

FRC-60

Operating Instructions

EN

Remote control



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Introduction

These operating instructions will help you familiarise yourself with the product FRC-60. It is in your interest to read these instructions carefully and to observe the directions contained herein. This will prevent faults and incorrect operation or possible damage to the product or its system components.

Please also obey the safety rules; doing so will 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.

About this document

Function of this document These operating instructions will tell you how to commission and operate the product FRC-60 in combination with its system components. Look after the operating instructions carefully; they must always be to hand at the location where the product is being used. They can be used as a reference should any operational or functional problems occur in the future.

Target group The FRC-60 operating instructions are designed for trained technicians or persons with practical welding experience. The manufacturer accepts no liability for damages caused by insufficient knowledge on the part of the user.

Abbreviations used	Abbrev.	Meaning in English	Meaning in German
	FRC	Fronius Remote Control	Fronius Fernbedienung
	FTU	Fronius Tripod Unit	Fronius Stativeinheit
	FCU	Fronius Control Unit	Fronius Steuergerät
	FTT	Fronius Tilting Turntable	Fronius Drehkipptisch
	FRT	Fronius Rotation Table	Fronius Drehtisch
	FRU	Fronius Rotator Unit	Fronius Rollenbock
	FPT	Fronius Pneumatic Torch	Fronius Brenner-Absenkeinheit
	FGU	Fronius Guide Unit	Fronius Führungseinheit
	FSU	Fronius Swivel Unit	Fronius Brenner-Verstelleinheit
	FTH	Fronius Torch Holder	Fronius Brennerhalter

Format	Text	Meaning
	-	List in no strict order
	1	Reference number for description
	Key 1 ..	Actions in order: You need to do something here
	1., 2.	Prompt to take actions in order: You need to do something here
	1., 1.1	Identification of spare parts
	A, B	Measurements

Copyright Copyright of these operating instructions remains with Fronius International GmbH. 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.

Meaning of the special safety instructions



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



"WARNING!" indicates a possibly 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!" highlights 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 "For your safety" section, special care is required.

For your safety

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 operator,
- 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
- 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, generally applicable and local regulations regarding accident prevention and environmental protection must be made available and observed.

All safety and danger notices on the device

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

Before switching on the device, remove any faults that could compromise safety.

Your personal safety is at stake!

Utilisation for intended purpose



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

The device is intended exclusively for the welding process described in the operating instructions.

Any use above and beyond this purpose is deemed improper. The manufacturer shall not be liable for any damage resulting from such improper use.

Utilisation in accordance with the "intended purpose" also includes

- reading carefully and following all operating instructions to the letter
- studying and obeying all safety and danger notices carefully
- performing all stipulated inspection and servicing work.

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.

Fronius accepts no liability for inadequate or incorrect results.

Environmental conditions



Operation and/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 liable for any damage resulting from such improper use.

Ambient temperature:

- during operation: -10 °C to + 40 °C (14 °F to 104 °F)
- during transport and storage: - 25 °C to + 55 °C (-13 °F to 131 °F)

Relative humidity:

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

Ambient air: free from dust, acids, corrosive gases and substances, etc.

For use at altitudes above sea level: up to 2000 m (6500 ft)

Obligations of the operator



The operator undertakes to allow only such people to work with the device who:

- are familiar with the fundamental instructions regarding safety and accident prevention, and have been instructed how to use the device
- have read and understood the "Safety rules" section and warning notices in these operating instructions, and then signed them to confirm this
- are trained to produce the required results.

The safe working of personnel must be checked at regular intervals.

Obligations of personnel



Before using the device, all persons instructed to do so undertake:

- to wear personal safety equipment and to use it correctly
- follow the basic instructions regarding safety at work and accident prevention
- to read the "Safety rules" section and warning notices in these operating instructions, and sign them to confirm that they have understood them and will follow them.

Before leaving the work area, ensure that no-one or nothing can come to any harm in your absence.

Protecting yourself and others



Persons involved with welding exposes themselves to numerous risks, e.g.:

- flying sparks and hot pieces of metal
- light from the arc, which can damage eyes and skin



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



- risk of electrocution from mains current and welding current



- greater noise pollution



- harmful welding smoke and gases

Anyone working on the workpiece whilst welding is taking place 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 safety visor.
- wear solid footwear that provides insulation even in wet conditions
- protect the hands with suitable gloves (electrically insulated and providing protection against heat).



