taking place.

Hazards from noxious gases and vapours (continued)

The harmfulness of the welding fumes will depend on e.g. the following components:
- the metals used in and for the workpiece
- the electrodes
- coatings
- cleaning and degreasing agents and the like

For this reason, pay attention to the relevant Materials Safety Data Sheets and the information given by the manufacturer regarding the components listed above.

Keep all flammable vapors (e.g. from solvents) well away from the arc radiation.

Hazards from flying sparks

Flying sparks can cause fires and explosions!

Never perform welding anywhere near combustible materials.

Combustible materials must be at least 11 meters (36 ft. 1.07 in.) away from the arc, or else must be covered over with approved coverings.

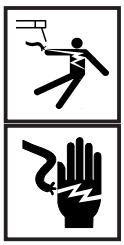
Have a suitable, approved fire extinguisher at the ready.

Sparks and hot metal particles may also get into surrounding areas through small cracks and openings. Take suitable measures here to ensure that there is no risk of injury or fire.

Do not perform welding in locations that are at risk from fire and/or explosion, or in enclosed tanks, barrels or pipes, unless these latter have been prepared for welding in accordance with the relevant national and international standards.

Welding must NEVER be performed on containers that have had gases, fuels, mineral oils etc. stored in them. Even small traces of these substances left in the containers are a major explosion hazard.

Hazards from mains and welding current



An electric shock is potentially life-threatening, and can be fatal.

Do not touch any live parts, either inside or outside the machine.

In MIG/MAG and TIG welding, the welding wire, the wire spool, the drive rollers and all metal parts having contact with the welding wire are also live.

Always place the wirefeeder on an adequately insulated floor or base, or else use a suitable insulating wirefeeder holder.

Ensure sufficient protection for yourself and for other people by means of a dry base or cover that provides adequate insulation against the ground/frame potential. The base or cover must completely cover the entire area between your body and the ground/frame potential.

All cables and other leads must be firmly attached, undamaged, properly insulated and adequately dimensioned. Immediately replace any loose connections, scorched, damaged or underdimensioned cables or other leads.

Hazards from mains and welding current
(continued)

Do not loop any cables or other leads around your body or any part of your body.

Never immerse the welding electrode (rod electrode, tungsten electrode, welding wire, ...) in liquid in order to cool it, and never touch it when the power source is ON.

Twice the open-circuit voltage of one single welding machine may occur between the welding electrodes of two welding machines. Touching the potentials of both electrodes simultaneously may be fatal.

Have the mains and the machine supply leads checked regularly by a qualified electrician to ensure that the PE (protective earth) conductor is functioning correctly.

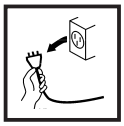
Only run the machine on a mains network with a PE conductor, and plugged into a power outlet socket with a protective-conductor contact.

If the machine is run on a mains network without a PE conductor and plugged into a power outlet socket without a protective-conductor contact, this counts as gross negligence and the manufacturer shall not be liable for any resulting damage.

Wherever necessary, use suitable measures to ensure that the workpiece is sufficiently grounded (earthed).

Switch off any appliances that are not in use.

Wear a safety harness if working at height.



Before doing any work on the machine, switch it off and unplug it from the mains.

Put up a clearly legible and easy-to-understand warning sign to stop anybody inadvertently plugging the machine back into the mains and switching it back on again.

After opening up the machine:
- discharge any components that may be storing an electrical charge
- ensure that all machine components are electrically dead.

If work needs to be performed on any live parts, there must be a second person on hand to immediately switch off the machine at the main switch in an emergency.

Stray welding currents

If the following instructions are ignored, stray welding currents may occur. These can cause:
- fires
- overheating of components that are connected to the workpiece
- destruction of PE conductors
- damage to the machine and other electrical equipment

Ensure that the workpiece clamp is tightly connected to the workpiece.

Attach the workpiece clamp as close as possible to the area to be welded.

On electrically conductive floors, the machine must be set up in such a way that it is sufficiently insulated from the floor.

Stray welding currents
(continued)

When using current supply distributors, twin head wire feeder fixtures etc., please note the following: The electrode on the unused welding torch/ welding tongs is also current carrying. Please ensure that there is sufficient insulating storage for the unused welding torch/tongs.

In the case of automated MIG/MAG applications, ensure that only insulated filler wire is routed from the welding wire drum, large wirefeeder spool or wirespool to the wirefeeder.

EMC device classifications

Devices with emission class A:
- are only designed for use in an industrial setting
- can cause conducted and emitted interference in other areas.

Devices with emission class B:
- satisfy the emissions criteria for residential and industrial areas. This also applies to residential areas in which power is supplied from the public low-voltage grid.

EMC device classification as per the rating plate or technical specifications

EMC measures

In certain cases, even though a device complies with the standard limit values for emissions, it may affect the application area for which it was designed (e.g. when there is sensitive equipment at the same location, or if the site where the device is installed is close to either radio or television receivers).
If this is the case, then the operator is obliged to take appropriate action to rectify the situation.

Examine and evaluate any possible electromagnetic problems that may occur on equipment in the vicinity, and the degree of immunity of this equipment, in accordance with national and international regulations:
- safety features
- mains, signal and data-transmission leads
- IT and telecoms equipment
- measurement and calibration devices

Ancillary measures for preventing EMC problems:

a) Mains supply
- If electromagnetic interference still occurs, despite the fact that the mains connection is in accordance with the regulations, take additional measures (e.g. use a suitable mains filter).

b) Welding cables
- Keep these as short as possible
- Arrange them so that they run close together (to prevent EMI problems as well)
- Lay them well away from other leads.

c) Equipotential bonding

d) Workpiece grounding (earthing)
- where necessary, run the connection to ground (earth) via suitable capacitors.

e) Shielding, where necessary
- Shield other equipment in the vicinity
- Shield the entire welding installation.

EMI Precautions

Electromagnetic fields may cause as yet unknown damage to health.
- Effects on the health of persons in the vicinity, e.g. users of heart pace-makers and hearing aids
- Users of heart pacemakers must take medical advice before going anywhere near welding equipment or welding workplaces
- Keep as much space as possible between welding cables and head/ body of welder for safety reasons
- Do not carrywelding cables and hose pack over shoulder and do not loop around body or or any part of body

Particular danger spots

Keep your hands, hair, clothing and tools well away from all moving parts, e.g.:
- fans
- toothed wheels, rollers, shafts
- wire-spools and welding wires

Do not put your fingers anywhere near the rotating toothed wheels of the wirefeed drive.

Covers and sideguards may only be opened or removed for as long as is absolutely necessary to carry out maintenance and repair work.

While the machine is in use:
- ensure that all the covers are closed and that all the sideguards are properly mounted ...
- ... and that all covers and sideguards are kept closed.

When the welding wire emerges from the torch, there is a high risk of injury (the wire may pierce the welder's hand, injure his face and eyes ...).

For this reason, when feeder-inching etc., always hold the torch so that it is pointing away from your body (machines with wirefeeder) and wear suitable protective goggles.

Do not touch the workpiece during and after welding - risk of injury from burning!

Slag may suddenly "jump" off workpieces as they cool. For this reason, continue to wear the regulation protective gear, and to ensure that other persons are suitably protected, when doing post-weld finishing on workpieces.

Allow welding torches - and other items of equipment that are used at high operating temperatures - to cool down before doing any work on them.

Special regulations apply to rooms at risk from fire and/or explosion.
Observe all relevant national and international regulations.

Power sources for use in spaces with increased electrical danger (e.g. boilers) must be identified by the S (for "safety") mark.
However, the power source should not be in such rooms.

Particular danger spots
(continued)

Risk of scalding from accidental discharge of hot coolant. Before unplugging the connectors for coolant forward flow and return flow, switch off the cooling unit.

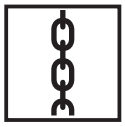
Observe the information on the coolant safety data sheet when handling coolant. The coolant safety data sheet may be obtained from your service centre or downloaded from the manufacturer's website.

When hoisting the machines by crane, only use suitable manufacturer-supplied lifting devices.

- Attach the chains and/or ropes to **all** the hoisting points provided on the suitable lifting device.
- The chains and/or ropes must be at an angle which is as close to the vertical as possible.
- Remove the gas cylinder and the wirefeed unit (from MIG/MAG and TIG units).

When hoisting the wirefeed unit by crane during welding, always use a suitable, insulating suspension arrangement (MIG/MAG and TIG units).

If a machine is fitted with a carrying strap or carrying handle, remember that this strap is ONLY to be used for lifting and carrying the machine by hand. The carrying strap is NOT suitable for transporting the machine by crane, fork-lift truck or by any other mechanical hoisting device.



All lifting accessories (straps, handles, chains, etc.) used in connection with the device or its components must be tested regularly (e.g. for mechanical damage, corrosion or changes caused by other environmental factors). The testing interval and scope of testing must comply with applicable national standards and directives as a minimum.

Danger of colourless and odourless inert gas escaping unnoticed, when using an adapter for the inert gas protection. Seal the adapter thread for the inert gas connection using Teflon tape before assembly.

Factors affecting welding results

The following requirements with regard to shielding gas quality must be met if the welding system is to operate in a correct and safe manner:

- Size of solid matter particles <40µm
- Pressure dew point <-20°C
- Max. oil content <25mg/m³

Filters must be used if necessary.

NOTE! There is an increased risk of soiling if ring mains are being used

Danger from shielding-gas cylinders

Shielding-gas cylinders contain pressurized gas and may explode if they are damaged. As shielding-gas cylinders are an integral part of the overall welding outfit, they also have to be treated with great care.

Protect shielding-gas cylinders containing compressed gas from excessive heat, mechanical impact, slag, naked flames, sparks and arcs.

Mount the shielding-gas cylinders in the vertical and fasten them in such a way that they cannot fall over (i.e. as shown in the instruction manual).

Keep shielding-gas cylinders well away from welding circuits (and, indeed, from any other electrical circuits).

Never hang a welding torch on a shielding-gas cylinder.

Never touch a shielding-gas cylinder with a welding electrode.

Explosion hazard - never perform welding on a pressurized shielding-gas cylinder.

Use only shielding-gas cylinders that are suitable for the application in question, together with matching, suitable accessories (pressure regulators, hoses and fittings, ...). Only use shielding-gas cylinders and accessories that are in good condition.

When opening the valve of a shielding-gas cylinder, always turn your face away from the outlet nozzle.

Close the shielding-gas cylinder valve when no welding is being carried out.

When the shielding-gas cylinder is not connected up, leave the cap in place on the shielding-gas cylinder valve.

Observe the manufacturer’s instructions and all relevant national and international rules applying to shielding-gas cylinders and accessories.

Safety precautions at the installation site and when being transported

A machine that topples over can easily kill someone! For this reason, always place the machine on an even, firm floor in such a way that it stands firmly.
- An angle of inclination of up to 10° is permissible.

Special regulations apply to rooms at risk from fire and/or explosion. Observe all relevant national and international regulations.

By means of internal instructions and checks, ensure that the workplace and the area around it are always kept clean and tidy.

The appliance must only be installed and operated in accordance with the protection type stated on the specifications plate.

When installing the appliance, please ensure a clearance radius of 0.5 m (1.6ft.) , so that cool air can circulate freely.

When transporting the appliance, please ensure that the valid national and regional guidelines and accident protection regulations are followed. This applies in particular to guidelines in respect of dangers during transportation and carriage.

Safety precautions at the installation site and when being transported
(continued)

Before transportation, completely drain any coolant and dismantle the following components:
- Wire feed
- Wire wound coil
- Gas bottle

Before commissioning and after transportation, a visual check for damage must be carried out. Any damage must be repaired by trained service personnel before commissioning.

Safety precautions in normal operation

Only operate the machine if all of its protective features are fully functional. If any of the protective features are not fully functional, this endangers:
- the life and well-being of the operator or other persons
- the equipment and other tangible assets belonging to the owner/operator
- efficient working with the equipment.

Any safety devices that are not fully functional must be put right before you switch on the machine.

Never evade safety features and never put safety features out of order.

Before switching on the machine, ensure that nobody can be endangered by your doing so.

- At least once a week, check the machine for any damage that may be visible from the outside, and check that the safety features all function correctly.
- Always fasten the shielding-gas cylinder firmly, and remove it altogether before hoisting the machine by crane.
- Owing to its special properties (in terms of electrical conductivity, frost-proofing, materials-compatibility, combustibility etc.), only original coolant of the manufacturer is suitable for use in our machines.
- Only use suitable original coolant of the manufacturer.
- Do not mix original coolant of the manufacturer with other coolants.
- If any damage occurs in cases where other coolants have been used, the manufacturer shall not be liable for any such damage, and all warranty claims shall be null and void.
- Under certain conditions, the coolant is flammable. Only transport the coolant in closed original containers, and keep it away from sources of ignition.
- Used coolant must be disposed of properly in accordance with the relevant national and international regulations. A safety data sheet is available from your service centre and on the manufacturer's homepage.
- Before starting welding - while the machine is still cool - check the coolant level.

Preventive and corrective maintenance

With parts sourced from other suppliers, there is no certainty that these parts will have been designed and manufactured to cope with the stressing and safety requirements that will be made of them. Use only original spares and wearing parts (this also applies to standard parts).

Do not make any alterations, installations or modifications to the machine without getting permission from the manufacturer first.

Replace immediately any components that are not in perfect condition.

When ordering spare parts, please state the exact designation and the relevant part number, as given in the spare parts list. Please also quote the serial number of your machine.

Safety inspection

The manufacturer recommends that a safety inspection of the device is performed at least once every 12 months.

The manufacturer recommends that the power source be calibrated during the same 12-month period.

A safety inspection should be carried out by a qualified electrician
- after any changes are made
- after any additional parts are installed, or after any conversions
- after repair, care and maintenance has been carried out
- at least every twelve months.

For safety inspections, follow the appropriate national and international standards and directives.

Further details on safety inspection and calibration can be obtained from your service centre. They will provide you on request with any documents you may require.

Disposal

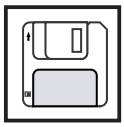
Do not dispose of this device with normal domestic waste!
To comply with the European Directive 2002/96/EC on Waste Electrical and Electronic Equipment and its implementation as national law, electrical equipment that has reached the end of its life must be collected separately and returned to an approved recycling facility Any device that you no longer require must be returned to our agent, or find out about the approved collection and recycling facilities in your area.
Ignoring this European Directive may have potentially adverse affects on the environment and your health!

Safety markings

Equipment with CE-markings fulfils the basic requirements of the Low-Voltage and Electromagnetic Compatibility Guideline (e.g. relevant product standards according to EN 60 974). .

Equipment marked with the CSA-Test Mark fulfils the requirements made in the relevant standards for Canada and the USA.

Data security



The user is responsible for the data security of changes made to factory settings. The manufacturer is not liable, if personal settings are deleted.

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Fronius Worldwide

General Details

Basic system principle

Designed as a primary transistor-switched welding machine, the welding rectifier TRANSTIG 1600 / 1700 (DC) represents a further deve-lopment of the transistor cont-rolled welding machine. It is especially suitable for TIG-manual-, and MANUAL ELEC-TRODE WELDING in the DC area. The machine's compact dimensions, low weight and modest power requirements are important advantages, both in the production and repair fields.UP/DOWN control (continuous welding-current regulation via torch trigger) is also integrated as standard.

Construction

Features such as its powder-coated sheet-steel housing, the way its controls are pro-tected by a plastic frame, and its bayonet-latching current sockets all testify to the high quality of its design. The shoulder strap makes the unit easy to move around, both within the factory and e.g. out on building sites.

Functional se-quence

The voltage from the mains power supply is rectified. A rapid transistor switching device inverts this voltage using a frequency of 100 kHz. The welding transformer produces the required working voltage, which is rectified and fed to the output sockets. An electronic controller adjusts the power-source characteristic
to suit the pre-selected welding process.

