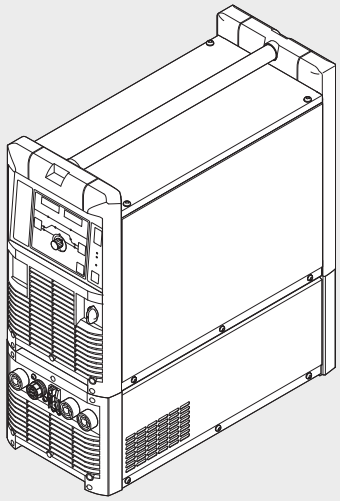
TransTig 2200
TransTig 2500 / 3000
TransTig 4000 / 5000
MagicWave 1700 / 2200
MagicWave 2500 / 3000
MagicWave 4000 / 5000

EN

Operating Instructions
Spare parts list

TIG Power source



42,0426,0027,EN 018-23022017

Dear reader,

Introduction

Thank you for the trust you have placed in our company and congratulations on buying this high-quality Fronius product. These instructions will help you familiarise yourself with the product. Reading the instructions carefully will enable you to learn about the many different features it has to offer. This will allow you to make full use of its advantages.

Please also note the safety rules to ensure greater safety when using the product. Careful handling of the product will repay you with years of safe and reliable operation. These are essential prerequisites for excellent results.

Contents

Safety rules

Explanation of safety symbols

DANGER! Indicates immediate and real danger. If it is not avoided, death or serious injury will result.

WARNING! Indicates a potentially dangerous situation. Death or serious injury may result if appropriate precautions are not taken.

CAUTION! Indicates a situation where damage or injury could occur. If it is not avoided, minor injury and/or damage to property may result.

NOTE! Indicates a risk of flawed results and possible damage to the equipment.

IMPORTANT! Indicates tips for correct operation and other particularly useful information. It does not indicate a potentially damaging or dangerous situation.

If you see any of the symbols depicted in the "Safety rules" chapter, special care is required.

General

The device is manufactured using state-of-the-art technology and according to recognised safety standards. If used incorrectly or misused, however, it can cause:

- injury or death to the operator or a third party,
- damage to the device and other material assets belonging to the operating company,
- inefficient operation of the device.

All persons involved in commissioning, operating, maintaining and servicing the device must:

- be suitably qualified,
- have sufficient knowledge of welding and
- read and follow these operating instructions carefully.

The operating instructions must always be at hand wherever the device is being used. In addition to the operating instructions, attention must also be paid to any generally applicable and local regulations regarding accident prevention and environmental protection.

All safety and danger notices on the device

- must be in a legible state,
- must not be damaged,
- must not be removed,
- must not be covered, pasted or painted over.

For the location of the safety and danger notices on the device, refer to the section headed "General" in the operating instructions for the device.
Before switching on the device, rectify any faults that could compromise safety.
This is for your personal safety!

Proper use

The device is to be used exclusively for its intended purpose.

The device is intended solely for the welding processes specified on the rating plate.
Any use above and beyond this purpose is deemed improper. The manufacturer shall not be held liable for any damage arising from such usage.

Proper use includes:
- carefully reading and following all the instructions given in the operating instructions
- studying and obeying all safety and danger notices carefully
- performing all stipulated inspection and maintenance work.

Never use the device for the following purposes:
- Thawing out pipes
- Charging batteries
- Starting engines

The device is designed for use in industry and the workshop. The manufacturer accepts no responsibility for any damage caused through use in a domestic setting.

The manufacturer likewise accepts no liability for inadequate or incorrect results.

Environmental conditions

Operation or storage of the device outside the stipulated area will be deemed as not in accordance with the intended purpose. The manufacturer shall not be held liable for any damage arising from such usage.

Ambient temperature range:
- during operation: -10 °C to + 40 °C (14 °F to 104 °F)
- during transport and storage: -20 °C to +55 °C (-4 °F to 131 °F)

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

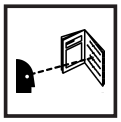
The surrounding air must be free from dust, acids, corrosive gases or substances, etc.
Can be used at altitudes of up to 2000 m (6561 ft. 8.16 in.)

Obligations of the operator

The operator must only allow persons to work with the device who:
- are familiar with the fundamental instructions regarding safety at work and accident prevention and have been instructed in how to use the device
- have read and understood these operating instructions, especially the section "safety rules", and have confirmed as much with their signatures
- are trained to produce the required results.

Checks must be carried out at regular intervals to ensure that operators are working in a safety-conscious manner.

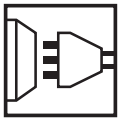
Obligations of personnel



Before using the device, all persons instructed to do so undertake:
- to observe the basic instructions regarding safety at work and accident prevention
- to read these operating instructions, especially the "Safety rules" section and sign to confirm that they have understood them and will follow them.

Before leaving the workplace, ensure that people or property cannot come to any harm in your absence.

Mains connection



Devices with a higher rating may affect the energy quality of the mains due to their current consumption.

This may affect a number of types of device in terms of:
- connection restrictions
- criteria with regard to the maximum permissible mains impedance *)
- criteria with regard to the minimum short-circuit power requirement *)

*) at the interface with the public grid
see Technical Data

In this case, the plant operator or the person using the device should check whether the device may be connected, where appropriate by discussing the matter with the power supply company.

NOTE! Ensure that the mains connection is earthed properly

Protecting yourself and others

Persons involved with welding expose themselves to numerous risks, e.g.:
- flying sparks and hot pieces of metal
- arc radiation, which can damage eyes and skin

- hazardous electromagnetic fields, which can endanger the lives of those using cardiac pacemakers

- risk of electrocution from mains current and welding current

- greater noise pollution

- harmful welding fumes and gases

Anyone working on the workpiece while welding is in progress must wear suitable protective clothing with the following properties:
- flame-resistant
- insulating and dry
- covers the whole body, is undamaged and in good condition
- safety helmet
- trousers with no turn-ups

Protective clothing refers to a variety of different items. Operators should:
- protect eyes and face from UV rays, heat and sparks using a protective visor and regulation filter.
- wear regulation protective goggles with side protection behind the protective visor.
- wear stout footwear that provides insulation even in wet conditions.
- protect the hands with suitable gloves (electrically insulated and providing protection against heat).
- wear ear protection to reduce the harmful effects of noise and to prevent injury.

Keep all persons, especially children, out of the working area while any devices are in operation or welding is in progress. If, however, there are people in the vicinity,
- make them aware of all the dangers (risk of dazzling by the arc, injury from flying sparks, harmful welding fumes, noise, possible risks from mains current and welding current, etc.),
- provide suitable protective equipment or
- erect suitable safety screens/curtains.

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.

Danger from toxic gases and vapours

The fumes produced during welding contain harmful gases and vapours.

Welding fumes contain substances that may, under certain circumstances, cause birth defects or cancer.

Keep your face away from welding fumes and gases.

Fumes and hazardous gases
- must not be breathed in
- must be extracted from the working area using appropriate methods.

Ensure an adequate supply of fresh air with a ventilation rate of at least 20 m³/hour.

Otherwise, a protective mask with an air supply must be worn.

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

If there is any doubt about whether the extraction capacity is sufficient, the measured toxic emission values should be compared with the permissible limit values.

Amongst others, the following components are responsible for the degree of toxicity of welding fumes:
- Metals used for the workpiece
- Electrodes
- Coatings
- Cleaners, degreasers, etc.

The relevant material safety data sheets and manufacturer's specifications for the listed components should therefore be studied carefully.

Flammable vapours (e.g. solvent fumes) should be kept away from the arc's radiation area.

Danger from flying sparks

Flying sparks may cause fires or explosions.

Never weld close to flammable materials.

Flammable materials must be at least 11 metres (36 ft. 1.07 in.) away from the arc, or alternatively covered with an approved cover.

A suitable, tested fire extinguisher must be available and ready for use.

Sparks and pieces of hot metal may also get into adjacent areas through small gaps or openings. Take appropriate precautions to prevent any danger of injury or fire.

Welding must not be performed in areas that are subject to fire or explosion or near sealed tanks, vessels or pipes unless these have been prepared in accordance with the relevant national and international standards.

Do not carry out welding on containers that are being or have been used to store gases, propellants, mineral oils or similar products. Residues pose an explosive hazard.

Risks from mains current and welding current

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

Do not touch live parts either inside or outside the device.

During MIG/MAG welding and TIG welding, the welding wire, the wirespool, the feed rollers and all pieces of metal that are in contact with the welding wire are live.

Always set the wirefeeder up on a sufficiently insulated surface or use a suitable, insulated wirefeeder holder.

Make sure that you and others are protected with an adequately insulated, dry temporary backing or cover for the earth or ground potential. This temporary backing or cover must extend over the entire area between the body and the earth or ground potential.

All cables and leads must be secured, undamaged, insulated and adequately dimensioned. Replace loose connections and scorched, damaged or inadequately dimensioned cables and leads immediately.
Use the handle to ensure the power connections are tight before every use.
In the case of power cables with a bayonet connector, rotate the power cable around the longitudinal axis by at least 180° and pre-load.

Do not wrap cables or leads around the body or parts of the body.

The electrode (rod electrode, tungsten electrode, welding wire, etc.) must
- never be immersed in liquid for cooling
- Never touch the electrode when the power source is switched on.

Double the open circuit voltage of a power source can occur between the welding electrodes of two power sources. Touching the potentials of both electrodes at the same time may be fatal under certain circumstances.

Arrange for the mains cable to be checked regularly by a qualified electrician to ensure the ground conductor is functioning properly.

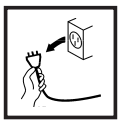
The device must only be operated on a mains supply with a ground conductor and a socket with a ground conductor contact.

Operating the device on a grid without a ground conductor and in a socket without a ground conductor contact will be deemed gross negligence. The manufacturer shall not be held liable for any damage arising from such usage.

If necessary, provide an adequate earth connection for the workpiece.

Switch off unused devices.

Wear a safety harness if working at height.



Before working on the device, switch it off and pull out the mains plug.

Attach a clearly legible and easy-to-understand warning sign to the device to prevent anyone from plugging the mains plug back in and switching it on again.

After opening the device:
- Discharge all live components
- Ensure that all components in the device are de-energised

If work on live parts is required, appoint a second person to switch off the main switch at the right moment.

Meandering welding currents

If the following instructions are ignored, meandering welding currents can develop with the following consequences:
- Fire hazard
- Overheating of parts connected to the workpiece
- Irreparable damage to ground conductors
- Damage to device and other electrical equipment

Ensure that the workpiece is held securely by the workpiece clamp.

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

If the floor is electrically conductive, the device must be set up with sufficient insulating material to insulate it from the floor.

If distribution boards, twin-head mounts, etc., are being used, note the following: The electrode of the welding torch / electrode holder that is not used is also live. Make sure that the welding torch / electrode holder that is not used is kept sufficiently insulated.

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

EMC Device Classifications

Devices in emission class A:
- Are only designed for use in industrial settings
- Can cause line-bound and radiated interference in other areas

Devices in emission class B:
- Satisfy the emissions criteria for residential and industrial areas. This is also true for residential areas in which the energy is supplied from the public low-voltage mains.

EMC device classification as per the rating plate or technical data.

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.

Check and evaluate the immunity to interference of nearby devices according to national and international regulations. Examples of equipment that may be susceptible to interference from the device include:

- Safety devices
- Power, signal and data transfer lines
- IT and telecommunications devices
- Measuring and calibrating devices

Supporting measures for avoidance of EMC problems:

1. Mains supply
   - If electromagnetic interference arises despite correct mains connection, additional measures are necessary (e.g. use a suitable line filter).
2. Welding power leads
   - must be kept as short as possible
   - must run close together (to avoid EMF problems)
   - must be kept well apart from other leads
3. Equipotential bonding
4. Earthing of the workpiece
   - If necessary, establish an earth connection using suitable capacitors.
5. Shielding, if necessary
   - Shield off other nearby devices
   - Shield off entire welding installation

EMF measures

Electromagnetic fields may pose as yet unknown risks to health:

- effects on the health of others in the vicinity, e.g. wearers of pacemakers and hearing aids
- wearers of pacemakers must seek advice from their doctor before approaching the device or any welding that is in progress
- for safety reasons, keep distances between the welding cables and the welder's head/torso as large as possible
- do not carry welding cables and hosepacks over the shoulders or wind them around any part of the body

Specific hazards

Keep hands, hair, clothing and tools away from moving parts. For example:

- Fans
- Cogs
- Rollers
- Shafts
- Wirespools and welding wires

Do not reach into the rotating cogs of the wire drive or into rotating drive components.

Covers and side panels may only be opened/removed while maintenance or repair work is being carried out.

During operation
- Ensure that all covers are closed and all side panels are fitted properly.
- Keep all covers and side panels closed.

The welding wire emerging from the welding torch poses a high risk of injury (piercing of the hand, injuries to the face and eyes, etc.).

Therefore always keep the welding torch away from the body (devices with wire-feed unit) and wear suitable protective goggles.

Never touch the workpiece during or after welding - risk of burns.

Slag can jump off cooling workpieces. The specified protective equipment must therefore also be worn when reworking workpieces, and steps must be taken to ensure that other people are also adequately protected.

Welding torches and other parts with a high operating temperature must be allowed to cool down before handling.

Special provisions apply in areas at risk of fire or explosion - observe relevant national and international regulations.

Power sources for work in areas with increased electric risk (e.g. near boilers) must carry the "Safety" sign. However, the power source must not be located in such areas.

Risk of scalding from escaping coolant. Switch off cooling unit before disconnecting coolant flow or return lines.

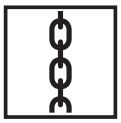
Observe the information on the coolant safety data sheet when handling coolant. The coolant safety data sheet may be obtained from your service centre or downloaded from the manufacturer's website.

Use only suitable load-carrying equipment supplied by the manufacturer when transporting devices by crane.

- Hook chains and/or ropes onto all suspension points provided on the load-carrying equipment.
- Chains and ropes must be at the smallest angle possible to the vertical.
- Remove gas cylinder and wire-feed unit (MIG/MAG and TIG devices).

If the wire-feed unit is attached to a crane holder during welding, always use a suitable, insulated wirefeeder hoisting attachment (MIG/MAG and TIG devices).

If the device has a carrying strap or handle, this is intended solely for carrying by hand. The carrying strap is not to be used if transporting with a crane, counterbalanced lift truck or other mechanical hoist.



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.

Odourless and colourless shielding gas may escape unnoticed if an adapter is used for the shielding gas connection. Prior to assembly, seal the device-side thread of the adapter for the shielding gas connection using suitable Teflon tape.

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 < 40 µm
- Pressure dew point < -20 °C
- Max. oil content < 25 mg/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 gas under pressure and can explode if damaged. As the shielding gas cylinders are part of the welding equipment, they must be handled with the greatest of care.

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

Mount the shielding gas cylinders vertically and secure according to instructions to prevent them falling over.

Keep the shielding gas cylinders well away from any welding or other electrical circuits.

Never hang a welding torch on a shielding gas cylinder.

Never touch a shielding gas cylinder with an electrode.

Risk of explosion - never attempt to weld a pressurised shielding gas cylinder.

Only use shielding gas cylinders suitable for the application in hand, along with the correct and appropriate accessories (regulator, hoses and fittings). Only use shielding gas cylinders and accessories that are in good condition.

Turn your face to one side when opening the valve of a shielding gas cylinder.

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

If the shielding gas cylinder is not connected, leave the valve cap in place on the cylinder.

The manufacturer's instructions must be observed as well as applicable national and international regulations for shielding gas cylinders and accessories.

Safety measures at the installation location and during transport

A device toppling over could easily kill someone. Place the device on a solid, level surface such that it remains stable
- The maximum permissible tilt angle is 10°.

Special regulations apply in rooms at risk of fire or explosion
- Observe relevant national and international regulations.

Use internal directives and checks to ensure that the workplace environment is always clean and clearly laid out.

Only set up and operate the device in accordance with the degree of protection shown on the rating plate.

When setting up the device, ensure there is an all-round clearance of 0.5 m (1 ft. 7.69 in.) to ensure that cooling air can flow in and escape unhindered.

When transporting the device, observe the relevant national and local guidelines and accident prevention regulations. This applies especially to guidelines regarding the risks arising during transport.

Before transporting the device, allow coolant to drain completely and detach the following components:
- Wire-feed unit
- Wirespool
- Shielding gas cylinder

After transporting the device, the device must be visually inspected for damage before commissioning. Any damage must be repaired by trained service technicians before commissioning the device.

Safety measures in normal operation

Only operate the device if all safety devices are fully functional. If the safety devices are not fully functional, there is a risk of
- injury or death to the operator or a third party,
- damage to the device and other material assets belonging to the operator,
- inefficient operation of the device.

Any safety devices that are not functioning properly must be repaired before switching on the device.

Never bypass or disable safety devices.

Before switching on the device, ensure that no one is likely to be endangered.

Check the device at least once a week for obvious damage and proper functioning of safety devices.

Always fasten the shielding gas cylinder securely and remove it beforehand if the device is to be transported by crane.

Only the manufacturer's original coolant is suitable for use with our devices due to its properties (electrical conductibility, anti-freeze agent, material compatibility, flammability, etc.).

Only use suitable original coolant from the manufacturer.

Do not mix the manufacturer's original coolant with other coolants.

The manufacturer accepts no liability for damage resulting from use of a different coolant. In addition, all warranty claims will be forfeited.

The coolant can ignite under certain conditions. Transport the coolant only in its original, sealed containers and keep well away from any sources of ignition.

Used coolant must be disposed of properly in accordance with the relevant national and international regulations. The coolant safety data sheet may be obtained from your service centre or downloaded from the manufacturer's website.

Check the coolant level before starting to weld and while the system is still cool.

Commissioning, maintenance and repair

It is impossible to guarantee that bought-in parts are designed and manufactured to meet the demands made of them, or that they satisfy safety requirements.

- Use only original spare and wearing parts (also applies to standard parts).
- Do not carry out any modifications, alterations, etc. to the device without the manufacturer's consent.
- Components that are not in perfect condition must be replaced immediately.
- When ordering, please give the exact designation and part number as shown in the spare parts list, as well as the serial number of your device.

The housing screws provide the ground conductor connection for earthing the housing parts.
Only use original housing screws in the correct number and tightened to the specified torque.

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 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 either be returned to your dealer or given to one of the approved collection and recycling facilities in your area. Ignoring this European Directive may have potentially adverse affects on the environment and your health!

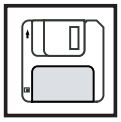
Safety symbols

Devices with the CE mark satisfy the essential requirements of the low-voltage and electromagnetic compatibility directive (e.g. relevant product standards from the EN 60 974 series).

Fronius International GmbH declares that the device complies with directive 2014/53/EU. The full text of the EU Declaration of Conformity is available from the following website: http://www.fronius.com

Devices with the CSA test mark satisfy the requirements of the relevant standards in Canada and the USA.

Data protection



The user is responsible for the safekeeping of any changes made to the factory settings. The manufacturer accepts no liability for any deleted personal settings.

Copyright

The text and illustrations are all technically correct at the time of printing. We reserve the right to make changes. The contents of the operating instructions shall not provide the basis for any claims whatsoever on the part of the purchaser. If you have any suggestions for improvement, or can point out any mistakes that you have found in the instructions, we will be most grateful for your comments.

General information

General

Device concept

TransTig 2200 Job, MagicWave 1700 Job and MagicWave 2200 Job with cooling unit

MagicWave 3000 Job with cooling unit and MagicWave 2500 Job

TransTig 5000 Job and MagicWave 5000 Job, both with cooling unit and trolley

The MagicWave (MW) 1700 / 2200 / 2500 / 3000 / 4000 / 5000 and TransTig (TT) 800 / 2200 / 2500 / 3000 / 4000 / 5000 TIG power sources are completely digitised, microprocessor controlled inverter power sources.

The modular design and potential for system add-ons ensure a high degree of flexibility. The devices can be adapted to any situation.

The straightforward operating concept means that essential functions can be seen at a glance and adjusted as required.

A standardised LocalNet interface makes it easy to connect digital system add-ons (e.g. JobMaster TIG welding torches, robot welding torches, remote control units, etc.).

Automatic cap shaping for AC welding with MagicWave power sources takes the diameter of the tungsten electrode into account to help produce optimum results.

The power sources are generator-compatible. They are exceptionally sturdy in day-to-day operation thanks to the protected control elements and their powder-coated housings.

To optimise the ignition sequence in TIG AC welding, the MagicWave takes account not only of the diameter of the electrode, but also of its temperature, calculated with reference to the preceding welding and welding off-times.

Functional principle

The central control and regulation unit of the power sources is coupled with a digital signal processor. The central control and regulation unit and signal processor control the entire welding process.
During the welding process, the actual data is measured continuously and the device responds immediately to any changes. Control algorithms ensure that the desired target state is maintained.

This results in:
- a precise welding process,
- exact reproducibility of all results
- excellent weld properties.

Field of application

The devices are used in workshops and industry for manual and automated TIG applications with unalloyed and low-alloy steel and high-alloy chrome-nickel steels.

The MagicWave power sources perform exceptionally well when it comes to welding aluminium, aluminium alloys and magnesium due to the variable AC frequency.

Warning notices on the device

US power sources come with extra warning notices affixed to the device. The warning notices must NOT be removed or painted over.

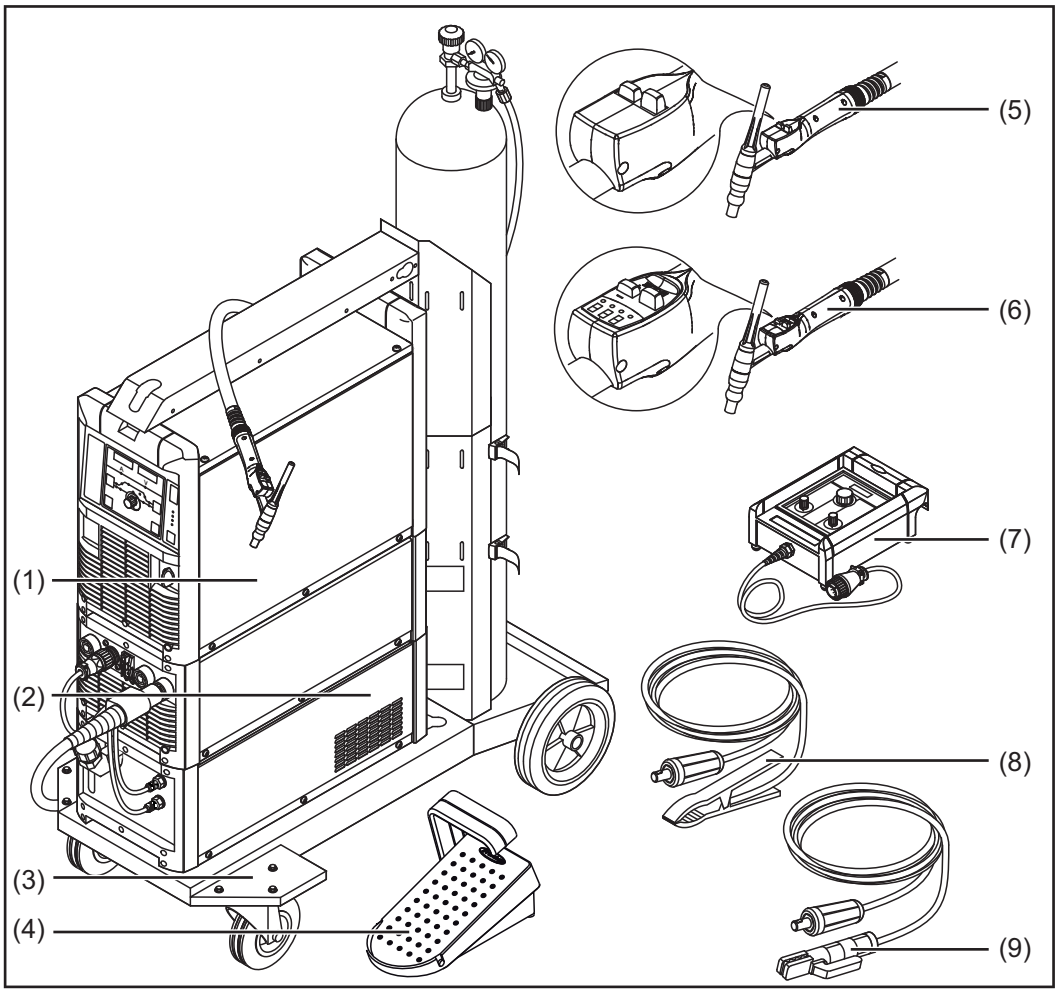
US version of power source with additional warning notices, e.g. MagicWave 2200

System components

General

The TransTig and MagicWave power sources can be used with a wide variety of system add-ons and options.

Overview



System add-ons and options

Item	Description
(1)	Power sources
(2)	Cooling units
(3)	Trolley with gas cylinder holder
(4)	Pedal remote control unit
(5)	TIG welding torch Standard / Up/Down
(6)	JobMaster TIG welding torch JobMaster TIG welding torch functions in conjunction with power sources: - welding current indicator on the welding torch - UP/Down control
(7)	Remote control units and robot accessories
(8)	Grounding (earthing) cable
(9)	Electrode cable

Control elements and connections

Description of the control panels

General

The key feature of the control panel is the logical way in which the control elements are arranged. All the main welding parameters needed for day-to-day working can easily be:

- selected using the buttons
- altered with the adjusting dial
- shown during welding on the digital display.

NOTE! Due to software updates, you may find that your device has certain functions that are not described in these operating instructions or vice versa. Individual illustrations may also differ slightly from the actual controls on your device, but these controls function in exactly the same way.

Safety

WARNING! Operating the equipment incorrectly can cause serious injury and damage. Do not use the functions described until you have thoroughly read and understood the following documents:

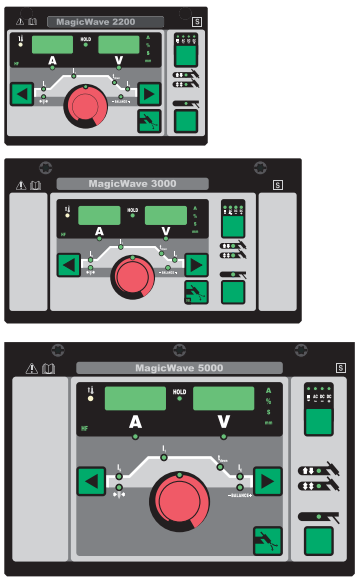
- these operating instructions
- all the operating instructions for the system components, especially the safety rules

Overview

"Description of the control panels" is composed of the following sections:

- MagicWave control panel
- TransTig control panel
- Key combinations - special functions

(1) (2) (3)



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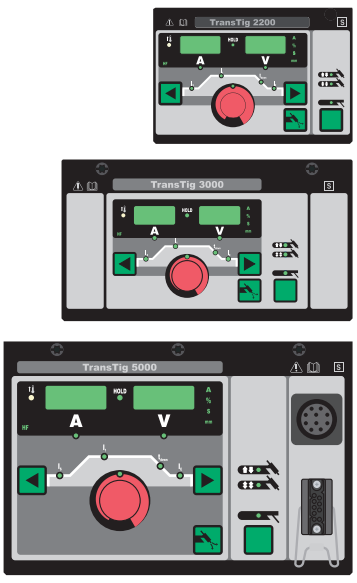


MagicWave control panels:

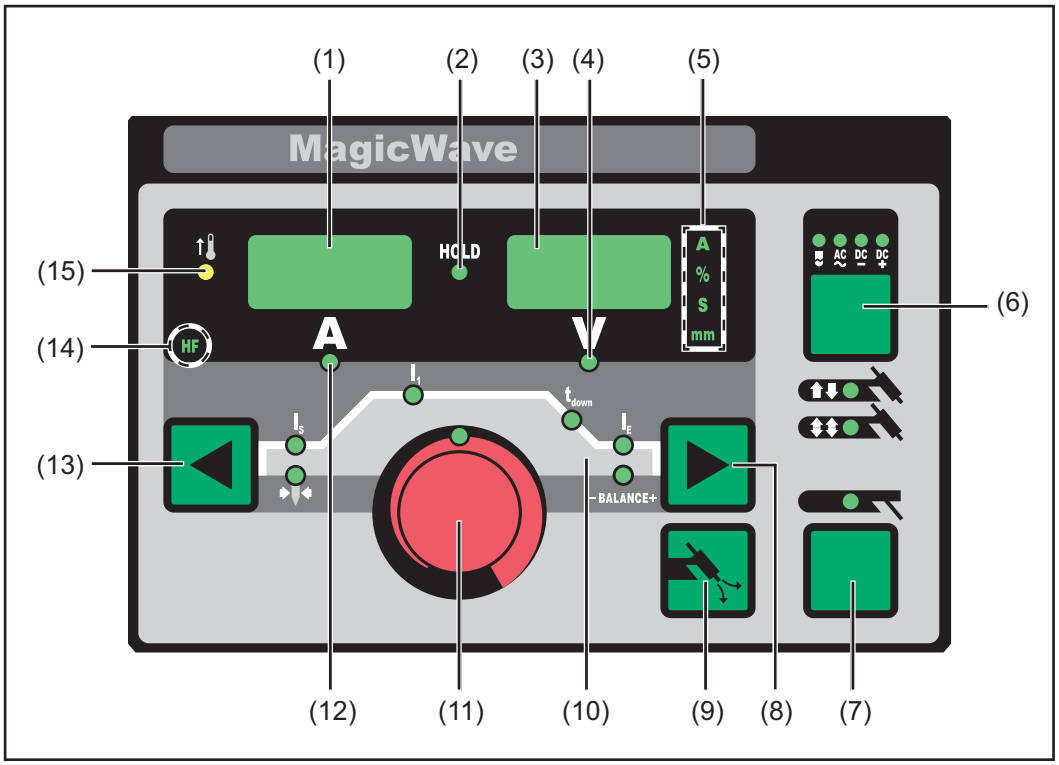
(1) MW 1700 / 2200
(2) MW 2500 / 3000
(3) MW 4000 / 5000

TransTig control panels:

(4) TT 2200
(5) TT 2500 / 3000
(6) TT 4000 / 5000

MagicWave control panel

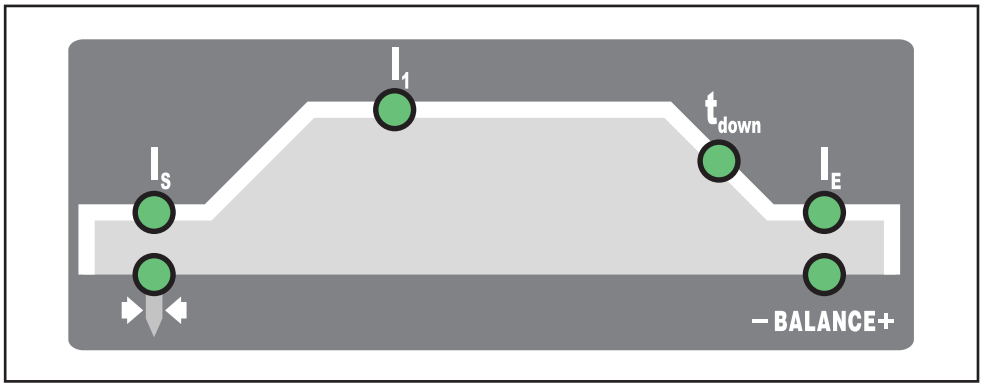
MagicWave control panel



No.	Function
(1)	**Left digital display**
(2)	**HOLD indicator** at the end of each welding operation, the actual values for the welding current and voltage are stored and the Hold indicator lights up. The Hold indicator refers to the last value reached by the main current I_1. As soon as any other welding parameter is selected, the Hold indicator goes off. The "Hold" values will continue to be available, however, if welding parameter I_1 is selected again. The Hold indicator is cleared when: - a new welding operation is started - the welding current I_1 is set - the mode is changed - the welding process is changed **NOTE** Hold values are not output if: - the main current phase is never reached, or - a pedal remote control is used.
(3)	**Right digital display**

No.	Function
(4)	**Welding voltage indicator** lights up when welding parameter I_1 is selected. During welding the current actual value for the welding voltage is displayed on the right-hand digital display. Before welding, the following appears on the right digital display: - 0.0 if a TIG welding mode is selected - 50 V if a MMA welding mode is selected (after a delay of 3 seconds; 50 V is the average value for the pulsed open circuit voltage)
(5)	**Unit indicators** **A indicator** **% indicator** lights up when the I_S, I_2 and I_E welding parameters and the dcY, I-G and HCU set-up parameters have been selected **s indicator** lights up when the t_{up} and t_{down} welding parameters plus the following set-up parameters have been selected: - GPr - G-L - G-H - UPS - tAC - Hti - HFt **mm indicator** lights up when the Fdb set-up parameter has been selected
(6)	**Process button** for selecting the welding process depending on the mode that has been chosen **2-step mode/4-step mode:** automatic cap-shaping; only available in conjunction with TIG AC welding TIG AC welding process TIG DC- welding process **Manual metal arc welding mode:** MMA AC welding process MMA DC- welding process MMA DC+ welding process When a process is selected, the LED on the relevant symbol lights up.
(7)	**Mode button** for selecting the mode 2-step mode 4-step mode Manual metal arc welding
(8)	**Right parameter selection button** for selecting welding parameters within the welding parameters overview (11) When a welding parameter is selected, the LED on the relevant parameter symbol lights up.