Insulated ear protection should be worn 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, inhaling welding fumes, noise, possible danger from mains or welding current, etc),
- provide suitable protective equipment or
- erect suitable safety screens/curtains.

Danger from toxic gases and vapours



The fumes produced during welding contain harmful gases and vapours.

This smoke contains substances which 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.

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

If there is any doubt about whether the extraction system is powerful enough, then the measured toxic emission values should be compared with the permissible limit values.

The following components are responsible, amongst other things, 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 (35 ft) 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 which 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 life-threatening and can be fatal.

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



During MIG/MAG or TIG welding, the welding wire, the wirespool, the drive rollers and all metal parts that are in contact with the welding wire are live.

Always set the wire-feed unit up on a sufficiently insulated surface or use a suitable, insulated wire-feed unit mount.

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 complete, undamaged, insulated and adequately dimensioned. Loose connections, scorched, damaged or inadequately dimensioned cables and leads must be repaired/replaced immediately .

Do not sling cables or leads either 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 be touched when current is flowing.

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

Arrange for the mains and device supply to be checked regularly by a qualified electrician to ensure the PE conductor is functioning properly.

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

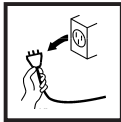
If the device is operated on a mains without a PE conductor and in a socket without an earth contact, this will be deemed to be gross negligence. The manufacturer shall not be liable for any damage resulting from such improper use.

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

Switch off unused devices.

Wear a safety harness if working at height.

Risks from mains current and welding current
(continued)



Before working on the device, switch it off and disconnect it from the mains supply.
Attach a clearly legible and easy-to-understand warning sign to the device to prevent anyone from reconnecting it to the mains 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 cannot be avoided, appoint a second person to switch off the main switch at the right moment.

EMC measures



It is the operator's responsibility to ensure that no electromagnetic interference occurs in electrical and electronic devices



If electromagnetic interference is detected, the operator is obliged to take action to rectify the situation.

Check for possible problems, and check and evaluate neighbouring devices' resistance to interference according to national and international requirements:

- Safety features
- power, signal and data transfer lines
- computer and telecommunications devices
- measuring and calibrating devices
- other persons' health, e.g. wearers of pacemakers and hearing aids
- those with pacemakers must seek advice from their doctor before approaching the device or any welding that is in progress

Electromagnetic fields may pose as yet unknown risks to health.

Supporting measures for avoidance of EMC problems:

- a) Mains supply
 - if electromagnetic interference arises despite correct mains connection, additional measures are necessary (e.g. use a suitable line filter).
- b) Welding leads
 - keep leads as short as possible
 - allow them to run closely together
 - kept well apart from other leads
- c) Equipotential bonding
- d) Earthing the workpiece
 - if necessary, establish an earth connection using suitable capacitors.
- e) Shield, if necessary
 - shield off other nearby devices
 - screen off entire welding installation

Specific areas of risk



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

- Fans
- Cogs
- Rollers
- Shafts
- Wirespools and welding wire
- Pneumatic equipment

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

Work environment:

The operator alone is responsible for the work environment, e.g. wearing eye protection when welding, extraction of gases and vapours, and enclosing the machine and/or the workstation (if not already integrated into the machine).

The operator alone is responsible for:

- connecting the machine to the existing layout
- enclosing the machine
- wearing eye protection when welding
- ensuring gases and vapours are extracted
- ensuring that workers are wearing personal protective equipment while welding

Fronius accepts no liability for accidents or injuries arising from failure to observe these points.


During operation:

- Ensure that all covers are closed and all side panels are fitted properly.
- Keep all covers and side panels closed.
- While machines are running, never reach into openings, holes and slots.
- When machines are moving/rotating, take care that parts of the body are not caught, pulled in, trapped, crushed, etc.
- Observe the mechanical loading of the device, otherwise there is a risk of dangerous fractures that will impair the stability of the device.



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



Devices that are to be used in rooms/areas with increased electric risk (e.g. near boilers) must carry the  Safety sign.

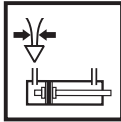


Use only suitable load-carrying equipment when transporting devices by crane.