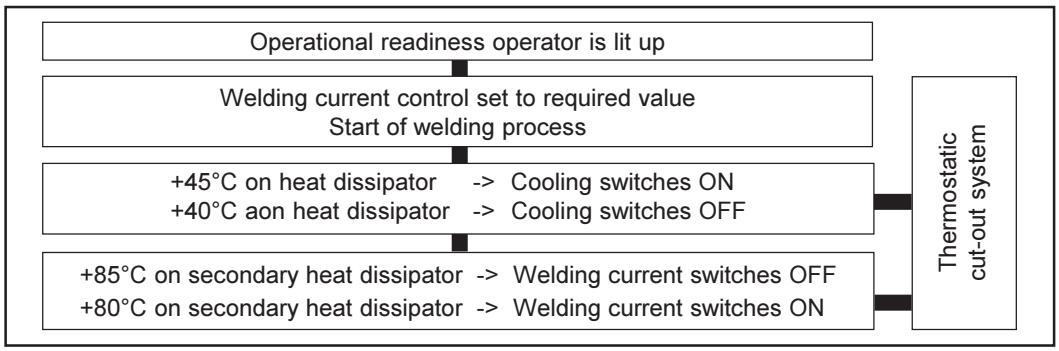


Fig. 1 Principle of the thermostatic cut-out system

Control panel

TT 1700 control panel

WARNING! Operating the equipment incorrectly can cause serious injury and damage. Do not use the functions described here until you have read and completely understood all of the following documents:
- these Operating Instructions
- all “Operating Instructions” for the system components, especially the “Safety rules”

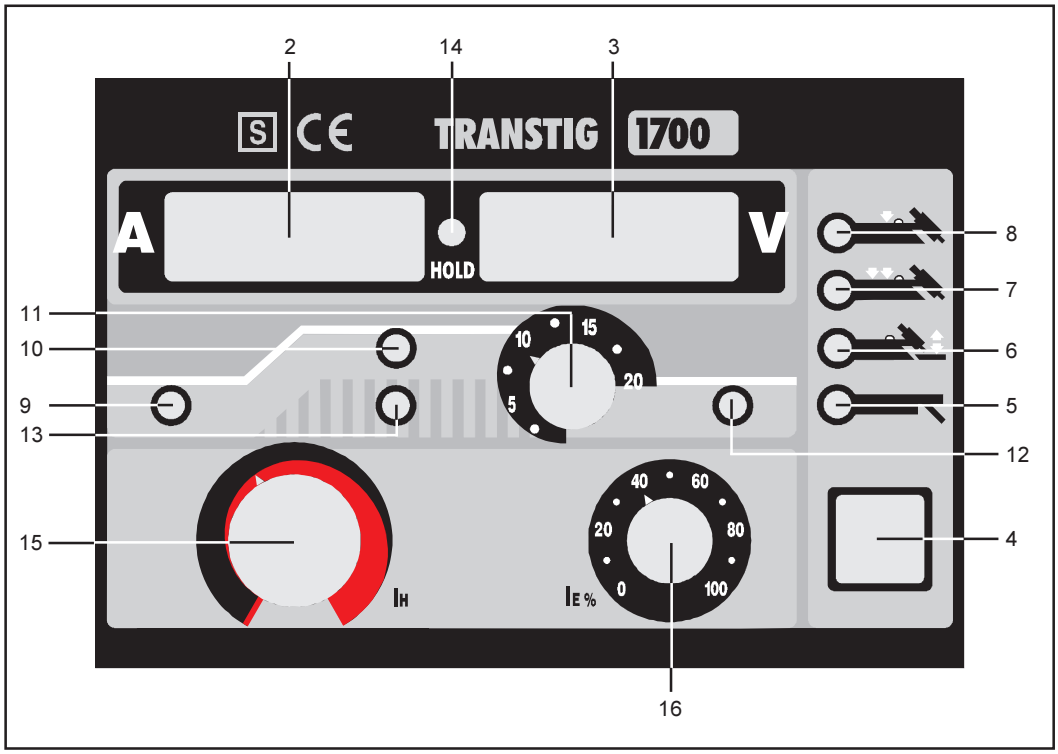


Fig. 2 Front panel Transtig 1700

Description of functions

Item	Function
(1)	**Mains ON / OFF switch** (see Fig.5)
(2)	**Digital-Ammeter** Indicator of the main current Command value -> desired welding current Actual value -> actual welding current
(3)	**Digital-Voltmeter** Indicator of the welding voltage
(4)	**Function button**

a) 2-step operation -> TIG welding with HF-ignition
b) 4-step operation -> TIG welding with HF-ignition

c) 2-step operation -> TIG welding with contact ignition
d) 4-step operation -> TIG welding with contact ignition

- Arc force control and hot-start devices are out of action
- When the TR 50mc, TR 51mc and TR 52mc remote-control units are used, the system switches over to the operating mode in question automatically
- LED indicators (7) or (8) resp. (6) + (7) or (6) + (8) lights up

Description of functions
(continued)

e) Manual electrode welding

- LED indicator (5) lights up and the digital voltmeter indicates the open-circuit voltage.
- The welding characteristics are governed by the values for ARC FORCE and HOT-START which are fixed in the machine itself.
- It is possible to influence these parameters from outside via the TPmc remote control unit and the inert menue at function selector switch position

---

(5) LED indicator for manual electrode welding

- Select via function button (4)
- LED indicator (10) lights up (for main current I_H) only at welding
- Welding current is present in the current socket [B]
- Welding current is either adjusted with the main current re-gulator (15), or via the dial (34) on the TPmc remote control unit

---

(6) LED indicator for contact ignition

- Select via function button (4)
- Lights up together with either LED (7) or LED (8)
- To ignite the arc, touch the workpiece with the tungsten electrode after pressing the torch trigger.
- The short-circuit current flowing when contact is made bet-ween the electrode and the workpiece corresponds to the minimum current.

Where to use contact ignition: Whenever the HF used in contact-free ignition would cause external interference.

---

(7) LED indicator for 4-step mode

---

(8) LED indicator for 2-step mode

---

(9) Starting current LED indicator I_S

- lights up when the starting current I_S is active

---

(9) Starting current LED indicator I_S

- lights up when the starting current I_S is active

---

(10) Main current LED indicator I_H

- lights up when the main current I_H is active

---

(11) DOWN-SLOPE or current drop time

- For continuous adjustment of the current drop speed from the main current down to the crater-fill current I_E
  Range: 0,1 to 20 seconds
- When the Down-Slope potentiometer is used, the pre-set value will be indicated for 3 seconds
  e. g.: d S L 1.0

---

(12) Final current LED indicator I_E

- lights up when the final current I_E is active

---

(13) LED indicator for TIG pulsed-arc welding

- As soon as the TIG pulsed-arc remote-control unit TR 50mc is connected up, the LED (13) starts to flash (see the section headed “TIG pulsed-arc remote-control unit TR 50mc”)

Description of functions
(continued)

(14) LED indicator "HOLD"

- Permits subsequent checking of the welding parameters
- Lights up after actual values have been stored (end of welding)
- The mean of the welding current and voltage values measured before the end of a welding operation is indicated by the digital displays (2) and (3)
- The function works in the operating mode for r.c. pedal unit, and pulsed-arc welding up to 20 Hz

Ways of deleting the HOLD function:

- By actuating the torch trigger between welds
- Switch the mains master switch off and back on again
- By adjusting the welding current dial (15) during the breaks between welding
- By pressing the function button (4)
- Every time you start welding

(15) Main current dial I_H = welding current

- For continuous adjustment of the welding current over the 2-140 A electrode or 2-160 A / 170A TIG range
- LED indicator (10) lights up (only at electrode operating mode)
- The digital ammeter indicates the command value for current as soon as the machine is in open circuit, and then switches over to an indication of the actual value.
  Command value -> desired welding current
  Actual value -> actual welding current

(16) CRATER-FILL CURRENT: I_E

- Only possible in 4-step operation
- Is set as a %-age of the main current
  When the crater-fill current potentiometer is used, the pre-set value will be indicated for 3 seconds
- The welding current is lowered to the crater-fill current when the torch trigger is pressed.
- LED control light (12) indicates that this is taking place

The following parameters are laid down

- Gas pre-flow time ..... 0,4 sec.
- Start arc ..... 29% of I_H
- Up-slope ..... 1,0 sec.
- Gas post-flow time ..... 5-15 sec.

All parameters can be changed individually, via a program menu.

Connections, switches and system add-ons

Connection points on front of machine

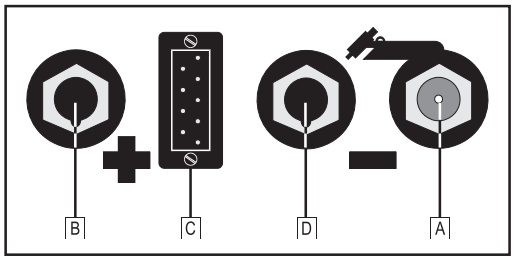


Fig. 3 Design with central welding torch connection GWZ

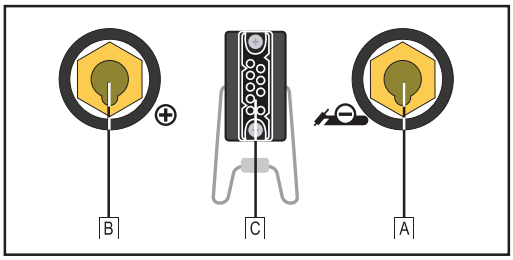


Fig. 4 Design with central welding torch connection F

[A] TIG TORCH CONNECTION
- for connecting the GAS + CURRENT supply for the welding torch

[B] (+) SOCKET with bayonet coupling
- as the earth cable connection point with TIG welding;
- as the connection either for the manual electrode cable or the earth cable with manual electrode welding, depending on the type of electrode used.

[C] TORCH CONTROL SOCKET
- Steuerstecker des Schweißbrenners einstecken und verriegeln

[D] (-) SOCKET with bayonet coupling
- only for welding torch central connection GWZ
- as the connection either for the manual electrode cable or the earth cable with manual electrode welding, depending on the type of electrode used.

Connections and switches on the rear of the machine

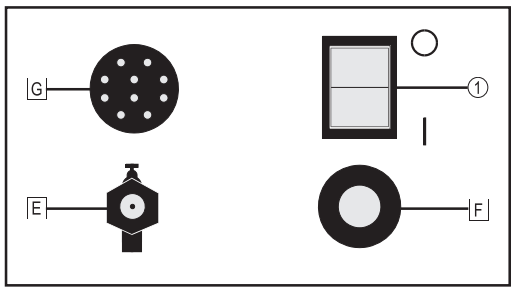


Fig. 5 Rear side of the machine

[E] GAS CONNECTION
- Screw the terminal nut of the gas hose onto the connection-fitting and tighten it

[F] MAINS CABLE WITH STRAIN-RELIEF GRIP

[G] CONNECTING SOCKET for remote control unit
- Plug the remote control cable plug into the socket, the right way round, and tighten the swivel nut
- The desired welding current is set on the remote control unit.
- The machine automatically recognizes the fact that the remote control unit has been plugged in
- The short-circuit-proof supply voltage to the remote control units protects the electronics in the event of any damage to the remote control cable.

Assembling a gas-cooled TIG torch

Design with central burner connection GWZ

- Pull back the rubber sleeve from the rear of the torch
- Screw the hexagon nut (width across = 21) of the gas+current connection onto the torch connector point on the machine [A] and tighten firmly
- Push the rubber sleeve back over the hexagon nut
- Plug the control plug into socket [C] and latch it

Important! Please see your torch's instruction manual for technical details on the torch and for information on torch assembly, care and maintenance.

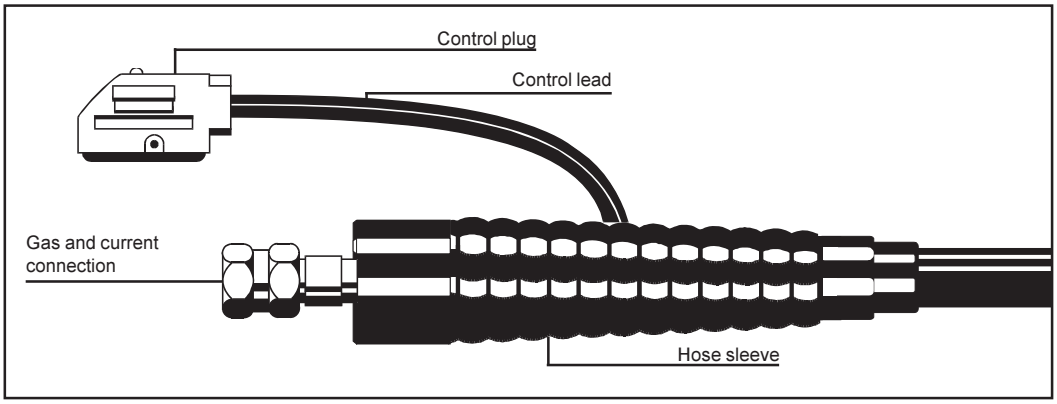


Fig. 6 Design with central burner connection GWZ: Torch connection gas-cooled

Design with Fronius central welding torch connection F

- Insert welding torch bayonet connection in the central connection on the equipment side of the welding torch [A] and lock in place by turning to the right
- Insert control plug in the socket [D] and lock in place

Important! Please see your torch's instruction manual for technical details on the torch and for information on torch assembly, care and maintenance.

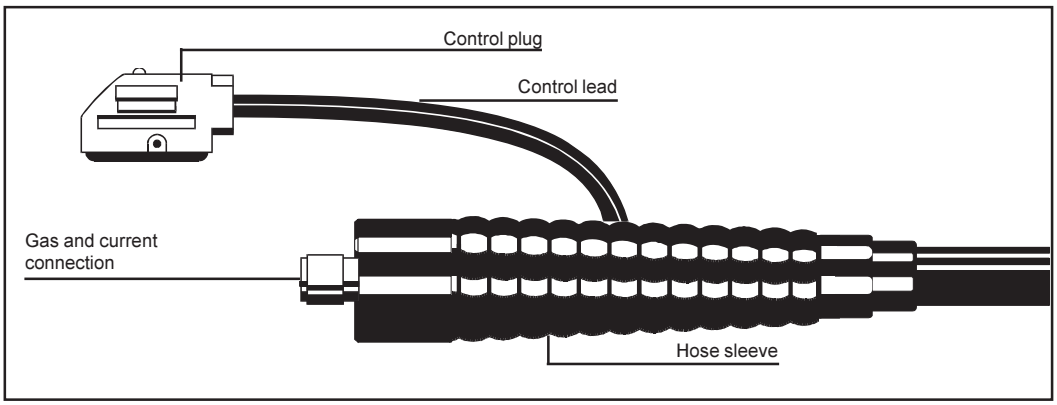


Fig. 7 Design with Fronius central welding torch connection F: Torch connection gas-cooled

Commissioning - General details

Mains connection

WARNING! Electrical work like fitting or changing the power plug, may only be carried out by a qualified electrician!

The Transtig 1600 / 1700 may be operated as standard on a mains voltage of 230V (+/- 15% tolerance range).

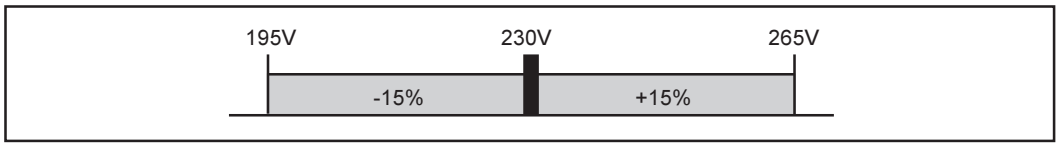


Fig. 8 Tolerance range of the mains voltage

NOTE! The high frequency used for contact-free ignition with TIG welding, can interfere with the operation of insufficiently shielded computer equipment, EDP centres and industrial robots, even causing complete system breakdown. Also, TIG welding may interfere with electronic telephone notworks and with radio and TV reception.

WARNING! On machines designed for use with a special voltage, the technical data on the machine rating plate will apply.

WARNING! The mains plug used must correspond exactly to the mains voltage and current rating of the welding machine in question, as given in the technical data!

WARNING! The fuse protection for the mains lead should be suitable for the current consumption of the welding machine!

WARNING! Never use the welding machine for thawing frozen pipes!

Setting-up instructions

Degree of protection: IP23
The machine is tested to IP23, meaning that it is protected against:
- penetration by solid bodies greater than diam. 12 mm
- spray up to an angle of 60° to the vertical

Open-air operation
As indicated by its protection category IP23, the machine may be set up and operated in the open air. However, the built-in electrical parts must be protected from direct wetting (see protection category IP23)

Colling air and dust
Position the machine so that the cooling air can be drawn in freely through the louvers, and then be expelled unhindered. The cool-ing air passes through ventilating slits in the casing into the interior of the machine, where it cools inactive components in the ventilation channel before flowing out through the ventilation outlet. The ventilation channel has an important protective function. The following cooling cycle is automatically controlled by an electronic thermostatic cut-out system. (Fig. 1). Make sure that any metal dust caused by e. g. grinding work is not sucked into the machine by the cooling fan.