No.	Function
(9)	**Gas test button** for setting the required shielding gas flow rate on the gas pressure regulator After pressing this button, gas flows for 30 seconds. Press the button again to stop the gas flow prematurely.
(10)	**Welding parameter overview** The welding parameters overview contains the most important welding parameters to be used when welding. The sequence of welding parameters follows a clothes-line structure. Use the left and right welding parameter selection buttons to navigate within the welding parameters overview.



Welding parameters overview

The welding parameters overview contains the following welding parameters:

Starting current Is
for TIG welding

The starting current I_S
is saved separately for the "TIG AC welding" and "TIG DC- welding" modes.

Main current I_1 (welding current)
- for TIG welding
- for MMA welding

Downslope t_{down}
when TIG welding, the period over which the current is decreased from the main current I_1 to the final current I_E

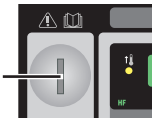
The downslope t_{down} is saved separately for 2-step and 4-step modes.

Final current I_E
for TIG welding

Balance
used to set the fusing power/cleaning action for TIG AC welding

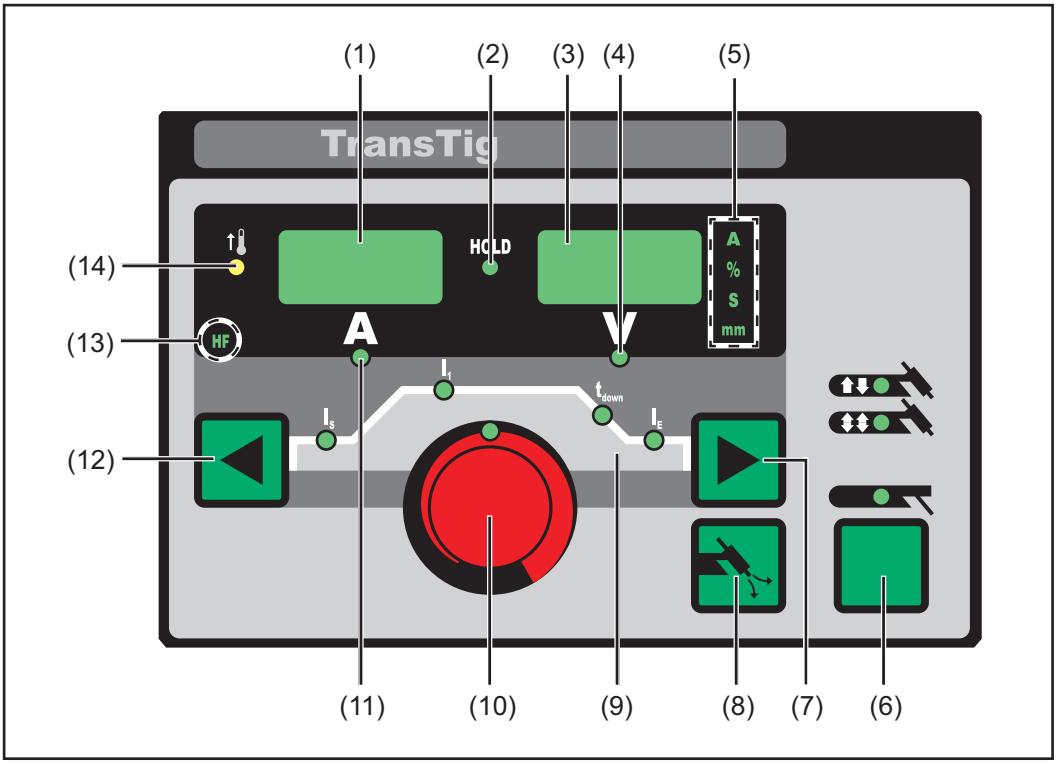
Electrode diameter
Used in TIG welding to enter the diameter of the tungsten electrode.

(11)	**Adjusting dial** for altering welding parameters. If the indicator on the adjusting dial lights up, then the selected welding parameter can be altered.

No.	Function
(12)	**Welding current indicator** for indicating the welding current for the welding parameters - Starting current I_S - Welding current I_1 - Final current I_E Before welding commences, the left-hand digital display shows the set value. For I_S and I_E, the right-hand digital display also shows the respective percentage of the welding current I_1. After welding begins, the welding parameter I_1 is automatically selected. The left-hand digital display shows the actual welding current value. In the welding parameters overview (10), LEDs for the various parameters (I_S, t_1, etc.) light up to show the relevant position in the welding process.
(13)	**Left parameter selection button** for selecting welding parameters within the welding parameters overview (10) When a welding parameter is selected, the LED on the relevant parameter symbol lights up.
(14)	**HF (high frequency) ignition indicator** HF lights up when the HFt set-up parameter has been set to an interval for the high frequency pulses
(15)	**Overtemperature indicator** lights up if the power source overheats (e.g. because the duty cycle has been exceeded). See the "Troubleshooting" section for more information.
(16)	**Keylock switch (option for MW 2500 / 3000 / 4000 / 5000)** When the key is in the horizontal position, all parameters and functions are disabled with the exception of the currently selected parameter or function. (16)  *Keylock switch position* **NOTE** The functions available on the control panel of system components are restricted in the same way as those of the control panel on the power source.

TransTig control panel

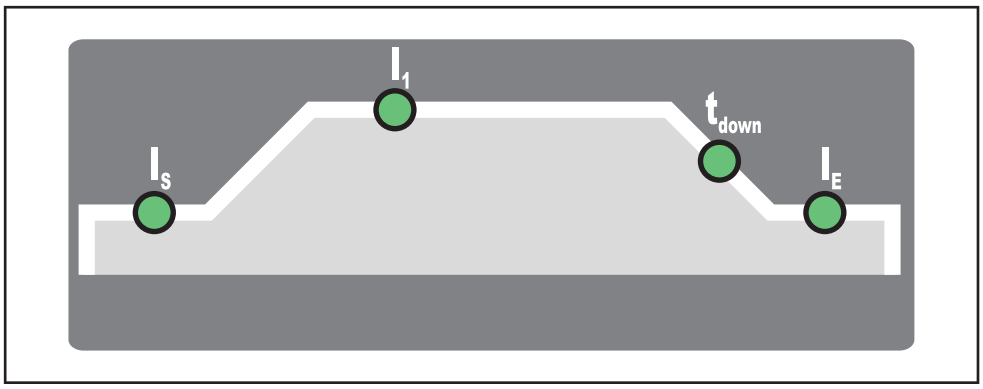
TransTig control panel



No.	Function
(1)	**Left digital display**
(2)	**HOLD indicator** at the end of each welding operation, the actual values for the welding current and voltage are stored and the Hold indicator lights up. The Hold indicator refers to the last value reached by the main current I_1. As soon as any other welding parameter is selected, the Hold indicator goes off. The "Hold" values will continue to be available, however, if welding parameter I_1 is selected again. The Hold indicator is cleared when: - a new welding operation is started - the welding current I_1 is set - the mode is changed - the process is changed **NOTE** Hold values are not output if: - the main current phase is never reached, or - a pedal remote control is used.
(3)	**Right digital display**

No.	Function
(4)	**Welding voltage indicator** lights up when parameter I_1 is selected. During welding the current actual value for the welding voltage is displayed on the right-hand digital display. Before welding, the following appears on the right digital display: - 0.0 if a TIG welding mode is selected - 50 V if a MMA welding mode is selected (after a delay of 3 seconds; 50 V is the average value for the pulsed open circuit voltage)
(5)	**Unit indicators** A **A indicator** % **% indicator** lights up when the I_S, I_2 and I_E welding parameters and the dcY, I-G and HCU set-up parameters have been selected S **s indicator** lights up when the t_{up} and t_{down} welding parameters plus the following set-up parameters have been selected: - GPr - tAC - G-L - Hti - G-H - HFt - UPS mm **mm indicator** lights up when the Fdb set-up parameter has been selected
(6)	**Mode button** for selecting the mode 2-step mode 4-step mode JOB Job mode Manual metal arc welding When a mode is selected, the LED on the relevant symbol lights up.
(7)	**Right parameter selection button** for selecting welding parameters within the welding parameters overview (10) When a welding parameter is selected, the LED on the relevant parameter symbol lights up.
(8)	**Gas test button** for setting the required shielding gas flow rate on the gas pressure regulator After pressing this button, gas flows for 30 seconds. Press the button again to stop the gas flow prematurely.

No.	Function
(9)	**Welding parameter overview** The welding parameters overview contains the most important welding parameters to be used when welding. The sequence of welding parameters follows a clothes-line structure. Use the left and right welding parameter selection buttons to navigate within the welding parameters overview.



Welding parameters overview

The welding parameters overview contains the following welding parameters:

Starting current I_S
for TIG welding

The starting current I_S
is saved separately for the "TIG AC welding" and "TIG DC- welding" modes.

Main current I_1 (welding current)
- for TIG welding
- for MMA welding

Downslope t_{down}
when TIG welding, the period over which the current is decreased from the main current I_1 to the final current I_E

The downslope t_{down} is saved separately for 2-step and 4-step modes.

Final current I_E
for TIG welding

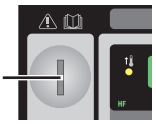
(10) Adjusting dial
for altering welding parameters. If the indicator on the adjusting dial lights up, then the selected welding parameter can be altered.

(11) Welding current indicator
for indicating the welding current for the parameters
- Starting current I_S
- Welding current I_1
- Final current I_E

Before welding commences, the left-hand digital display shows the set value. For I_S and I_E, the right-hand digital display also shows the respective percentage of the welding current I_1.

After welding begins, the welding parameter I_1 is automatically selected. The left-hand digital display shows the actual welding current value.

In the welding parameters overview (9), LEDs for the various parameters (I_S, I_1, etc.) light up to show the relevant position in the welding process.

No.	Function
(12)	**Left parameter selection button** for selecting welding parameters within the welding parameters overview (9) When a welding parameter is selected, the LED on the relevant parameter symbol lights up.
(13)	**HF (high frequency) ignition indicator** HF lights up when the HFt set-up parameter has been set to an interval for the high frequency pulses
(14)	**Overtemperature indicator** lights up if the power source overheats (e.g. because the duty cycle has been exceeded). See the "Troubleshooting" section for more information.
(15)	**Keylock switch (option for TT 2500 / 3000 / 4000 / 5000)** When the key is in the horizontal position, all parameters and functions are disabled with the exception of the currently selected parameter or function. (15)  *Keylock switch position* **NOTE** The functions available on the control panel of system components are restricted in the same way as those of the control panel on the power source.

Key combinations - special functions

General

The following functions can be called up by pressing buttons simultaneously or repeatedly on the MagicWave and TransTig control panels.

Displaying the software version, operating time and coolant flow

To display the software version:
while pressing and holding the Mode button, press the left parameter selection button.
The software version appears on the digital displays.

Display operating time:
press the left parameter selection button again

The operating time records the actual arc burning time since starting for the first time.
For example: "654 | 32.1" = 65,432.1 hours = 65,432 hours | 6 mins

NOTE The operating time display is not suitable as a -basis for calculating hiring fees, guarantee, etc.

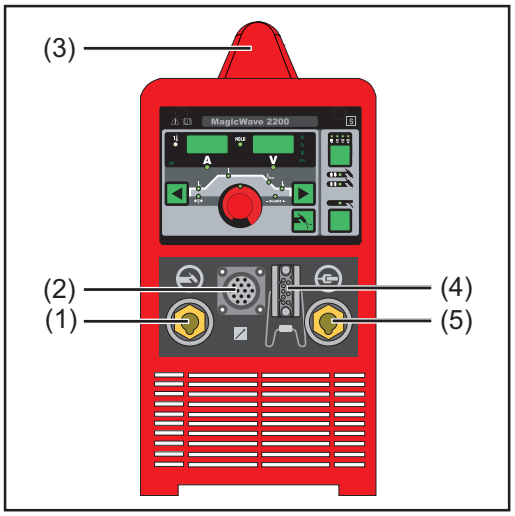
Display coolant flow (only in conjunction with a cooling unit with the flow watchdog option):
press the left parameter selection button again

The current coolant flow of the cooling unit is shown in l/min (CFL = **C**oolant **Fl**ow)
If the coolant flow is less than 0.7 l/min, the power source switches off after the end of the time specified in welding parameter C-t and the error message "no | H2O" is shown.

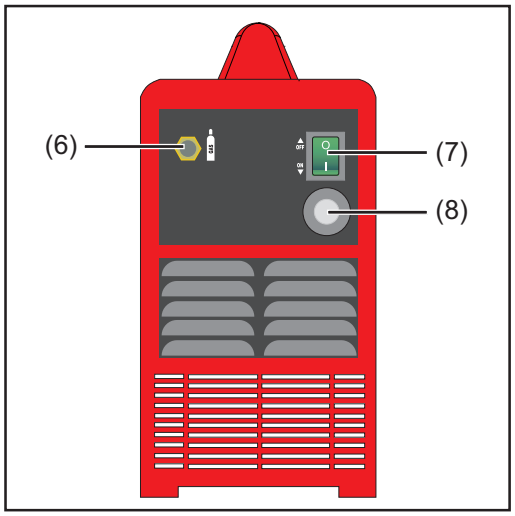
To exit, press the Mode button.

Connections, switches and mechanical components

MagicWave 1700 / 2200



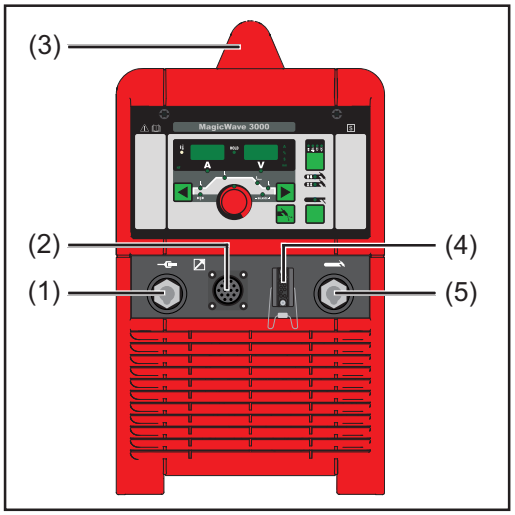
MagicWave 1700 / 2200 - front



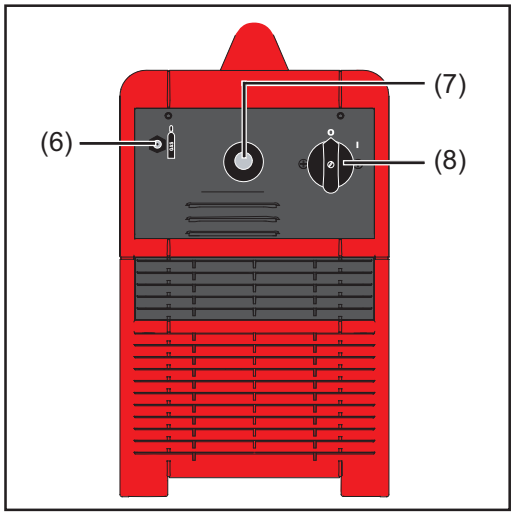
MagicWave 1700 / 2200 - rear

No.	Function
(1)	**Welding torch connection** for connecting: - the TIG welding torch - the electrode cable for manual metal arc welding
(2)	**LocalNet connection** standardised connection socket for system add-ons (e.g. remote control, JobMaster TIG welding torch, etc.)
(3)	**Handle** (only for MagicWave 2200) carrying strap for MagicWave 1700
(4)	**Torch control connection** for connecting the control plug of a conventional welding torch
(5)	**Grounding (earthing) cable connection** for connecting the grounding (earthing) cable
(6)	**Shielding gas connection**
(7)	**Mains switch** for switching the power source on and off
(8)	**Mains cable with strain relief device**

MagicWave 2500 / 3000



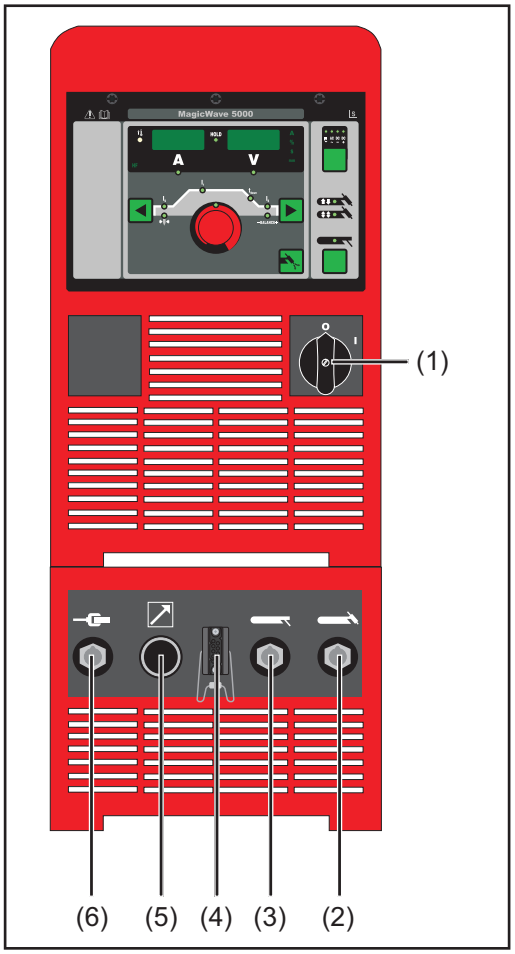
MagicWave 2500 / 3000 - front



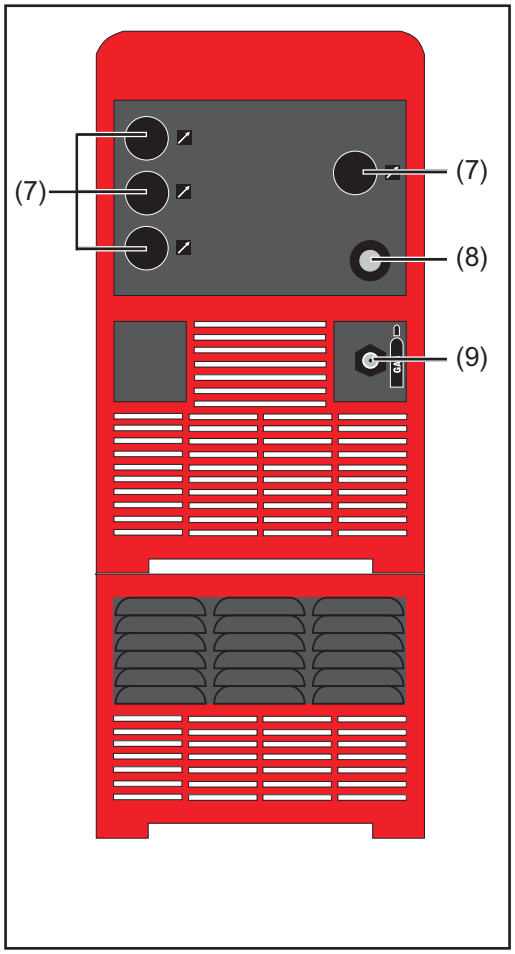
MagicWave 2500 / 3000 - rear

No.	Function
(1)	**Grounding (earthing) cable connection** for connecting the grounding (earthing) cable
(2)	**LocalNet connection** standardised connection socket for system add-ons (e.g. remote control, JobMaster TIG welding torch, etc.)
(3)	**Handle**
(4)	**Torch control connection** for connecting the control plug of a conventional welding torch
(5)	**Welding torch connection** for connecting: - the TIG welding torch - the electrode cable for manual metal arc welding
(6)	**Shielding gas connection**
(7)	**Mains cable with strain relief device**
(8)	**Mains switch** for switching the power source on and off

MagicWave 4000 / 5000



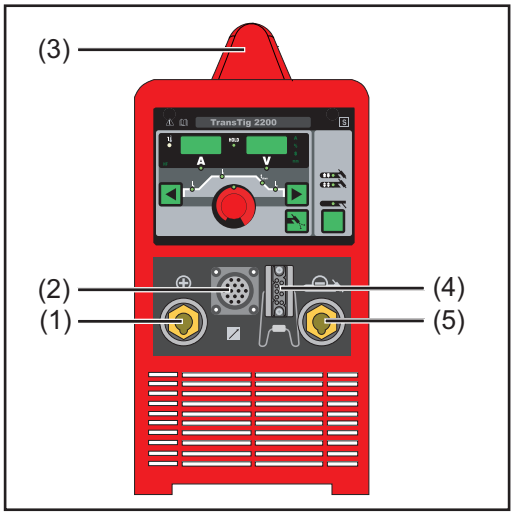
MagicWave 4000 / 5000 - front



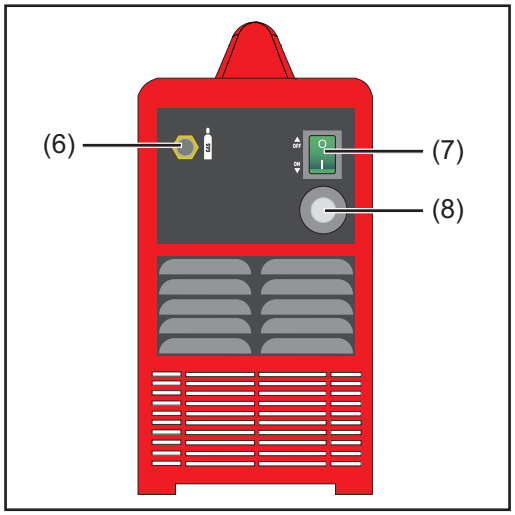
MagicWave 4000 / 5000 - rear

No.	Function
(1)	**Mains switch** for switching the power source on and off
(2)	**Welding torch connection** for connecting the TIG welding torch
(3)	**Electrode holder connection** for connecting the electrode cable for manual metal arc welding
(4)	**Torch control connection** for connecting the control plug of a conventional welding torch
(5)	**LocalNet connection** standardised connection socket for system add-ons (e.g. remote control, JobMaster TIG welding torch, etc.)
(6)	**Grounding (earthing) cable connection** for connecting the grounding (earthing) cable
(7)	**Blanking cover** reserved for LocalNet connection
(8)	**Mains cable with strain relief device**
(9)	**Shielding gas connection**

TransTig 2200



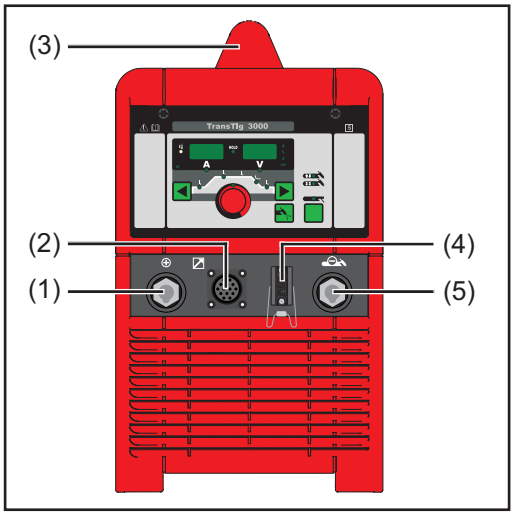
TransTig 800 / 2200 - front



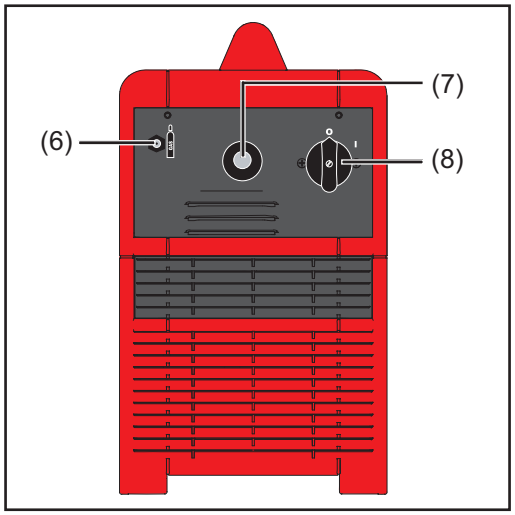
TransTig 800 / 2200 - rear

No.	Function
(1)	**(+) current socket with bayonet latch** for connecting - the grounding (earthing) cable when TIG welding - the electrode cable or grounding (earthing) cable during MMA welding (depending on electrode type)
(2)	**LocalNet connection** standardised connection socket for system add-ons (e.g. remote control, JobMaster TIG welding torch, etc.)
(3)	**Handle**
(4)	**Torch control connection** for connecting the control plug of a conventional welding torch
(5)	**(-) current socket with bayonet latch** for connecting - the TIG welding torch - the electrode cable or grounding (earthing) cable during MMA welding (depending on electrode type)
(6)	**Shielding gas connection**
(7)	**Mains switch** for switching the power source on and off
(8)	**Mains cable with strain relief device**

TransTig 2500 / 3000



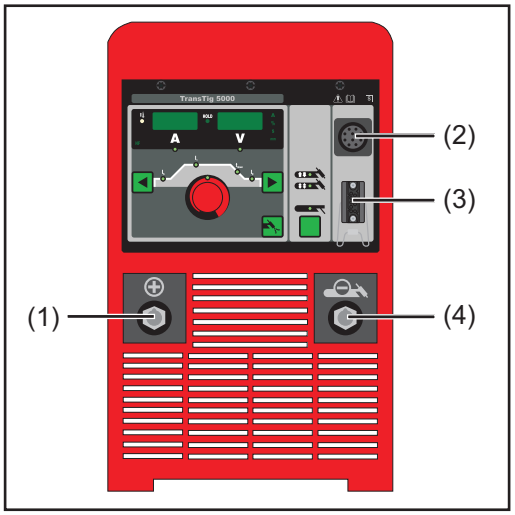
TransTig 2500 / 3000 - front



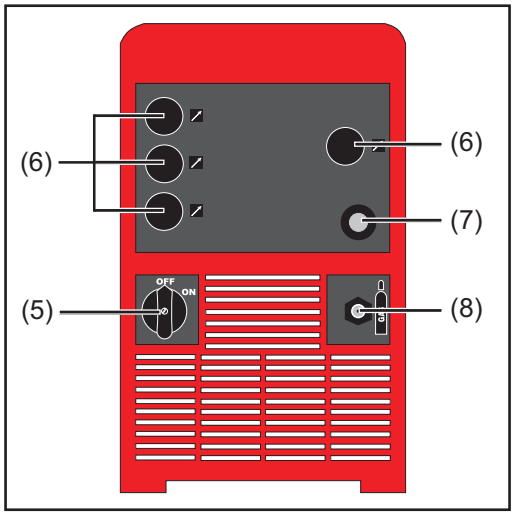
TransTig 2500 / 3000 - rear

No.	Function
(1)	**(+) current socket with bayonet latch** for connecting - the grounding (earthing) cable when TIG welding - the electrode cable or grounding (earthing) cable during MMA welding (depending on the type of electrode)
(2)	**LocalNet connection** standardised connection socket for system add-ons (e.g. remote control, JobMaster TIG welding torch, etc.)
(3)	**Handle**
(4)	**Torch control connection** for connecting the control plug of a conventional welding torch
(5)	**(-) current socket with bayonet latch** for connecting - the TIG welding torch - the electrode cable or grounding (earthing) cable during MMA welding (depending on the type of electrode)
(6)	**Shielding gas connection**
(7)	**Mains cable with strain relief device**
(8)	**Mains switch** for switching the power source on and off

TransTig 4000 / 5000



TransTig 4000 / 5000 - front



TransTig 4000 / 5000 - rear

No.	Function
(1)	**(+) current socket with bayonet latch** for connecting - the grounding (earthing) cable when TIG welding - the electrode cable or grounding (earthing) cable during MMA welding (depending on the type of electrode)
(2)	**LocalNet connection** standardised connection socket for system add-ons (e.g. remote control, JobMaster TIG welding torch, etc.)
(3)	**Torch control connection** for connecting the control plug of a conventional welding torch
(4)	**(-) current socket with bayonet latch** for connecting - the TIG welding torch - the electrode cable or grounding (earthing) cable during MMA welding (depending on the type of electrode)
(5)	**Mains switch** for switching the power source on and off OFF = - O - ON = - I -
(6)	**Blanking cover** reserved for LocalNet connection
(7)	**Mains cable with strain relief device**
(8)	**Shielding gas connection**

Installation and commissioning

Minimum equipment needed for welding task

General

Depending on which welding process you intend to use, a certain minimum equipment level will be needed in order to work with the power source.
The welding processes and the minimum equipment levels required for the welding task are then described.

TIG AC welding

- MagicWave power source
- Grounding (earthing) cable
- TIG welding torch with rocker switch
- Gas connection (shielding gas supply), with pressure regulator
- Filler metals (as required by the application)

TIG DC welding

- Power source
- Grounding (earthing) cable
- TIG welding torch with rocker switch
- Gas connection (shielding gas supply)
- Filler metals (as required by the application)

MMA welding

- Power source
- Grounding (earthing) cable
- Electrode holder
- Rod electrodes (as required by the application)

Before installation and commissioning

Safety

WARNING! Incorrect operation or shoddy workmanship can cause serious injury or damage. All work described in this document must only be carried out by trained and qualified personnel. All functions described in this document must only be used by trained and qualified personnel. Do not carry out any of the work or use any of the functions described until you have fully read and understood the following documents:

- this document
- all the operating instructions for the system components, especially the safety rules

Utilisation for intended purpose

The power source is intended exclusively for TIG and MMA welding.
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.

Proper use also includes:

- following all the information in the operating instructions
- carrying out all the specified inspection and servicing work

Setup regulations

The device is tested to "Degree of protection IP23", meaning:

- protection against penetration by solid foreign bodies with diameters > 12.5 mm (0.49 in.)
- protection against direct sprays of water up to 60° from the vertical

The device can be set up and operated outdoors in accordance with IP23.
Avoid direct wetting (e.g. from rain).

WARNING! If one of these machines topples over or falls it could cause serious or even fatal injury. Place device on a solid, level surface in such a way that it remains stable.

The venting duct is a very important safety feature. When choosing the location for the device, ensure that the cooling air can enter and exit unhindered through the air ducts on the front and back of the device. Electrically conductive dust (e.g. from grinding work) must not be allowed to get sucked into the device.

Mains connection

The devices are designed to run on the mains voltage shown on the respective rating plates. If your version of the device does not come with mains cables and plugs ready-fitted, these must be fitted in accordance with national regulations and standards. For details of fuse protection of the mains lead, please see the Technical Data.

NOTE! Inadequately dimensioned electrical installations can cause serious damage. The incoming mains lead and its fuse must be dimensioned to suit the local power supply. The technical data shown on the rating plate applies.

Generator-powered operation (MW 1700 / 2200, TT 2200)

The MW 1700/2200 and TT 2200 power sources are generator-compatible, provided that the maximum apparent power delivered by the generator is at least 10 kVA.