- Attach chains and/or ropes to the suspension points provided on the load-carrying equipment.
- Chains/ropes must be at the smallest angle possible to the vertical.

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, fork-lift or other mechanical hoist.

Pneumatic equipment



On welding machines with integral pneumatic equipment, observe the following:

- The maximum operating pressure of the pneumatic system of 8 bar may not be exceeded, unless other operating pressure values are specified in the operating instructions.
- Fluctuations in compressed air result in erratic operation of the device.
- Contaminated compressed air shortens the service life of pneumatic components. A maintenance list for pneumatic components has therefore been included in the operating instructions.
- Keep the ambient air free from: dust, acids, corrosive gases or substances.
- Only dismantle the cylinder and other pneumatic components with the assistance of Fronius-trained service personnel.
- When commissioning machines note that valves may have undefined switching positions. This may lead to uncontrolled movements. Maintain a safe distance.
- Switch off compressed air when working on the pneumatic system. Vent the entire system and prevent it from being switched on again.

Safety measures at the installation location and during transport



A device that topples over can easily kill someone. Place the device on a solid, level surface in such a way that it remains stable



Special regulations apply in rooms at risk of fire or explosion. Observe the applicable 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.

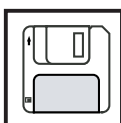
When setting up the device, ensure there is a clearance of 0.5 m (1.6 ft.) all round so that cooling air can enter and exit unhindered.

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 transportation.

Before transporting the device, unplug all cables and remove all components that are not built in (e.g. printers, keyboards, etc.).

After transporting the device, and before commissioning, you **MUST** carry out a visual inspection to check whether it has been damaged in any way. Any damage must be repaired by Fronius-trained service personnel before commissioning takes place.

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.

Safety measures in normal operation



Only operate the device when all protection devices are fully functional. If the protection 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 protection 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.

Maintenance and repair



It is impossible to guarantee that bought-in parts are designed and manufactured to meet the demands made on them, or that they satisfy safety requirements. Use only original replacement and wearing parts (also applies to standard parts).

- Only trained experts may change parts and may only do so after having read the supplied installation and dismantling instructions.
- Components that are not in perfect condition must be changed immediately.
- When ordering, provide the exact description and item number according to the spare parts list, as well as the serial number of your device.

Do not carry out and changes, installations or conversions to the device without the manufacturer's permission.

Safety inspection



Emergency Stop protective equipment:

The EMERGENCY STOP protective feature must be checked once a week to ensure it is functioning correctly. The only exception to this is if a different inspection frequency is called for in the operating instructions of the device or relevant system configuration.

The operator is obliged to carry out a safety inspection of the device at least once every 12 months.

A safety inspection must 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.

For further details on safety inspections, contact your local Fronius service centre. They will provide you on request with any documents you may require.

Disposal



Do not dispose of this device with normal domestic waste!

To comply with the European Directive 2002/96/EC on Waste Electrical and Electronic Equipment and its implementation as national law, electrical equipment that has reached the end of its life must be collected separately and returned to an approved recycling facility. Any device that you no longer require must be returned to your dealer, or find out about the approved collection and recycling facilities in your area.

Ignoring this European Directive may have potentially adverse effects on the environment and your health!

Safety symbols



Devices with the CE marking satisfy the essential requirements of the low-voltage and electromagnetic compatibility directives.



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

General

Device concept



FRC-60 remote control

The FRC-60 remote control is a system component and is used to operate the powered FTU 900-500, 900-1000, 1200-1000 and 1600-1500 tripod units.

The system performs mechanised lengthwise seam and overlay welding. The remote control is connected to the tripod unit using a flanged plug connector. The device can also be used in harsh environments owing to its robust design, stable aluminium frame and powder coating of all housing components. The FRC-60 remote control is equipped with a digital display and thus allows continuous monitoring of the traversing speed in real time.

Proper use

The FRC-60 remote control should only be used for remotely operating and presetting the powered FTU 900-500, 900-1000, 1200-1000 and 1600-1500 tripod units. Any use above and beyond this purpose is deemed improper. The manufacturer shall not be liable for any damage resulting from such improper use.