Stability
The power source can be stood on a surface with an inclination of up to 15°! At inclinations above 15° there is a risk of the power source toppling over.

TIG operating modes

General remarks

Warning! Operating the equipment incorrectly can cause serious injury and damage. Do not use the functions described here until you have read and completely understood all of the following documents:
- these Operating Instructions
- all “Operating Instructions” for the system components, especially the “Safety rules”

2-step mode

- Activated from TIG torch trigger
- Mainly used for tack welding
- In the "PRESETTINGS LEVEL___" program level (TIG parameters), StS must be set to OFF

Functional sequence

1. Pull back and hold trigger
- Gas pre-flow time elapses
- LArc ignites at the pre-set start arc value I_S(with HF ignition: HF cuts out automatically after the ignition cycle)
- After ignition, the welding current rises via the internally pre-set upslope to the welding current I_H
- LED (10) lights up

2. Release trigger
- Arc goes out (with or without downslope)
- Internally pre-set gas post-flow time elapses
  If a TR 52mc pedal remote-control unit is being used, the machine automatically switches over to the 2-step mode.

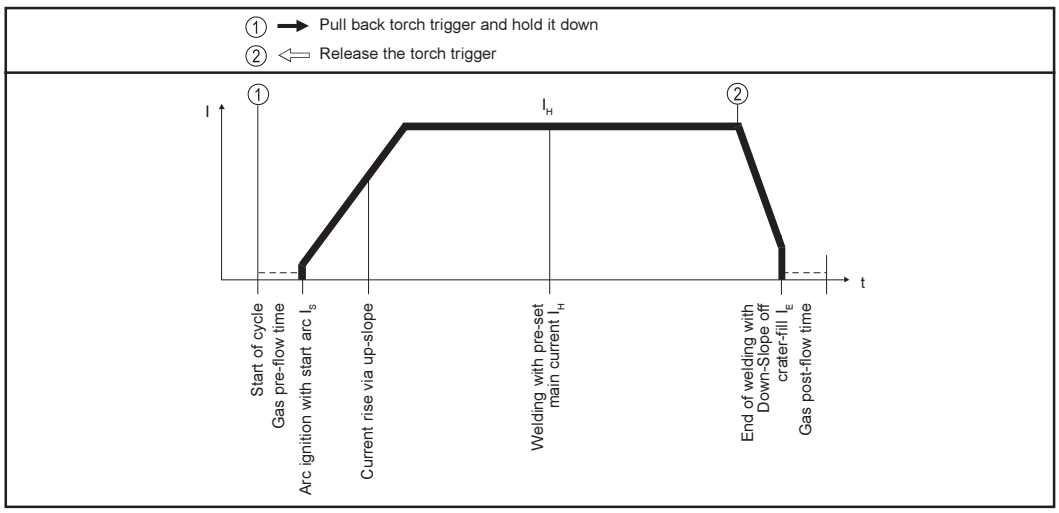


Fig. 9 Functional sequence in 2-step operating mode

Special 2-step mode

- Activated from TIG torch trigger
- Mainly used for tack welding
- In the "PRESETTINGS LEVEL___" (see "Working with the program levels"), TIG parameters, StS must be set to ON

Functional sequence

1. Pull back and hold trigger

- Gas pre-flow time elapses
- Arc ignites at the pre-set start arc value I_S (with HF ignition: HF cuts out automatically after the ignition cycle)
- Welding current rises directly (without upslope) to welding current I_H
- LED (10) lights up

2. Release trigger

- Arc goes out (without downslope)
- Internally pre-set gas post-flow time elapses
  If a TR 52mc pedal remote-control unit is being used, the machine automatically switches over to the 2-step mode.

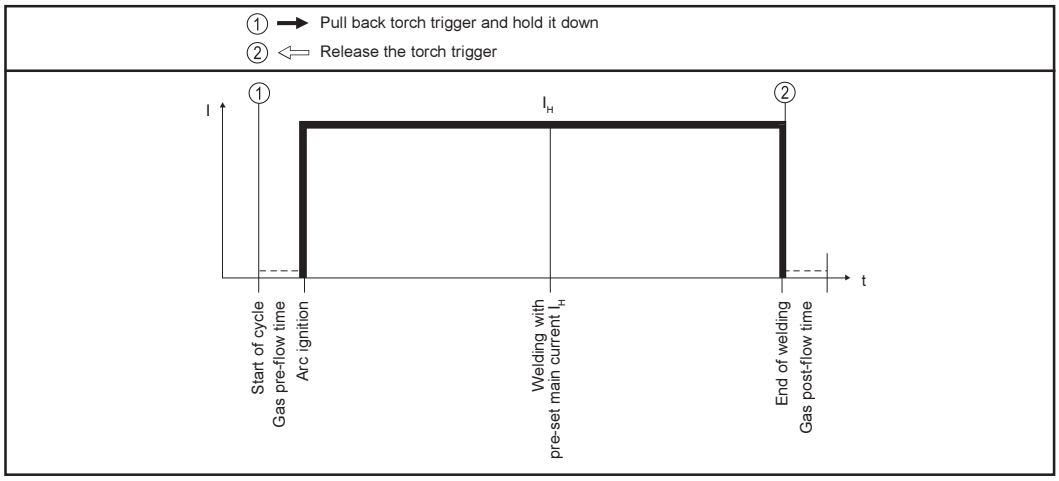


Fig. 10 Functional sequence in special 2-step mode

4-step mode - without intermediate lowering

- In the manual or automatic welding modes, for flawless welding joints
- Pre-settable parameters such as gas pre-flow, start arc, upslope time, main current, downslope time, crater-fill cur-rent and gas post-flow time
- In the "PRESETTINGS LEVEL ___" program level (see section headed “Working with the program-levels”) (TIG parameters), SFS must be set to OFF

Functional sequence

1. Pull back and hold trigger
- Gas pre-flow time elapses
- Arc ignites with the pre-set start-arc current I_S (with HF ignition; HF cuts out automatically after the ignition cycle)
- LED (9) lights up

2. Release trigger
- Welding current rises via the pre-set upslope to the value set on dial (15) for the welding current I_H
- LED (10) lights up

3. Pull back and hold trigger again
- Welding current drops via the downslope set on dial (11) to the value set for the crater-fill current I_E on dial (16)
- LED (12) lights up

4. Release trigger
- Arc goes out
- Internally pre-set gas post-flow time elapses

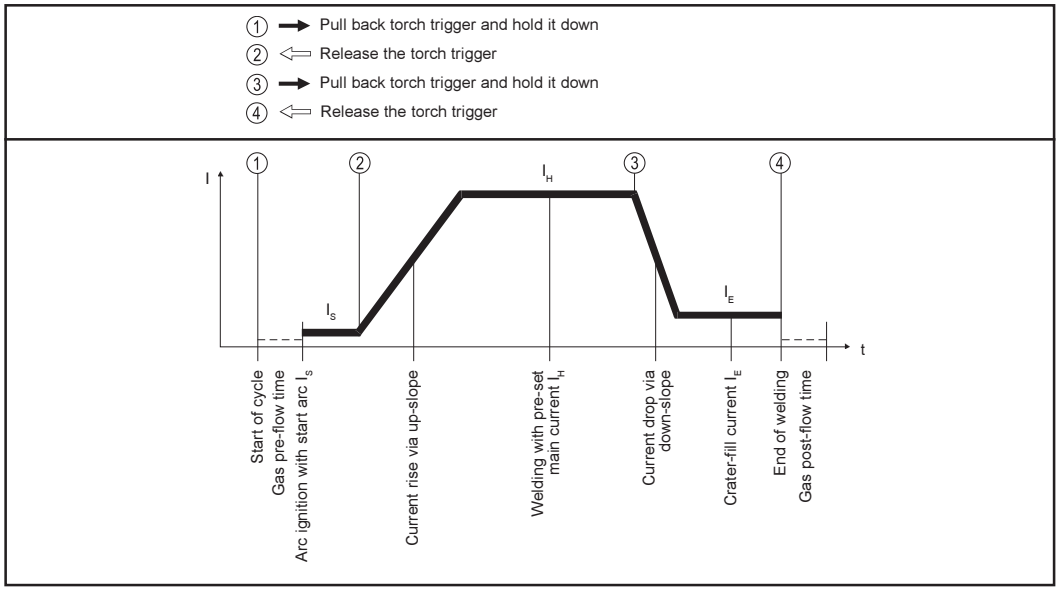


Fig. 11 Functional sequence in 4-step operating mode - without intermediate lowering

4-step mode - with intermediate lowering

- Activated from TIG torch trigger with double-pushbutton function
  - Intermediate lowering to the reduced current $I_{E:}$ Welding current can be lowered from the main current to the reduced current I_E and back, without interrupting the weld-ing sequence
- In the "PRESETTINGS LEVEL___" (see "Working with the program-levels"), TIG parameters, SFS must be set to OFF

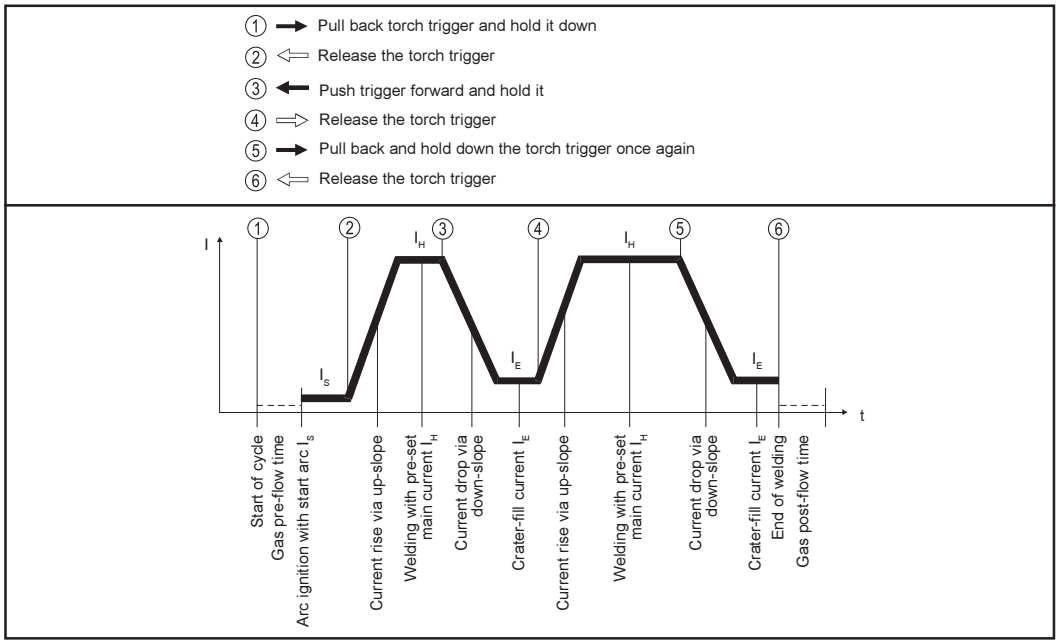


Fig. 12 Functional sequence in 4-step operating mode - Variant I - with intermediate lowering

Important!

- Current reduction with no interruption to welding is only possible when the main current is activated
- If the torch trigger is accidentally pushed forward in open circuit, no ignition cycle takes place

Special 4-step mode - Variant I

- Enables the 4-step mode to be activated from TIG torch triggers without the double-pushbutton function
- ZIntermediate lowering to the reduced current I_3 (for details of how to set this, see "Working with the program-levels")
  - Welding current can be lowered from the main current to the reduced current I_3 and back, without interrupting the welding sequence
- In the "PRESETTINGS LEVEL___" program level (see "Working with the program-levels"), Parameter I3, the reduced current I3 can be set as a percentage of the main current I_H
- In the "PRESETTINGS LEVEL___" (see "Working with the program-levels"), TIG parameters, SFS must be set to 1

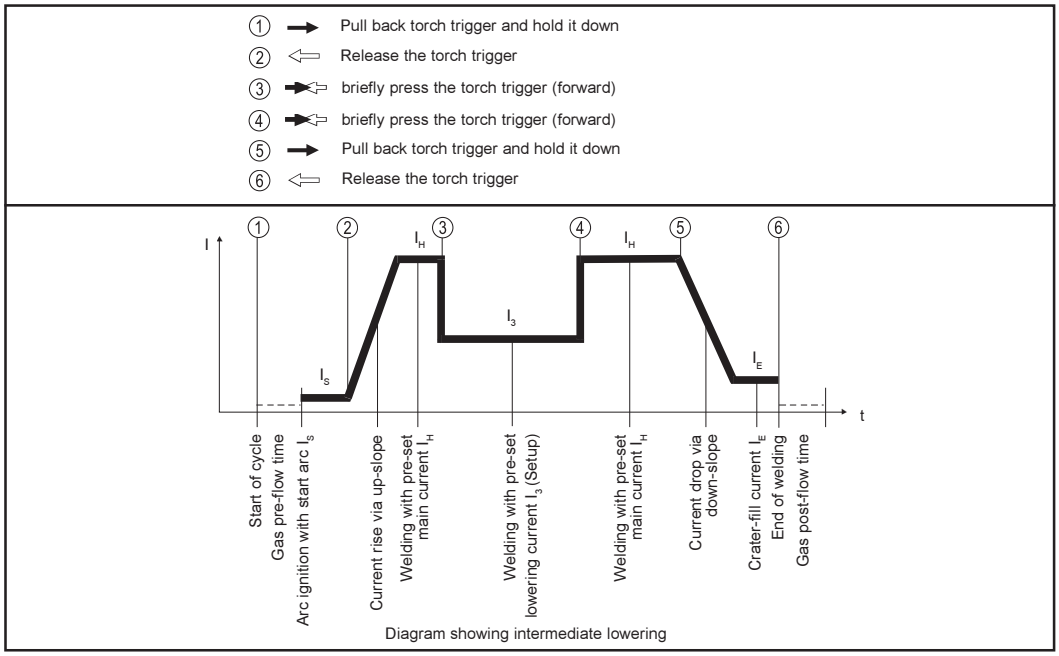


Fig. 13 Functional sequence in special 4-step mode - Variant I

Special 4-step mode - Variant II / III / IV / V

- Enables the 4-step mode to be activated from TIG torch triggers with the double-push button function
- In the "PRESETTINGS LEVEL___" (see "Working with the program-levels"), TIG parameters, SFS must be set to
  - "2" for Variant 2
  - "3" for Variant 3
  - "4" for Variant 4
  - "5" for Variant 5