NOTE The voltage delivered by the generator must never exceed the upper or lower limits of the mains voltage tolerance range. Details of the mains voltage tolerance are given in the "Technical data" section.

Connecting up the mains cable on US power sources

General

The US power sources are supplied without a mains cable. A mains cable appropriate for the connection voltage must be fitted prior to commissioning.
A strain-relief device for a cable cross-section AWG 10 is installed on the power source. Strain-relief devices for larger cable cross-sections must be designed accordingly.

Stipulated mains cables and strain-relief devices

Power source	Mains voltage	Cable cross-section
TT 4000/5000 MV Job, MW 4000/5000 MV Job	3 x 380 - 460 V 3 x 200 - 240 V	AWG 10 AWG 6

AWG ... **A**merican **W**ire **G**auge

Safety

WARNING! Work that is carried out incorrectly can cause serious injury and damage. The following activities must only be carried out by trained and qualified personnel. Pay particular attention to the "Safety rules" sections in the power source and system component operating instructions.

Connecting the mains cable

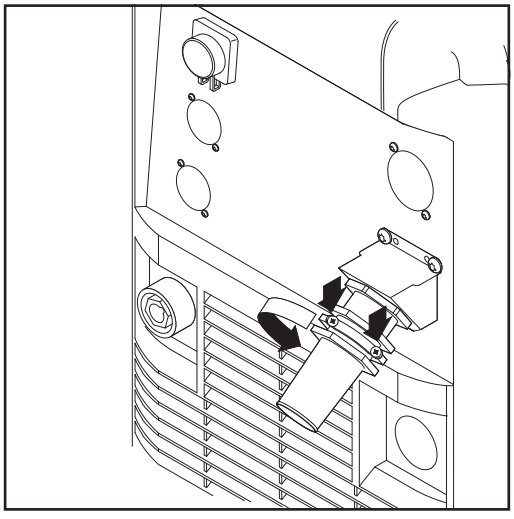
1 Remove the left side panel of the power source

2 Strip about 100 mm (4 in.) of insulation from the end of the mains cable

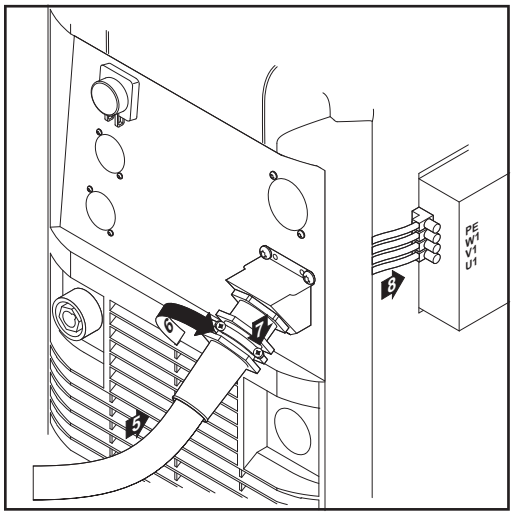
NOTE! The PE conductor (green, or green with yellow stripes) should be approx. 10 - 15 mm (0.4 - 0.6 in.) longer than the phase conductors.

3 Fit ferrules to phase conductors and the PE conductor of the mains cable; crimp ferrules with pliers

NOTE! If ferrules are not used, there is a risk of short circuits between the phase conductors or between phase conductors and the PE conductor. Fit ferrules to all phase conductors and the PE conductor of the stripped mains cable.



4 Undo the screws (2 x) and clamping nut (size 30) on the strain-relief device



5 Insert the mains cable into the strain-relief device

NOTE! Push the mains cable in far enough to make it possible to connect the PE conductor and the phase conductors to the block terminal properly.

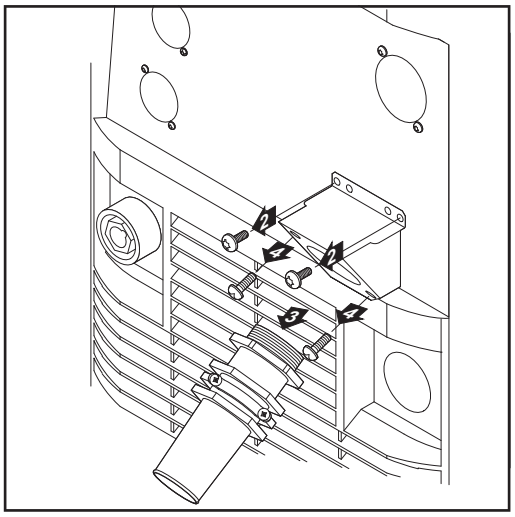
6 Tighten the clamping nut (size 30 mm)

7 Tighten the screws (2 x)

8 Connect the mains cable to the block terminal correctly:
- PE conductor (green, or green with yellow stripes) to the PE connection
- Phase conductors to connections L1 - L3

9 Replace the left side panel of the power source

Replacing the strain-relief device

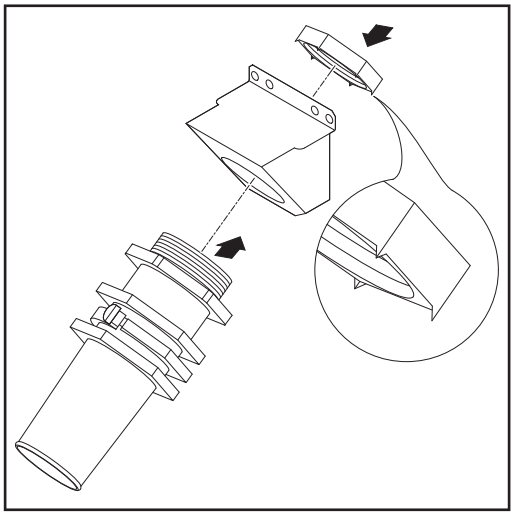


1 Remove the left side panel of the power source

2 Remove the screws (2 x) from the old strain-relief device

3 Pull the old strain-relief device forwards to detach it

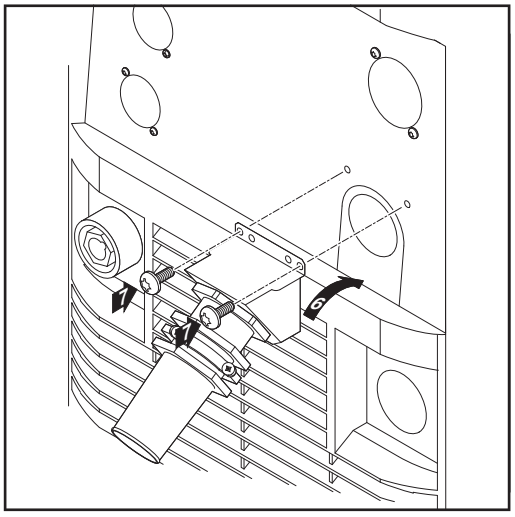
4 Remove the screws for the adapter plate, and remove the adapter plate



5 Insert the hexagon nut (size 50 mm) into the holding plate

NOTE! The points of the hexagon nut must point towards the holding plate for a reliable ground (earth) connection to the power source housing.

6 Screw the front of the large strain-relief device into the hexagon nut (size 50 mm). The hexagon nut (size 50 mm) now bites into the holding plate.



7 Slot the large strain-relief device into the housing and fasten it with 2 screws

8 Connecting the mains cable

9 Replace the left side panel of the power source

Start-up

Safety

WARNING! An electric shock can be fatal. If the machine is plugged into the mains electricity supply during installation, there is a high risk of very serious injury and damage. Do not carry out any work on the device unless
- the mains switch is in the "O" position,
- the device is unplugged from the mains.

Remarks on the cooling unit

We recommend using a cooling unit for the following applications and situations:
- JobMaster TIG welding torch
- Hosepacks over 5 m long
- TIG AC welding
- In general, where welding is performed in higher power ranges

The cooling unit is powered from the power source. The cooling unit is ready for operation when the mains switch of the power source is in the "I" position.
More information on the cooling unit can be found in the operating instructions for the cooling unit.

General

This section describes how to commission the power source:
- for the main TIG welding application
- with reference to a standard configuration for a TIG welding device.

The standard configuration consists of the following system components:
- power source
- cooling unit
- TIG manual welding torch
- pressure regulator
- gas cylinder
- gas cylinder holder
- trolley

The steps set out below provide an overview of how to commission the power source. For detailed information about the individual steps, please refer to the operating instructions for the system components.

Connecting the gas cylinder

WARNING! If gas cylinders topple over, there is a risk of very serious injury and damage.
- Place gas cylinders on a solid, level surface in such a way that they remain stable
- Secure gas cylinders to prevent them from toppling over: fix the safety strap at the same height as the top part of the cylinder
- Never fix the safety strap around the neck of the cylinder

Follow the gas cylinder manufacturer's safety instructions.

1. Secure the gas cylinder
2. Take the protective cap off the gas cylinder
3. Briefly open the gas cylinder valve to remove any dust or dirt
4. Check the seal on the pressure regulator

5 Screw the pressure regulator onto the gas cylinder and tighten it

When using a TIG welding torch with an integral gas connector:

6 Use the gas hose to connect the pressure regulator to the shielding gas connection on the rear of the power source

7 Tighten the union nut on the gas hose

When using a TIG welding torch with no integral gas connector:

6 Connect the TIG welding torch gas hose to the pressure regulator

---

Establishing a ground (earth) connection to the workpiece

1 Move the mains switch to the O position

2 Plug the grounding (earthing) cable in and latch it
- for MagicWave: in the grounding (earthing) cable connection
- for TransTig: in the (+) current socket

3 Use the other end of the grounding (earthing) cable to establish a connection to the workpiece

---

Connecting the welding torch

CAUTION! Risk of damage from high frequencies. Do not use the JobMaster TIG welding torch with a LocalNet distributor.

1 Move the mains switch to the O position

2 Plug in the TIG welding torch cable and latch it by turning it clockwise:
- for MagicWave: in the welding torch connection
- for TransTig: in the (-) current socket

3 Plug the welding torch control plug into the torch control connection and latch it
or
connect the control line of the JobMaster TIG welding torch to the LocalNet connection

NOTE! Do not use pure tungsten electrodes (colour-coded green) on TransTig power sources.

4 Equip the welding torch in accordance with the welding torch operating instructions

5 Only when using a water-cooled torch and cooling unit:
Plug in the welding torch water connections to the water flow (black) and return (red) connections on the cooling unit.

Welding

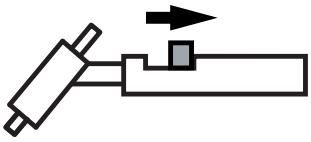
TIG modes

Safety

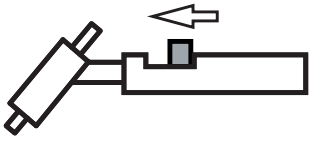
WARNING! Operating the equipment incorrectly can cause serious injury and damage. Do not use the functions described until you have thoroughly read and understood the following documents:
- these operating instructions
- all the operating instructions for the system components, especially the safety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

See the "The Setup menu" section for information on the settings, setting range and units of measurement of the available welding parameters.

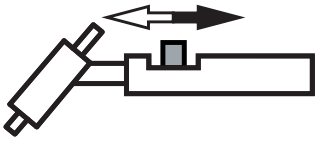
Symbols and their explanations



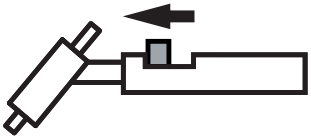
Pull back and hold the torch trigger



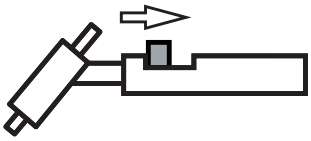
Release the torch trigger



Briefly pull back the torch trigger (< 0.5 s)



Push forward and hold the torch trigger

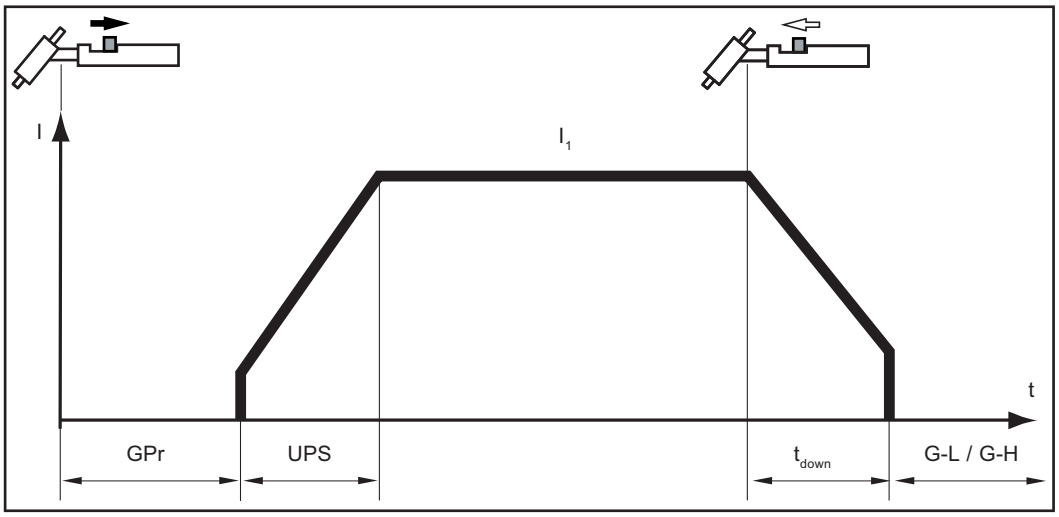


Release the torch trigger

GPr Gas pre-flow time	**SPt** Spot welding time
I_S Starting-current phase: the temperature is raised gently at low welding current, so that the filler metal can be positioned correctly	**I_E** Final current phase: to prevent any local overheating of the base material due to heat build-up towards the end of welding. This eliminates any risk of weld seam drop-through.
t_S Starting current time	**t_E** Final current time
UPS Upslope phase: the starting current is continuously increased until it reaches the main current (welding current) I_1	**t_{down}** Downslope phase: the welding current is continuously lowered until it reaches the end-crater current.
I_1 Main current phase (welding-current phase): uniform thermal input into the base material, whose temperature is raised by the advancing heat	**I-2** Reduced current phase: intermediate lowering of the welding current in order to prevent any local overheating of the base material
G-H Gas post-flow time at maximum welding current	**G-L** Gas post-flow time at minimum welding current

2-step mode

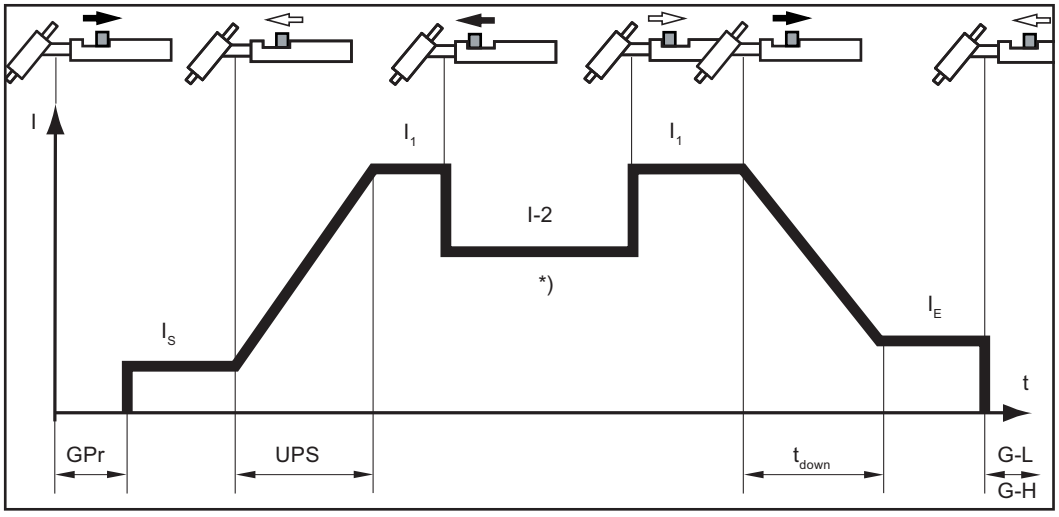
- Welding: Pull back and hold the torch trigger
- End of welding: Release the torch trigger



2-step mode

4-step mode

- Welding start-up with starting current I_S: Pull back and hold the torch trigger
- Welding with main current I_1: Release the torch trigger
- Lowering to final current I_E: Pull back and hold the torch trigger
- End of welding: Release the torch trigger



4-step mode

*) Intermediate lowering

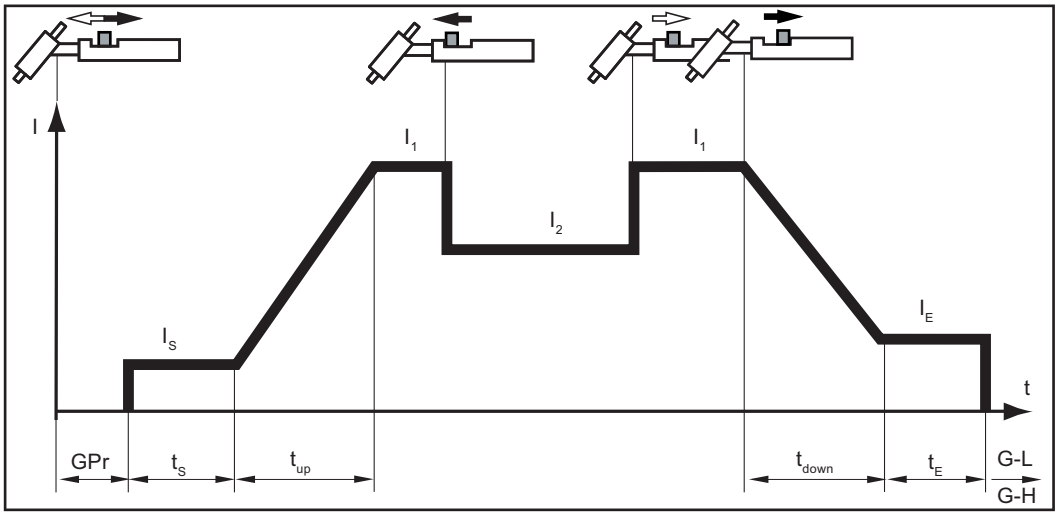
Intermediate lowering during the main current phase reduces the welding current to the specified reduced current I-2 reduced.

- To activate intermediate lowering, push forward and hold the torch trigger
- To revert to the main current, release the torch trigger

Special 4-step mode: variant 4

Variant 4 of the special 4-step mode is activated when the SFS set-up parameter is set to "4".

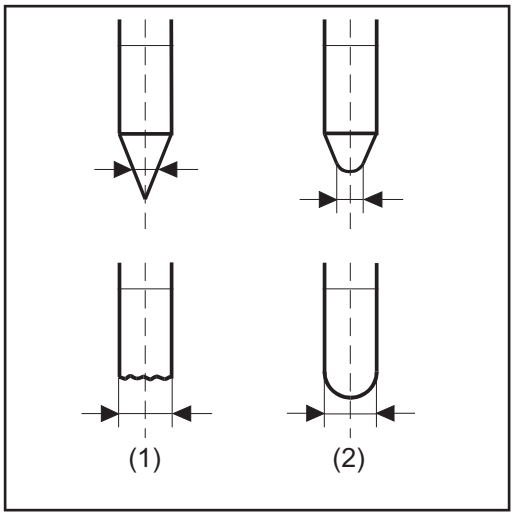
- Welding start-up and welding: briefly pull back and release the torch trigger - the welding current will rise at the specified upslope value from the starting current I_S until it reaches the main current value I_1.
- Push forward and hold the torch trigger for intermediate lowering
- Release the torch trigger to resume the main current I_1
- End of welding: briefly pull back and release the torch trigger



Special 4-step mode: variant 4

Cap shaping and cap overloading

Cap shaping



On MagicWave power sources, an automatic cap-shaping function is available for the TIG AC welding process:

- When the TIG AC welding process is selected, activate automatic cap-shaping
- The ideal cap for the specified diameter of the tungsten electrode is formed during welding start-up.
  A separate cap-shaping operation on a test workpiece is not necessary.
- The automatic cap-shaping function is then reset and deactivated.
  The automatic cap-shaping function has to be activated separately for each tungsten electrode.

(1) Before ignition
(2) After ignition

NOTE! The automatic cap-shaping function is not necessary if a sufficiently large cap has already formed at the tip of the tungsten electrode.

TIG welding

Safety

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

WARNING! An electric shock can be fatal. If the power source is connected to the mains electricity supply during installation, there is a high risk of very serious injury and damage. Before carrying out any work on the device make sure that:
- the power source mains switch is in the "O" position
- the power source is unplugged from the mains

Welding parameters

Starting current I_S

Unit	%
Setting range	0 - 200% of main current I_1
Factory setting	35 AC, 50 DC

The starting current I_S is saved separately for the "TIG AC welding" and "TIG DC welding" modes.

Main current I_1

Unit	A	
Setting range	MW 1700 Job..... 3 - 170	-
	MW 2200 Job..... 3 - 220	TT 2200 Job ... 3 - 220
	MW 2500 Job..... 3 - 250	TT 2500 Job ... 3 - 250
	MW 3000 Job..... 3 - 300	TT 3000 Job ... 3 - 300
	MW 4000 Job..... 3 - 400	TT 4000 Job ... 3 - 400
	MW 5000 Job..... 3 - 500	TT 5000 Job ... 3 - 500
Factory setting	-	

NOTE On welding torches with the Up/Down function, the entire setting range can be selected while the device is idling. During welding, the main current can be corrected in steps of +/-20 A.

Downslope t_{down}

Unit	s
Setting range	0,0 - 9,9
Factory setting	1,0

The downslope t_{down} is saved separately for 2-step and 4-step modes.

Final current I_E

Unit	% (of main current I_1)
Setting range	0 - 100
Factory setting	30

Balance (only on MagicWave for TIG AC welding process)

Unit	1
Setting range	-5 to +5
Factory setting	0

-5: highest fusing power, lowest cleaning action

+5: highest cleaning action, lowest fusing power

Electrode diameter

Unit	mm	in.
Setting range	OFF - max.	OFF - max.
Factory setting	2,4	0.095

Preparation

1 Plug in the mains plug

CAUTION! Risk of injury and damage from electric shock. As soon as the mains switch is in the "I" position, the tungsten electrode of the welding torch is live. Make sure that the tungsten electrode does not touch any persons or electrically conductive or earthed parts (e.g. housing, etc.).

2 Move the mains switch to the I position

All the indicators on the control panel light up briefly.

TIG welding

1 Press the Mode button to select the required TIG mode:

2-step mode

4-step mode

2 Only with MagicWave: Press the Mode button to select the required TIG mode:

AC welding process

AC welding process with automatic cap-shaping function

DC welding process

3 Use the left or right parameter selection button to select the relevant welding parameters in the welding parameters overview

4 Use the adjusting dial to set the selected welding parameter to the required value

All welding parameter set values that have been set using the adjusting dial remain stored until the next time they are changed. This applies even if the power source is switched off and on again in the meantime.

5 Open the gas cylinder valve

6 Set the shielding gas flow rate:

Press the Gas test button
The test gas flow lasts for a maximum of 30 seconds. Press the button again to stop the gas flow prematurely.

- Turn the adjusting screw on the underside of the pressure regulator until the pressure gauge shows the required gas flow rate

7 For long hosepacks and if condensation forms when the device is left unused in a cold environment:
purge protective gas shield and set the GPU set-up parameter to a time value

8 Start welding (ignite the arc)

Igniting the arc

General

To ensure the best ignition sequence in the TIG AC welding process, the MagicWave power sources take account of:

- the diameter of the tungsten electrode
- the current temperature of the tungsten electrode with reference to the preceding welding and weld-off times

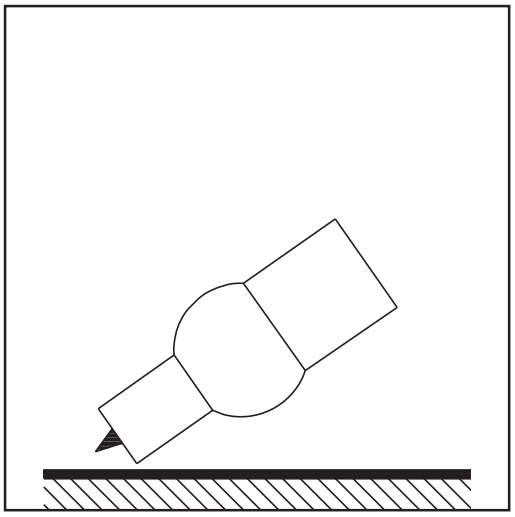
Igniting the arc using high frequency (HF ignition)

HF ignition is activated when a time value has been set for the HFt setup parameter. The HF ignition indicator lights up on the control panel.

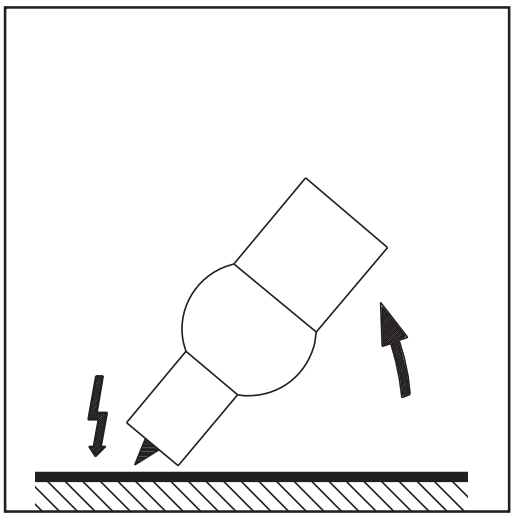
HF

Compared with touchdown ignition, HF ignition eliminates the risk of contamination of the tungsten electrode and the workpiece.

Procedure for HF ignition:

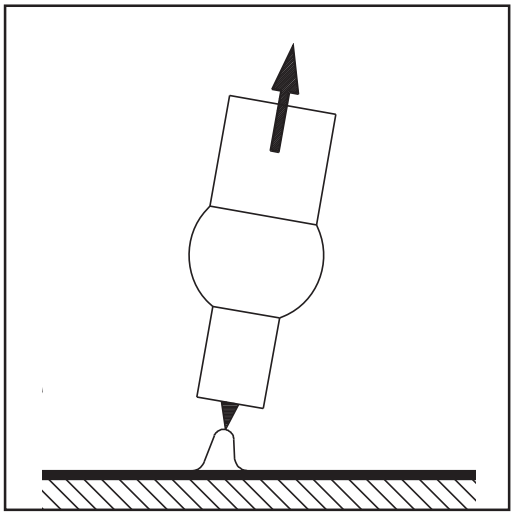


1 Place the gas nozzle down on the ignition location so that there is a gap of approx. 2 to 3 mm (5/64 to 1/8 in.) between the tungsten electrode and the workpiece



2 Increase the tilt angle of the torch and actuate the torch trigger according to the mode you have selected

The arc ignites without the electrode touching down on the workpiece.



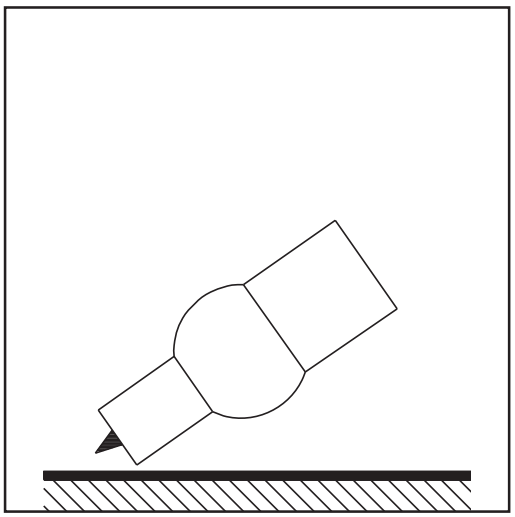
3 Tilt the torch back into the normal position

4 Carry out welding

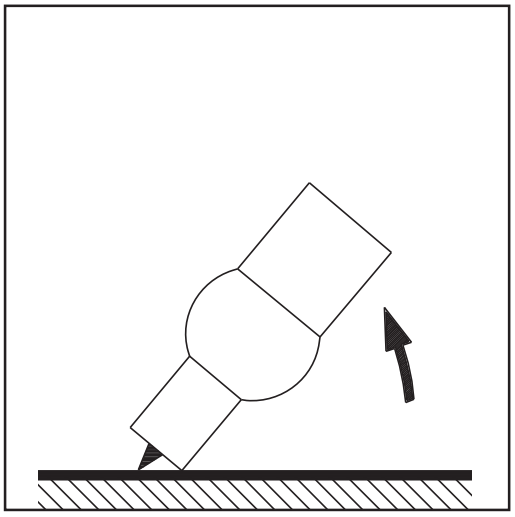
Touchdown ignition

If the HFt setup parameter is set to OFF, HF ignition is deactivated. The welding arc is ignited by touching the workpiece with the tungsten electrode.

Procedure for igniting the arc using touchdown ignition:



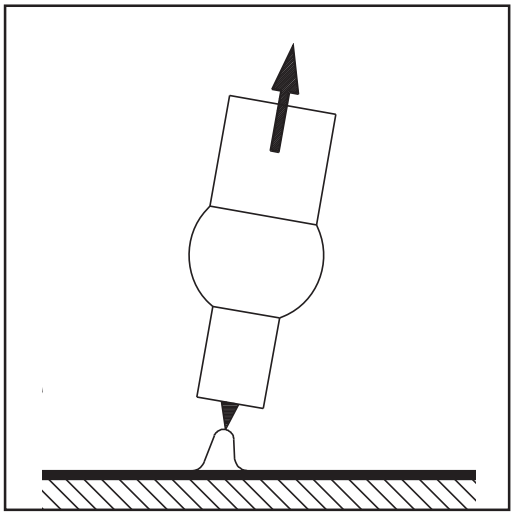
1 Place the gas nozzle down on the ignition location so that there is a gap of approx. 2 to 3 mm (5/64 to 1/8 in.) between the tungsten electrode and the workpiece



2 Actuate the torch trigger

Shielding gas flows.

3 Gradually tilt the welding torch up until the tungsten electrode touches the workpiece



4 Raise the welding torch and move it into its normal position

The arc ignites.

5 Carry out welding

End of welding

1 Depending on the set mode, finish welding by releasing the torch trigger

2 Wait for the set gas post-flow and hold welding torch in position over the end of the weld seam

Special functions and options

Arc break watch-dog function

If the arc breaks and the current does not start to flow again within the time specified in the set-up menu, the power source cuts out automatically. The service code "no | Arc" appears on the control panel.

To start the welding process again, press any key on the control panel or the torch trigger.

Ignition time-out function

The power source has an ignition time-out function.

Once the torch trigger is pressed, gas pre-flow begins immediately. Ignition then begins. If an arc does not appear within the time specified in the set-up menu, the power source cuts out automatically. The service code "no | IGn" appears on the control panel.

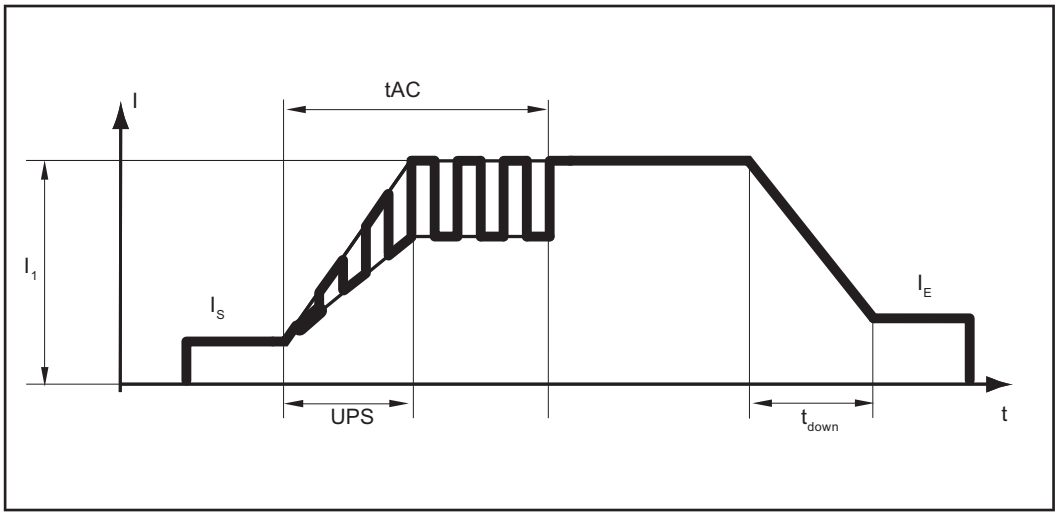
To try again, press any key on the control panel or press the torch trigger.