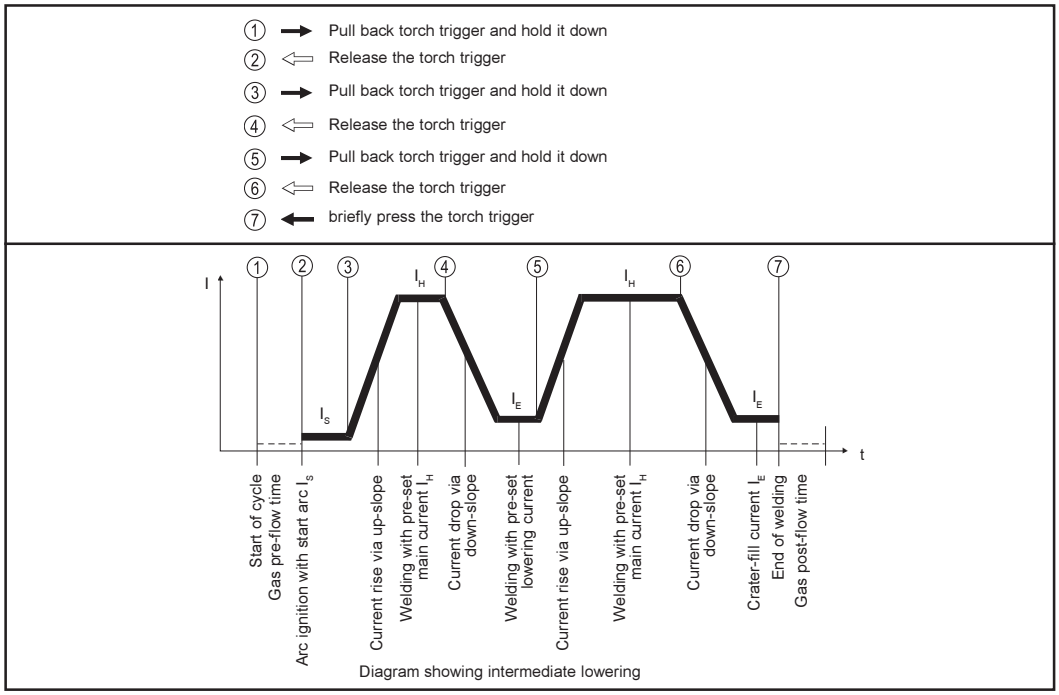


Fig. 14 Functional sequence in special 4-step mode - Variant II

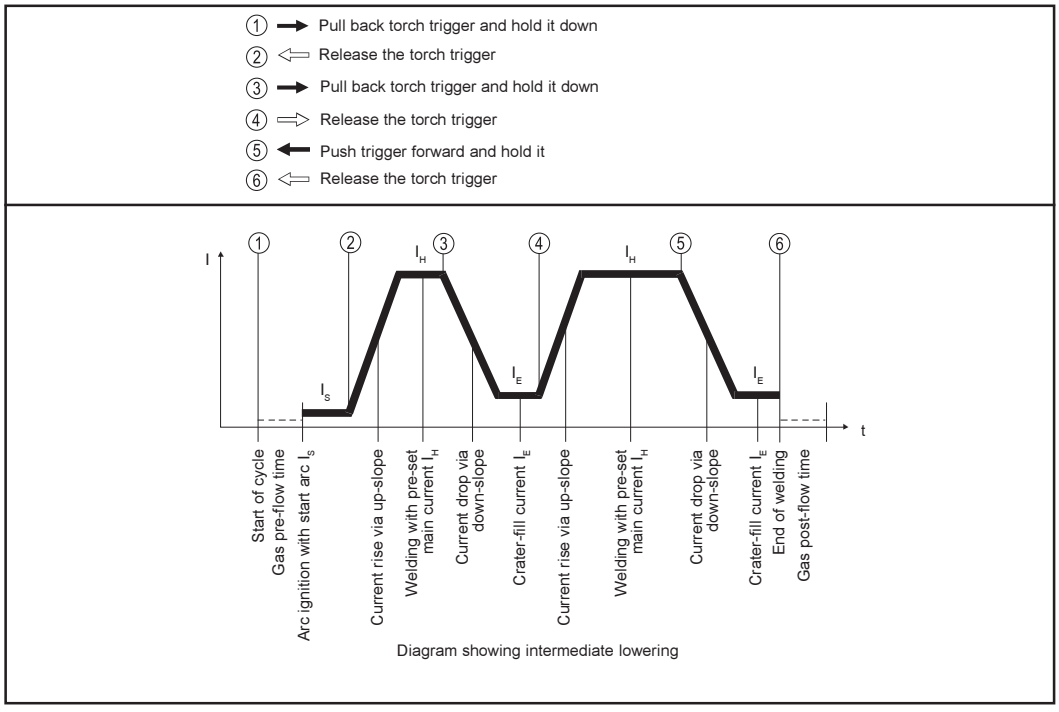


Fig. 15 Functional sequence in special 4-step operating mode - Variant III

Special 4-step mode - Variant II / III / IV / V
(continued)

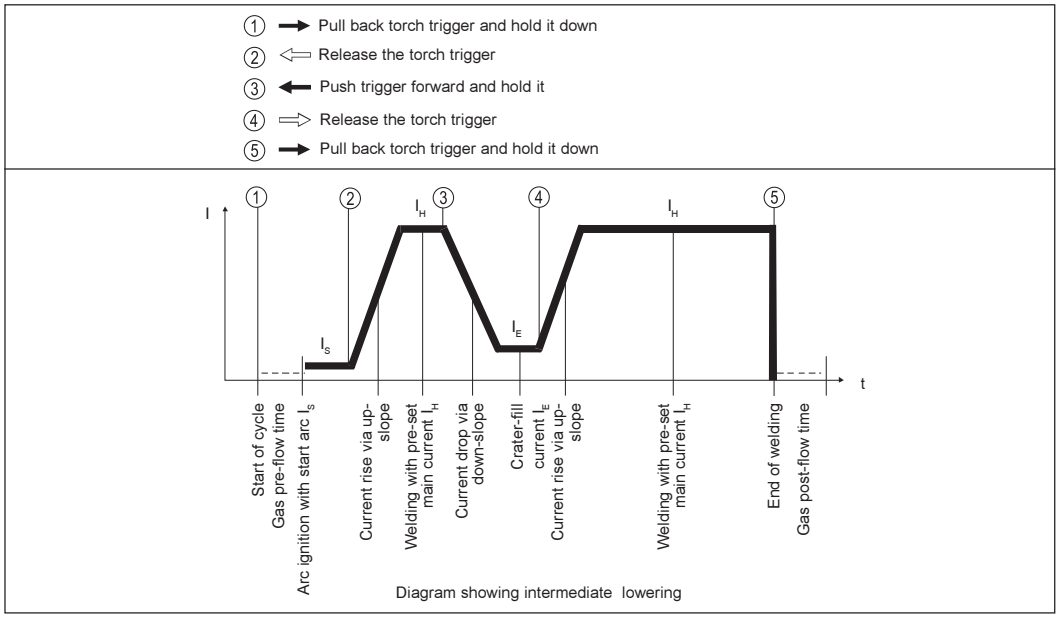


Fig. 16 Functional sequence in special 4-step mode - Variant IV

Variante V (Fig. 17) allows the welder to raise and lower the welding current without an Up/Down torch.

The longer the torch-trigger rocker switch is pushed forward during welding, the more the welding current is increased (up to maximum).

After the welder releases the torch trigger, the welding current remains constant. The longer the torch trigger is pushed forward once again, the further the welding current is reduced.

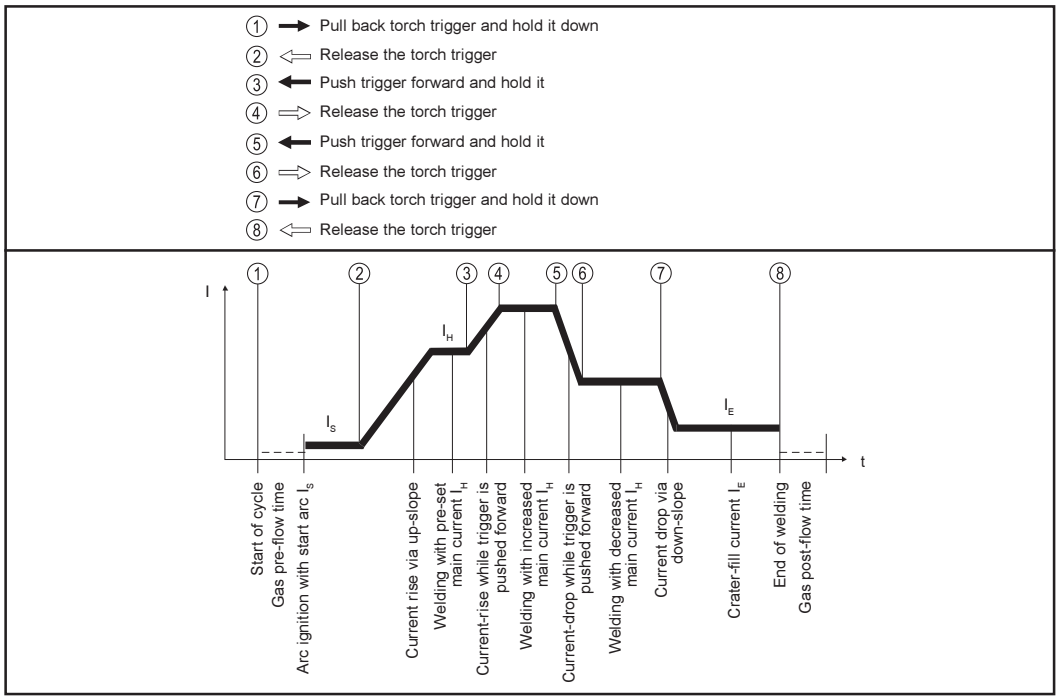


Fig. 17 Functional sequence in special 4-step mode - Variant V

Working with the program levels

Accessing the relevant program level

- With button (4) pressed, switch on the machine
- --- appears -> “Presettings“ level
- Press and hold down the torch trigger until
  1. P1 appears -> Service-menu level
  2. P1 appears -> Codelock level
  3. --- appears again -> Presettings level
- Release button (4)

Presettings level ---

Use button (4) to select the parameters, and the torch trigger to change their values.
Only the parameters for the operating mode that is set (TIG/ Electrode) are shown.

Parameters for TIG operating mode DC

GAS	Gas pre-flow 0-20s.
G-L	Gas post-flow at I_{min} 2,0-26s.
G-H	Gas post-flow at I_{max} 2,0-26s.
UPS	Up-slope 0,1-7s.
SCU	Start Current - Start arc 0-100%
I3	Reduced current, 0-100% of I_H
HFt	Time of HF-period (from 0,01-0,4s)
SCU	Starting current - As absolute value of max. main current (160A/170A) As relative value of pre-set main current
StS	Special 2-step mode ON/OFF
SFS	Special-4-step mode OFF/1/2/3/4/5
ELd	Diameter of tungsten electrode (from 0-3,2mm)
PRO	Program - For storing the parameters, once these have been set, by pressing the torch trigger
FAC	Factory - For activating the parameters pre-set by Fronius, by pressing the torch trigger

Parameters for electrode operating mode

Hti	Hotstart time	0,2-2s
HCU	Hotstart current	0-100%
dYn	Arcforce dynamic	0-100A
PRO	Program - For storing the parameters, once these have been set, by pressing the torch trigger	
FAC	Factory - For activating the parameters pre-set by Fronius, by pressing the torch trigger.	

Parameters of the pre-set Fronius-program (FAC)

GAS	0,4s	SCU	rEL
G-L	5,0s	StS	OFF
G-H	15,0	SFS	OFF
UPS	1,0s	ELd	2,4mm
SCU	29%	Hti	0,5s
I3	50%	HCU	50%
HFt	0,01s	dyn	30A

Service-menu Level P1

Service-menu with various test programs

You can find a detailed description of the service menu in the Operating Instructions “Set-up functions / Error indications”, which are available as on option (42,0410,0494).

Level codelock P2

The Transtig 1600 machine comes with an electronic codelock. The codelock is not activated when the machines leave the factory. Whenever you change the numerical combination, keep a written note of it! Only a 3-digit code may be used. (On new machines, the code number is set to “321”)

1. Procedure

- Access "Codelock level P2"
- "Cod _?_" appears on the display
- Enter the present code (on new machines, this is 321)
  - Set the desired numbers with dial I_H (15)
  - Conform each numeral with button (4)
  - Repeat this procedure twice, until "Cod OFF" or "Cod ON" appears on the display

2. Change and activate code

a.) Display reads „Cod OFF“:
  - Using the torch trigger, switch to „Cod ON“ (see Pt. 2b for further instructions)

b.) Display reads „Cod ON“:
  - Use function button (4) to change to „CYC__?“
    CYC (cycle) indicates how often the unit can be switched on without the code having to be entered
  - Using the torch trigger, set the number of cycles
  - Press function button (4) until „Cod ?---“ appears on the display
  - Enter the new numerical code
    - Enter 0-9/A-H using the torch trigger
    - Confirm each numeral with function button (4)
    - Repeat this procedure twice, until all 3 digits of the new code have been entered
  - Press the torch trigger
  - The display reads „Cod _-_“
  - Re-enter the new code, for control purposes:
    - set the desired numerals with dial I_H (15)
    - confirm each numeral with button (4)
    - repeat this procedure twice, until the code has been entered
    - the third time you confirm, the code is automatically stored in the memory

NOTE! If you enter the code incorrectly three times in a row (ERR), the machine will automatically switch to „LOC“. You must switch the machine off and repeat the entire procedure!

  - Machine is now ready for use

3. Deactivate code

- Display reads „Cod ON“
- Using the torch trigger, switch to „Cod OFF“
- Press button (4) to shift to „PRO“
- To deactivate the present code, press the torch trigger
- Machine is now ready for use

Important! From now on, the code is 321 again!

Machine start-up when codelock is activated

- Switch on at the master switch (1). The display („Cod _?_“) now asks you to enter the code number
- Enter the first numeral of the combination using dial I_H (15)
- Confirm this numeral with function button (4)
- Repeat this procedure twice more
- Machine is now ready for use

TIG welding with high-frequency ignition (HF)

Safety

WARNING! At TIG welding, the manual electrode cable will always be live when:
- the mains master switch (1) is ON
- the operating mode is in the or position and when the “start welding” signal has been given from the torch trigger.

WARNING! Make sure, when the manual electrode cable is not in use, that it is either disconnected from the machine or else fastened to the machine in such a way (insulated) that the electrode holder and the coated electrode cannot touch any electrically conductive or earthed parts.

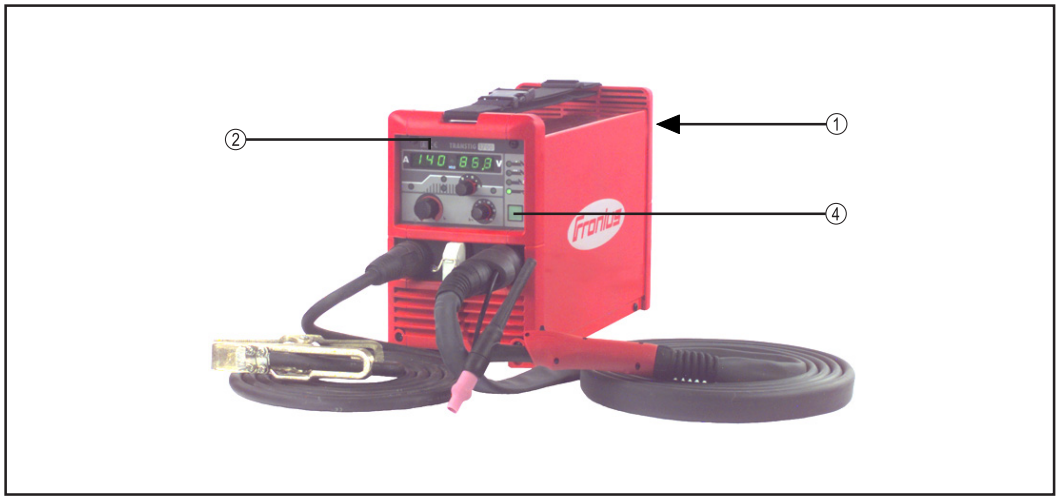


Fig. 18 Transtig 1600 / 1700 TIG welding machine consisting of: power source with control unit, manual torch, earth cable (gas cylinder with pressure regulator without figure)

Start up

- Fit the torch with a tungsten electrode and a gas nozzle (see the instruction manual for the torch concerned).
- Plug the earth cable into the current socket [B] and latch in place firmly.
- Connect the gas hose to the machine and the gas pressure regulator.
- Plug in the mains plug.
- Switch on the mains master switch (1)
- Shift selector button (4) into the or positions. LED (7) or (8) lights up.
- If necessary, connect a remote control unit
- Select welding parameters (command value for main current I_H is displayed on ammeter 2).
- Open the gas cylinder valve by turning it anticlockwise.

Igniting the arc
- Make sure the welding current is switched off. Place the electrode on the weld at the point where the arc is to be ignited, tilt the torch backwards until the edge of the gas nozzle is resting on the workpiece, leaving a gap of between 2 and 3 mm between the tip of the electrode and the workpiece. Fig. 19a
- Close your visor.
- Switch on the welding current with the torch trigger
- Arc ignites without touching the workpiece. Fig. 19b
- Move the torch into the normal position. Fig. 19c

Advantage: no contamination of either the electrode or the workpiece.

Important! After ignition, the high frequency switches off automatically.

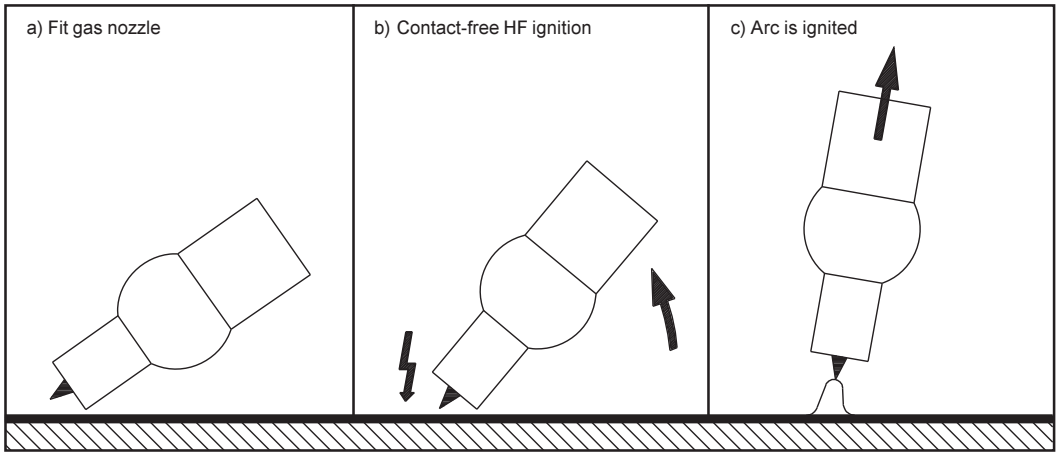


Fig. 19 Ignition with HF ignition

Ignition monitoring
If, after fruitless attempts to ignite an arc or after an arc-interrupt, the welder forgets to stop the control sequence *(2-step or 4-step)* by means of the torch trigger, the shielding gas will continue to flow, leading to considerable wastage of gas. To prevent this, a monitoring function automatically interrupts the control sequence after approx. **5 seconds** in such a case. When another attempt is made to ignite an arc, this must once again be initiated via the torch trigger.

TIG welding with contact ignition (without HF)

Safety

WARNING! At TIG welding, the manual electrode cable will always be live when:
- the mains master switch (1) is ON
- the operating mode is in the or position and when the “start welding” signal has been given from the torch trigger.

WARNING! Make sure, when the manual electrode cable is not in use, that it is either disconnected from the machine or else fastened to the machine in such a way (insulated) that the electrode holder and the coated electrode cannot touch any electrically conductive or earthed parts.

Start up

- Fit the torch with a tungsten electrode and a gas nozzle (see the instruction manual for the torch concerned).
- Plug the earth cable into the current socket and latch in place firmly.
- Connect the gas hose to the machine and the gas pressure regulator.
- Plug in the mains plug.
- Switch on the mains master switch (1)
- Press selector button (4) to the and or and positions. LED (6) and (8) resp. (6) and (7) lights up
- If necessary, connect a remote control unit
- Select welding parameters (command value for main current I_H is displayed on ammeter 2).
- Open the gas cylinder valve by turning it anticlockwise.

Igniting the arc

- Make sure the welding current is switched off. Place the electrode on the weld at the point where the arc is to be ignited, tilt the torch backwards until the edge of the gas nozzle is resting on the workpiece, leaving a gap of between 2 and 3 mm between the tip of the electrode and the workpiece. Fig. 20a
- Close your visor.
- Switch on the welding current with the torch trigger - shielding gas starts flowing
- Resting the torch on the edge of the nozzle, gradually tilt it upwards until the tip of the electrode touches the workpiece. Fig. 20b
- The arc ignites when the torch is raised
- Move into the normal position. (Fig. 20c)
- Start welding

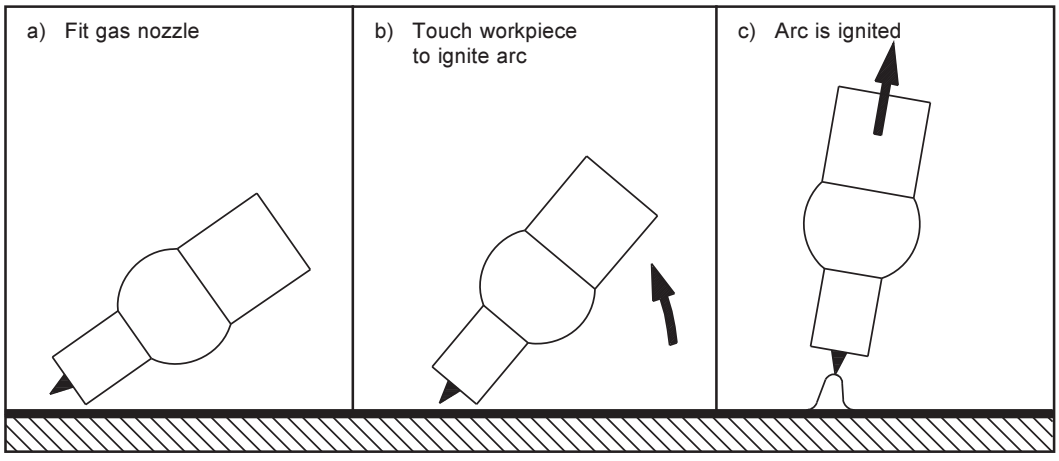


Fig. 20 Ignition with contact ignition

Manual electrode welding

Safety

WARNING! Operating the equipment incorrectly can cause serious injury and damage. Do not use the functions described here until you have read and completely understood all of the following documents:
- these Operating Instructions
- all operating instructions for the system components, especially the “Safety rules”

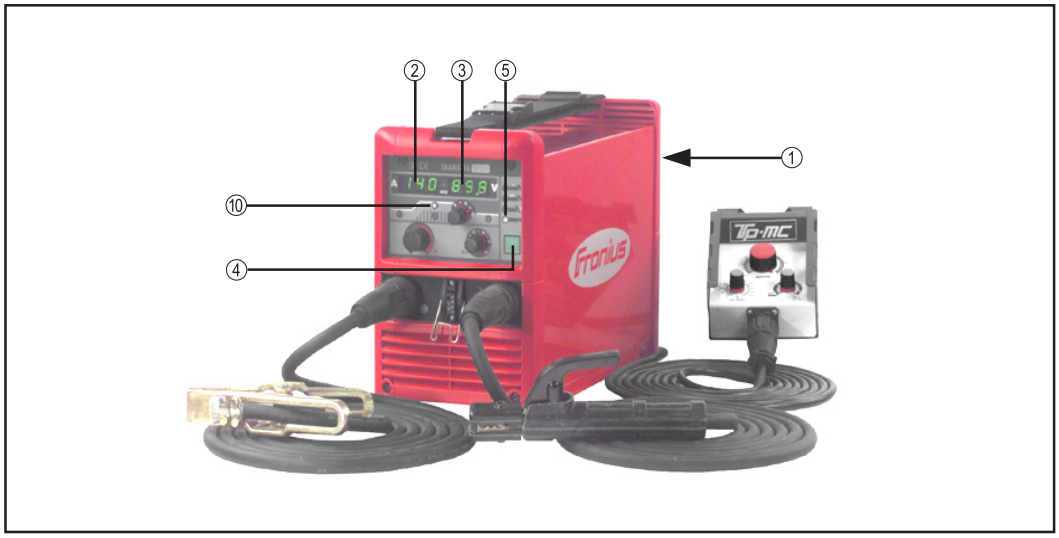


Fig. 21 The Transtig 1600 / 1700 as a manual electrode welding machine, consisting of: power source with control unit, Tpmc manual remote control unit (may be used optionally) and welding cables

Start up

- Plug the welding cable into the appropriate current socket (see symbols) and secure it by turning it clockwise. (Cable cross-sectional area 35 - 50 mm^2)
- Select the correct polarity for the type of electrode to be used.
- Shift the mains master switch (1) to "1".
- Press the function button (4) to the position.
  The LED indicator (5) and welding current indicator (10) lights up.
- Digital-Voltmeter (3) indicates the open circuit voltage
- Connect TPmc remote control unit if required (set arc force and Hot-Start)
- Pre-select welding current (command value for main current I_H is displayed on ammeter 2)
- Initiate the welding operation.

WARNING! The tungsten electrode on the mounted welding torch will always be live when the mains master switch (1) is ON and the operating mode is in the position. Make sure, when the torch is not in use, that it is either disconnected from the machine or else fastened to the machine in such a way (insulated) that the tungsten electrode cannot touch any electrically conductive or earthed parts.

Remote control operation

General

Remote control units are intended for use in situations where the welding parameters must be set directly from the welding workplace. The remote control unit is connected electrically to the power source by means of special cables 5 or 10 m in length.

The following types of remote control unit are available:
- Manual electrode and TIG remote control unit ..... TPmc
- TIG pulsed-arc remote control unit..... TR50mc
- TIG spot-welding remote control unit TR51mc
- TIG Remote-control pedal unit TR52mc

TR 50mc remote control pulsing unit

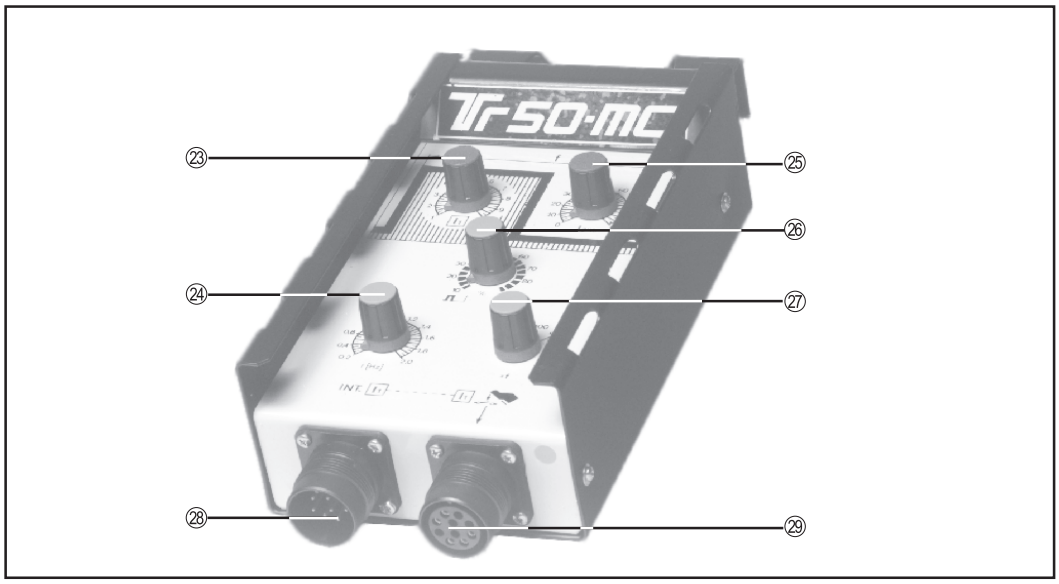


Fig. 22 TR 50 mc remote control pulsing unit

Since a pre-set amperage is not always ideal for the entire duration of a welding task, pulsating welding current is often used. For example, when welding pipes in cramped conditions, a change in amperage is often necessary. Should temperatures rise too high, there is a danger that liquid metal will begin to drop from the welding pool. Too low, and the workpiece material will not melt sufficiently. A relatively low welding current (background current I_2) rises via a steep up-slope to a considerably higher value (pulse current I_1) and drops again after a pre-set period (Duty-Cycle) to the basic setting (background current I_2), a process which repeats itself over and over again.
During the welding process, small sections of the weld zone melt and solidify quickly. Welding a seam using this method is thus considerably easier to control.
This technique is also used when welding thin sheet metal. Each fusion point overlaps the next, thus forming a neat and regular seam. When the TIG pulsing technique is used when welding by hand, the welding rod is applied at each current peak.
(Only possible in the lowest frequency range, i.e. 0,2 - 2 Hz).
Higher pulse frequencies are generally used in automatic welding applications and serve mainly to stabilize the welding arc.

TR 50mc remote control pulsing unit
(contiued)

With the TR 50mc remote control pulsing unit two operational modes are possible:
- Regulation of impulse current I_1 by TR 50mc remote control unit.
- Adjustment of impulse current I_1 by means of the TR 52mc remote control pedal unit.

(23) Pulsing current dial I_1 (main current)
- For continuous adjustment of the pulsing / main current

(24) Pulse frequency dial f (Hz)
- For continuous adjustment of the pulse frequency, depen-ding on which frequency range has been preselected by switch (27).

(25) Background current dial I_2
- The setting for the background current is made as a percentage of the value set for the pulsing current I_1

(26) Duty-Cycle dial %
- Setting dial for pulse / interval relationship = this dial is for setting the relati-onship, in percentage terms, between the pulsing current phase and the background current phase.

Setting-examples

⎍⎍ **Duty cycle dial (26) is in scale position 10,**
- Short pulsing current phase of 10 %
- Long background current phase of 90 %
- Low degree of heat impact.

Duty Cycle dial (26) is in scale position 50, (see Fig.23)
- Pulsing current phase and background current phase are equally long (each 50 %)

I Means medium degree of heat impact.

⎍⎍ **Duty cycle dial (26) is in scale position 90,**
- Long pulsing current phase of 90 %
- Short background current phase of 10 %
- High degree of heat impact.

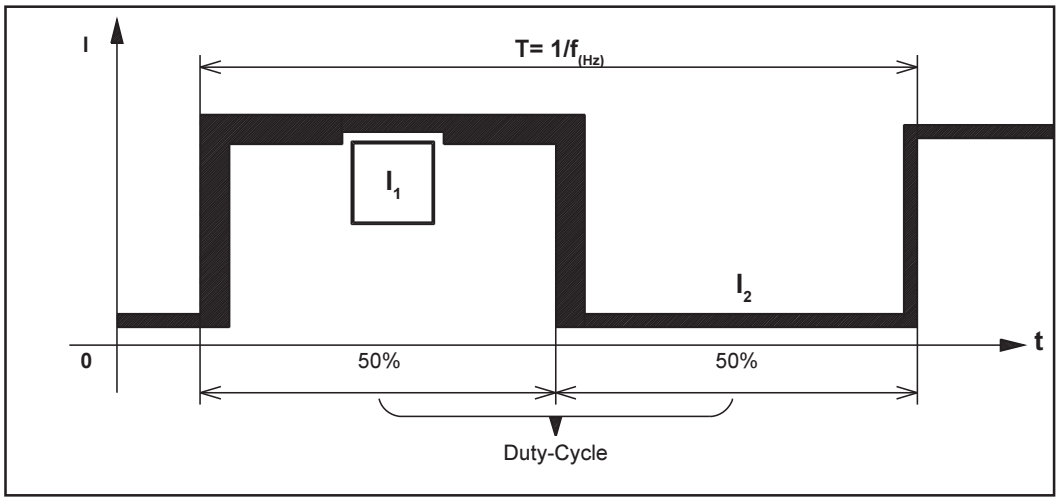


Fig. 23 Setting-example Duty-Cycle in scale position "50"

TR 50mc remote control pulsing unit
(continued)

(27) Frequency range switch

Operating mode:
Regulation of pulse current I_1 using a remote control
- Link the connecting socket [G] on the power source and the remote-control unit socket (28) electrically with the remote control cable.
- Plug in the plug-in connections the right way round, and screw the coupling ring on as far as possible.
- LED indicator (13) blinks up on the power source
- Set desired operating mode with function button (4)
- The appropriate LED-indicator (5), (6), (7) or (8) lights up
- Pre-select the frequency range (0.2 - 2Hz, 2 - 20Hz, 20 - 200Hz, 200 - 2000Hz) with the range switch (27).
- The pulsing current I_1 is set continuously with setting dial (23)
- The setting for the background current I_2 is made as a percentage of the pulsing current I_1, with setting dial (25)
- To select the duty cycle use dial (26)
- Set the pulse frequency dial (24) to the desired value.
- Mean welding-current amperage is indicated on display A
- The downslope parameter is set directly on the power source.

In the 4-step operating mode, the pulse phase begins as soon as the operator releases the torch trigger in the up-slope. As can be seen in Fig. 12, pulsing also takes place in the down-slope.

Important! If you wish to be able to switch from main current to crater-fill current while in pulsed-arc mode (without interrupting welding), use:
- 4-step mode and a FRONIUS TIG torch with double control-switch function, or:
- special 4-step mode and a non-Fronius TIG torch

Please see chapter "Description of controls" for more details of the 4-step and special 4-step operating modes.