Tacking function

The tacking function is available for the TIG DC welding process.

When a time period is specified for the tAC (tacking) set-up parameter, the tacking function is assigned to 2-step mode and 4-step mode. The operating sequence of the modes remains unchanged.
During this period, a pulsed welding current is present that makes the weld pool run together better when two parts are being tacked.

Mode of operation of tacking function when the TIG DC welding process is selected:



Tacking function - welding current curve

Legend:

tAC	Duration of pulsed welding current for the tacking process
I_S	Starting current
I_E	Final current
UPS	Upslope
t_{Down}	Downslope
I_1	Main current

IMPORTANT The following points apply to the pulsed welding current:
The power source automatically regulates the pulsing parameters as a function of the pre-set main current I_1.

The pulsed welding current begins:
- after the end of the starting-current phase I_S
- with the upslope phase UPS

Depending on what tAC time has been set, the pulsed welding current may continue up to and including the final current phase I_E (tAC set-up parameter set to "ON").

After the tAC time has elapsed, welding continues at a constant welding current, and any pulsing parameters that may have been set continue to be available.

MMA welding

Safety

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

WARNING! An electric shock can be fatal. If the power source is connected to the mains electricity supply during installation, there is a high risk of very serious injury and damage. Before carrying out any work on the device make sure that:
- the power source mains switch is in the "O" position
- the power source is unplugged from the mains

Preparation

1 Switch off cooling units (set-up parameter C-C to OFF)

2 Move the mains switch to the O position

3 Disconnect the mains plug

4 Disconnect the TIG welding torch

5 Plug the grounding (earthing) cable in and latch it into place:
- for MagicWave: in the grounding (earthing) cable connection
- for TransTig: in the (+) current socket

6 Use the other end of the grounding (earthing) cable to establish a connection to the workpiece

7 Plug in the electrode cable and twist it clockwise to latch it into place:
- for MagicWave: in the welding torch connection
- for TransTig: in the (-) current socket

8 Plug in the mains plug

CAUTION! Risk of injury and damage from electric shock. As soon as the mains switch is in the "I" position, the rod electrode in the electrode holder is live. Make sure that the rod electrode does not touch any persons or electrically conducting or earthed parts (e.g. the housing etc.).

9 Move the mains switch to the I position

All the indicators on the control panel light up briefly.

Manual metal arc welding

1 Press the Mode button to select:

MMA welding mode

NOTE! If the MMA welding mode is selected, the welding voltage will only be available after a 3-second delay.

2 Only for MagicWave: press the process button to select the required welding process:

MMA AC welding process

MMA DC- welding process

MMA DC+ welding process

NOTE! The TransTig power source has no switchover facility between the MMA DC- and MMA DC+ welding processes.

Procedure with TransTig power source for switching from MMA DC- welding to MMA DC+ welding:

a) Move the mains switch to the O position
b) Disconnect the mains plug
c) Reconnect the electrode holder and the earthing (grounding) cable to the opposite current sockets (i.e. swap them over)
d) Plug in the mains plug

CAUTION! Risk of injury and damage from electric shock. As soon as the mains switch is in the "I" position, the rod electrode in the electrode holder is live. Make sure that the rod electrode does not touch any persons or electrically conducting or earthed parts (e.g. the housing etc.).

e) Move the mains switch to the "I" position
all the indicators on the control panel will briefly light up

3 Select the desired welding current with the adjusting dial

The welding current value is displayed in the left-hand digital display.

NOTE! All welding parameter set values that have been set using the adjusting dial remain stored until the next time they are changed. This applies even if the power source is switched off and on again in the meantime.

4 Start welding

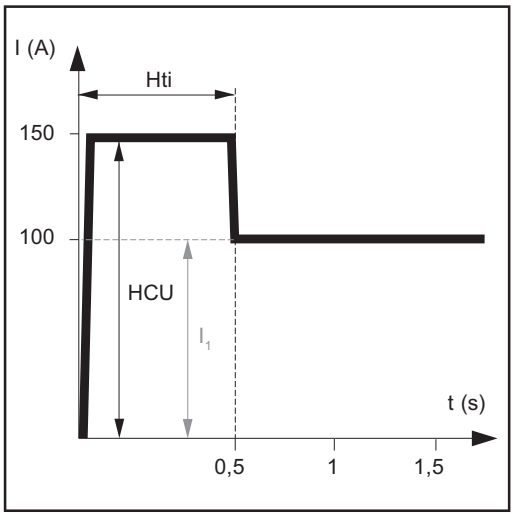
Hotstart function

To obtain optimum welding results, it will sometimes be necessary to adjust the hotstart function.

Benefits

- Improved ignition, even when using electrodes with poor ignition properties
- Better fusion of the base material in the start-up phase, meaning fewer cold-shut defects
- Largely prevents slag inclusions

See the "Set-up menu: level 2" section for details on setting the available welding parameters.



Example of hotstart function

Legend

Hti	Hot-current time, 0-2 s, factory setting: 0.5 s
HCU	HotStart current, 0-200%, factory setting 150%
I_1	Main current = set welding current

Function:
during the specified hot-current time (Hti), the welding current I_1 is increased to the HotStart current HCU.

To activate the hotstart function, the HotStart current HCU must be > 100.

Settings examples:

HCU = 100
The HotStart current corresponds to the set welding current I_1.
The hotstart function is not activated.

HCU = 170
The HotStart current is 70% higher than the set welding current I_1.
The hotstart function is activated.

HCU = 200
The HotStart current is twice the set welding current I_1.
The hotstart function is activated, the HotStart current is at its maximum.
HCU = 2 x I_1

Anti-stick function

As the arc becomes shorter, the welding voltage may drop so far that the rod electrode will tend to stick. This may also cause the rod electrode to burn out.

Electrode burn-out is prevented by activating the anti-stick function. If the rod electrode begins to stick, the power source immediately switches the welding current off. After the rod electrode has been detached from the workpiece, the welding process can be continued without any problems.

The anti-stick function can be activated and deactivated in the "Set-up menu - level 2" section.

Setup settings

The Setup menu

General

The set-up menu provides easy access to the knowledge base in the power source and to additional functions. The set-up menu can be used to make simple adjustments of the welding parameters to suit the various job settings.

The following can be found in the set-up menu:
- Set-up parameters that have an immediate effect on the welding process
- Set-up parameters needed for making the preliminary settings on the welding system

The welding parameters are arranged in logical groups. Each of these groups is called up by pressing a different combination of buttons.

Overview

"The Set-up menu" is composed of the following sections:
- Protective gas shield set-up menu
- TIG set-up menu
- Rod electrode set-up menu
- Rod electrode set-up menu level 2

Shielding gas setup menu

General

The Protective gas shield set-up menu provides easy access to the protective gas shield settings.

Opening the Protective gas shield set-up menu

1 Press and hold the "Mode" button

2 Press the Gas test button

The power source is now in the Protective gas shield set-up menu. The last welding parameter selected is displayed.

Changing welding parameters

1 Use the left or right parameter selection button to select the welding parameter that you want to change

2 Use the adjusting dial to change the welding parameter value

Exiting the set-up menu

1 Press the Mode button

Welding parameters in the Protective gas shield set-up menu

GPr
Gas pre-flow time

Unit	s
Setting range	0,0 - 9,9
Factory setting	0,4

G-L
Gas-Low - gas post-flow time at minimum welding current (minimum gas post-flow time)

Unit	s
Setting range	0,0 - 25,0
Factory setting	5

G-H
Gas-High - Increase in the gas post-flow time at maximum welding current

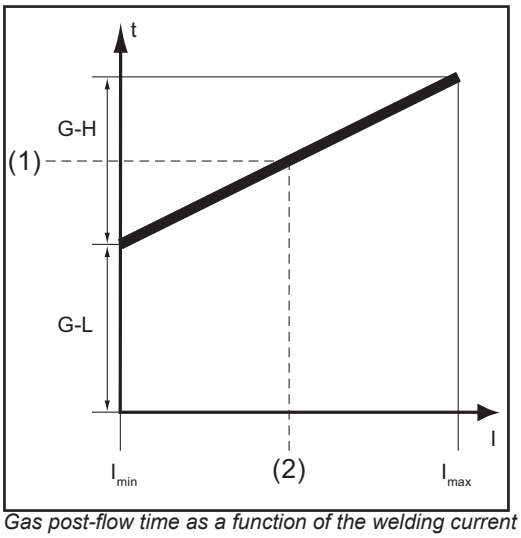
Unit	s
Setting range	0.0 - 40.0/Aut

Factory setting Aut

The value set for G-H only applies if the maximum welding current actually has been set. The actual value is derived from the present welding current. For a medium welding current, for example, the actual value will be half of the value set for G-H.

IMPORTANT! The values set for the G-L and G-H set-up parameters are added together. For example, if both welding parameters are set to the maximum (40 s), the gas post-flow will last:
- 40 s at minimum welding current
- 80 s at maximum welding current
- 60 s if the welding current is exactly half the maximum, etc.

If Aut is set, the gas post-flow time G-H is calculated automatically.



Gas post-flow time as a function of the welding current

Legend:

(1).... Gas post-flow time at any given moment

(2).... Welding current at any given moment

GPU

Gas purger - protective gas shield purging

Unit	min
Setting range	OFF / 0.1 - 10.0
Factory setting	OFF

Purging of the protective gas shield begins as soon as GPU is allocated a value.

For safety reasons, purging of the protective gas shield cannot be restarted until a new GPU value is entered.

IMPORTANT! Purging of the protective gas shield is necessary if condensation forms when the device is left unused in a cold environment for a prolonged period. Long hosepacks are most affected.

TIG setup menu

Opening the TIG set-up menu

1 Press the Mode button to select 2-step mode or 4-step mode

2 Press and hold the "Mode" button

3 Press the right parameter selection button

The power source is now in the TIG set-up menu. The last welding parameter selected is displayed.

Changing welding parameters

1 Use the left or right parameter selection button to select the welding parameter that you want to change

2 Use the adjusting dial to change the welding parameter value

Exiting the set-up menu

1 Press the Mode button

Welding parameters in the TIG set-up menu

"Minimum" and "maximum" are used for setting ranges that differ according to power source, wire-feed unit, welding program, etc.

tAC

Tacking function when TIG DC welding is selected: Duration of the pulsed welding current at the start of tacking

Unit	s
Setting range	OFF / 0.1 - 9.9 / ON
Factory setting	OFF
ON	The pulsed welding current remains in effect until the end of the tacking operation
0.1 - 9.9 s	The set time begins with the upslope phase. After the end of the pre-set time period, welding continues at a constant current; any pulsing parameters that have been set are available.
OFF	The tacking function is deactivated

C-C
Cooling unit control (option)

Unit	-
Setting range	Aut / ON / OFF
Factory setting	Aut
Aut	Cooling unit is switched off 2 minutes after the end of welding
ON	Cooling unit is ON all the time
OFF	Cooling unit is OFF all the time

IMPORTANT! If the coolant unit is provided with the optional "thermostat", the coolant return temperature is checked continuously. If the return temperature is less than 50 °C, the cooling unit is switched off automatically.

UPS
UpSlope - continuous increase of starting current up to welding current I_1

Unit	s
Setting range	0,0 - 9,9
Factory setting	0,1

EId (TransTig only)
Electrode diameter

Unit	mm	in.
Setting range	0 - max.	0 - max.
Factory setting	2,4	0.1

HFt
High frequency time - high frequency ignition: Time interval between the HF pulses

Unit	s
Setting range	0.01 - 0.4 / OFF / EHF (start with external arc starters, e.g. plasma welding)
Factory setting	0,01

NOTE! If there are problems with sensitive equipment in the immediate vicinity, increase the HFt parameter to a maximum of 0.4 s.

HF The special HF ignition indicator remains lit as long as a value has been specified for the HFt parameter.

If the HFt set-up parameter is set to "OFF", no high frequency ignition takes place at the start of welding. In this case, welding starts with touchdown ignition.

Pri
Pre Ignition - delayed ignition with immediate high frequency start

Unit	s
Setting range	OFF / 0.1 - 1
Factory setting	OFF

If a time value is set for the parameter Pri, the welding arc is ignited with a delay corresponding to this value: Press the torch trigger - high frequency is activated for the specified duration - the welding arc is ignited

I-2
Reduced current - Intermediate lowering of the welding current in order to prevent any local overheating of the base material (4-step mode).

Unit	% (of main current I_1)
Setting range	0 - 100
Factory setting	50

ACF
AC frequency

Unit	Hz
Setting range	Syn / 40 - 250
Factory setting	60
Syn	for mains synchronisation of two power sources for simultaneous AC welding.

IMPORTANT! In addition to the "Syn" setting, take account of the "PhA" parameter (phase adjustment in set-up menu - level 2 AC/polarity reversal).

Low frequency	soft, distant arc with shallow heat input
High frequency	focused arc with deep heat input

FAC

Factory - for resetting the welding machine
Press and hold the Store button for 2 s to reset the machine to the factory settings. When the digital display shows "PrG", the welding system has been reset.

IMPORTANT! When the welding system is reset, all the personal settings in the set-up menu are lost. Jobs are not deleted when the welding machine is reset - these are preserved. Welding parameter settings in set-up menu - level 2 are not deleted.

PhA (only with MW / TT 2500 / 3000 / 4000 / 5000)
Phase adjustment of the mains connection of two power sources for simultaneous AC welding.

Unit	-
Setting range	0 - 5
Factory setting	0

IMPORTANT! Before phase adjustment the "ACF" parameter must be set to "Syn" in the AC/polarity reversal set-up menu.

Phase adjustment takes place as follows:
- Prepare a test workpiece for simultaneous AC welding.
- Adjust the PhA value on a power source to between 0 and 5 until the best weld result is achieved.

Rod electrode setup menu

Open the rod electrode set-up menu

1 Press the Mode button to select the MMA welding mode

2 Press and hold the "Mode" button

3 Press the right parameter selection button

The power source is now in the rod electrode set-up menu. The last welding parameter selected is displayed.

Changing welding parameters

1 Use the left or right parameter selection button to select the welding parameter that you want to change

2 Use the adjusting dial to change the welding parameter value

Exiting the set-up menu

1 Press the Mode button

Welding parameters in the rod electrode set-up menu

"Minimum" and "maximum" are used for setting ranges that differ according to power source, wire-feed unit, welding program, etc.

HCU
HotStart current

Unit	% (of main current I_1)
Setting range	0 - 200
Factory setting	150

Hti
Hot-current time

Unit	s
Setting range	0 - 2,0
Factory setting	0,5

To obtain optimum welding results, it will sometimes be necessary to adjust the hotstart function.

Benefits:
- Improved ignition, even when using electrodes with poor ignition properties
- Better fusion of the base material in the start-up phase, meaning fewer cold-shut defects
- Largely prevents slag inclusions

dYn
dYn - arc force dynamic correction

Unit	-
Setting range	0 - 100
Factory setting	20
0	soft, low-spatter arc
100	harder, more stable arc

To obtain optimum welding results, it will sometimes be necessary to adjust the arc-force dynamic.

Functional principle:
at the instant of droplet transfer or when a short circuit occurs, there is a momentary rise in amperage. In order to obtain a stable arc, the welding current is temporarily increased. If the rod electrode threatens to sink into the weld pool, this measure prevents the weld pool solidifying, as well as preventing more prolonged short circuiting of the arc. This largely prevents the rod electrode from sticking.

FAC
Factory - Reset welding machine
- Press and hold the Store button for 2 s to reset the machine to the factory settings.
- When the digital display reads "PrG", the welding machine has been reset.

IMPORTANT! When the welding system is reset, all the personal settings in the set-up menu are lost. Jobs are not deleted when the welding machine is reset - these are preserved. Parameter settings in set-up menu - level 2 are not deleted.

2nd
set-up menu - level 2: second level of the set-up menu

Rod electrode setup menu: level 2

Opening the rod electrode set-up menu level 2

1. Open the rod electrode set-up menu
2. Select "2nd" welding parameter

2. Press and hold the "Mode" button

3. Press the right parameter selection button

   The power source is now in the rod electrode set-up menu - level 2. The last welding parameter selected is displayed.

Changing welding parameters

1. Use the left or right parameter selection button to select the welding parameter that you want to change

2. Use the adjusting dial to change the welding parameter value

Exiting the rod electrode set-up menu - level 2

1. Press the Mode button

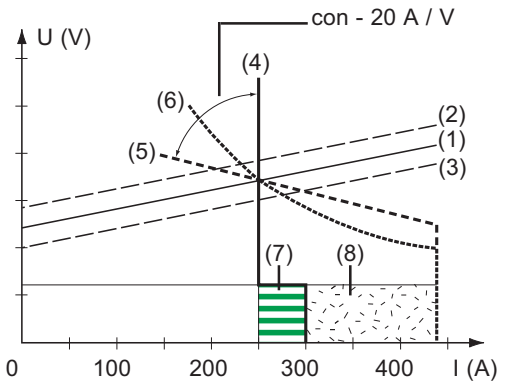
   The power source is now in the rod electrode set-up menu

2. To exit from the Rod electrode set-up menu, press the Mode button again

Welding parameters in the rod electrode set-up menu level 2

ELn
Electrode line - characteristic selection

Unit	1
Setting range	con or 0.1 - 20 or P
Factory setting	con



(1) Load line for rod electrode

(2) Load line for rod electrode where arc length is increased

(3) Load line for rod electrode where arc length is reduced

(4) Characteristic where "CON" parameter is selected (constant welding current)

(5) Characteristic where "0.1 - 20" parameter is selected (drooping characteristic with adjustable slope)

(6) Characteristic where "P" parameter is selected (constant welding power)

(7) Example of pre-set arc-force dynamic where characteristic (4) is selected

(8) Example of pre-set arc-force dynamic where characteristic (5) or (6) is selected

Characteristics that can be selected using the ELn function

“con” parameter (constant welding current)

- If the “con” parameter is set, the welding current will be kept constant, irrespective of the welding voltage. This results in a vertical characteristic (4).
- The “con” parameter is especially suitable for rutile electrodes and basic electrodes, as well as for arc air gouging.
- For arc air gouging, set the arc-force dynamic to "100".

Parameter "0.1 - 20" (drooping characteristic with adjustable slope)

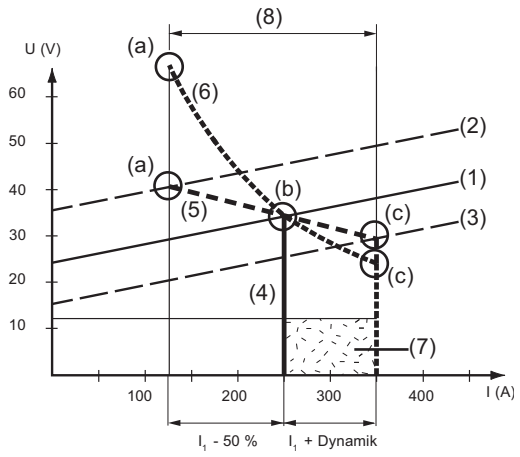
- Parameter “0.1 - 20” is used to set a drooping characteristic (5). The setting range extends from 0.1 A / V (very steep) to 20 A / V (very flat).
- Setting a flat characteristic (5) is only advisable for cellulose electrodes.

NOTE! When setting a flat characteristic (5), set the arc-force dynamic to a higher value.

"P" parameter (constant welding power)

- If the “P” parameter is set, the welding power is kept constant, irrespective of the welding voltage and welding current. This results in a hyperbolic characteristic (6).
- The “P” parameter is particularly suitable for cellulose electrodes.

NOTE! If there are problems with a rod electrode tending to "stick", set the arc-force dynamic to a higher value.



(1) Load line for rod electrode

(2) Load line for rod electrode where arc length is increased

(3) Load line for rod electrode where arc length is reduced

(4) Characteristic where "CON" parameter is selected (constant welding current)

(5) Characteristic where "0.1 - 20" parameter is selected (drooping characteristic with adjustable slope)

(6) Characteristic where "P" parameter is selected (constant welding power)

(7) Example of pre-set arc-force dynamic where characteristic (5) or (6) is selected

(8) Possible change in the current where characteristic (5) or (6) is selected, as a function of the welding voltage (arc length)

(a) Operating point where arc length is long

(b) Operating point when welding current IH is set

(c) Operating point where arc length is short

Setting example: I1 = 250 A, arc-force dynamic = 50

The characteristics (4), (5) and (6) shown here apply when using a rod electrode whose characteristic corresponds - at a given arc length - to the load line (1).

Depending on what welding current (I) has been set, the point of intersection (operating point) of characteristics (4), (5) and (6) will be displaced along the load line (1). The operating point provides information on the actual welding voltage and the actual welding current.

Where the welding current (I_1) is permanently set, the operating point may migrate along the characteristics (4), (5) and (6) depending on the welding voltage at that moment in time. The welding voltage U is dependent upon the length of the arc.

If the arc length changes (e.g. in accordance with the load line (2)) the resulting operating point will be the point where the corresponding characteristic (4), (5) or (6) intersects with the load line (2).

Applies to characteristics (5) and (6): Depending upon the welding voltage (arc length), the welding current (I) will also become either smaller or larger, even though the value set for I_1 remains the same.

Troubleshooting and maintenance

Troubleshooting

General

The digital power sources are equipped with an intelligent safety system. This means that apart from the fuse for the coolant pump, it has been possible to dispense with fuses entirely. After a possible malfunction or error has been remedied, the power source can be put back into normal operation again without any fuses having to be replaced.

Safety

WARNING! Work that is carried out incorrectly can cause serious injury or damage. All the work described below must only be carried out by trained and qualified personnel. Do not carry out any of the work described below until you have fully read and understood the following documents:
- this document
- all documents relating to the system components, especially the safety rules

WARNING! An electric shock can be fatal. Before starting the work described below:
- turn the power source mains switch to the "O" position
- disconnect the power source from the mains
- ensure that the power source remains disconnected from the mains until all work has been completed

After opening the device, use a suitable measuring instrument to check that electrically charged components (e.g. capacitors) have been discharged.

WARNING! An inadequate ground conductor connection can cause serious injury or damage. The housing screws provide a suitable ground conductor connection for earthing the housing and must NOT be replaced by any other screws that do not provide a reliable ground conductor connection.

Displayed service codes

If any error message that is not described here appears on the displays, then the fault can only be fixed by After-Sales Service. Make a note of the error message shown in the display and of the serial number and configuration of the power source, and contact our After-Sales Service team with a detailed description of the error.

tP1 | xxx

Note: xxx stands for a temperature value

Cause: Overtemperature in the primary circuit of the power source

Remedy: Allow power source to cool down

tP2 | xxx

Note: xxx stands for a temperature value

Cause: Overtemperature in the primary circuit of the power source

Remedy: Allow power source to cool down

tP3 | xxx

Note: xxx stands for a temperature value

Cause: Overtemperature in the primary circuit of the power source

Remedy: Allow power source to cool down

---

tP4 | xxx

Note: xxx stands for a temperature value

Cause: Overtemperature in the primary circuit of the power source

Remedy: Allow power source to cool down

---

tP5 | xxx

Note: xxx stands for a temperature value

Cause: Overtemperature in the primary circuit of the power source

Remedy: Allow power source to cool down

---

tP6 | xxx

Note: xxx stands for a temperature value

Cause: Overtemperature in the primary circuit of the power source

Remedy: Allow power source to cool down

---

tS1 | xxx

Note: xxx stands for a temperature value

Cause: Overtemperature in the secondary circuit of the power source

Remedy: Allow power source to cool down

---

tS2 | xxx

Note: xxx stands for a temperature value

Cause: Overtemperature in the secondary circuit of the power source

Remedy: Allow power source to cool down

---

tS3 | xxx

Note: xxx stands for a temperature value

Cause: Overtemperature in the secondary circuit of the power source

Remedy: Allow power source to cool down

---

tSt | xxx

Note: xxx stands for a temperature value

Cause: Overtemperature in the power source control circuit

Remedy: Allow power source to cool down

Err | 051

Cause: Mains undervoltage: The mains voltage has dropped below the lower limit of the tolerance range (see section "Technical data")

Remedy: Check the mains voltage

Err | 052

Cause: Mains overvoltage: The mains voltage has exceeded the upper limit of the tolerance range (see section "Technical data")

Remedy: Check the mains voltage

---

no | IGn

Cause: "Ignition time-out" function is active; current did not start flowing before the length of wire specified in the set-up menu had been fed. The power source safety cut-out has tripped.

Remedy: Press the torch trigger repeatedly; clean the workpiece surface; if necessary, increase the time until the safety cut-out is triggered in the set-up menu: level 2

Err | PE

Cause: The earth current watchdog has triggered the safety cut-out of the power source.

Remedy: Switch off the power source, wait for 10 seconds and then switch it on again. If you have tried this several times and the error keeps recurring, contact After-Sales Service.

Err | IP

Cause: Primary overcurrent

Remedy: Contact After-Sales Service

Err | bPS

Cause: Fault in power module

Remedy: Contact After-Sales Service

---

dSP | Axx

Cause: Fault in the central control and regulation unit

Remedy: Contact After-Sales Service

---

dSP | Cxx

Cause: Fault in the central control and regulation unit

Remedy: Contact After-Sales Service

---

dSP | Exx

Cause: Fault in the central control and regulation unit

Remedy: Contact After-Sales Service

---

dSP | Sy

Cause: Fault in the central control and regulation unit

Remedy: Contact After-Sales Service

---

dSP | nSy

Cause: Fault in the central control and regulation unit

Remedy: Contact After-Sales Service

---

no | Arc

Cause: Arc break

Remedy: Press the torch trigger repeatedly; clean the surface of the workpiece

---

no | H2O

Cause: Cooling unit flow watchdog has been triggered

Remedy: Check the cooling unit; if necessary, top up the coolant or bleed the system as described in "Putting the cooling unit into service"

---

hot | H2O

Cause: Thermostat on cooling unit has tripped

Remedy: Wait until the end of the cooling phase, i.e. until "Hot | H2O" is no longer displayed.
ROB 5000 or field bus coupler for robot control: Before resuming welding, initialise the "Source error reset" signal.

Power source - troubleshooting

Power source does not function

Mains switch is on, but indicators are not lit up

Cause: There is a break in the mains lead; the mains plug is not plugged in

Remedy: Check the mains lead, ensure that the mains plug is plugged in

Cause: Mains socket or mains plug faulty

Remedy: Replace faulty parts

Cause: Mains fuse protection

Remedy: Change the mains fuse protection

No welding current

Mains switch is ON, overtemperature indicator is lit up

Cause: Overload

Remedy: Check duty cycle

Cause: Thermostatic safety cut-out has tripped

Remedy: Wait until the power source automatically comes back on after the end of the cooling phase

Cause: The fan in the power source is faulty

Remedy: Contact After-Sales Service

No welding current

Mains switch is on, indicators are lit up

Cause: Grounding (earthing) connection is incorrect

Remedy: Check the grounding (earthing) connection and terminal for correct polarity

Cause: There is a break in the current cable in the welding torch

Remedy: Replace welding torch

Nothing happens when the torch trigger is pressed

Mains switch is on, indicators are lit up

Cause: The control plug is not plugged in

Remedy: Plug in the control plug

Cause: Welding torch or welding torch control line is faulty

Remedy: Replace welding torch

No protective gas shield

All other functions are OK

Cause: Gas cylinder is empty

Remedy: Change the gas cylinder

Cause: Gas pressure regulator is faulty

Remedy: Change the gas pressure regulator

Cause: Gas hose is not fitted or is damaged

Remedy: Fit or change the gas hose

Cause: Welding torch is faulty

Remedy: Change the welding torch

Cause: Gas solenoid valve is faulty

Remedy: Contact After-Sales Service

Poor weld properties

Cause: Incorrect welding parameters

Remedy: Check the settings

Cause: Grounding (earthing) connection is incorrect

Remedy: Check the grounding (earthing) connection and terminal for correct polarity

---

The welding torch becomes very hot

Cause: The dimensions of the welding torch are inadequate

Remedy: Observe the duty cycle and loading limits

Cause: Only on water-cooled machines: water flow is insufficient

Remedy: Check the water level, water flow rate, cleanliness, etc. If the coolant pump is blocked: use a screwdriver - placed on the bushing - to turn the coolant pump shaft

Cause: Only on water-cooled machines: C-C parameter is set to "OFF".

Remedy: In the set-up menu, set the C-C parameter to "Aut" or "ON".

Care, maintenance and disposal

General

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 it remains in a usable condition for many years.

Safety

WARNING! Work that is carried out incorrectly can cause serious injury or damage. All the work described below must only be carried out by trained and qualified personnel. Do not carry out any of the work described below until you have fully read and understood the following documents:
- this document
- all documents relating to the system components, especially the safety rules

WARNING! An electric shock can be fatal. Before starting the work described below:
- turn the power source mains switch to the "O" position
- disconnect the power source from the mains
- ensure that the power source remains disconnected from the mains until all work has been completed

After opening the device, use a suitable measuring instrument to check that electrically charged components (e.g. capacitors) have been discharged.

WARNING! An inadequate ground conductor connection can cause serious injury or damage. The housing screws provide a suitable ground conductor connection for earthing the housing and must NOT be replaced by any other screws that do not provide a reliable ground conductor connection.

At every start-up

- Check mains plug, mains cable, welding torch, interconnecting hosepack and grounding (earthing) connection for damage
- Check that there is a gap of 0.5 m (1 ft. 8 in.) all around the device to ensure that cooling air can flow and escape unhindered

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

Every 2 months

- If present: clean air filter

Every 6 months

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

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

Appendix

Technical data

Special voltages

NOTE! An inadequately dimensioned electrical installation can cause serious damage. The mains cable and its fuse must be dimensioned accordingly. The technical data shown on the rating plate applies.