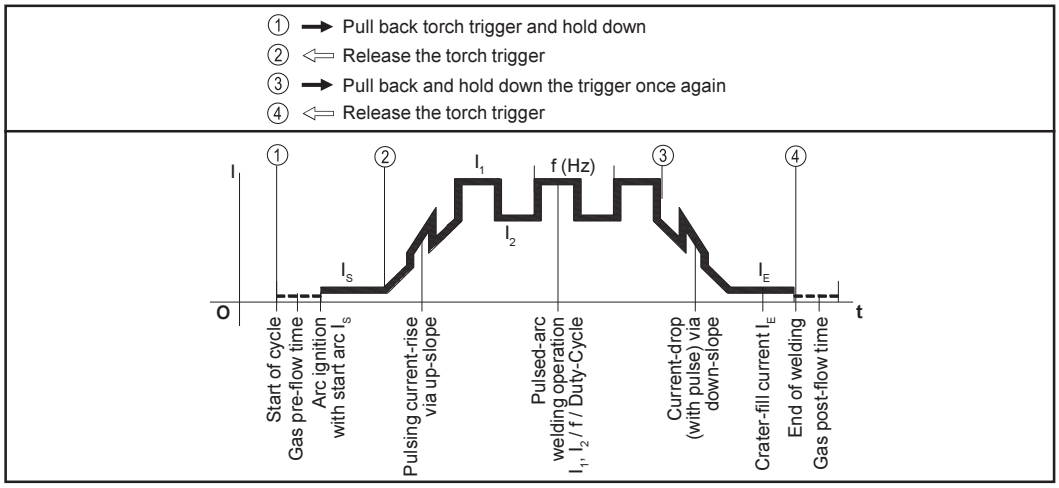


Fig. 24 Functional sequence in pulsed-arc welding operation using TR 50mc (4-step)

TR 50mc remote control pulsing unit
(continued)

Operating mode:
Regulation of pulse current I_1 using TR 52mc remote-control pedal unit
It is particularly advantageous with manual TIG welding in cases where it is necessary to alter the welding pulse current during the welding operation. (Where the welder is dealing with materials of different strengths, for example).

- Link the connecting socket [G] on the power source and the socket (28) on the remote-control pulsing unit electrically with the remote control cable.
- A remote control cable of the same type may be used for linking the remote-control pulsing unit (socket 29) electri-cally to the remote control pedal unit (socket 30).
- Plug in the plug-in connections the right way round, and screw the coupling ring on as far as possible.
- When the TR 52mc remote-control pedal unit is connected, the machine automatically switches over to 2-step operation.
- LED indicator (13) blinks up on the power source
- Set desired operating mode with function button (4)
- The appropriate LED indicator (5), (6) or (8) lights up -operating mode electrode (LED indicator 5) is possible
- The mean welding-current amperage is indicated on display A. - No "Hold" function
- To initiate the ignition process, gently step on the pedal.
- The level of the start arc current, the pulse current I_1 and the final crater current can also be controlled from the pedal.
- The base current I_2 that is set using the dial (25) on the TR 50mc is a constant percentage of the value of the pulse current I_1.
- When the welder takes his foot right off the pedal, the welding current is switched off, thus interrupting the welding operation.
- Gas post-flow time elapses.

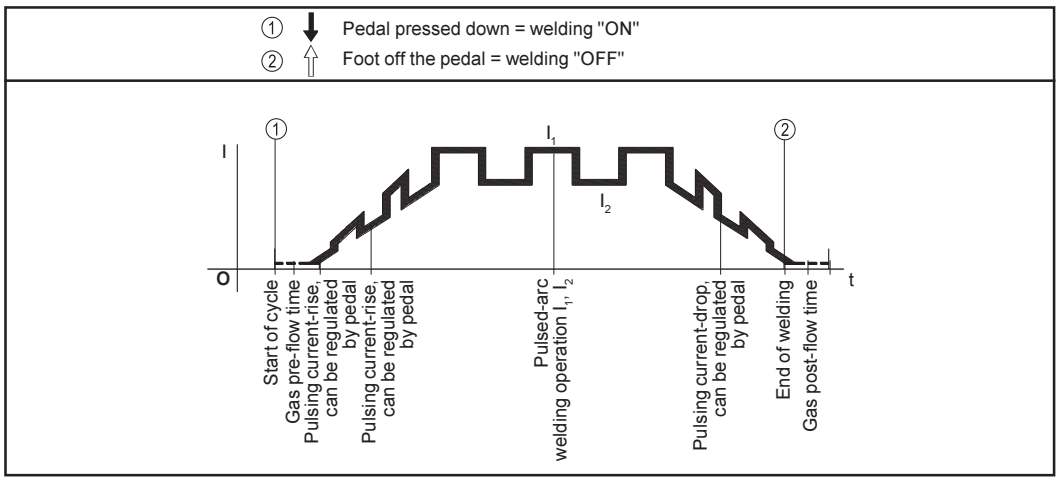


Fig. 25 Functional sequence in pulsed-arc operation, in conjunction with the TR 52mc remote-control pedal unit (2-step)

TR 52mc remote control pedal unit

Due to the fact that workpieces are often awkwardly shaped, it is often necessary to alter the amperage in the course of the welding operation. (e.g. repairing the edges of tools, improvements to cutting dies).
The TR52mc pedal remote-control unit is designrd to be used for jobs such as these.

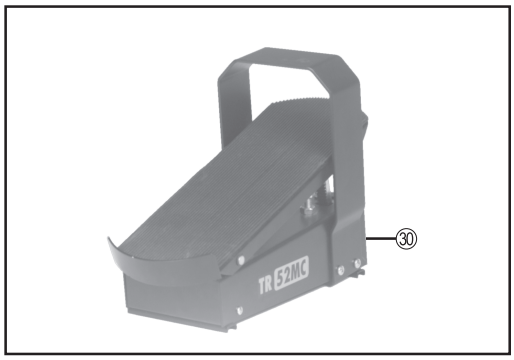


Fig. 26 TR 52mc remote control pedal unit.

Connecting the remote control unit

- Link the connecting socket [G] on the power source and the socket (30) on the remote-control unit electrically with the remote control cable.
- Plug in the plug-in connections the right way round, and screw the coupling ring on as far as possible.

Functional description

- When the TR 52mc remote-control pedal unit is connected, the machine automatically switches over to 2-step operation.
- Set desired operating mode with function button (4)
- The appropriate LED indicator (5), (6) or (8) lights up - operating mode electrode (LED indicator 5) is possible
- The mean welding-current amperage is indicated on display A. - No "Hold" function
- Gas pre-flow time and gas post-flow time are set directly at the power source.
- To initiate the ignition process, gently step on the pedal.
- The level of the start arc current, the main current I_H and the final crater current can also be controlled from the pedal.
- When the welder takes his foot right off the pedal, the welding current is switched off, thus interrupting the welding operation.
  Gas post-flow time elapses.

Limitation of main current

If the maximum welding current value is set internally on the main current I_H dial (15) then the remote control pedal may be depressed to its full extent without the main welding current exceeding the pre-set value. This has the advantage that the selected current range is covered by one complete depression of the foot pedal.

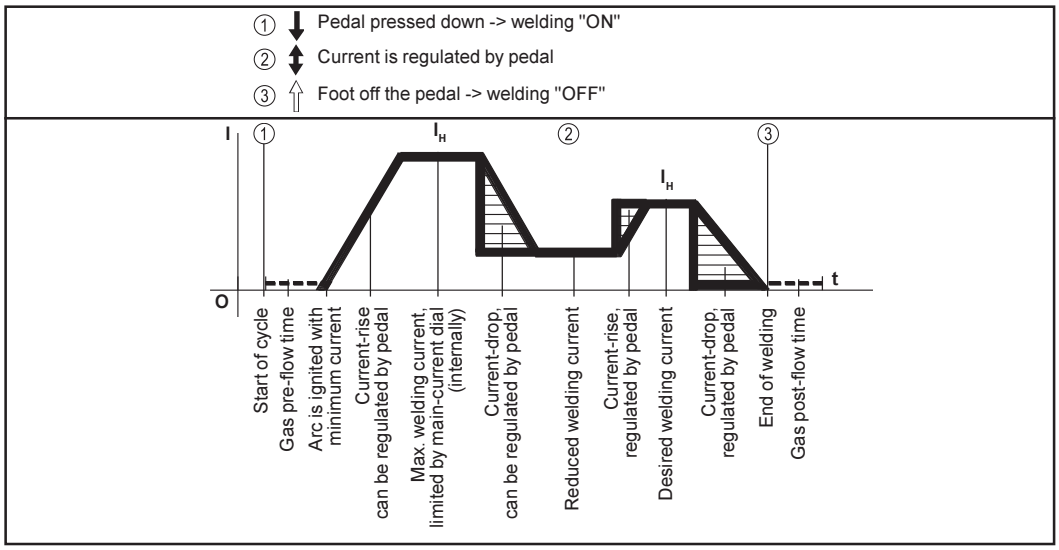


Fig. 27 Functional sequence with the TR 52mc remote control pedal unit (2-step)

TR 51mc remote control spot-welding unit

Standard welding of thin sheet metal constructions in such a way that they do not rust is often not possible due to severe warping of the material. This is where spot welding comes into its own. Similarly, problem welds, such as joins which are only accessible from a single side, can easily be dealt with using the TIG spot-welding process.

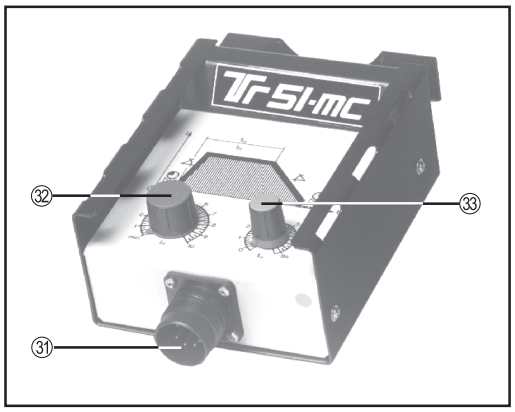


Fig. 28 TR 51mc remote control spot-welding unit

Connecting the remote control unit

- Link the connecting socket [G] on the power source and the socket (31) on the remote-control unit electrically with the remote control cable.
- Plug in the plug-in connections the right way round, and screw the coupling ring on as far as possible.

Functional description

- The machine automatically switches over to 2-step operation
- LED indicator (8) lights up
- The current drop time is set directly on the power source
- A special - insulated - spot-welding nozzle is used, which is mounted on the cone.
- Depending on the size of spot-weld required, mount the tungsten electrode approx. 2 - 3 mm back from the edge of the nozzle
- Set spot-welding current and time on the remote-control unit.
- Place the torch on the workpiece and gently press down onto the base material
- To carry out the spot-weld actuate the torch trigger. (Make sure there is no air-gap!)

The automatic spot-welding sequence is as follows

- Pull back and release the torch trigger.
- Gas pre-flow time elapses.
- Arc ignites with start-arc current.
- Current rises via the set up-slope to the spot-welding current value set on the dial (32).
- The spot-welding time (0,1 - 8 secs.) set on the dial (33) elapses.
- The current drops via the down-slope (dial 11) to the final crater current.
- The gas post-flow time elapses.

Important! In the event of any trouble, the welder can manually interrupt the automatic spot-welding sequence by pulling back and releasing the trigger again!

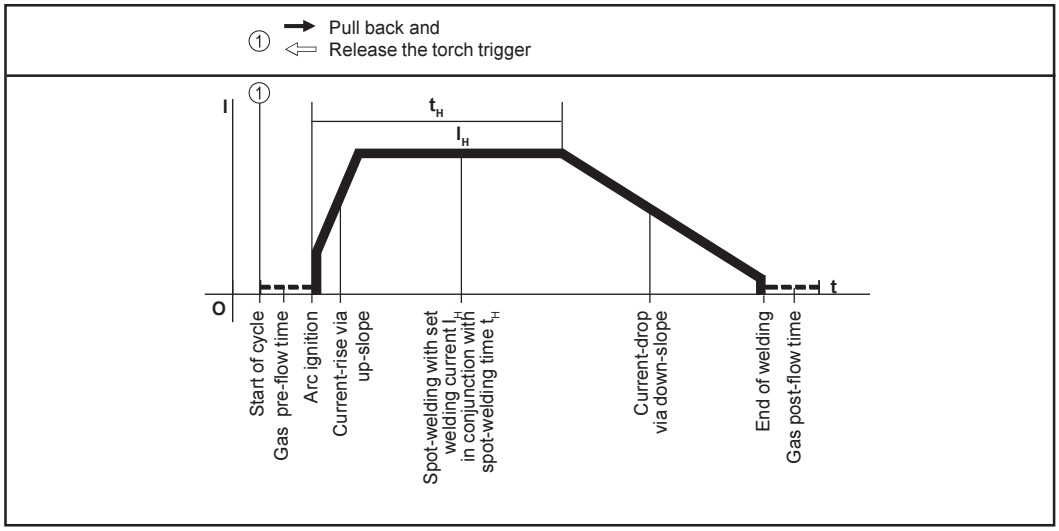


Fig. 29 Functional sequence with the TR 51mc remote control spot-welding unit

TPmc remote control unit

This workplace remote control unit is intended for use in particular with manual electrode and TIG welding.

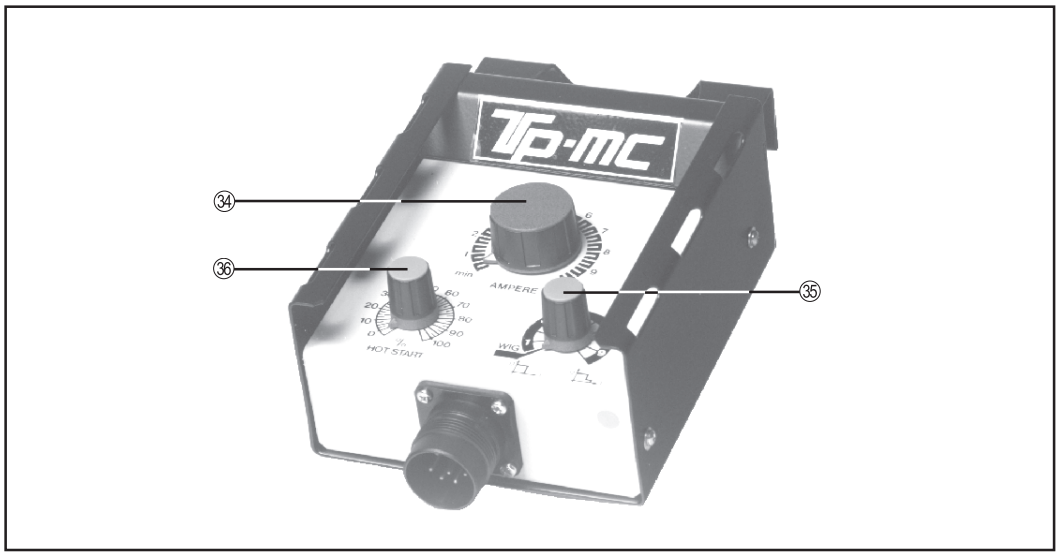


Fig. 30 TPmc remote control unit

(34) Welding current dial

- for continuous adjustment of the welding current

(35) Arc force control dial

- influences the short circuit amperage at the moment of drop transfer (from electrode to workpiece)

At scale setting "0" there is no increase at all in the short circuit amperage at the moment of drop transfer (soft arc).
Range of application: welding using rutile electrodes (fine globules), basic sheathed electrodes in the medium and upper amperage ranges

NOTE! When welded at low load, basic-sheathed electrodes tend to "GET STUCK" on the workpiece.

At scale setting "10" there is a very considerable in-crease in amperage at the moment of drop transfer (hard arc).
Range of application: Basic sheathed electrodes (coarse-globule), when these are to be welded in the lower amperage range (vertical-up seams, edge hardfacing welds, root welding etc.)

Important! When the setting on the arc force control dial is adjusted upwards, the following may be observed when rutile, basic-sheathed or special electrodes are being used:

- easy ignition
- reduction in welding misfires
- less electrode burn-on
- good root penetration
- occasionally an increase in spattering
- when welding thin sheet metal the danger of "burning through" increases

TPmc remote control unit
(continued)

With fine-globule electrodes (titanium) the above will not be observed, as metal transfer occurs without a short circuit being produced.