MagicWave 1700 / 2200

	MW 1700	MW 2200
Mains voltage	230 V	230 V
Mains voltage tolerance	-20 % / +15 %	-20 % / +15 %
Mains frequency	50/60 Hz	50/60 Hz
Mains fuse protection (slow-blow)	16 A	16 A
Mains connection [1)]	Restrictions possible	No restrictions
Primary continuous power (100% d.c. [2)])	3.3 kVA	3.7 kVA
Cos phi	0,99	0,99
Welding current range		
TIG	3 - 170 A	3 - 220 A
Electrode	10 - 140 A	10 - 180 A
Welding current at		
10 min/25 °C (77 °F) 40% d.c.[2)]	170 A	220 A
10 min/25 °C (77 °F) 60% d.c.[2)]	140 A	180 A
10 min/25 °C (77 °F) 100% d.c.[2)]	110 A	150 A
10 min/40 °C (104 °F) 35% d.c.[2)]	170 A	220 A
10 min/40 °C (104 °F) 60% d.c.[2)]	130 A	170 A
10 min/40 °C (104 °F) 100% d.c.[2)]	100 A	150 A
Open circuit voltage	88 V	88 V
Working voltage		
TIG	10.1 - 16.8 V	10.1 - 18.8 V
Electrode	20.4 - 25.6 V	20.4 - 27.2 V
Striking voltage (U_p)	9.5 kV	9.5 kV
The arc striking voltage is suitable for manual operation.		
Degree of protection	IP 23	IP 23
Type of cooling	AF	AF
Insulation class	B	B
EMC emission class (in accordance with EN/IEC 60974-10)	A	A
Dimensions L x W x H (with handle)	485 / 180 / 344 mm 19.1 / 7.1 / 13.6 in.	485 / 180 / 390 mm 19.1 / 7.1 / 15.4 in.
Weight (without handle)	14.6 kg 30.8 lb.	17.4 kg 38.3 lb.
Weight (with handle)	15 kg 33 lb.	17.8 kg 39.2 lb.
Mark of conformity	S, CE	S, CE

MagicWave 2500 / 3000

	MW 2500	MW 3000
Mains voltage	3 x 400 V	3 x 400 V
Mains voltage tolerance	± 15 %	± 15 %
Mains frequency	50/60 Hz	50/60 Hz
Mains fuse protection (slow-blow)	16 A	16 A
Mains connection [1]	Z_{max} at PCC [3] = 122 mOhm	Z_{max} at PCC [3] = 87 mOhm
Primary continuous power (100% d.c. [2])	4.7 kVA	5.5 kVA
Cos phi	0,99	0,99
Welding current range		
TIG	3 - 250 A	3 - 300 A
Electrode	10 - 250 A	10 - 300 A
Welding current at		
10 min/40 °C (104 °F) 35% d.c.[2]	-	300 A
10 min/40 °C (104 °F) 40% d.c.[2]	250 A	-
10 min/40 °C (104 °F) 100% d.c.[2]	180 A	200 A
Open circuit voltage	89 V	89 V
Working voltage		
TIG	10.1 - 20.0 V	10.1 - 22.0 V
Electrode	20.4 - 30.0 V	20.4 - 32.0 V
Striking voltage (U_p)	10 kV	10 kV
The arc striking voltage is suitable for manual operation.		
Degree of protection	IP 23	IP 23
Type of cooling	AF	AF
Insulation class	B	B
EMC emission class (in accordance with EN/IEC 60974-10)	A	A
Dimensions L x W x H (with handle)	560 / 250 / 435 mm 22.0 / 9.8 / 17.1 in.	560 / 250 / 435 mm 22.0 / 9.8 / 17.1 in.
Weight	26.6 kg 58.64 lb.	28.1 kg 61.95 lb.
Mark of conformity	S, CE	S, CE

MagicWave 2500 / 3000 MV

	MW 2500 MV	MW 3000 MV
Mains voltage	3 x 200 - 240 V 3 x 400 - 460 V 1 x 200 - 240 V	3 x 200 - 240 V 3 x 400 - 460 V 1 x 200 - 240 V
Mains voltage tolerance	± 10 %	± 10 %
Mains frequency	50/60 Hz	50/60 Hz
Mains fuse protection (slow-blow)		
3 x 400 - 460 V 3 x 200 - 240 V 1 x 200 - 240 V	16 A 32 A 32 A	16 A 32 A 32 A
Mains connection [1]	Z_{max} at PCC [3] = 122 mOhm	Z_{max} at PCC [3] = 87 mOhm

	MW 2500 MV	MW 3000 MV
Primary continuous power (100% d.c. [2)])		
3 x 400 - 460 V	4.8 kVA	5.1 kVA
3 x 200 - 240 V	4.4 kVA	4.9 kVA
1 x 200 - 240 V	3.9 kVA	4.3 kVA
Cos phi	0,99	0,99
Welding current range (3-phase)		
TIG	3 - 250 A	3 - 300 A
Electrode	10 - 250 A	10 - 300 A
Welding current range (single phase)		
TIG	3 - 220 A	3 - 220 A
Electrode	10 - 180 A	10 - 180 A
Welding current at 3 x 400 - 460 V		
10 min/40 °C (104 °F) 35% d.c.[2)]	-	300 A
10 min/40 °C (104 °F) 40% d.c.[2)]	250 A	-
10 min/40 °C (104 °F) 100% d.c.[2)]	180 A	190 A
Welding current at 3 x 200 - 240 V		
10 min/40 °C (104 °F) 30% d.c.[2)]	-	300 A
10 min/40 °C (104 °F) 35% d.c.[2)]	250 A	-
10 min/40 °C (104 °F) 100% d.c.[2)]	170 A	180 A
Welding current at 1 x 200 - 240 V		
10 min/40 °C (104 °F) 40% d.c.[2)]	220 A	-
10 min/40 °C (104 °F) 50% d.c.[2)]	-	220 A
10 min/40 °C (104 °F) 100% d.c.[2)]	150 A	160 A
Open circuit voltage	89 V	89 V
Working voltage		
TIG	10.1 - 20.0 V	10.1 - 22.0 V
Electrode	20.4 - 30.0 V	20.4 - 32.0 V
Striking voltage (U_p)	10 kV	10 kV
The arc striking voltage is suitable for manual operation.		
Degree of protection	IP 23	IP 23
Type of cooling	AF	AF
Insulation class	B	B
EMC emission class (in accordance with EN/IEC 60974-10)	A	A
Dimensions L x W x H (with handle)	560 / 250 / 435 mm 22.0 / 9.8 / 17.1 in.	560 / 250 / 435 mm 22.0 / 9.8 / 17.1 in.
Weight	28.2 kg 62.17 lb.	30 kg 66.14 lb
Mark of conformity	S, CE	S, CE

MagicWave 4000 / 5000

	MW 4000	MW 5000
Mains voltage	3 x 400 V	3 x 400 V
Mains voltage tolerance	± 15 %	± 15 %
Mains frequency	50/60 Hz	50/60 Hz

	MW 4000	MW 5000
Mains fuse protection (slow-blow)	35 A	35 A
Mains connection [1)]	Restrictions possible	Restrictions possible
Primary continuous power (100% d.c. [2)])	15.5 kVA	17.9 kVA
Cos phi	0,99	0,99
Welding current range		
TIG	3 - 400 A	3 - 500 A
Electrode	10 - 400 A	10 - 440 A
Welding current at		
10 min/40 °C (104 °F) 40% d.c.[2)]	-	500 A
10 min/40 °C (104 °F) 45% d.c.[2)]	400 A	-
10 min/40 °C (104 °F) 60% d.c.[2)]	365 A	440 A
10 min/40 °C (104 °F) 100% d.c.[2)]	310 A	350 A
Open circuit voltage	90 V	90 V
Working voltage		
TIG	10.1 - 26.0 V	10.1 - 30.0 V
Electrode	20.4 - 36.0 V	20.4 - 37.6 V
Striking voltage (U_p)	9.5 kV	9.5 kV
The arc striking voltage is suitable for manual operation.		
Degree of protection	IP 23	IP 23
Type of cooling	AF	AF
Insulation class	F	F
EMC emission class (in accordance with EN/IEC 60974-10)	A	A
Dimensions L x W x H (with handle)	625 / 290 / 705 mm 24.6 / 11.4 / 27.8 in.	625 / 290 / 705 mm 24.6 / 11.4 / 27.8 in.
Weight	58.2 kg 128 lb.	58.2 kg 128 lb.
Mark of conformity	S, CE	S, CE

MagicWave 4000 / 5000 MV

	MW 4000 MV	MW 5000 MV
Mains voltage	3 x 200 - 240 V 3 x 380 - 460 V	3 x 200 - 240 V 3 x 380 - 460 V
Mains voltage tolerance	± 10 %	± 10 %
Mains frequency	50/60 Hz	50/60 Hz
Mains fuse protection (slow-blow)	63/35 A	63/35 A
Mains connection [1)]	Restrictions possible	Restrictions possible
Primary continuous power (100% d.c. [2)])	13.9 kVA	16.5 kVA
Cos phi	0,99	0,99
Welding current range		
TIG	3 - 400 A	3 - 500 A
Electrode	10 - 400 A	10 - 440 A

	MW 4000 MV	MW 5000 MV
Welding current at		
10 min/40 °C (104 °F) 40% d.c.[2)]	-	500 A
10 min/40 °C (104 °F) 45% d.c.[2)]	400 A	-
10 min/40 °C (104 °F) 60% d.c.[2)]	360 A	440 A
10 min/40 °C (104 °F) 100% d.c.[2)]	300 A	350 A
Open circuit voltage	90 V	90 V
Working voltage		
TIG	10.1 - 26.0 V	10.1 - 30.0 V
Electrode	20.4 - 36.0 V	20.4 - 37.6 V
Striking voltage (U_p)	9.5 kV	9.5 kV
The arc striking voltage is suitable for manual operation.		
Degree of protection	IP 23	IP 23
Type of cooling	AF	AF
Insulation class	F	F
EMC emission class (in accordance with EN/IEC 60974-10)	A	A
Dimensions L x W x H (with handle)	625 / 290 / 705 mm 24.6 / 11.4 / 27.8 in.	625 / 290 / 705 mm 24.6 / 11.4 / 27.8 in.
Weight	60 kg 132.30 lb.	60 kg 132.30 lb.
Mark of conformity	S, CE, CSA	S, CE, CSA

TransTig 2200

Mains voltage	230 V
Mains voltage tolerance	-20 % / +15 %
Mains frequency	50/60 Hz
Mains fuse protection (slow-blow)	16 A
Mains connection [1)]	No restrictions
Primary continuous power (100% d.c. [2)])	3.0 kVA
Cos phi	0,99
Welding current range	
TIG	3 - 220 A
Electrode	10 - 180 A
Welding current at	
10 min/25 °C (77 °F) 50% d.c.[2)]	220 A
10 min/25 °C (77 °F) 60% d.c.[2)]	200 A
10 min/25 °C (77 °F) 100% d.c.[2)]	170 A
10 min/40 °C (104 °F) 40% d.c.[2)]	220 A
10 min/40 °C (104 °F) 60% d.c.[2)]	180 A
10 min/40 °C (104 °F) 100% d.c.[2)]	150 A
Open circuit voltage	84 V
Working voltage	
TIG	10.1 - 18.8 V
Electrode	20.4 - 27.2 V
Striking voltage (U_p)	9.5 kV

The arc striking voltage is suitable for manual operation.	
Degree of protection	IP 23
Type of cooling	AF
Insulation class	B
EMC emission class (in accordance with EN/IEC 60974-10)	A
Dimensions L x W x H (with handle)	485 / 180 / 390 mm 19.1 / 7.1 / 15.4 in.
Weight (without handle)	16.4 kg 37 lb.
Weight (with handle)	16.8 kg 37 lb.
Mark of conformity	S, CE

TransTig 2500 / 3000

	TT 2500	**TT 3000**
Mains voltage	3 x 400 V	3 x 400 V
Mains voltage tolerance	± 15 %	± 15 %
Mains frequency	50/60 Hz	50/60 Hz
Mains fuse protection (slow-blow)	16 A	16 A
Mains connection [1]	Z_{max} at PCC [3] = 172 mOhm	Z_{max} at PCC [3] = 97 mOhm
Primary continuous power (100% d.c. [2])	5.1 kVA	5.7 kVA
Cos phi	0,99	0,99
Welding current range		
TIG	3 - 250 A	3 - 300 A
Electrode	10 - 250 A	10 - 300 A
Welding current at		
10 min/40 °C (104 °F) 45% d.c.[2]	-	300 A
10 min/40 °C (104 °F) 50% d.c.[2]	250 A	-
10 min/40 °C (104 °F) 60% d.c.[2]	240 A	270 A
10 min/40 °C (104 °F) 100% d.c.[2]	210 A	230 A
Open circuit voltage	85 V	85 V
Working voltage		
TIG	10.1 - 20.0 V	10.1 - 22.0 V
Electrode	20.4 - 30.0 V	20.1 - 32.0 V
Striking voltage (U_p)	10 kV	10 kV
The arc striking voltage is suitable for manual operation.		
Degree of protection	IP 23	IP 23
Type of cooling	AF	AF
Insulation class	B	B
EMC emission class (in accordance with EN/IEC 60974-10)	A	A
Dimensions L x W x H (with handle)	560 / 250 / 435 mm 22.0 / 9.8 / 17.1 in.	560 / 250 / 435 mm 22.0 / 9.8 / 17.1 in.

	TT 2500	TT 3000
Weight	24.2 kg 53.35 lb.	24.2 kg 53.35 lb.
Mark of conformity	S, CE	S, CE

TransTig 2500 / 3000 MV

	TT 2500 MV	TT 3000 MV
Mains voltage	3 x 200 - 240 V 3 x 400 - 460 V 1 x 200 - 240 V	3 x 200 - 240 V 3 x 400 - 460 V 1 x 200 - 240 V
Mains voltage tolerance	± 10 %	± 10 %
Mains frequency	50/60 Hz	50/60 Hz
Mains fuse protection (slow-blow)		
3 x 400 - 460 V 3 x 200 - 240 V 1 x 200 - 240 V	16 A 32 A 32 A	16 A 32 A 32 A
Mains connection [1]	Z_{max} at PCC [3] = 172 mOhm	Z_{max} at PCC [3] = 97 mOhm
Primary continuous power (100% d.c. [2])		
3 x 400 - 460 V 3 x 200 - 240 V 1 x 200 - 240 V	4.7 kVA 4.1 kVA 4.3 kVA	5.9 kVA 5.0 kVA 4.3 kVA
Cos phi	0,99	0,99
Welding current range (3-phase)		
TIG	3 - 250 A	3 - 300 A
Electrode	10 - 250 A	10 - 300 A
Welding current range (single phase)		
TIG	3 - 220 A	3 - 220 A
Electrode	10 - 180 A	10 - 180 A
Welding current at 3 x 400 - 460 V		
10 min/40 °C (104 °F) 45% d.c.[2]	-	300 A
10 min/40 °C (104 °F) 50% d.c.[2]	250 A	-
10 min/40 °C (104 °F) 100% d.c.[2]	200 A	240 A
Welding current at 3 x 200 - 240 V		
10 min/40 °C (104 °F) 35% d.c.[2]	-	-
10 min/40 °C (104 °F) 40% d.c.[2]	250 A	300 A
10 min/40 °C (104 °F) 100% d.c.[2]	180 A	210 A
Welding current at 1 x 200 - 240 V		
10 min/40 °C (104 °F) 50% d.c.[2]	220 A	-
10 min/40 °C (104 °F) 55% d.c.[2]	-	220 A
10 min/40 °C (104 °F) 100% d.c.[2]	190 A	190 A
Open circuit voltage	85 V	85 V
Working voltage		
TIG	10.1 - 20.0 V	10.1 - 22.0 V
Electrode	20.4 - 30.0 V	20.4 - 32.0 V
Striking voltage (U_p)	10 kV	10 kV
The arc striking voltage is suitable for manual operation.		

	TT 2500 MV	TT 3000 MV
Degree of protection	IP 23	IP 23
Type of cooling	AF	AF
Insulation class	B	B
EMC emission class (in accordance with EN/IEC 60974-10)	A	A
Dimensions L x W x H (with handle)	560 / 250 / 435 mm 22.0 / 9.8 / 17.1 in.	560 / 250 / 435 mm 22.0 / 9.8 / 17.1 in.
Weight	25.9 kg 57.10 lb.	25.9 kg 57.10 lb.
Mark of conformity	S, CE	S, CE

TransTig 4000 / 5000

	TT 4000	TT 5000
Mains voltage	3 x 400 V	3 x 400 V
Mains voltage tolerance	± 15 %	± 15 %
Mains frequency	50/60 Hz	50/60 Hz
Mains fuse protection (slow-blow)	35 A	35 A
Mains connection [1)]	Restrictions possible	Restrictions possible
Primary continuous power (100% d.c. [2)])	11.8 kVA	15.1 kVA
Cos phi	0,99	0,99
Welding current range		
TIG	3 - 400 A	3 - 500 A
Electrode	10 - 400 A	10 - 500 A
Welding current at		
10 min/40 °C (104 °F) 40% d.c.[2)]	-	500 A
10 min/40 °C (104 °F) 45% d.c.[2)]	400 A	-
10 min/40 °C (104 °F) 60% d.c.[2)]	365 A	450 A
10 min/40 °C (104 °F) 100% d.c.[2)]	310 A	350 A
Open circuit voltage	86 V	86 V
Working voltage		
TIG	10.1 - 26.0 V	10.1 - 30.0 V
Electrode	20.4 - 36.0 V	20.4 - 40.0 V
Striking voltage (U_p)	9.5 kV	9.5 kV
The arc striking voltage is suitable for manual operation.		
Degree of protection	IP 23	IP 23
Type of cooling	AF	AF
Insulation class	F	F
EMC emission class (in accordance with EN/IEC 60974-10)	A	A
Dimensions L x W x H (with handle)	625 / 290 / 475 mm 24.6 / 11.4 / 18.7 in.	625 / 290 / 475 mm 24.6 / 11.4 / 18.7 in.
Weight	39.8 kg 87.7 lb.	39.8 kg 87.7 lb.
Mark of conformity	S, CE	S, CE

TransTig 4000 / 5000 MV

	TT 4000 MV	TT 5000 MV
Mains voltage	3 x 200 - 240 V 3 x 380 - 460 V	3 x 200 - 240 V 3 x 380 - 460 V
Mains voltage tolerance	± 10 %	± 10 %
Mains frequency	50/60 Hz	50/60 Hz
Mains fuse protection (slow-blow)	63/35 A	63/35 A
Mains connection [1)]	Restrictions possible	Restrictions possible
Primary continuous power (100% d.c. [2)])	11.5 kVA	14.2 kVA
Cos phi	0,99	0,99
Welding current range		
TIG	3 - 400 A	3 - 500 A
Electrode	10 - 400 A	10 - 500 A
Welding current at		
10 min/40 °C (104 °F) 40% d.c.[2)]	-	500 A
10 min/40 °C (104 °F) 45% d.c.[2)]	400 A	-
10 min/40 °C (104 °F) 60% d.c.[2)]	360 A	440 A
10 min/40 °C (104 °F) 100% d.c.[2)]	300 A	350 A
Open circuit voltage	86 V	86 V
Working voltage		
TIG	10.1 - 26.0 V	10.1 - 30.0 V
Electrode	20.4 - 36.0 V	20.4 - 40.0 V
Striking voltage (U_p)	9.5 kV	9.5 kV
The arc striking voltage is suitable for manual operation.		
Degree of protection	IP 23	IP 23
Type of cooling	AF	AF
Insulation class	F	F
EMC emission class (in accordance with EN/IEC 60974-10)	A	A
Dimensions L x W x H (with handle)	625 / 290 / 475 mm 24.6 / 11.4 / 18.7 in.	625 / 290 / 475 mm 24.6 / 11.4 / 18.7 in.
Weight	42.0 kg 92.6 lb.	42.0 kg 92.6 lb.
Mark of conformity	S, CE, CSA	S, CE, CSA

Explanation of footnotes

1) connected to public mains supply with 230 / 400 V and 50 Hz
2) d.c. = duty cycle
3) PCC = interface to the public grid

Terms and abbreviations used

General

The terms and abbreviations listed here are used in connection with functions that are either included in the standard scope of supply or that are available as optional extras.

Terms and abbreviations A - F

ACF
AC frequency

C-C
Cooling unit control

dYn
dynamic
Arc force dynamic correction for standard arcs, pulse correction for pulsed arcs or correction of various welding parameters in CMT (job correction or arc force dynamic and pulse correction settings in the set-up menu for the Standard control panel)

Eld
Electrode diameter
When "Eld" is selected for the external parameter "E-P", the electrode diameter on the JobMaster TIG welding torch can be adjusted.

FAC
Factory
Reset welding machine

Terms and abbreviations G - H

G-H
Gas post-flow time high
Gas post-flow time at maximum welding current

G-L
Gas post-flow time low
Gas post-flow time at minimum welding current

GPR
Gas pre-flow time

GPU
Gas purger

HCU
Hot-start current

HFt
High frequency time
High frequency ignition

Hti
Hot-current time
(MMA welding)

Terms and abbreviations I - U

I-2
Reduced current (4-step mode with intermediate lowering)

PhA
Phase Adjustment
Phase adjustment of the mains connection of two power sources for simultaneous AC welding

Pri
Pre Ignition - delayed high frequency ignition

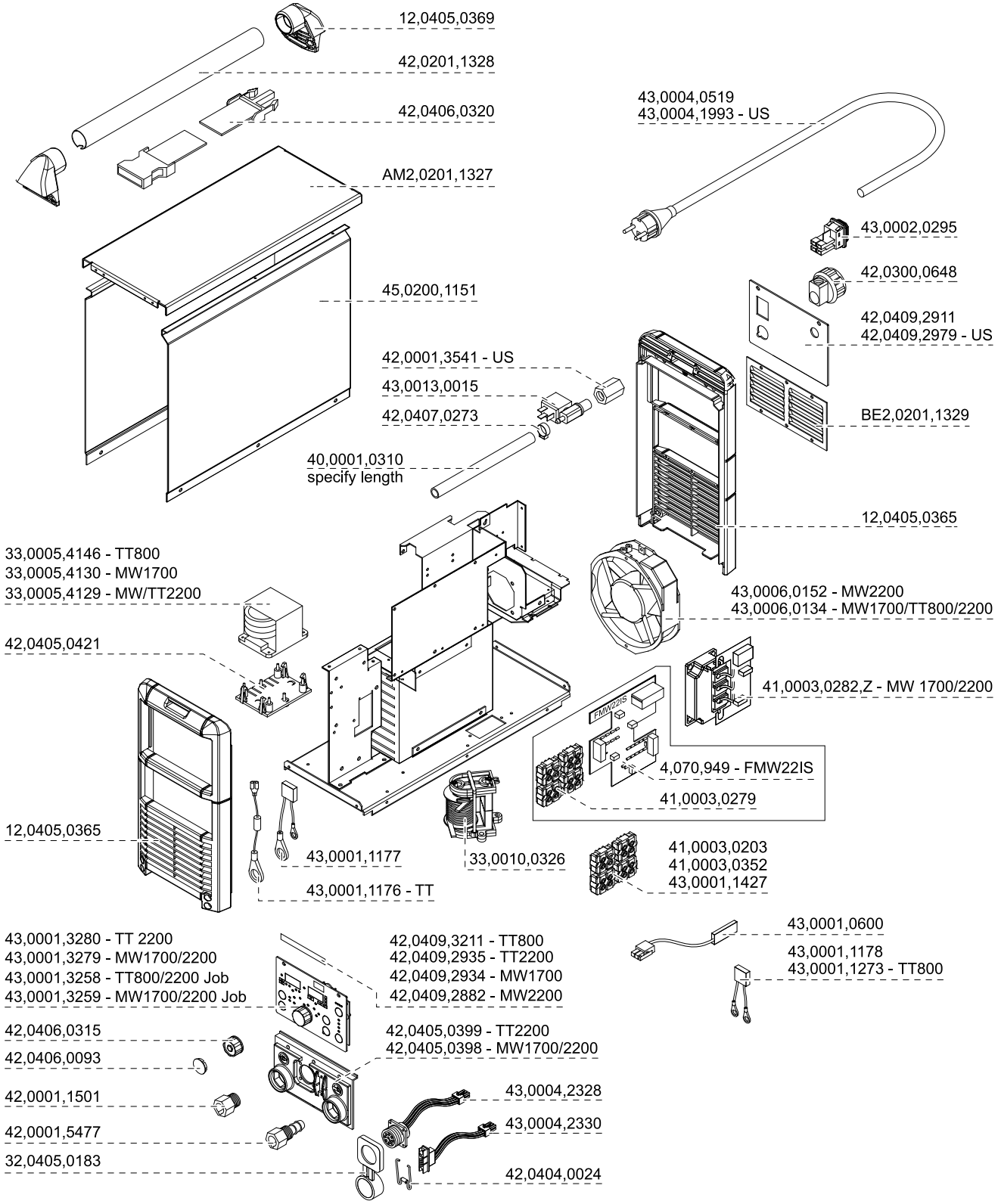
tAC
Tacking function

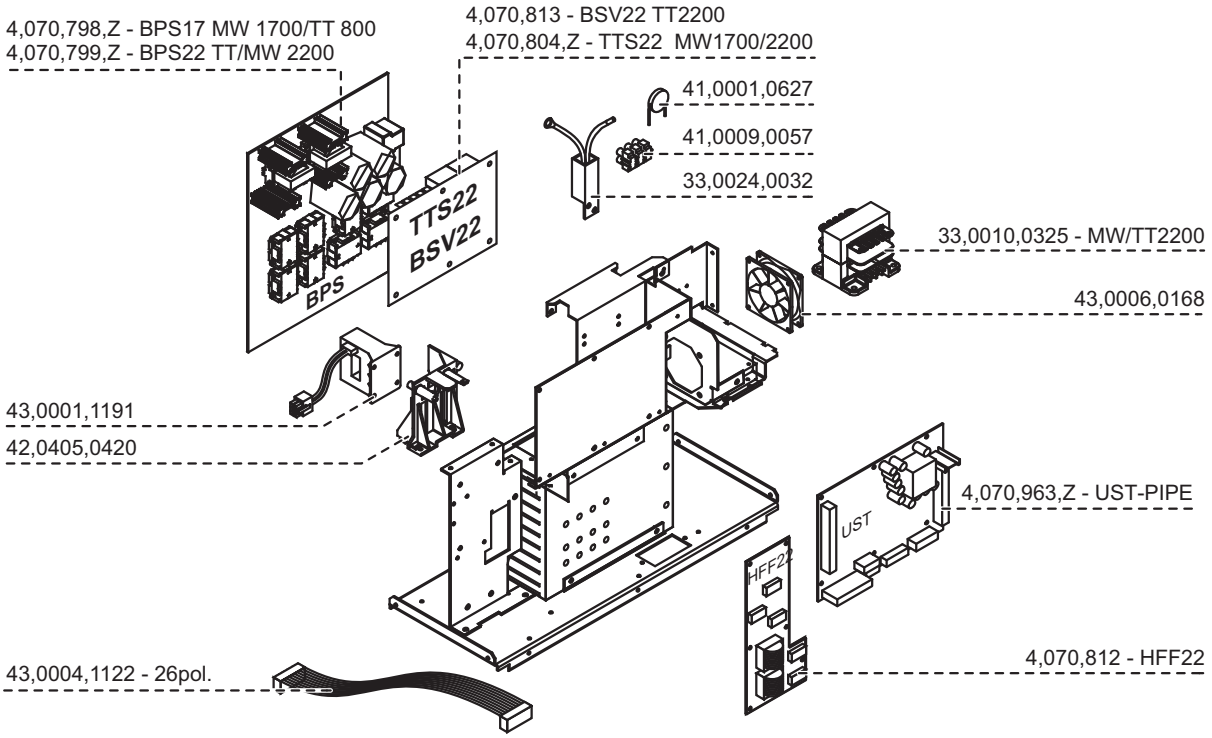
UPS
UpSlope
The starting current is continuously increased until it reaches the welding current

Spare parts and circuit diagrams

Spare parts list: TT 800 / 2200 Job, MW 1700 / 2200 Job, TT 2200, MW 1700 / 2200

MagicWave 2200 Job G/F	**4,075,119**	**MagicWave 2200 G/F**	**4,075,125**
MagicWave 2200 Job G/F/US	**4,075,119,800**	**MagicWave 2200 G/F/US**	**4,075,125,800**
TransTig 800 Job G/F	**4,075,159**	**TransTig 2200 G/F**	**4,075,126**
TransTig 2200 Job G/F	**4,075,120**	**TransTig 2200 G/F/US**	**4,075,126,800**
TransTig 2200 Job G/F/US	**4,075,120,800**	**MagicWave 1700 G/F**	**4,075,127**
MagicWave 1700 Job G/F	**4,075,121**	**MagicWave 1700 G/F/US**	**4,075,127,800**
MagicWave 1700 Job G/F/US	**4,075,121,800**		

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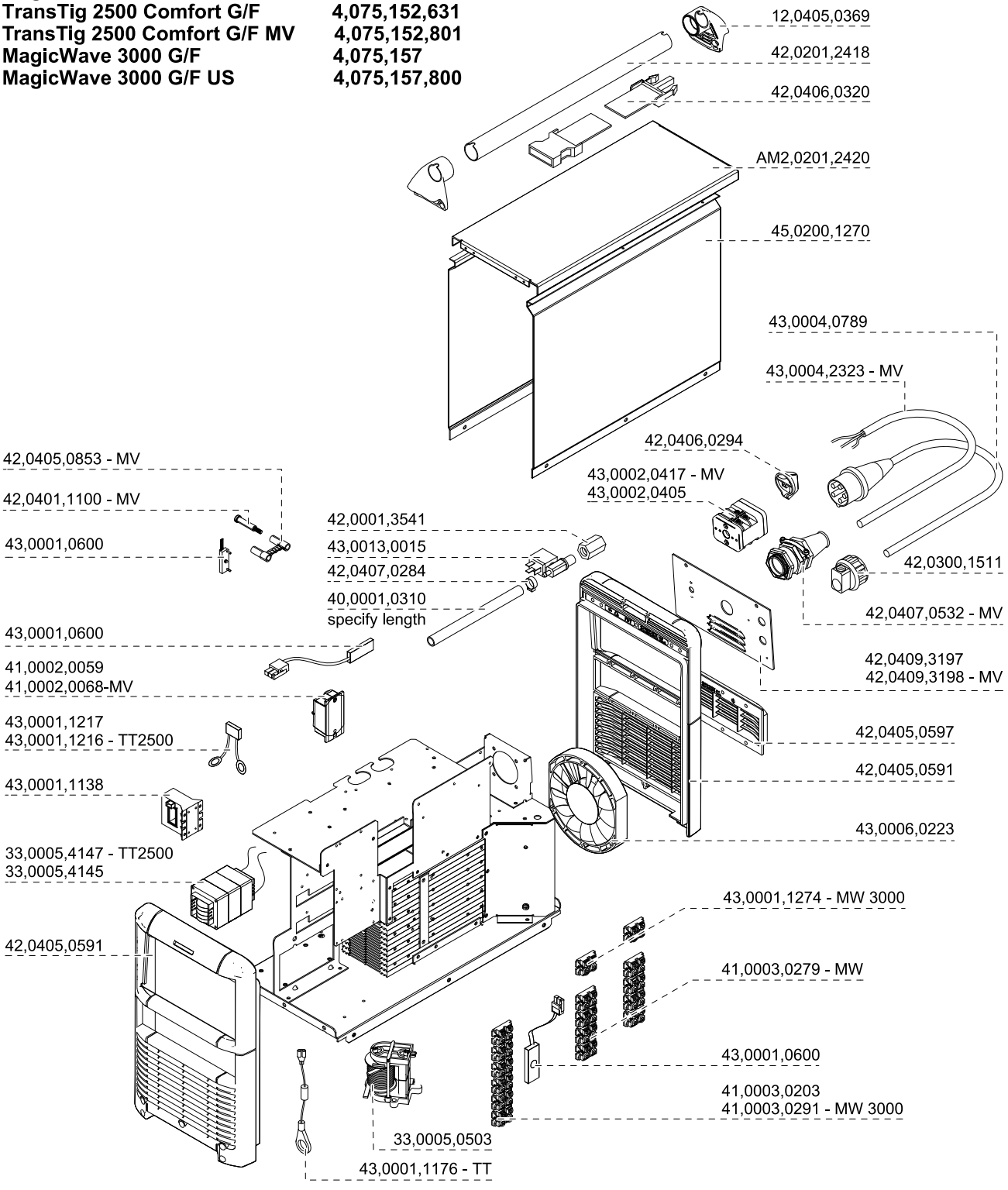
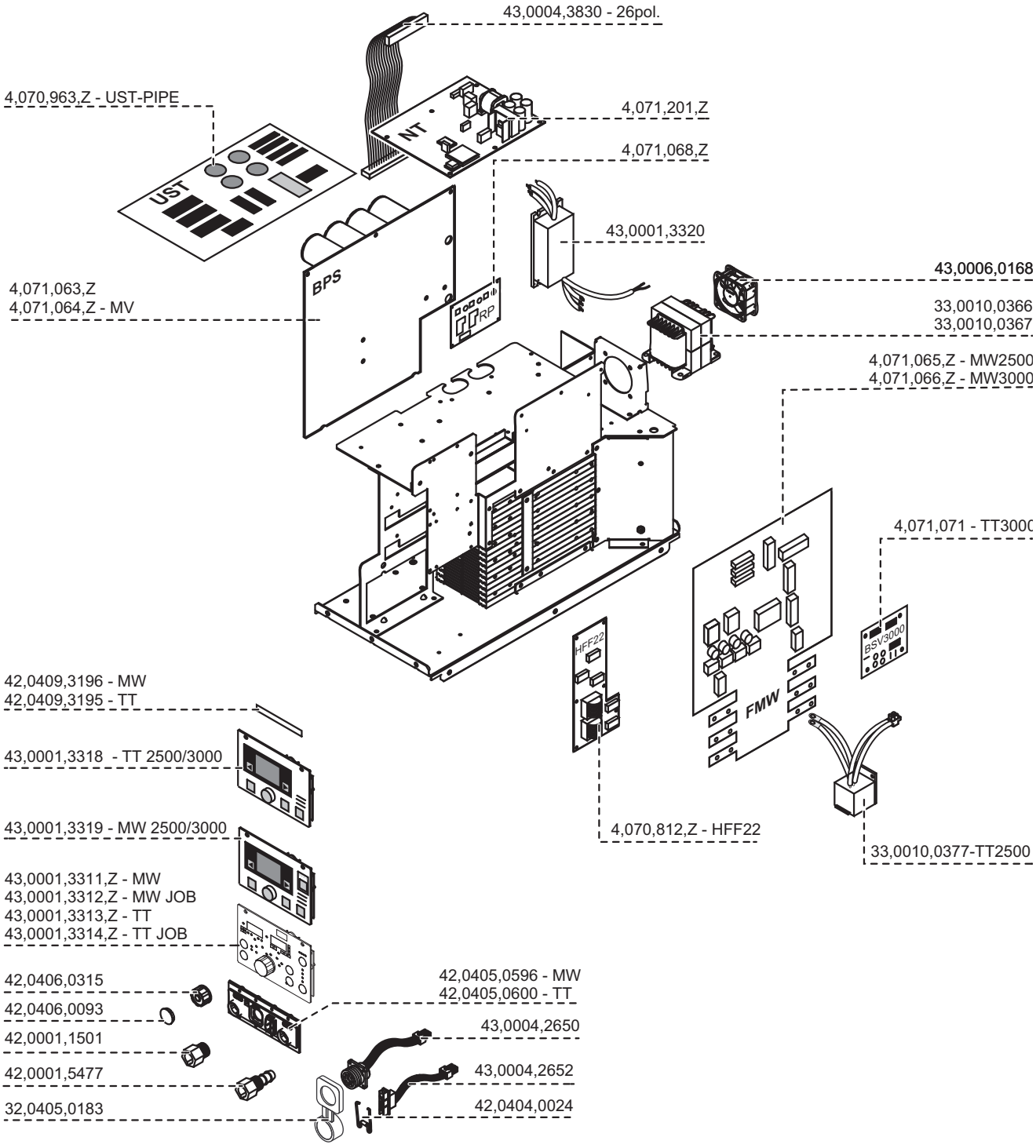
4,070,799,Z - BPS22 TT/MW 2200
4,070,813 - BSV22 TT2200
4,070,804,Z - TTS22 MW1700/2200
41,0001,0627
41,0009,0057
33,0024,0032
33,0010,0325 - MW/TT2200
43,0006,0168
43,0001,1191
42,0405,0420
4,070,963,Z - UST-PIPE
43,0004,1122 - 26pol.
4,070,812 - HFF22
TTS22
BSV22
BPS
UST
HFF22