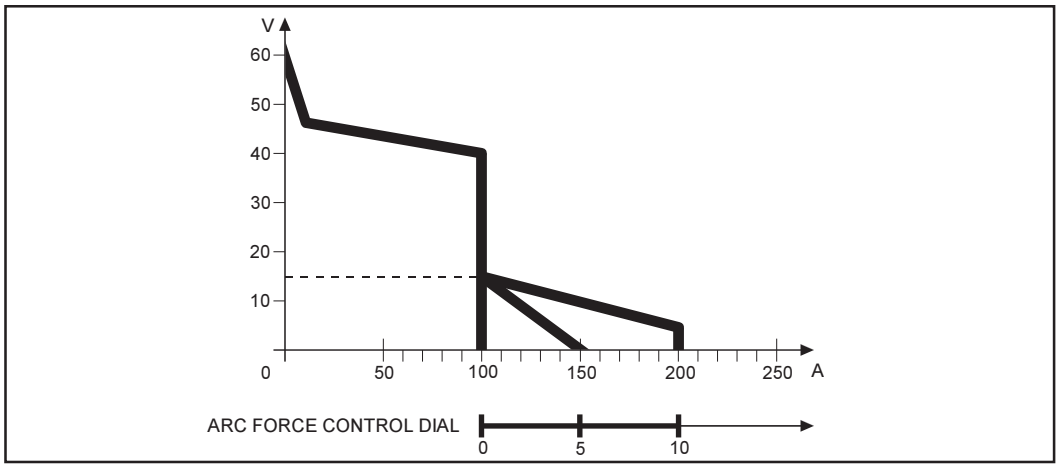


Fig. 31 Effect of arc force control dial (35) on constant-current characteristic at the moment of short circuiting. Welding current setting 100 A

(36) HOT-START control dial

- only effective in the electrode ignition phase
- improved ignition even with electrodes where ignition is normally more difficult
- improved melting of the base material in the ignition phase, meaning far fewer cold laps
- considerable reduction of slag inclusions
- is added to the set welding current value on a percentage basis

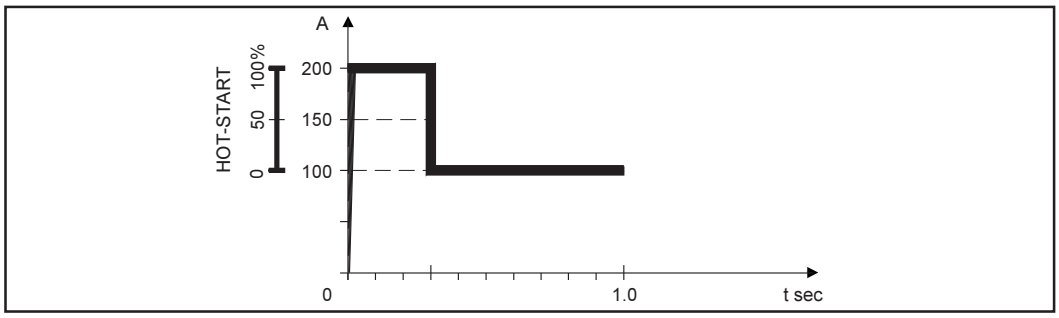


Fig. 32 Ignition phase using HOT-START control. Welding current setting 100 A

Important! The maximum setting for the HOT-START current is limited by the maximum circuit of the machine.

Connecting the remote control unit:

- use the remote control cable to create an electrical link bet-ween the connecting socket [G] on the power source and the socket on the remote control unit.
- insert the plug-in connections into the correct sockets and screw the coupling ring on as far as possible.
- shift the function selector button (4) into the right position for the operating mode in question

Welding without a remote control unit

The parameters for Hot-Start and arc force are pre-set within the machine to average (mean) values

Troubleshooting

Safety

WARNING! An electric shock can be fatal. Before opening up the machine
- Switch the mains switch to the “O” position
- Unplug the machine from the mains
- Put up an easy-to-understand warning sign to stop anybody inadvertently switching it back on again
- Using a suitable measuring instrument, check to make sure that electrically charged components (e.g. capacitors) have been discharged

CAUTION! Inadequate PE conductor connections can cause serious injury and damage. The housing screws provide a suitable PE conductor connection for earthing (grounding) the housing and must NOT be replaced by any other screws which do not provide a reliable PE conductor connection.

Displayed service codes

If any error message that is described here appears on the displays, then the fault is one that can only be put right by a service technician. Make a note of the error message shown in the display, and of the serial number and configuration of the power source, and get in touch with our after-sales service, giving them a detailed description of the error.

Error is reported by TMS16 board

Err 002	Temperature-sensor short circuit
Err 003	Break in temperature-sensor circuit
Err 006	I command-value compensation error
Err 007	RAM access error
Err 008	SEEPROM access error
Err 009	Secondary overvoltage error
Err 012	ADC offset error
Err 013	ADC gain error
Err 017	Primary overcurrent error
Err 018	Supply voltage error (+5V, +15V)
Err 021	Stack-Overflow
U-P	Primary overvoltage

Troubleshooting

1. Machine does not work

Mains switch is ON, but relevant operating status LED and digital displays are not lit up

Cause:	Break in mains lead, Mains plug is not plugged in
Remedy:	Check mains lead, and mains voltage if necessary
Cause:	Mains fuse is faulty
Remedy:	Change the fuse
Ursache:	Mains power socket or plug is faulty
Remedy:	Replace any faulty parts

2. No reaction when torch trigger is actuated
Mains switch is ON, relevant operating status LED and digital displays are lit up, but LED displays (9), (10), (12) do not light up when trigger is pulled back

Cause: Torch control plug is not plugged in, or the plug-in connection is faulty
Remedy: Plug in the control plug and secure it, check connection, replace if necessary

Cause: Torch switch (micro-switch) or torch control line is faulty
Remedy: Repair or replace torch

Cause: The "Power ON" reset time after switch-on (10 sec) has not yet elapsed
Remedy: After switching on the mains switch, wait for about 10 sec before starting to weld

---

3. No welding current
Mains switch is ON, relevant operating status LED and digital displays are lit up, LED displays (9), (10), (12) light up when the trigger is pulled back. HF and shielding gas are present

Cause: Earth cable is not connected
Remedy: Clamp the earth cable to the workpiece

Cause: Earth cable is plugged into wrong current socket
Remedy: Plug the earth cable into the ⏚ socket and secure it

Cause: Torch is faulty
Remedy: Change the torch

Cause: Short circuit in welding-current circuit in electrode welding mode (longer than 1 sec.)
Remedy: Eliminate the short circuit in the welding-current circuit

---

4. No welding current
Mains switch (1) is ON, relevant operating status LED is lit up, digital displays (2) and (3) are signaling t - S e.g.: 8 1 °C (Overtemp. Sec.)

Cause: Max. duty cycle has been exceeded or fan is faulty (Display is signaling secondary overtem-perature) t - S
Remedy: Allow the machine to cool -> do not switch off, check working of fan

Cause: Cooling air-stream is insufficient
Remedy: Ensure adequate supply of cooling air

Ursache: Primary module is very dirty
Remedy: Open up the machine and blast clean with dry compressed air

---

5. Arc sometimes breaks (in manual electrode)

Cause: Arc-drop voltage of electrode is too high
Remedy: Use an alternative electrode if possible

---

6. No shielding gas
all other functions are OK

Cause: Gas cylinder is empty
Remedy: Change the gas cylinder

Cause: Pressure regulator is defective
Remedy: Change the regulator

Cause: Gas hose is not connected, or is faulty
Remedy: Connect the gas hose, replace faulty hose

Cause: Welding torch is faulty
Remedy: Replace the torch

Cause: Gas solenoid valve is defective
Remedy: Call after-sales service

---

7. No gas post-flow
Tungsten electrode discolours after end of welding

Cause: Gas pre-flow time is set too short
Remedy: Using internal program parameters, increase the gas post-flow time (depends on welding amperage)

---

8. Poor arc ignition

Cause: Gasvorströmzeit zu kurz eingestellt
Remedy: Increase gas pre-flow time

Cause: HF is too weak
Remedy: See Pt.9 below

Cause: Tungsten electrode is alloyed up, or pointed tip is damaged
Remedy: Sharpen tip of tungsten electrode

Cause: Tungsten electrode is underloaded
Remedy: Use a suitable electrode for the amperage (also start-arc amperage) in question

Cause: Gas nozzle is dirty; HF jumps over the gas nozzle onto the workpiece
Remedy: Use a new ceramic nozzle

Cause: Gas nozzle is too small for the diameter of tungsten electrode used
Remedy: Use a bigger gas nozzle

Cause: Torch is damaged: torch body, protective hose etc. are faulty
Remedy: Replace the damaged parts or change the torch

---

9. HF is too weak

Cause: No shielding gas, or not enough
Remedy: see Pt.6 above

---

10. Remote control unit does not work
(all other functions are OK)

Cause: Remote control cable is not properly connected
Remedy: Plug in the remote control cable the right way round

Cause: Remote control unit or cable is faulty
Remedy: Change the remote control unit or cable

Cause: 10-pole remote control socket is faulty
Remedy: Change the remote control socket

WARNING! Where fuses need to be changed, they must be replaced by fuses of the same rating. No warranty claims will be accepted in respect of damage caused by the use of too high a raiting of fuse!

Care, maintenance and disposal

General remarks

Under normal operating conditions the power source requires only a minimum of care and maintenance. However, it is vital to observe some important points to ensure the welding machine remains in a usable condition for many years.

WARNING! An electric shock can be fatal. Before opening the machine
- Switch the mains switch „OFF“
- Unplug machine from the mains
- Put up an easy-to-understand warning sign to stop anybody inadvertently switching it back on again
- Using a suitable measuring instrument, check to make sure that electrically charged components (e.g. capacitors) have been discharged

Every start-up

- Check mains plug, mains cable, welding torch, interconnection cable assembly and bondings for damage
- Check that there is a gap of 0.5 m (1.6 ft.) all around the machine to ensure that cooling air can flow and escape unhindered.

NOTE! Air inlets and outlets must never be covered, not even partly.

Every 2 months

- Optional: clean air filter

Every 6 months

- Dismantle machine side panels and clean machine inside with dry reduced compressed air

NOTE! Risk of damage to electronic components. Do not bring the air nozzle too close to the electronic components.

- If a lot of dust has accumulated, clean the cooling air ducts.

Disposal

Dispose of in accordance with the applicable national and local regulations.

Technical data

TransTig 1600 / TransTig 1700

		TransTig 1600	TransTig 1700
Mains voltage		1 x 230 V	1 x 230 V
Mains voltage tolerance		+/- 15 %	+/- 15 %
Power frequency		50 / 60 Hz	50 / 60 Hz
Mains fusing protection		16 A slow blow	16 A slow blow
Apparent power at	50% ED*	7,0 kVA	6,2 kVA
	100% ED*	3,7 kVA	5,0 kVA
Cos phi	100 A	0,99	-
	120 A	-	0,99
Efficiency	50 A	90 %	-
	80 A	-	89 %
Welding current range	TIG	2 - 160 A	2 - 170 A
	EL	2 - 140 A	2 - 140 A
Welding current TIG			
10 min/40°C (104°F)	35% ED*	160 A	170 A
10 min/40°C (104°F)	60% ED*	-	135 A
10 min/40°C (104°F)	100% ED*	110 A	120 A
Welding current EL			
10 min/40°C (104°F)	50% ED*	140 A	140 A
10 min/40°C (104°F)	100% ED*	100 A	115 A
Welding voltage range according to standard characteristic			
	TIG	10,1 - 16,4 V	10,1 - 16,8 V
	Electrode	20,1 - 25,6 V	20,1 - 25,6 V
Open circuit voltage	230 V	45 V DC	92 V DC
Insulation category		B	B
Protection class		IP 23	IP 23
Type of cooling		AF	AF
Marks of conformity		S, CE	S, CE

*duty cycle

(D) Ersatzteilliste
Schaltplan

(GB) Spare Parts List
Circuit Diagram

(F) Liste de pièces de rechange
Schéma de connexions

(I) Lista parti di ricambio
Schema

(E) Lista de repuestos
Esquema de cableado

(P) Lista de peças sobresselentes
Esquema de conexões

(NL) Onderdelenlijst
Bedradingsschema

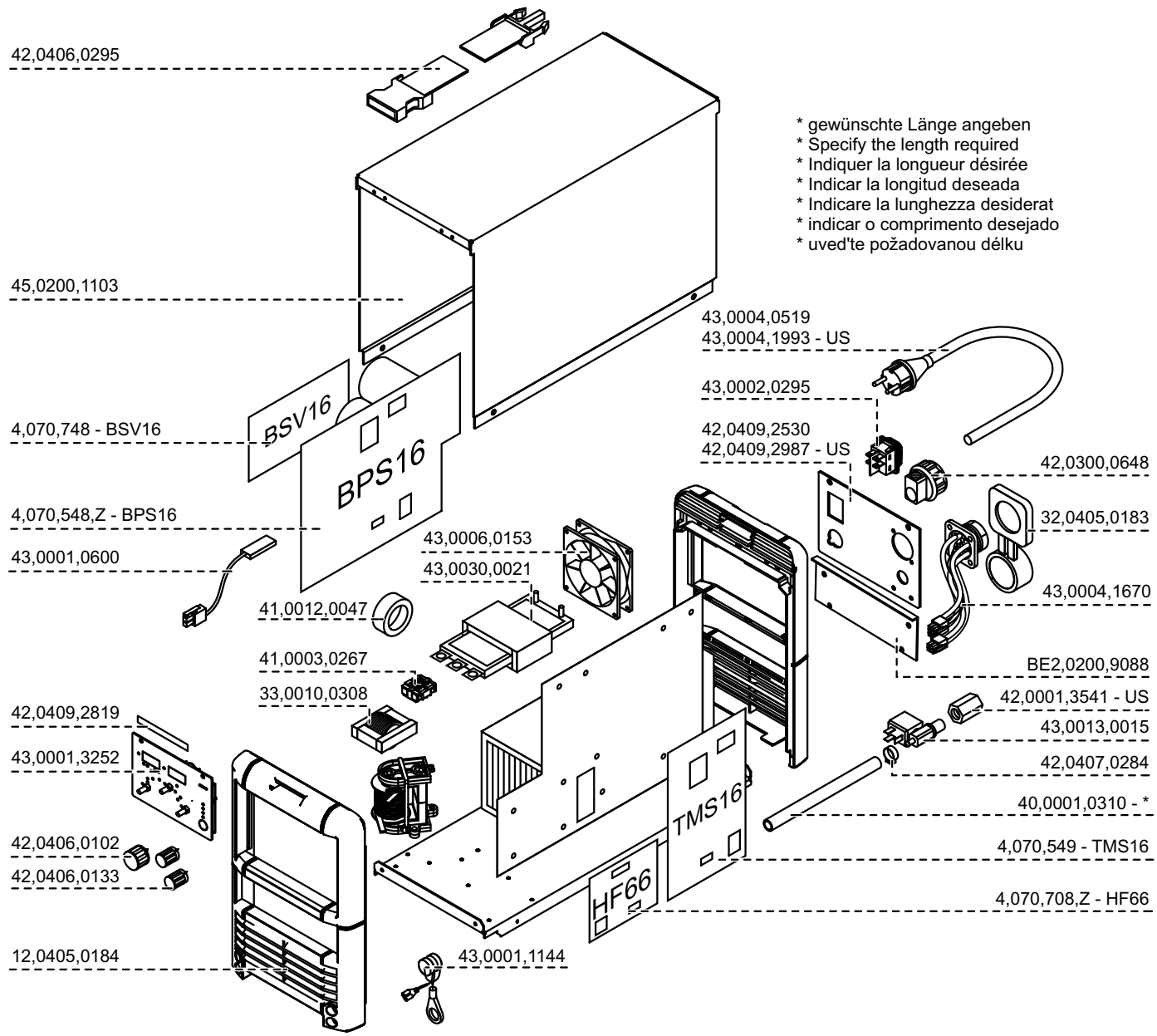
(N) Reservdelsliste
Koblingsplan

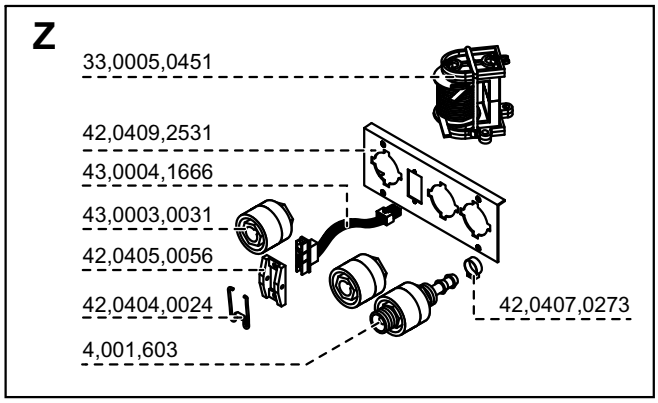
(CZ) Seznam náhradních dílů
Schéma zapojení

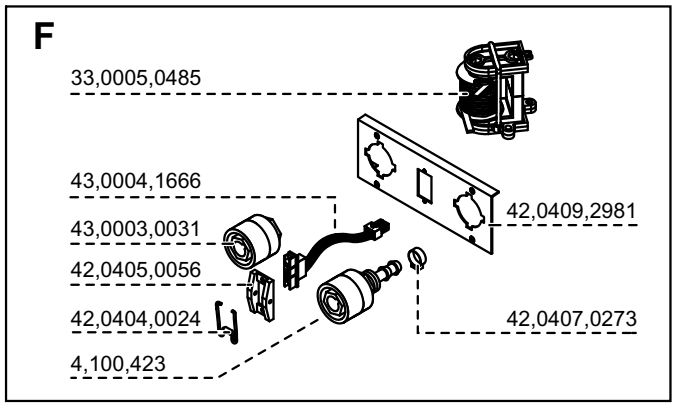
(RUS) Список запасных частей
Электрическая схема

(SK) Zoznam náhradných dielov
Schéma zapojenia

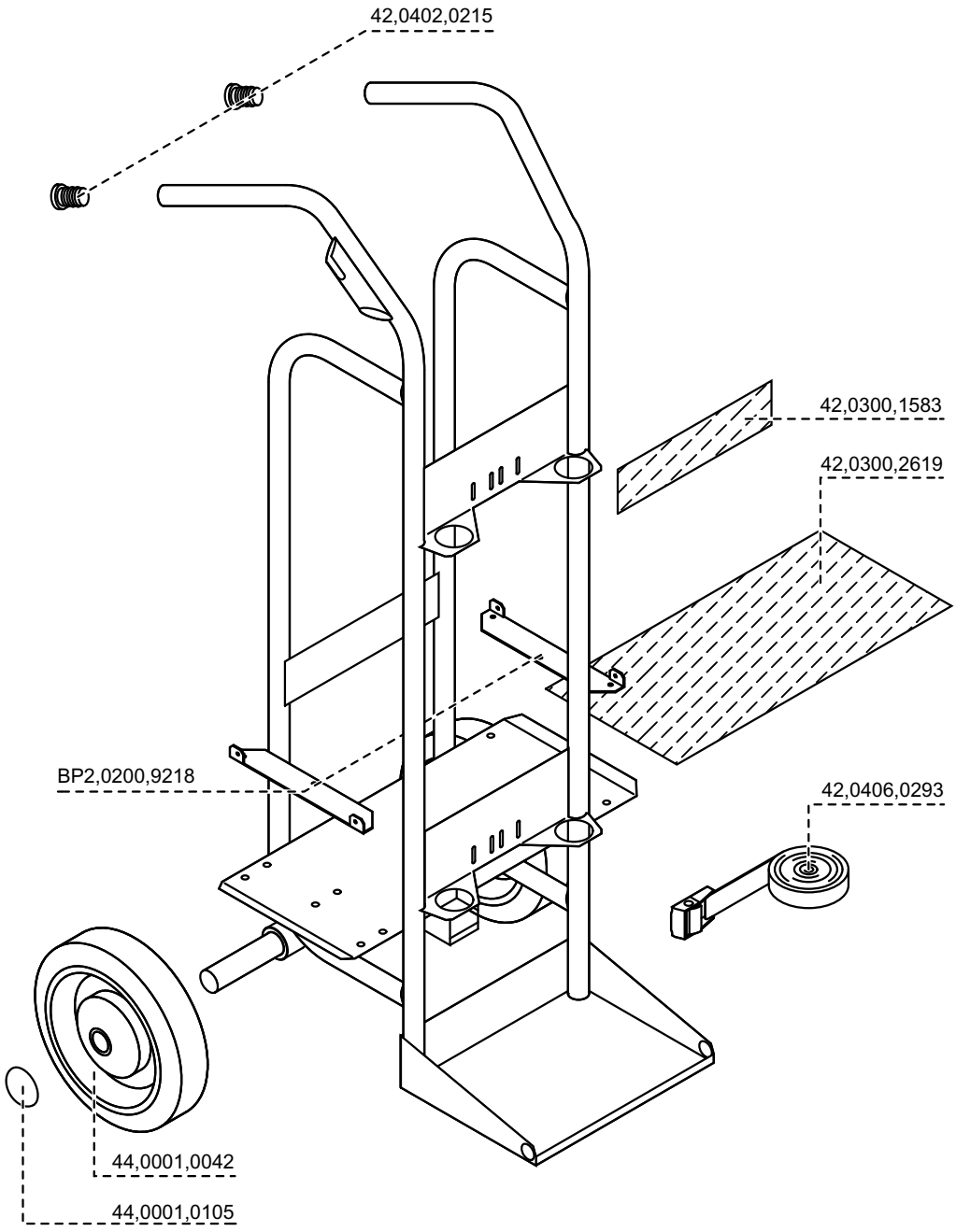
TransTig 1600 G/Z	**4,075,089**
TransTig 1600 G/F	**4,075,089,636**
TransTig 1700 G/Z	**4,075,115**
TransTig 1700 G/F	**4,075,115,636**
TransTig 1700 G/F/US	**4,075,115,800**

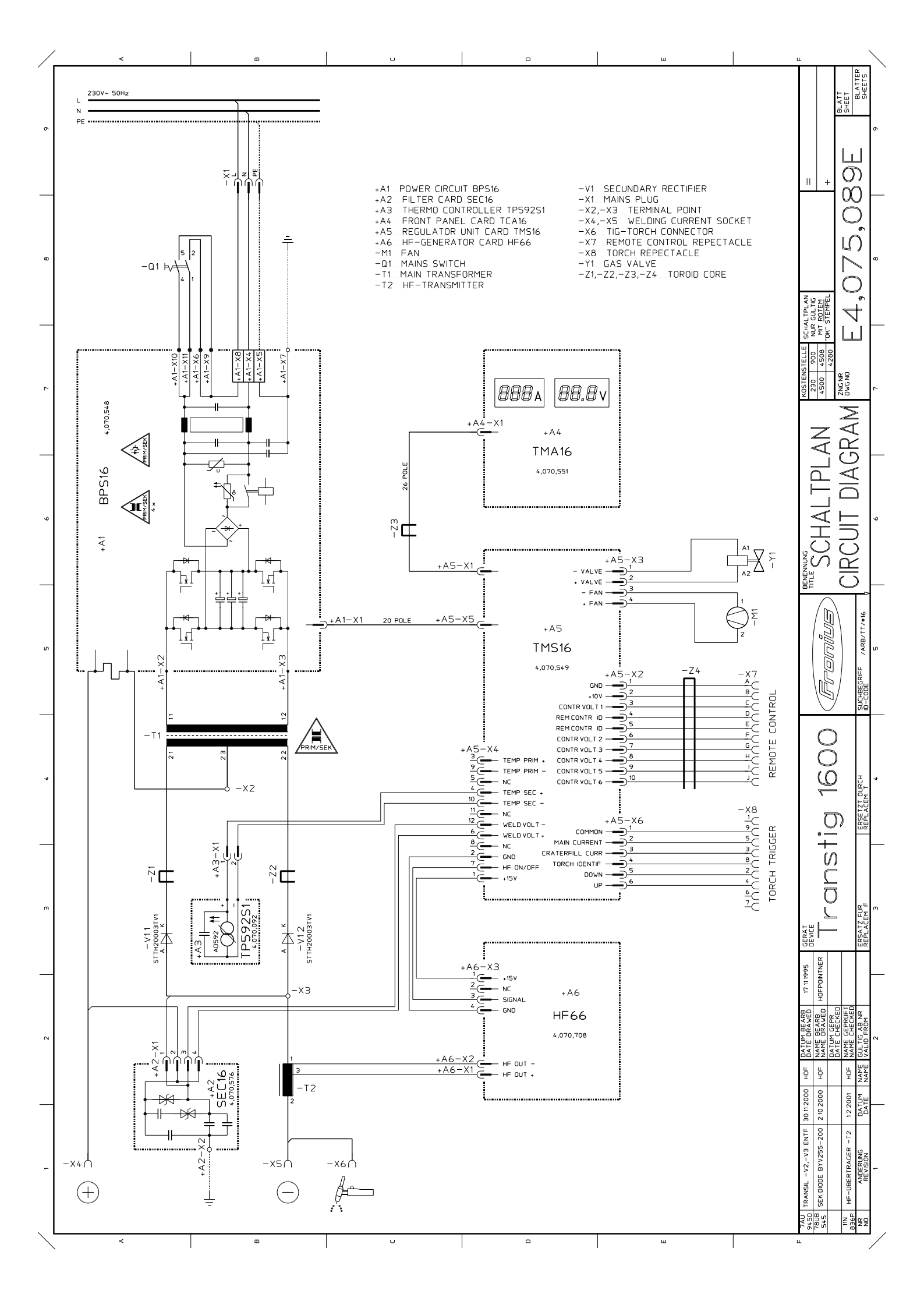






Carriage Easy- LT **4,045,917**




230V~ 50Hz
L
N
PE
+A1 POWER CIRCUIT BPS16
+A2 FILTER CARD SEC16
+A3 THERMO CONTROLLER TP592S1
+A4 FRONT PANEL CARD TCA16
+A5 REGULATOR UNIT CARD TMS16
+A6 HF-GENERATOR CARD HF66
-M1 FAN
-Q1 MAINS SWITCH
-T1 MAIN TRANSFORMER
-T2 HF-TRANSMITTER
-V1 SECUNDARY RECTIFIER
-X1 MAINS PLUG
-X2,-X3 TERMINAL POINT
-X4,-X5 WELDING CURRENT SOCKET
-X6 TIG-TORCH CONNECTOR
-X7 REMOTE CONTROL REPECTACLE
-X8 TORCH REPECTACLE
-Y1 GAS VALVE
-Z1,-Z2,-Z3,-Z4 TOROID CORE
BPS16
4,070,548
TMA16
4,070,551
TMS16
4,070,549
HF66
4,070,708
SEC16
4,070,576
TP592S1
4,070,092
26 POLE
20 POLE
REMOTE CONTROL
TORCH TRIGGER
GND
+10V
CONTR VOLT 1
REM CONTR ID
REM CONTR ID
CONTR VOLT 2
CONTR VOLT 3
CONTR VOLT 4
CONTR VOLT 5
CONTR VOLT 6
TEMP PRIM +
TEMP PRIM -
NC
TEMP SEC +
TEMP SEC -
NC
WELD VOLT -
WELD VOLT +
NC
GND
HF ON/OFF
+15V
COMMON
MAIN CURRENT
CRATERFILL CURR
TORCH IDENTIF
DOWN
UP
- VALVE
+ VALVE
- FAN
+ FAN
HF OUT -
HF OUT +
PRIM/SEK
PRIM/SEK 4x
AD592
STTH20003TV1
STTH20003TV1
SCHALTPLAN
CIRCUIT DIAGRAM
Transtig 1600
E 4,075,089E
KOSTENSTELLE
230 900
4500 4508
4280
ZNG NR
DWG NO
SCHALTPLAN NUR GÜLTIG MIT ROTEM "OK" STEMPEL
BENENNUNG
TITLE
GERÄT
DEVICE
BLATT
SHEET
BLÄTTER
SHEETS
ERSETZT DURCH
REPLACEM T
ERSATZ FÜR
REPLACEM F
SUCHBEGRIFF
ID-CODE
/ARB/TT/416
DATUM BEARB
DATE DRAWED
NAME BEARB
NAME DRAWED
DATUM GEPRÜFT
DATE CHECKED
NAME GEPRÜFT
NAME CHECKED
GÜLTIG AB NR
VALID FROM
NAME
NAME
DATUM
DATE
ÄNDERUNG
REVISION
NR
NO
7AU 9450
78UB 545
1IN 836P
TRANSIL - V2,-V3 ENTF
SEK DIODE BYV255-200
HF-ÜBERTRAGER -T2
30.11.2000
2.10.2000
1.2.2001
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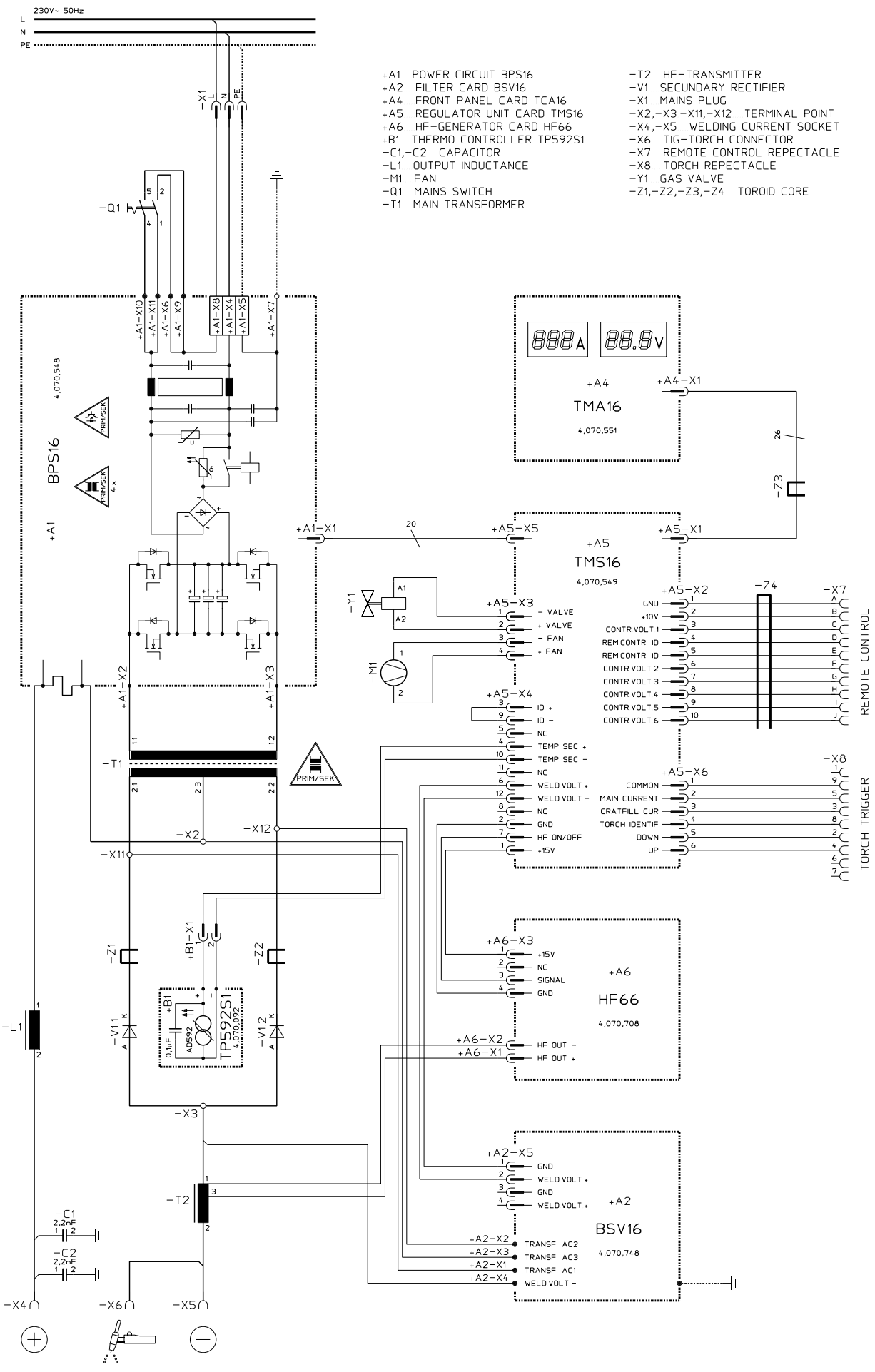
HOFPOINTNER


230V~ 50Hz
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-C1,-C2 CAPACITOR
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-V1 SECUNDARY RECTIFIER
-X1 MAINS PLUG
-X2,-X3-X11,-X12 TERMINAL POINT
-X4,-X5 WELDING CURRENT SOCKET
-X6 TIG-TORCH CONNECTOR
-X7 REMOTE CONTROL REPECTACLE
-X8 TORCH REPECTACLE
-Y1 GAS VALVE
-Z1,-Z2,-Z3,-Z4 TOROID CORE
BPS16
4,070,548
TMA16
4,070,551
TMS16
4,070,549
HF66
4,070,708
BSV16
4,070,748
TP592S1
4,070,092
REMOTE CONTROL
TORCH TRIGGER
E4,075,115
SCHALTPLAN
CIRCUIT DIAGRAM
Transtig 1700
Fronius

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