Spare parts list: TransTig / MagicWave 2500 / 3000

MagicWave 2500 G/F	**4,075,155**
MagicWave 2500 G/F US	**4,075,155,800**
TransTig 2500 G/F	**4,075,151**
TransTig 2500 G/F US	**4,075,151,800**
MagicWave 2500 Job G/F	**4,075,156**
MagicWave 2500 Job G/F US	**4,075,156,800**
TransTig 2500 Job G/F	**4,075,152**
TransTig 2500 Job G/F US	**4,075,152,800**
MagicWave 2500 Comfort G/F	**4,075,156,631**
MagicWave 2500 Comfort MV G/F	**4,075,156,801**
TransTig 2500 Comfort G/F	**4,075,152,631**
TransTig 2500 Comfort G/F MV	**4,075,152,801**
MagicWave 3000 G/F	**4,075,157**
MagicWave 3000 G/F US	**4,075,157,800**

TransTig 3000 G/F	**4,075,153**
TransTig 3000 G/F US	**4,075,153,800**
MagicWave 3000 Job G/F	**4,075,158**
MagicWave 3000 Job G/F US	**4,075,158,800**
TransTig 3000 Job G/F	**4,075,154**
TransTig 3000 Job G/F US	**4,075,154,800**
MagicWave 3000 Comfort G/F	**4,075,158,631**
MagicWave 3000 Comfort MV G/F	**4,075,158,801**
TransTig 3000 Comfort G/F	**4,075,154,631**
TransTig 3000 Comfrt G/F MV	**4,075,154,801**

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4,071,068,Z
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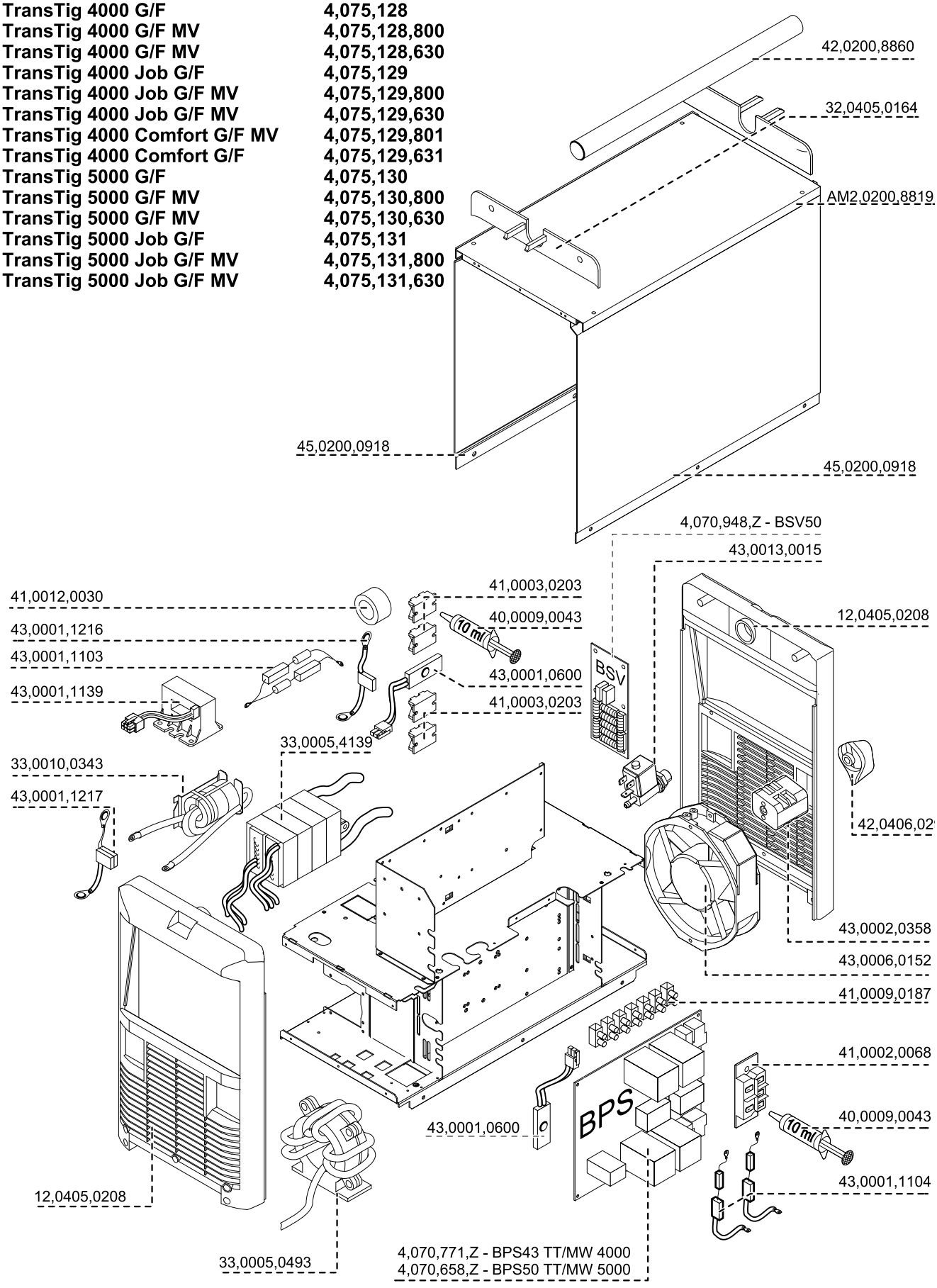
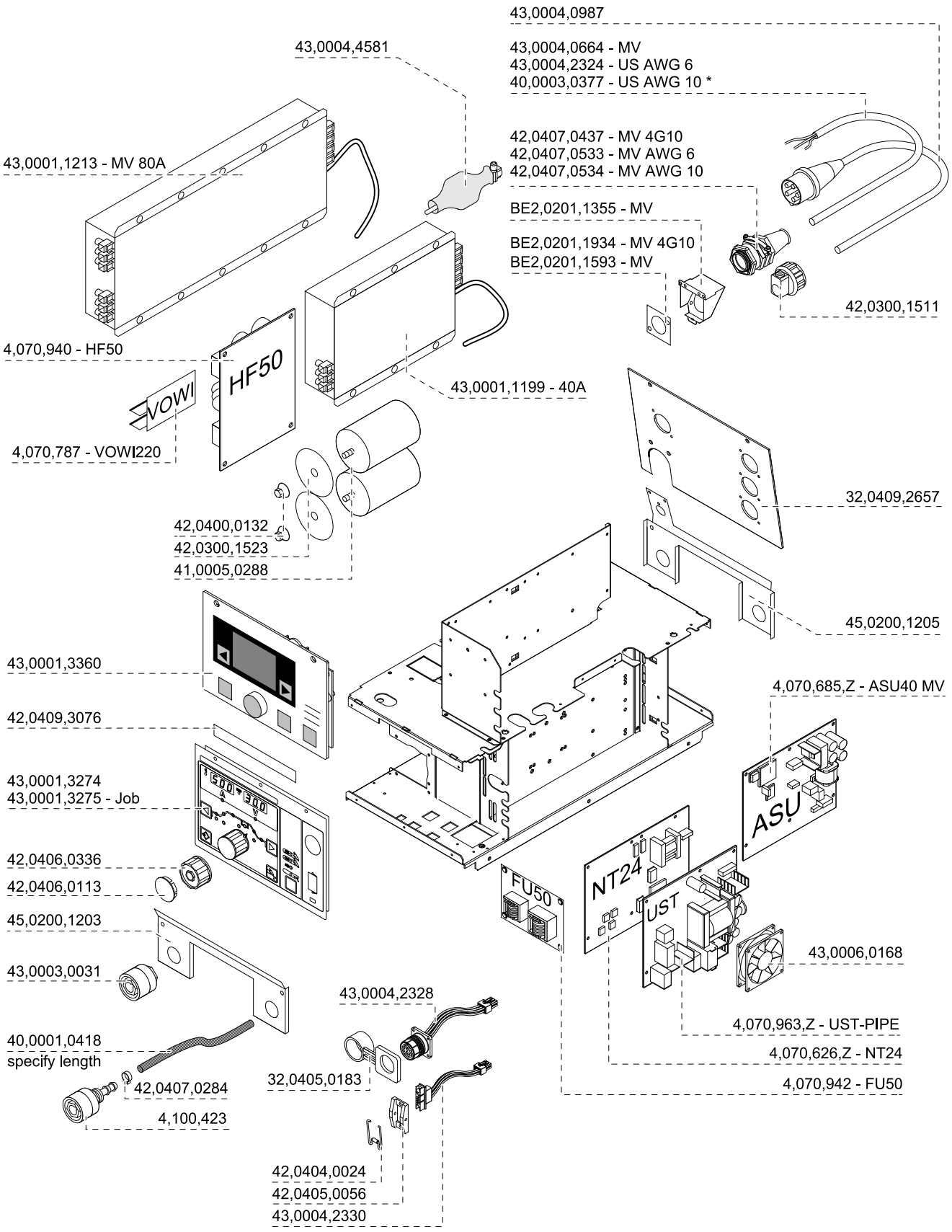
4,071,063,Z
4,071,064,Z - MV
33,0010,0366
33,0010,0367
4,071,065,Z - MW2500
4,071,066,Z - MW3000
4,071,071 - TT3000
42,0409,3196 - MW
42,0409,3195 - TT
43,0001,3318 - TT 2500/3000
43,0001,3319 - MW 2500/3000
43,0001,3311,Z - MW
43,0001,3312,Z - MW JOB
43,0001,3313,Z - TT
43,0001,3314,Z - TT JOB
4,070,812,Z - HFF22
33,0010,0377-TT2500
42,0406,0315
42,0406,0093
42,0001,1501
42,0001,5477
32,0405,0183
42,0405,0596 - MW
42,0405,0600 - TT
43,0004,2650
43,0004,2652
42,0404,0024
UST
NT
BPS
HFF22
BSV3000
FMW

Spare parts list: TransTig 4000 / 5000

TransTig 4000 G/F	**4,075,128**
TransTig 4000 G/F MV	**4,075,128,800**
TransTig 4000 G/F MV	**4,075,128,630**
TransTig 4000 Job G/F	**4,075,129**
TransTig 4000 Job G/F MV	**4,075,129,800**
TransTig 4000 Job G/F MV	**4,075,129,630**
TransTig 4000 Comfort G/F MV	**4,075,129,801**
TransTig 4000 Comfort G/F	**4,075,129,631**
TransTig 5000 G/F	**4,075,130**
TransTig 5000 G/F MV	**4,075,130,800**
TransTig 5000 G/F MV	**4,075,130,630**
TransTig 5000 Job G/F	**4,075,131**
TransTig 5000 Job G/F MV	**4,075,131,800**
TransTig 5000 Job G/F MV	**4,075,131,630**

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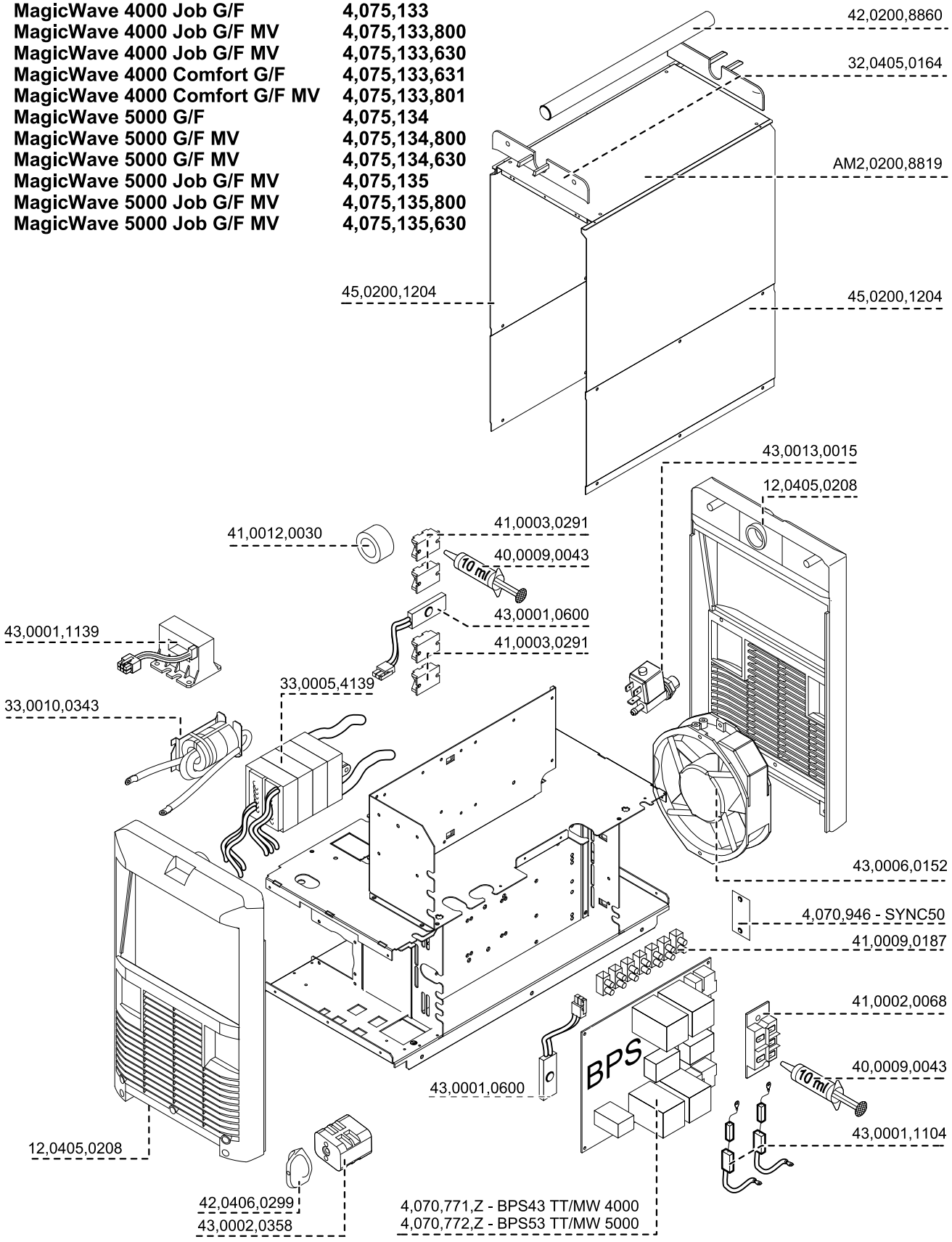
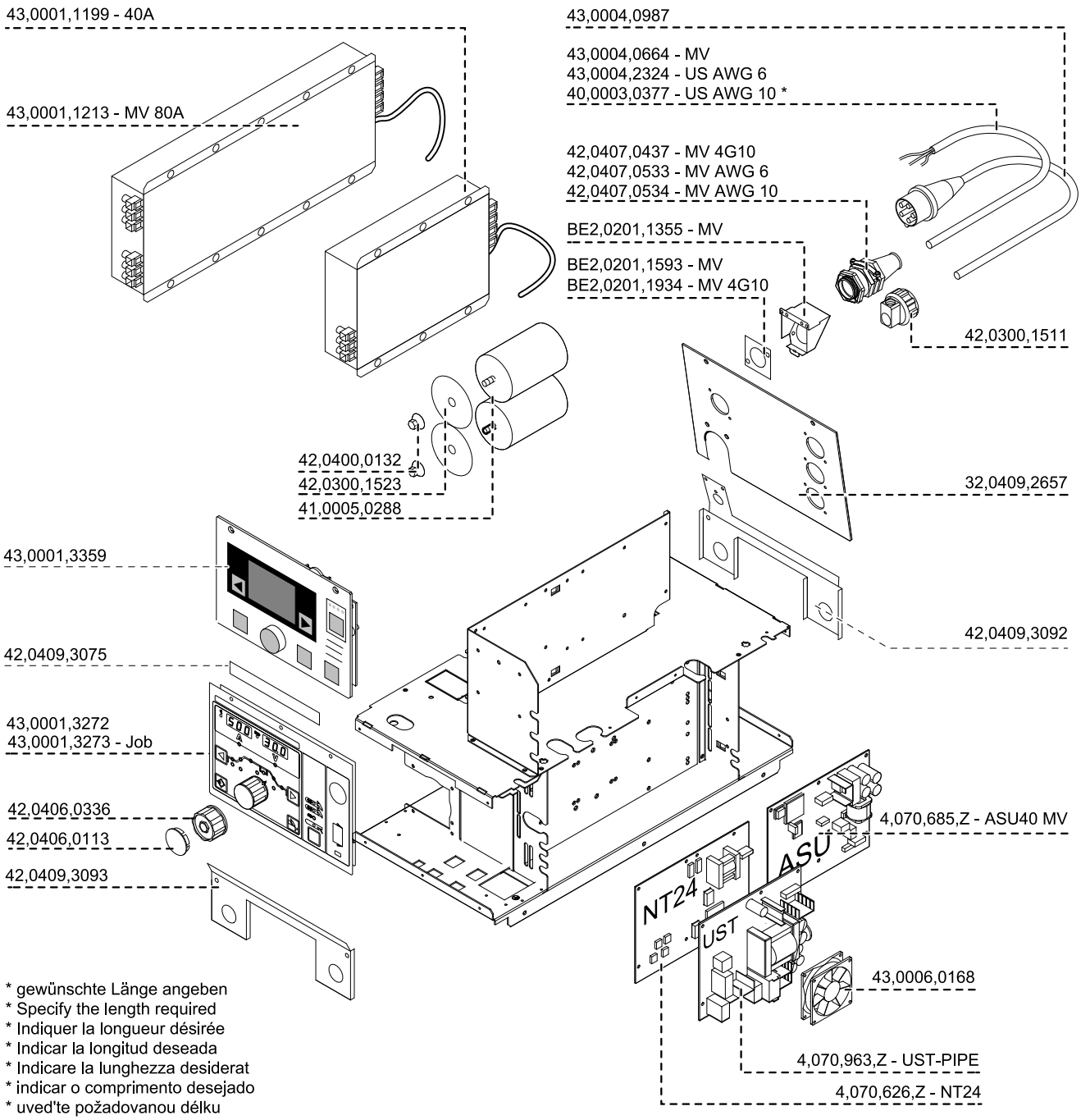
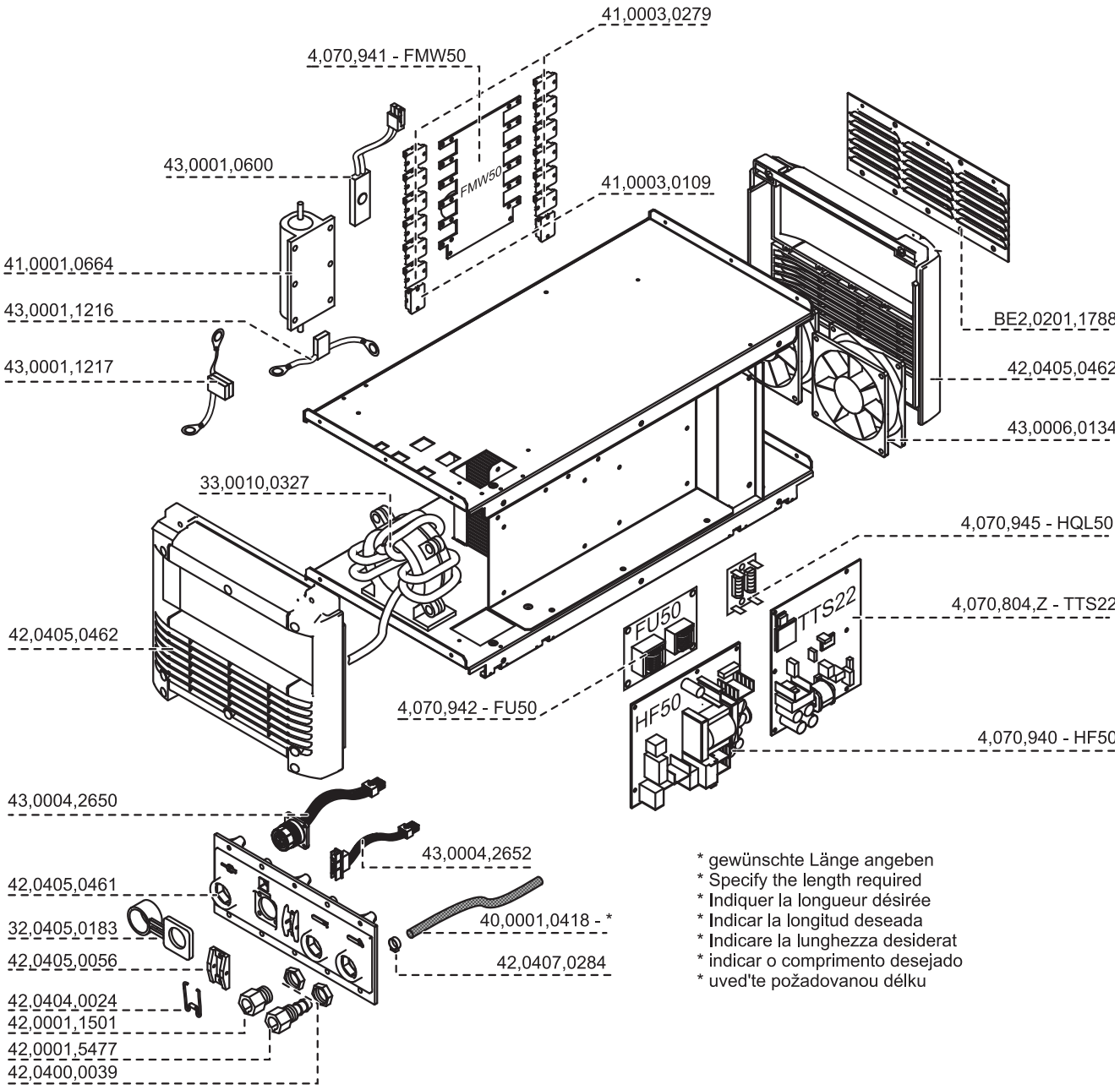
43,0004,0664 - MV
43,0004,2324 - US AWG 6
40,0003,0377 - US AWG 10 *
43,0001,1213 - MV 80A
42,0407,0437 - MV 4G10
42,0407,0533 - MV AWG 6
42,0407,0534 - MV AWG 10
BE2,0201,1355 - MV
BE2,0201,1934 - MV 4G10
BE2,0201,1593 - MV
42,0300,1511
4,070,940 - HF50
HF50
VOWI
43,0001,1199 - 40A
4,070,787 - VOWI220
32,0409,2657
42,0400,0132
42,0300,1523
41,0005,0288
45,0200,1205
43,0001,3360
4,070,685,Z - ASU40 MV
42,0409,3076
43,0001,3274
43,0001,3275 - Job
ASU
NT24
UST
FU50
42,0406,0336
42,0406,0113
45,0200,1203
43,0003,0031
43,0006,0168
43,0004,2328
4,070,963,Z - UST-PIPE
40,0001,0418
specify length
4,070,626,Z - NT24
32,0405,0183
42,0407,0284
4,070,942 - FU50
4,100,423
42,0404,0024
42,0405,0056
43,0004,2330

Spare parts list: MagicWave 4000 / 5000

MagicWave 4000 G/F	**4,075,132**
MagicWave 4000 G/F MV	**4,075,132,800**
MagicWave 4000 G/F MV	**4,075,132,630**
MagicWave 4000 Job G/F	**4,075,133**
MagicWave 4000 Job G/F MV	**4,075,133,800**
MagicWave 4000 Job G/F MV	**4,075,133,630**
MagicWave 4000 Comfort G/F	**4,075,133,631**
MagicWave 4000 Comfort G/F MV	**4,075,133,801**
MagicWave 5000 G/F	**4,075,134**
MagicWave 5000 G/F MV	**4,075,134,800**
MagicWave 5000 G/F MV	**4,075,134,630**
MagicWave 5000 Job G/F MV	**4,075,135**
MagicWave 5000 Job G/F MV	**4,075,135,800**
MagicWave 5000 Job G/F MV	**4,075,135,630**

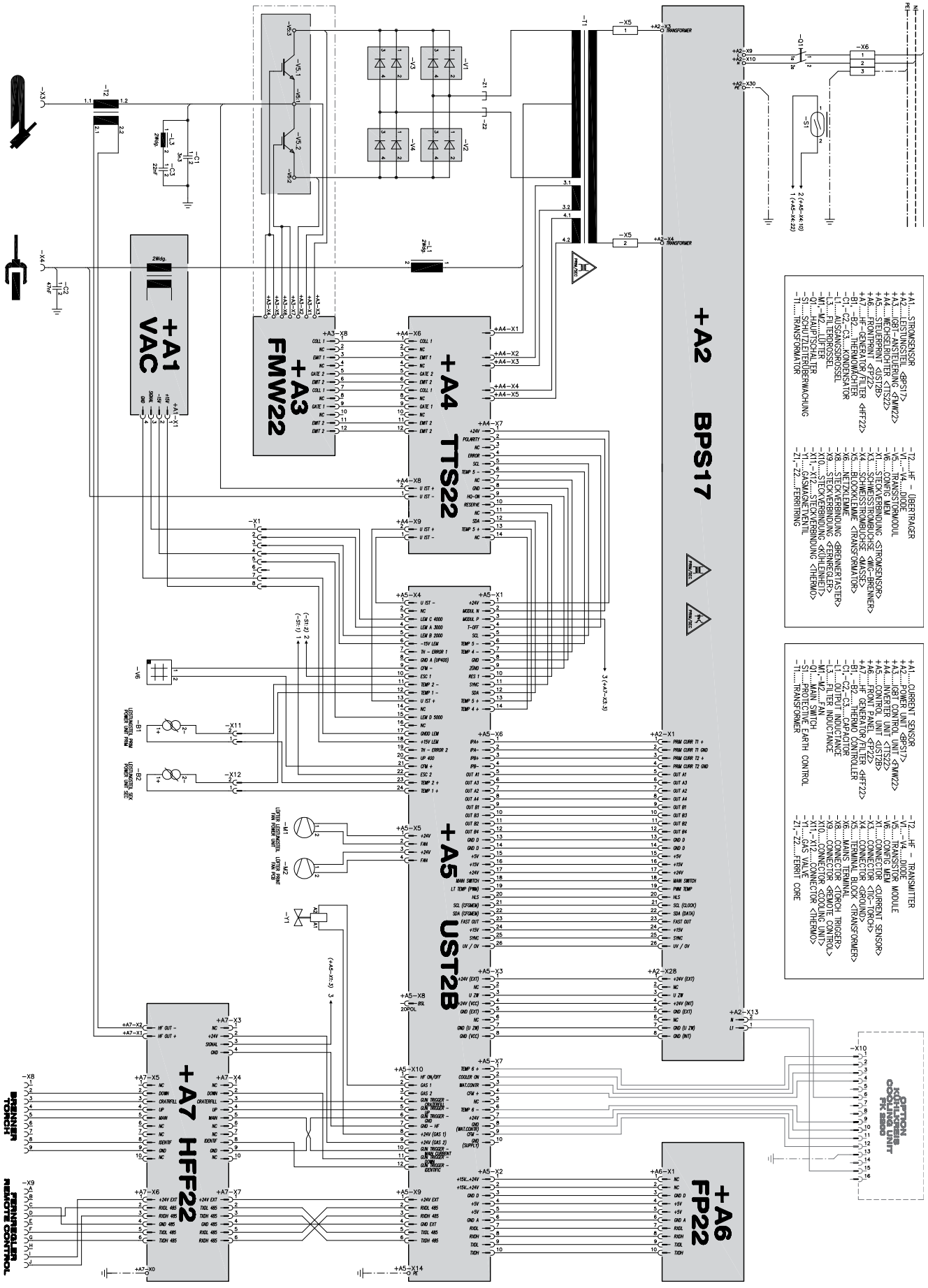



43,0001,1199 - 40A
43,0001,1213 - MV 80A
43,0004,0987
43,0004,0664 - MV
43,0004,2324 - US AWG 6
40,0003,0377 - US AWG 10 *
42,0407,0437 - MV 4G10
42,0407,0533 - MV AWG 6
42,0407,0534 - MV AWG 10
BE2,0201,1355 - MV
BE2,0201,1593 - MV
BE2,0201,1934 - MV 4G10
42,0300,1511
42,0400,0132
42,0300,1523
41,0005,0288
32,0409,2657
43,0001,3359
42,0409,3075
42,0409,3092
43,0001,3272
43,0001,3273 - Job
42,0406,0336
42,0406,0113
42,0409,3093
4,070,685,Z - ASU40 MV
NT24
UST
ASU
43,0006,0168
4,070,963,Z - UST-PIPE
4,070,626,Z - NT24
* gewünschte Länge angeben
* Specify the length required
* Indiquer la longueur désirée
* Indicar la longitud deseada
* Indicare la lunghezza desiderat
* indicar o comprimento desejado
* uved'te požadovanou délku

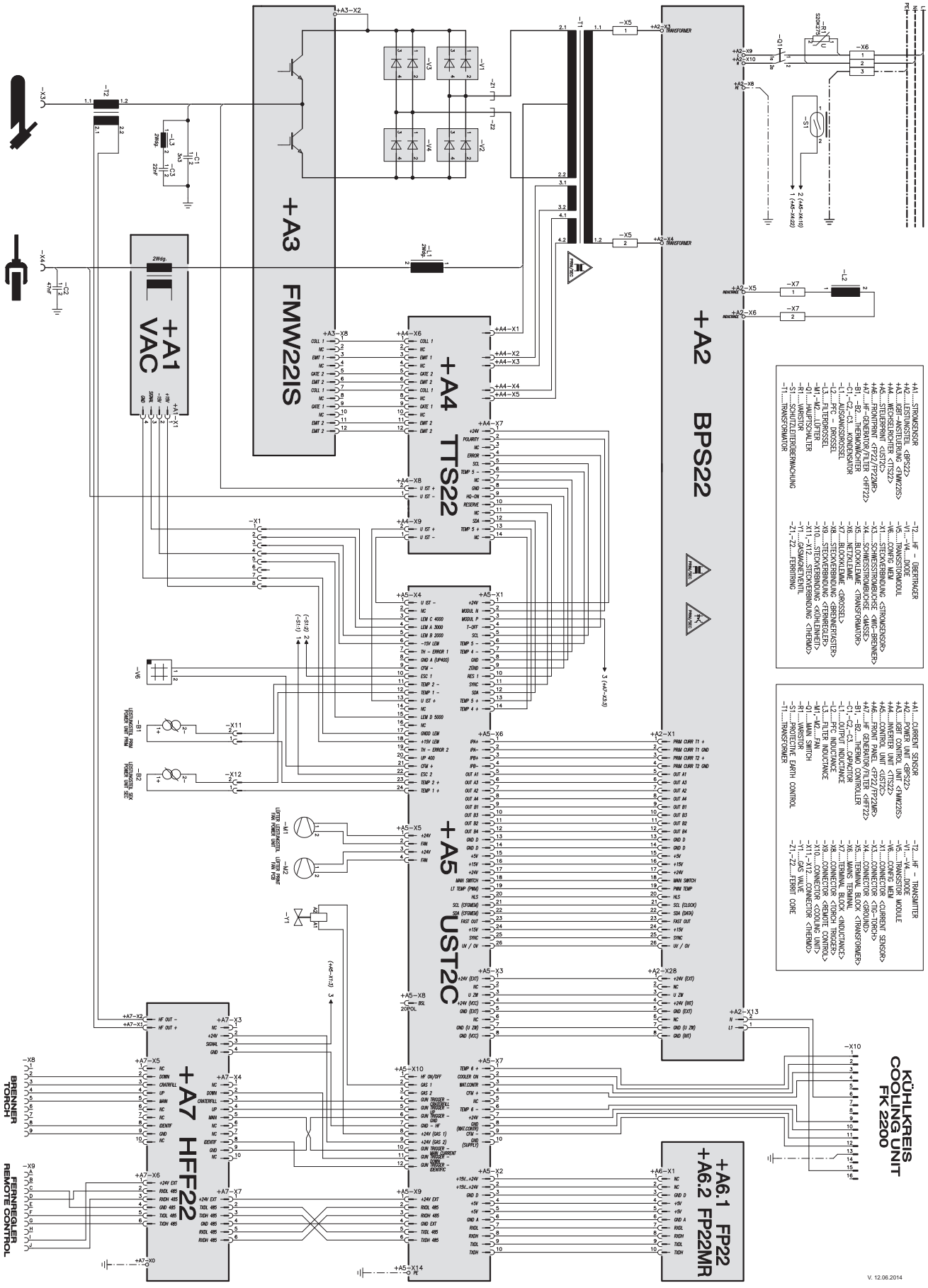


* gewünschte Länge angeben
* Specify the length required
* Indiquer la longueur désirée
* Indicar la longitud deseada
* Indicare la lunghezza desiderat
* indicar o comprimento desejado
* uved'te požadovanou délku

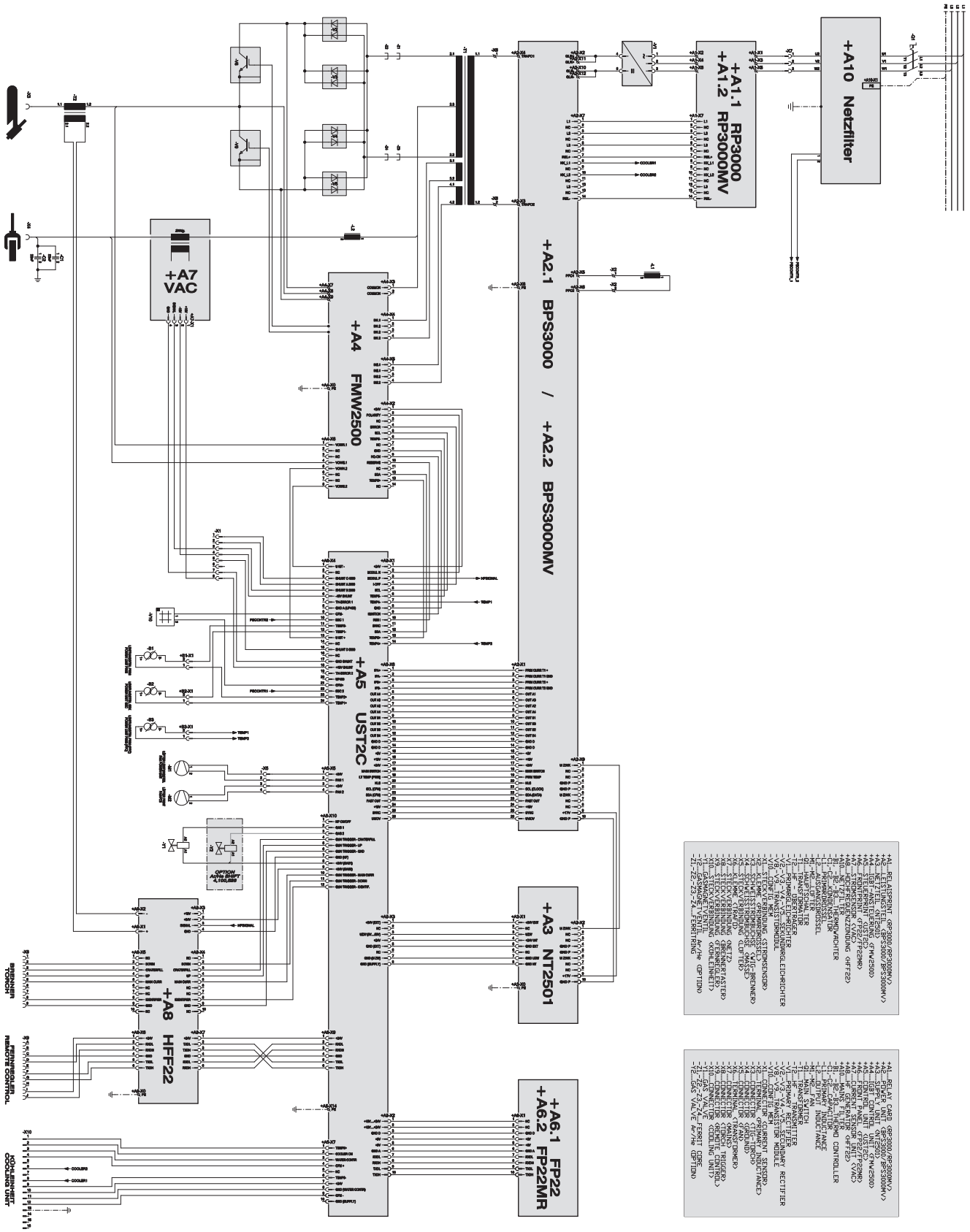
Circuit diagrams: MagicWave 1700



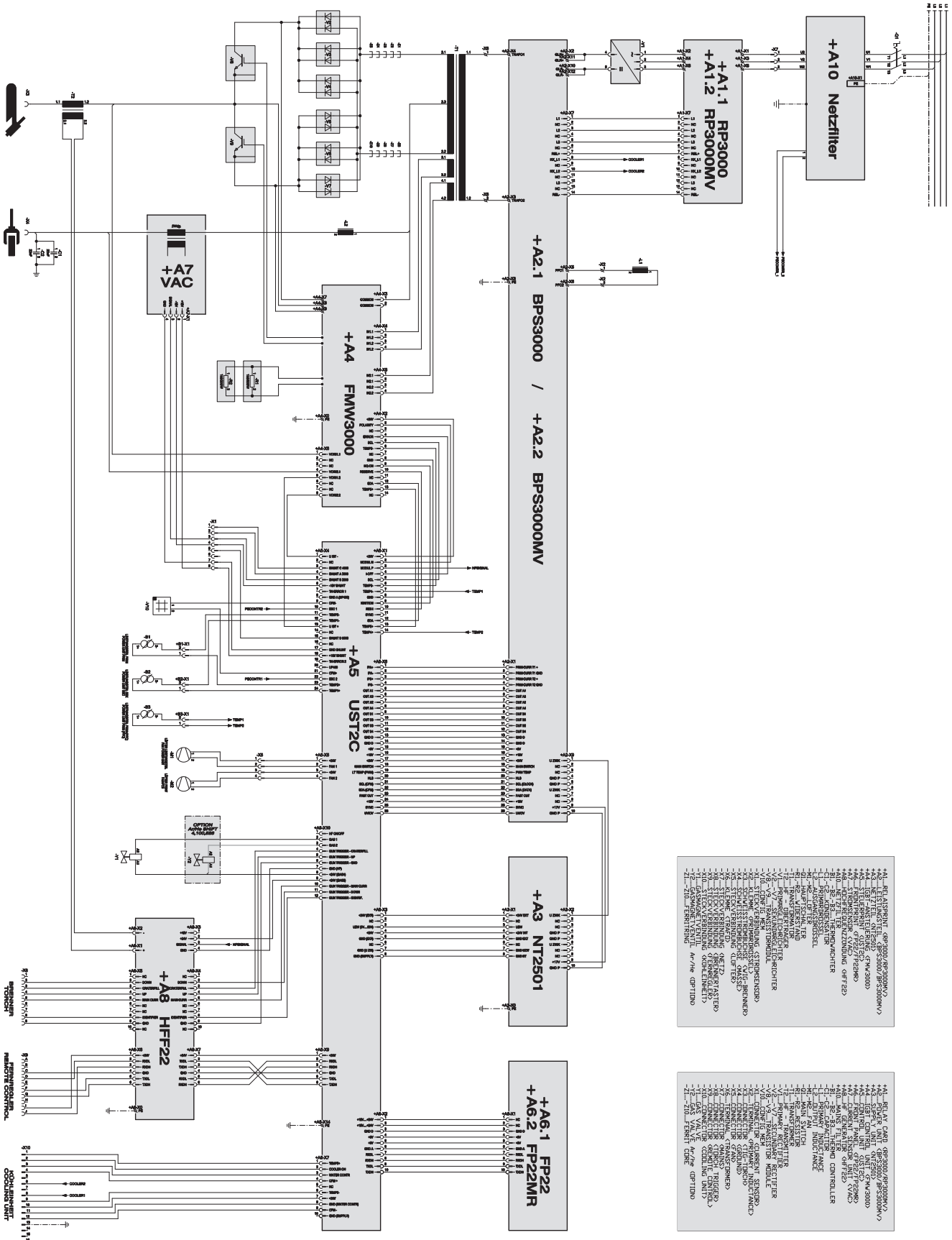
Circuit diagrams: MagicWave 2200



Circuit diagrams: MagicWave 2500 / MagicWave 2500 MV

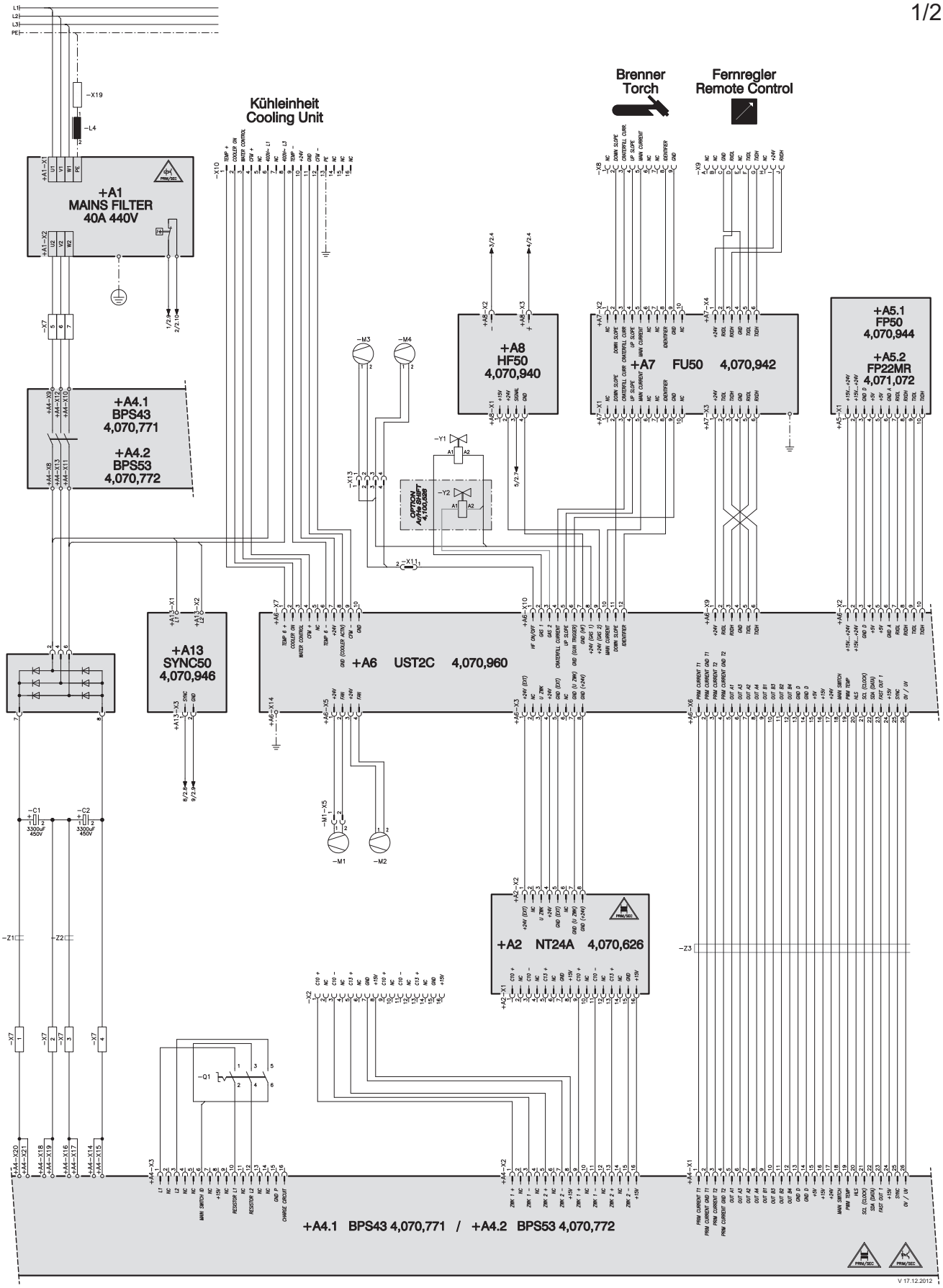


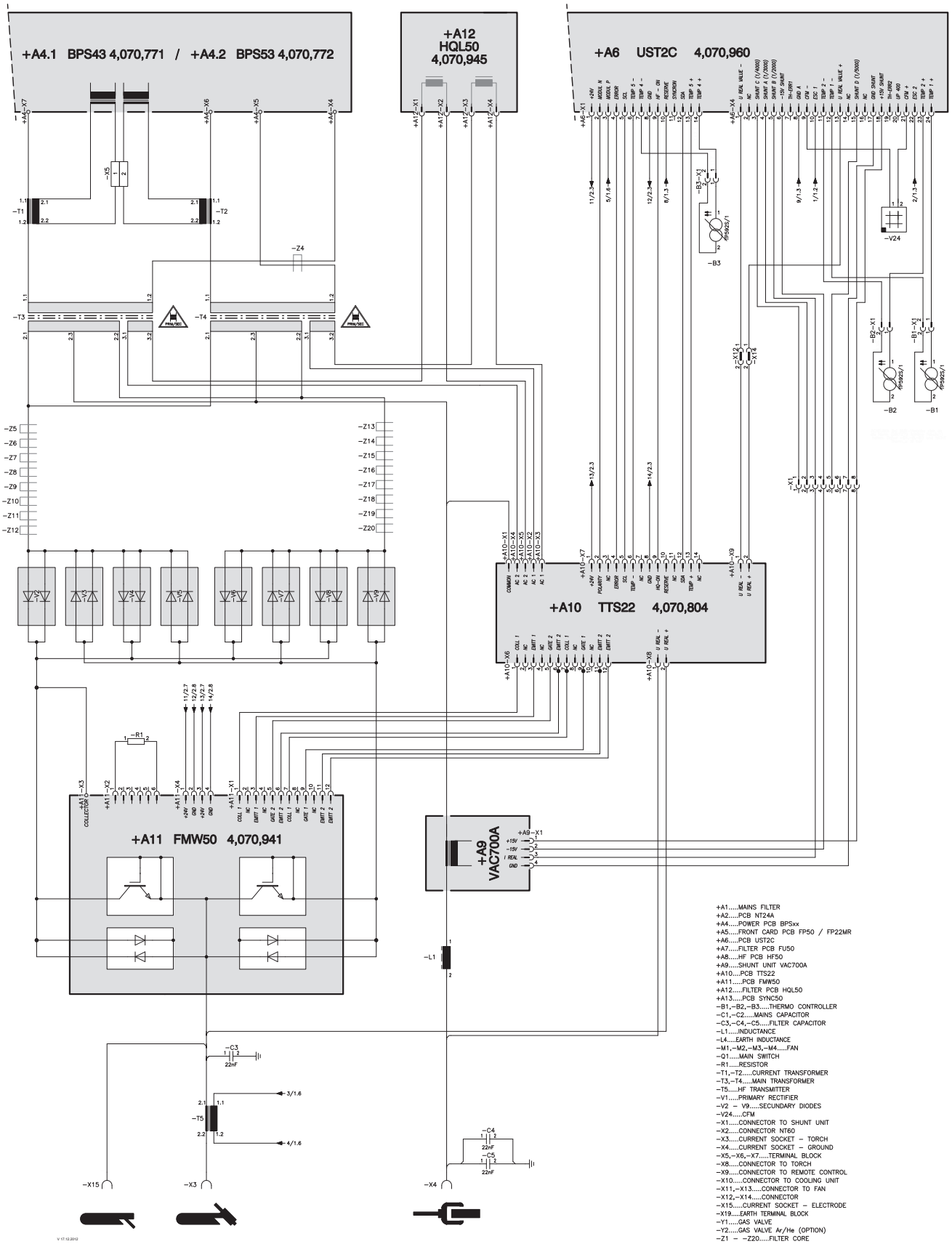
Circuit diagrams: MagicWave 3000 / MagicWave 3000 MV



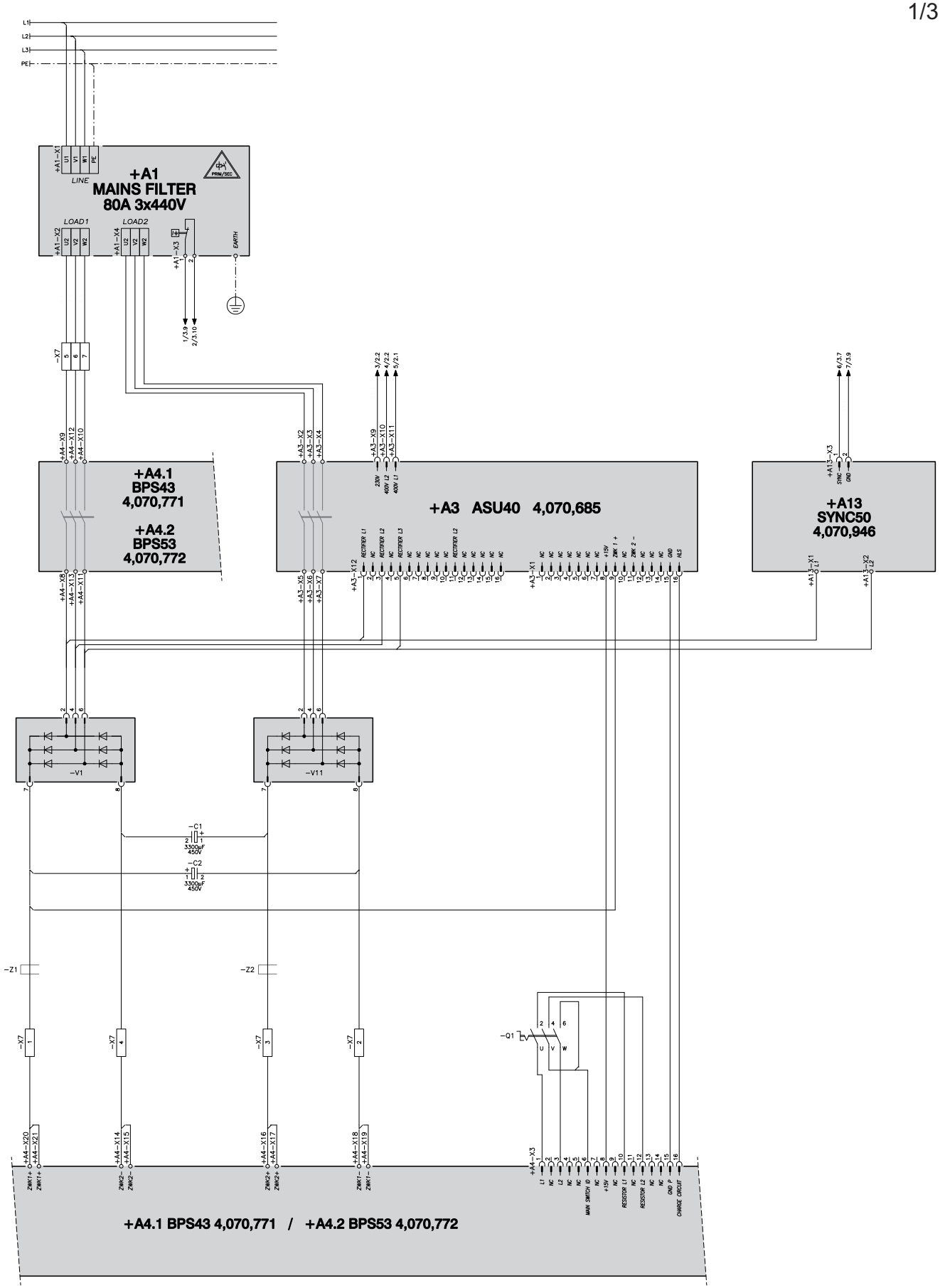
Circuit diagrams: MagicWave 4000 / MagicWave 5000

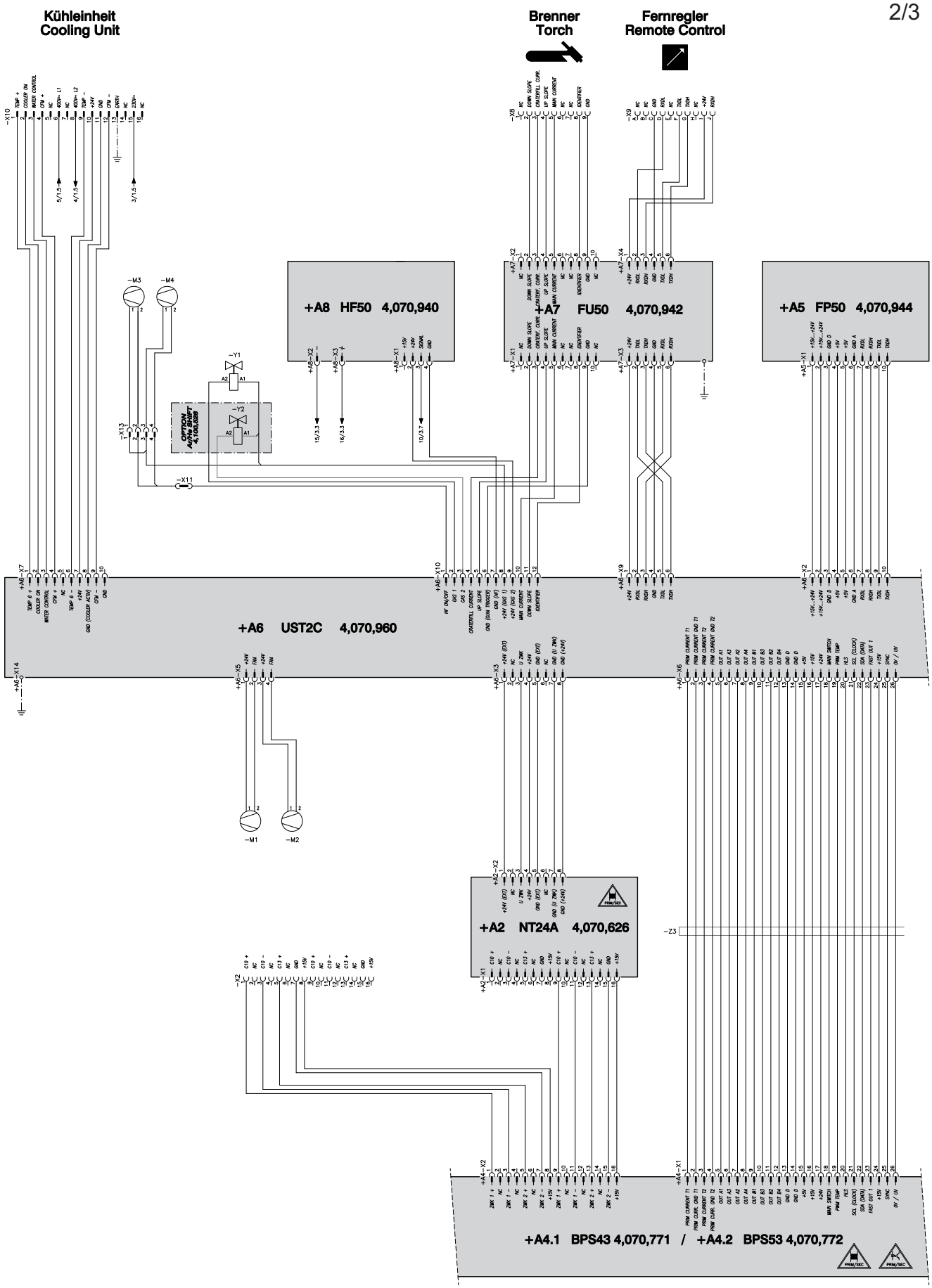
1/2

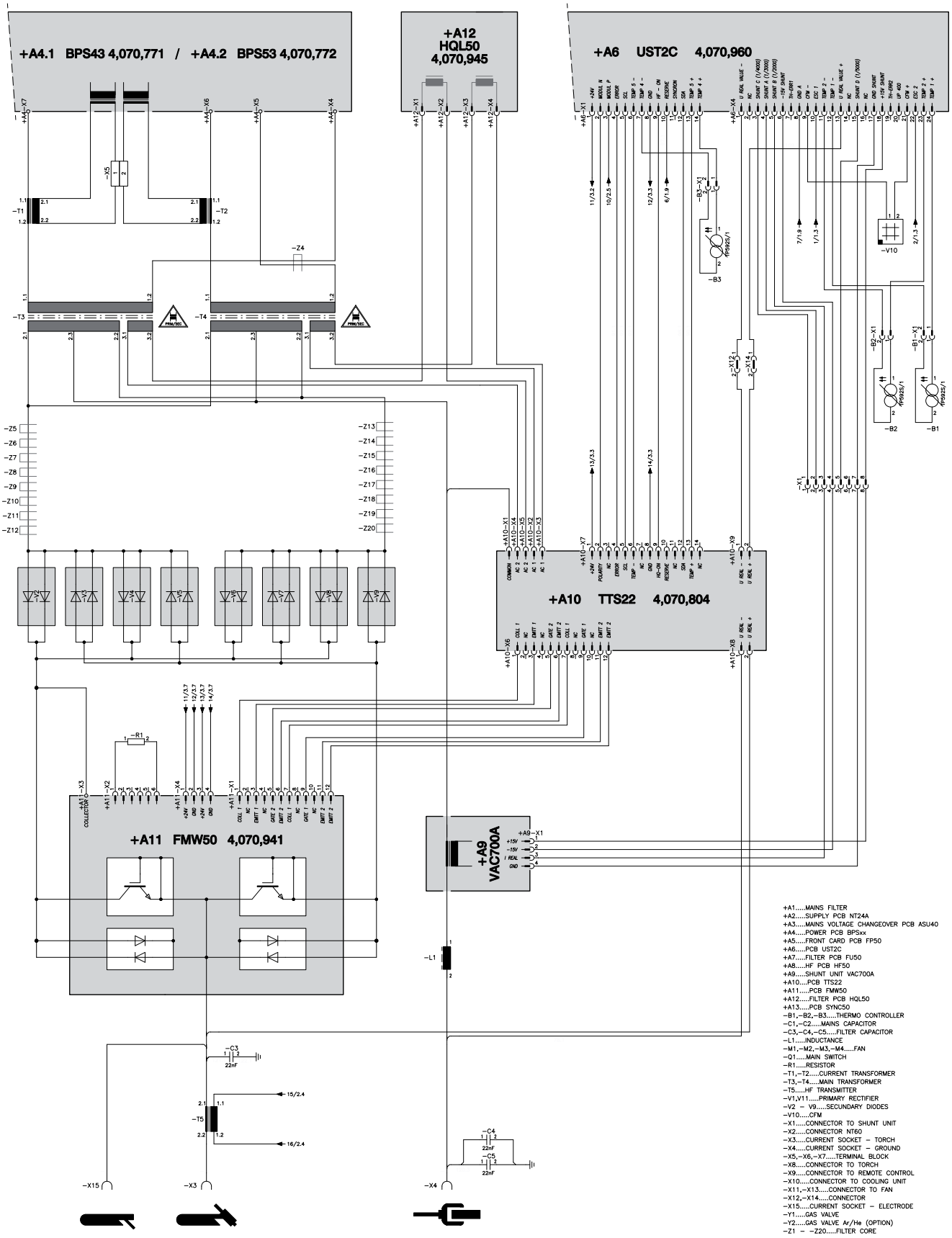



+A4.1 BPS43 4,070,771 / +A4.2 BPS53 4,070,772
+A12 HQL50 4,070,945
+A6 UST2C 4,070,960
+A10 TTS22 4,070,804
+A11 FMW50 4,070,941
+A9 VAC700A
+A1.....MAINS FILTER
+A2.....PCB NT24A
+A4.....POWER PCB BPSxx
+A5.....FRONT CARD PCB FP50 / FP22MR
+A6.....PCB UST2C
+A7.....FILTER PCB FU50
+A8.....HF PCB HF50
+A9.....SHUNT UNIT VAC700A
+A10.....PCB TTS22
+A11.....PCB FMW50
+A12.....FILTER PCB HQL50
+A13.....PCB SYNC50
–B1,–B2,–B3.....THERMO CONTROLLER
–C1,–C2.....MAINS CAPACITOR
–C3,–C4,–C5.....FILTER CAPACITOR
–L1.....INDUCTANCE
–L4.....EARTH INDUCTANCE
–M1,–M2,–M3,–M4.....FAN
–Q1.....MAIN SWITCH
–R1.....RESISTOR
–T1,–T2.....CURRENT TRANSFORMER
–T3,–T4.....MAIN TRANSFORMER
–T5.....HF TRANSMITTER
–V1.....PRIMARY RECTIFIER
–V2 – V9.....SECUNDARY DIODES
–V24.....CFM
–X1.....CONNECTOR TO SHUNT UNIT
–X2.....CONNECTOR NT60
–X3.....CURRENT SOCKET – TORCH
–X4.....CURRENT SOCKET – GROUND
–X5,–X6,–X7.....TERMINAL BLOCK
–X8.....CONNECTOR TO TORCH
–X9.....CONNECTOR TO REMOTE CONTROL
–X10.....CONNECTOR TO COOLING UNIT
–X11,–X13.....CONNECTOR TO FAN
–X12,–X14.....CONNECTOR
–X15.....CURRENT SOCKET – ELECTRODE
–X19.....EARTH TERMINAL BLOCK
–Y1.....GAS VALVE
–Y2.....GAS VALVE Ar/He (OPTION)
–Z1 – –Z20.....FILTER CORE

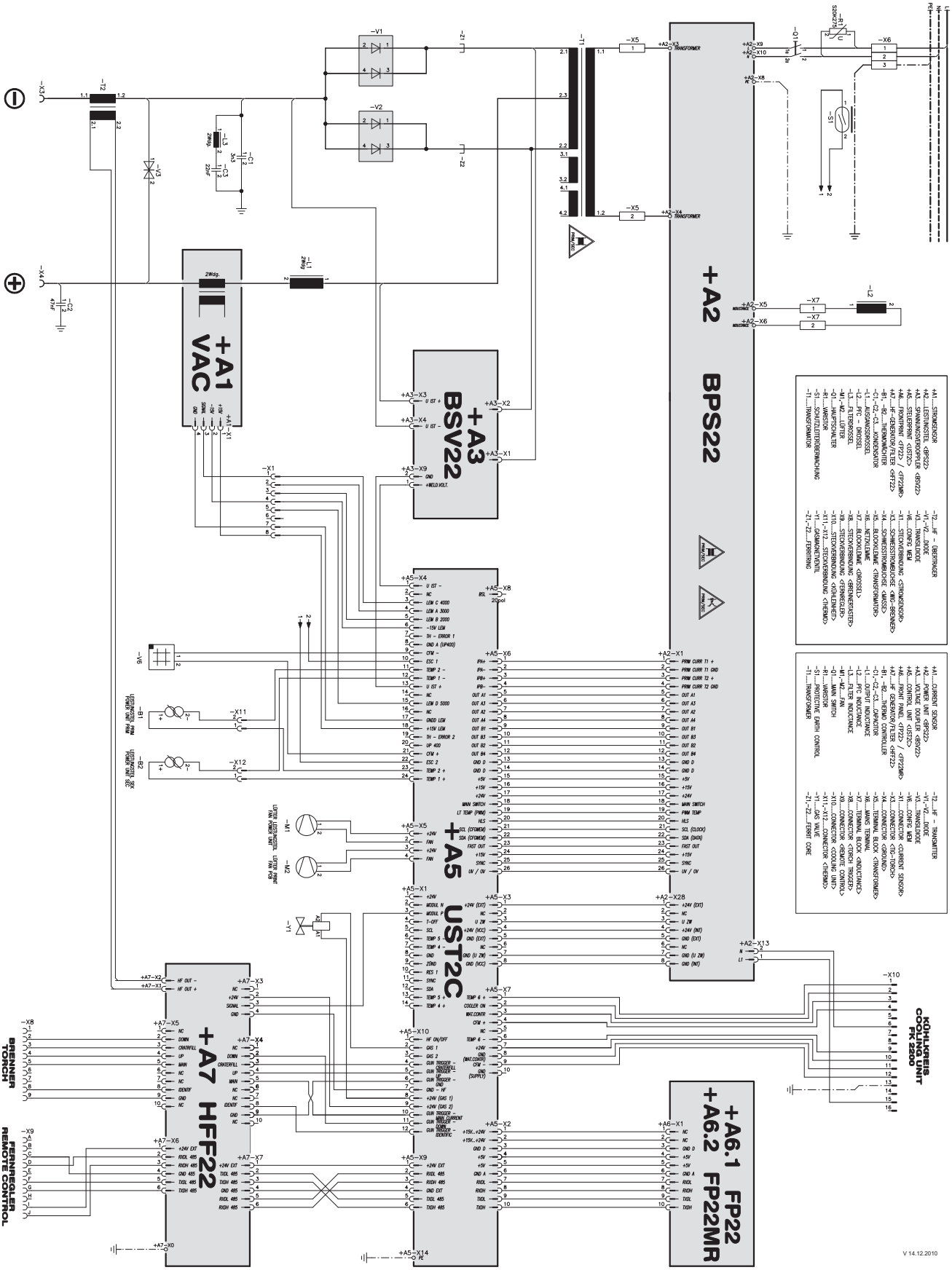
Circuit diagrams: MagicWave 4000 MV / MagicWave 5000 MV



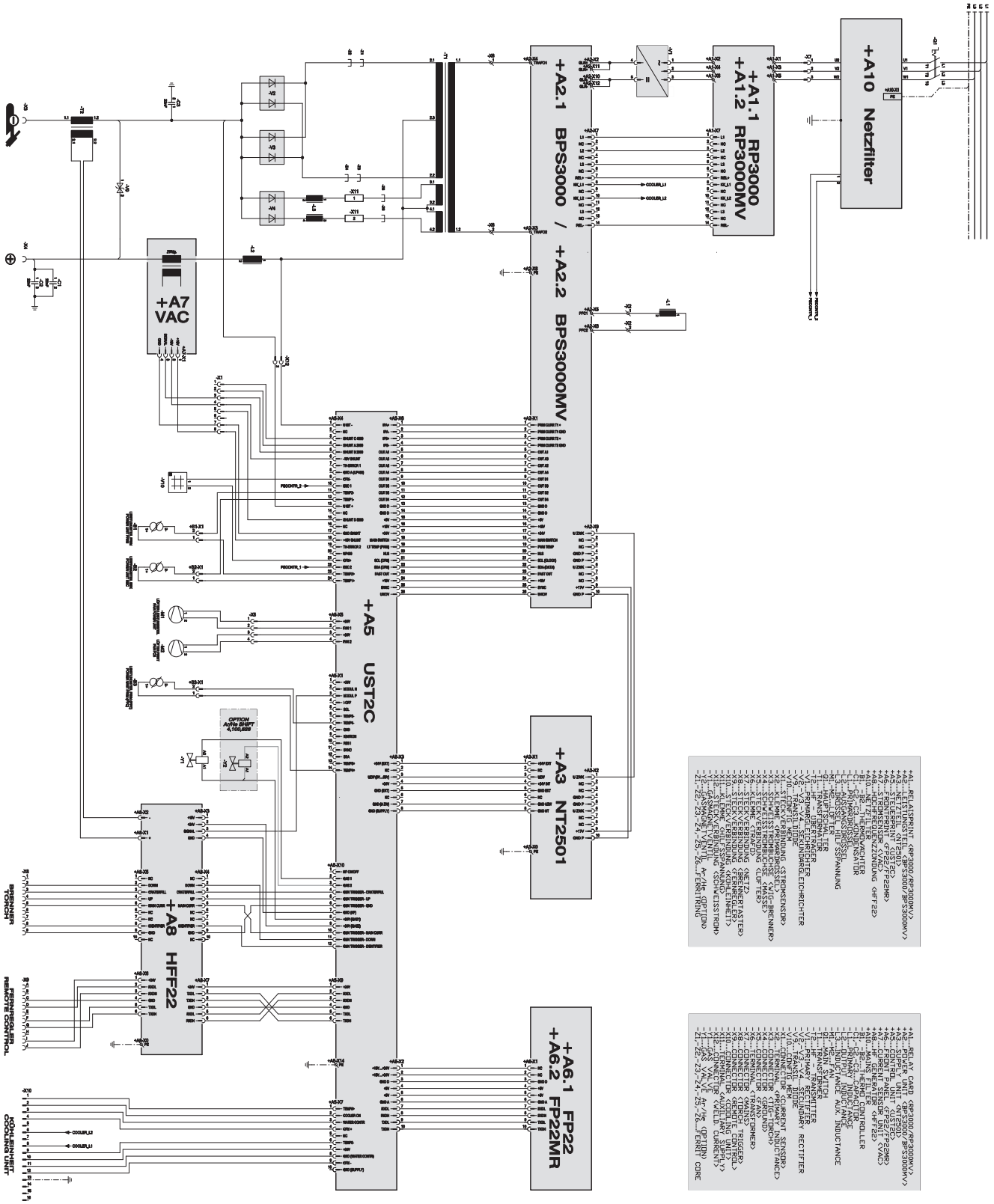

Kühleinheit
Cooling Unit
Brenner
Torch
Fernregler
Remote Control
+A8 HF50 4,070,940
+A7 FU50 4,070,942
+A5 FP50 4,070,944
+A6 UST2C 4,070,960
+A2 NT24A 4,070,626
+A4.1 BPS43 4,070,771 / +A4.2 BPS53 4,070,772
OPTION
Air/Ar Shift
4,100,888


+A4.1 BPS43 4,070,771 / +A4.2 BPS53 4,070,772
+A12 HQL50 4,070,945
+A6 UST2C 4,070,960
+A10 TTS22 4,070,804
+A11 FMW50 4,070,941
+A9 VAC700A
+A1.....MAINS FILTER
+A2.....SUPPLY PCB NT24A
+A3.....MAINS VOLTAGE CHANGEOVER PCB ASU40
+A4.....POWER PCB BPSxx
+A5.....FRONT CARD PCB FP50
+A6.....PCB UST2C
+A7.....FILTER PCB FU50
+A8.....HF PCB HF50
+A9.....SHUNT UNIT VAC700A
+A10.....PCB TTS22
+A11.....PCB FMW50
+A12.....FILTER PCB HQL50
+A13.....PCB SYNC50
–B1,–B2,–B3.....THERMO CONTROLLER
–C1,–C2.....MAINS CAPACITOR
–C3,–C4,–C5.....FILTER CAPACITOR
–L1.....INDUCTANCE
–M1,–M2,–M3,–M4.....FAN
–Q1.....MAIN SWITCH
–R1.....RESISTOR
–T1,–T2.....CURRENT TRANSFORMER
–T3,–T4.....MAIN TRANSFORMER
–T5.....HF TRANSMITTER
–V1,V11.....PRIMARY RECTIFIER
–V2 – V9.....SECUNDARY DIODES
–V10.....CFM
–X1.....CONNECTOR TO SHUNT UNIT
–X2.....CONNECTOR NT60
–X3.....CURRENT SOCKET – TORCH
–X4.....CURRENT SOCKET – GROUND
–X5,–X6,–X7.....TERMINAL BLOCK
–X8.....CONNECTOR TO TORCH
–X9.....CONNECTOR TO REMOTE CONTROL
–X10.....CONNECTOR TO COOLING UNIT
–X11,–X13.....CONNECTOR TO FAN
–X12,–X14.....CONNECTOR
–X15.....CURRENT SOCKET – ELECTRODE
–Y1.....GAS VALVE
–Y2.....GAS VALVE Ar/He (OPTION)
–Z1 – –Z20.....FILTER CORE

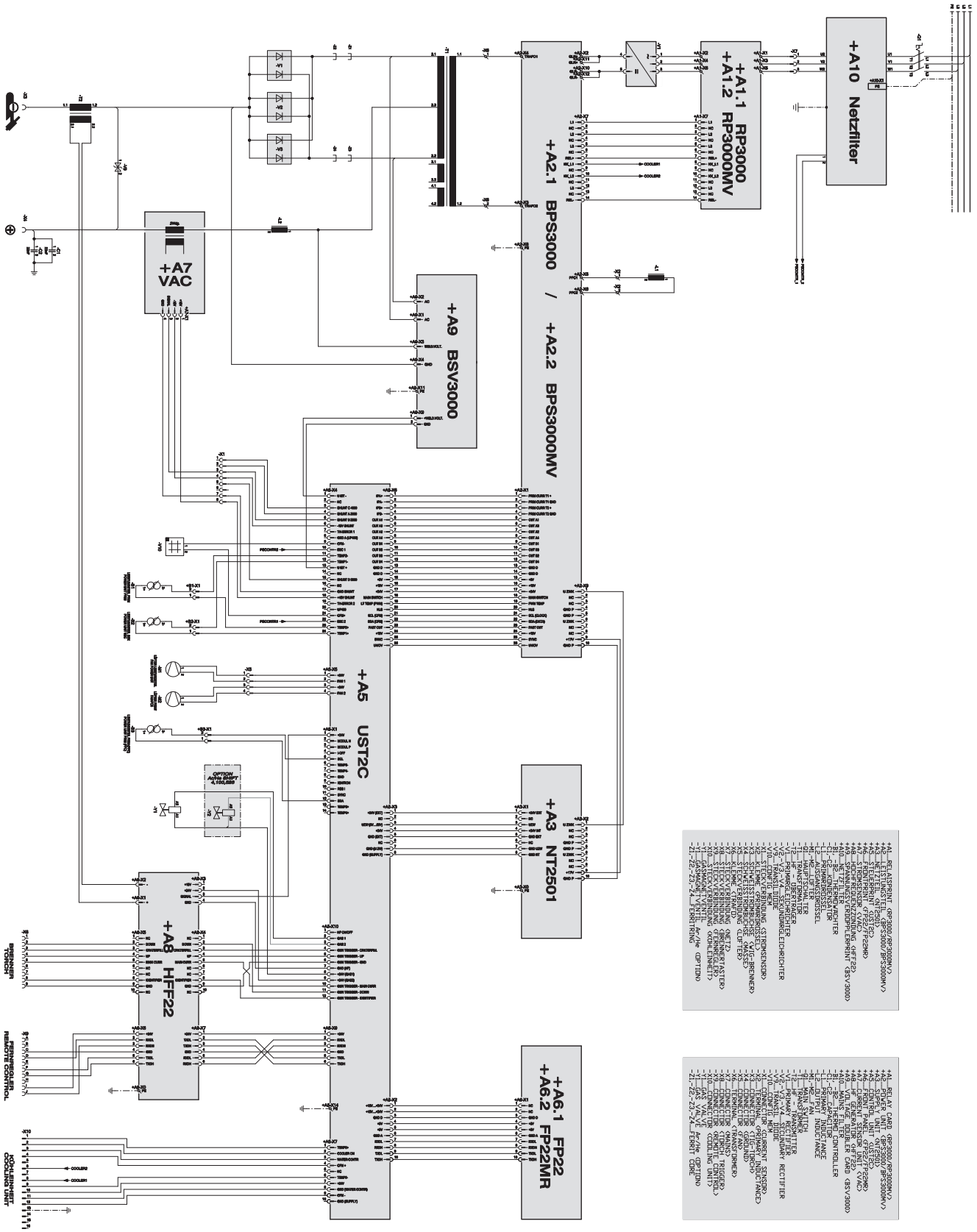
Circuit diagrams: TransTig 2200



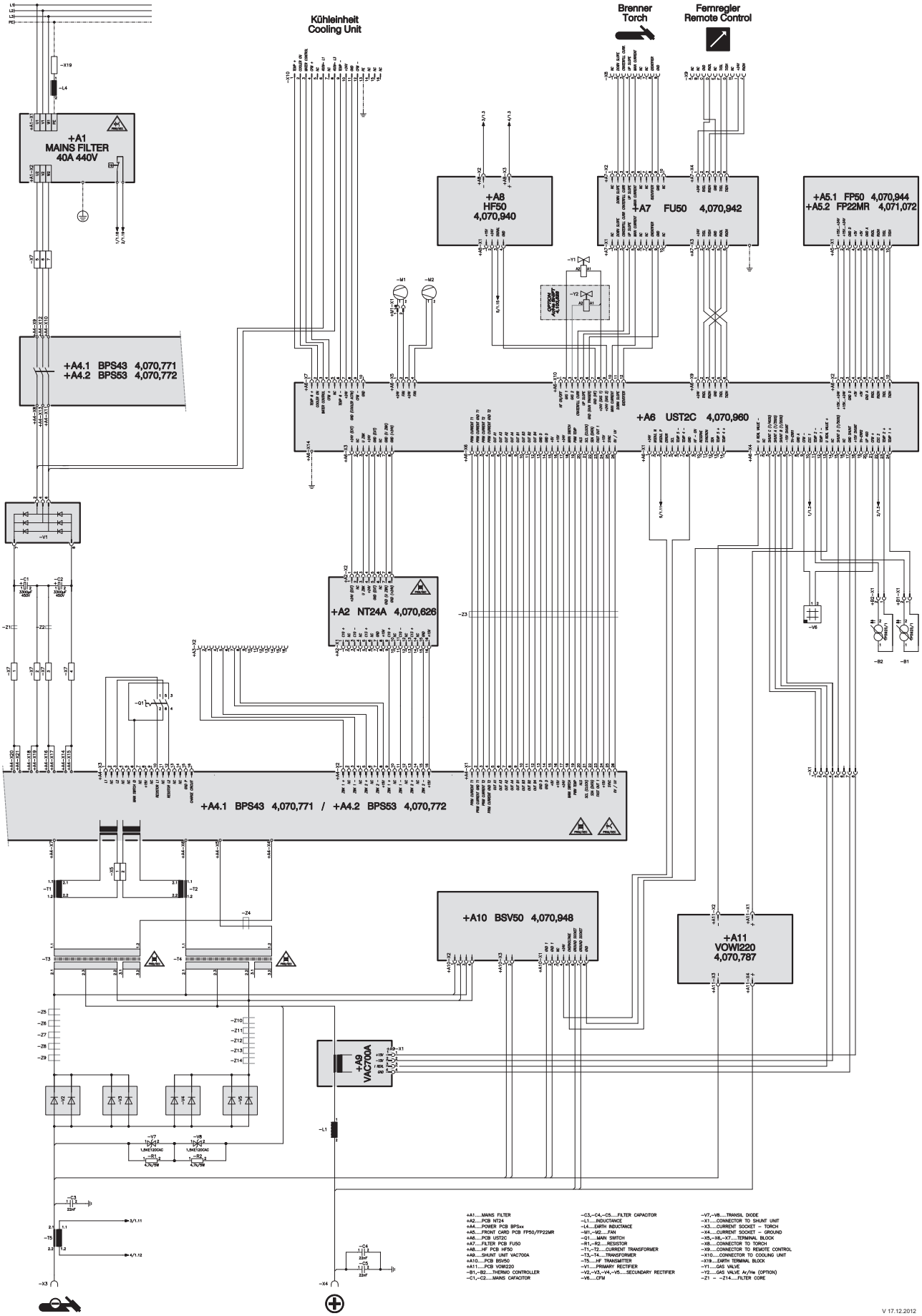
Circuit diagrams: TransTig 2500 / TransTig 2500 MV



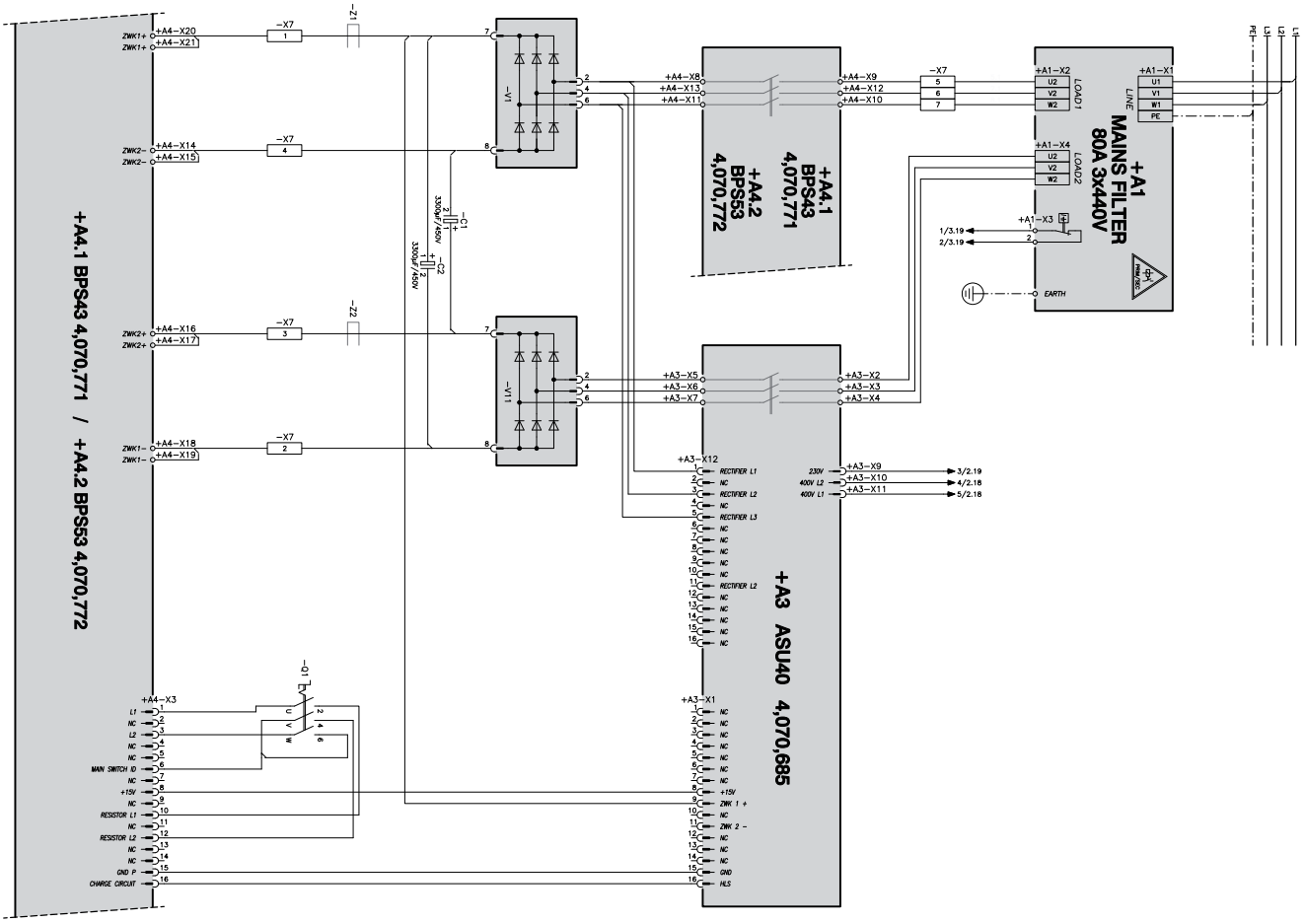
Circuit diagrams: TransTig 3000 / TransTig 3000 MV

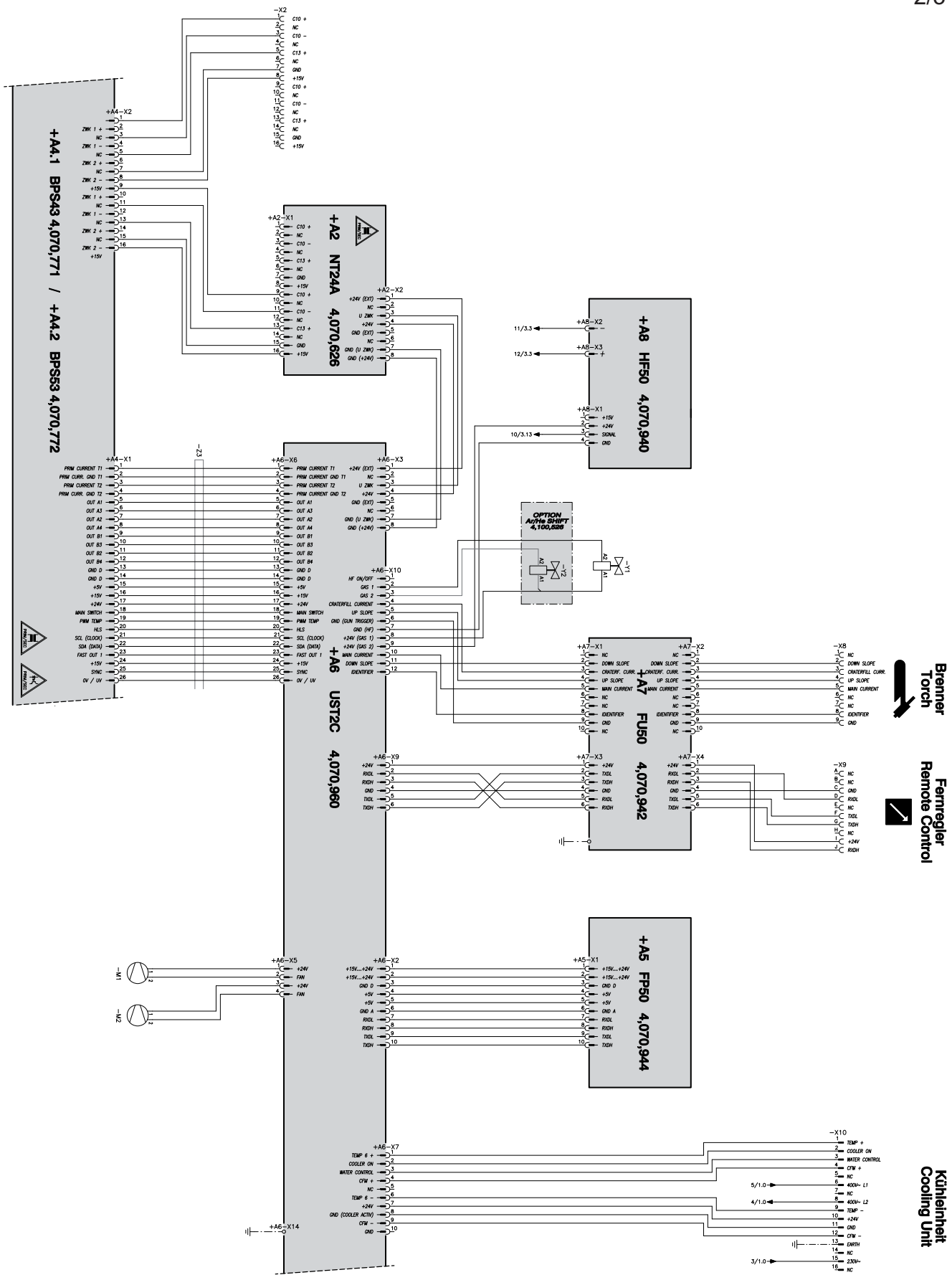


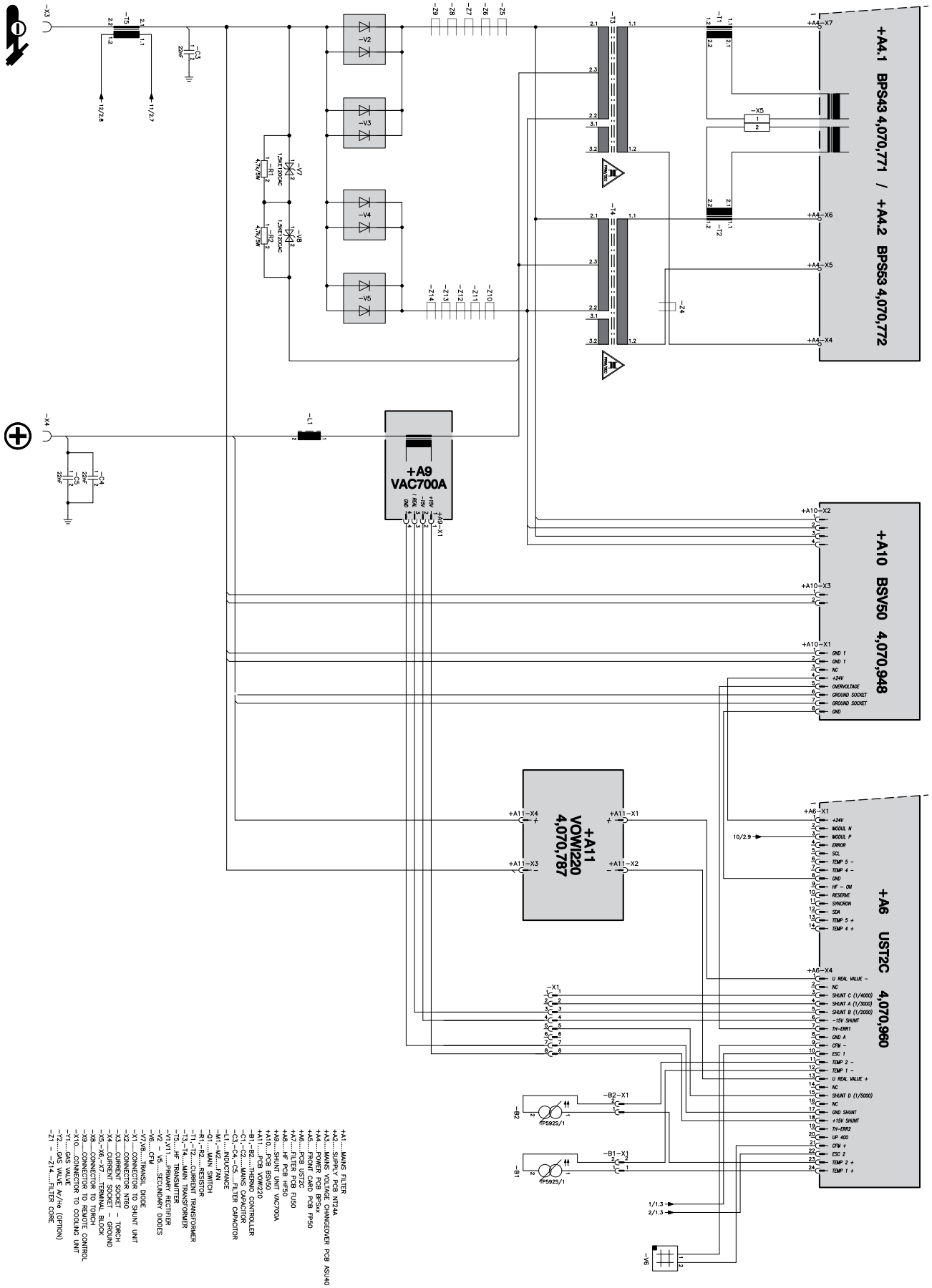
Circuit diagrams: TransTig 4000 / TransTig 5000



Circuit diagrams: TransTig 4000 MV / TransTig 5000 MV




+A4.1 BPS43 4,070,771 / +A4.2 BPS53 4,070,772
+A2 NT24A 4,070,626
+A8 HF50 4,070,940
+A6 UST2C 4,070,960
+A7 FU50 4,070,942
+A5 FP50 4,070,944
OPTION Ar/He SHIFT 4,100,626
Brenner Torch
Fernregler Remote Control
Kühleinheit Cooling Unit



+A1.....MAINS FILTER
+A2.....SUPPLY PCB N°4A
+A3.....MAINS VOLTAGE CHANGEOVER PCB ASU40
+A4.....POWER PCB BPS43
+A5.....FRONT CARD PCB FP50
+A6.....PCB UST2C
+A7.....FILTER PCB FU50
+A8.....HF PCB HF50
+A9.....SUPPLY UNIT VAC700A
+A10....PCB BSV50
+A11....PCB VOW220
-B1-/-B2-....THERMO CONTROLLER
-C1-/-C2-....MAINS CAPACITOR
-C3-/-C4-/-C5-....FILTER CAPACITOR
-L1.....INDUCTANCE
-Q1.....MAIN SWITCH
-R1-/-R2-....RESISTOR
-T1-/-T2-....CURRENT TRANSFORMER
-T3-/-T4-....MAIN TRANSFORMER
-T5.....HF TRANSMITTER
-V1/-V11-....PRIMARY RECTIFIER
-V2 - -V5....SECUNDARY DIODES
-V6.....CFM
-V7/-V8....TRANSIL DIODE
-X1.....CONNECTOR TO SHUNT UNIT
-X2.....CONNECTOR TO PCB
-X3.....CURRENT SOCKET - TORCH
-X4.....CURRENT SOCKET - GROUND
-X5/-X6/-X7....TERMINAL BLOCK
-X8.....CONNECTOR TO TORCH
-X9.....CONNECTOR TO REMOTE CONTROL
-X10....CONNECTOR TO COOLING UNIT
-Y1.....GAS VALVE
-Y2.....GAS VALVE Ar/He (OPTION)
-Z1 - -Z14....FILTER CORE

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