The device can be used for:

- Remote control of welding axis ... for performing mechanised lengthwise seam welds
- Remote control of offset welding axis ... for performing overlay welding

Can be used in the following welding processes:

- MIG/MAG process
- CMT process
- TIG process

Proper use includes:

- following all the information in the operating instructions
- using the spare parts stipulated by Fronius
- using this document in combination with the operating instructions for the integrated system components (tripod unit, power source, wire-feed unit, etc.)

Standard equipment

The FRC-60 remote control is equipped with the following as standard:

- connected to the remote control: 1 remote control cable, 17-pin, 3 m, incl. flanged plug with union nut
- attached to the remote control: remote control holder

Options

Designation	Item no.
Remote control holder (designed for wall mounting or for mounting on the vertical column of the tripod unit)	BP8,0604,000
3 m adapter cable (cable for connecting the FTU control box to the power source)	38,0100,0018
Installation kit for the FTU offset axis (only in combination with 8,100,151)	8,100,152

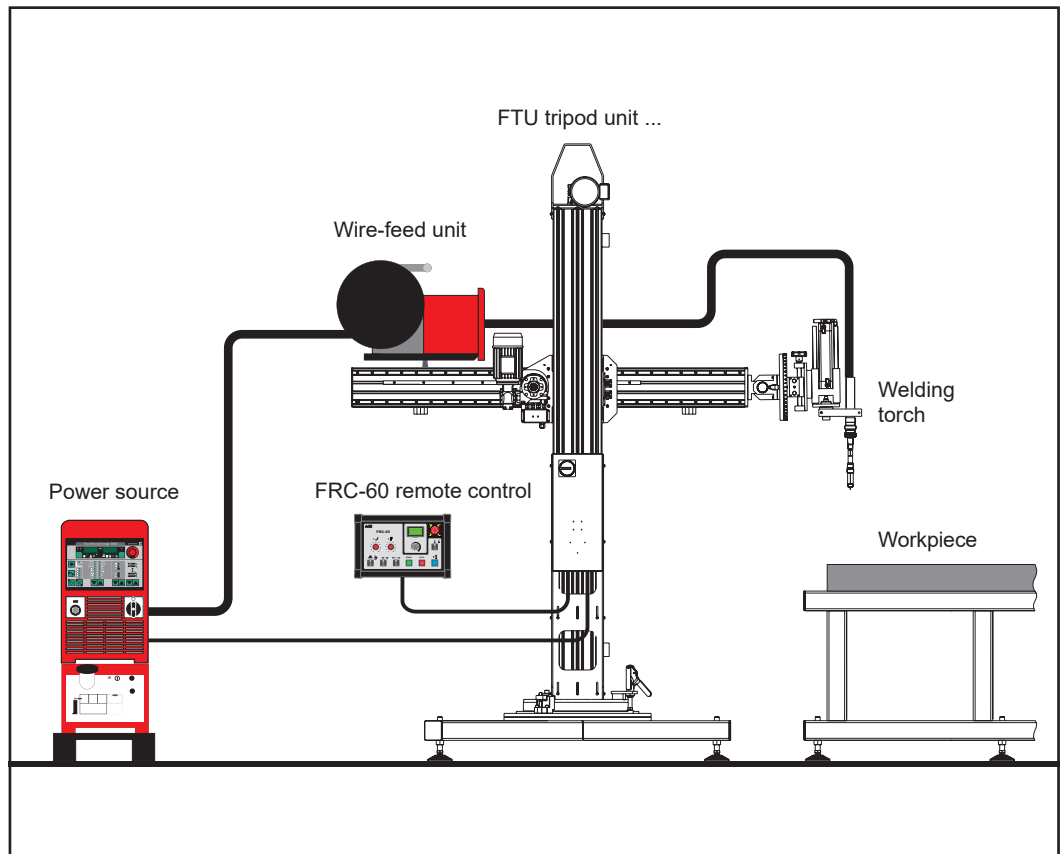
System descriptions

General

The illustrations below show the FRC-60 remote control connected up to commonly-used components. Two separate applications are represented.

"Welding axis" application

In this application the remote control is used to activate a mechanised lengthwise seam weld. This is done with the workpiece in either a horizontal or vertical position. The welding path is set by means of adjustable limit positions on the tripod unit. The remote control positions the welding torch in relation to the workpiece by means of a motor, and the welding process then begins. Welding finishes when the limit position on the tripod unit is reached.

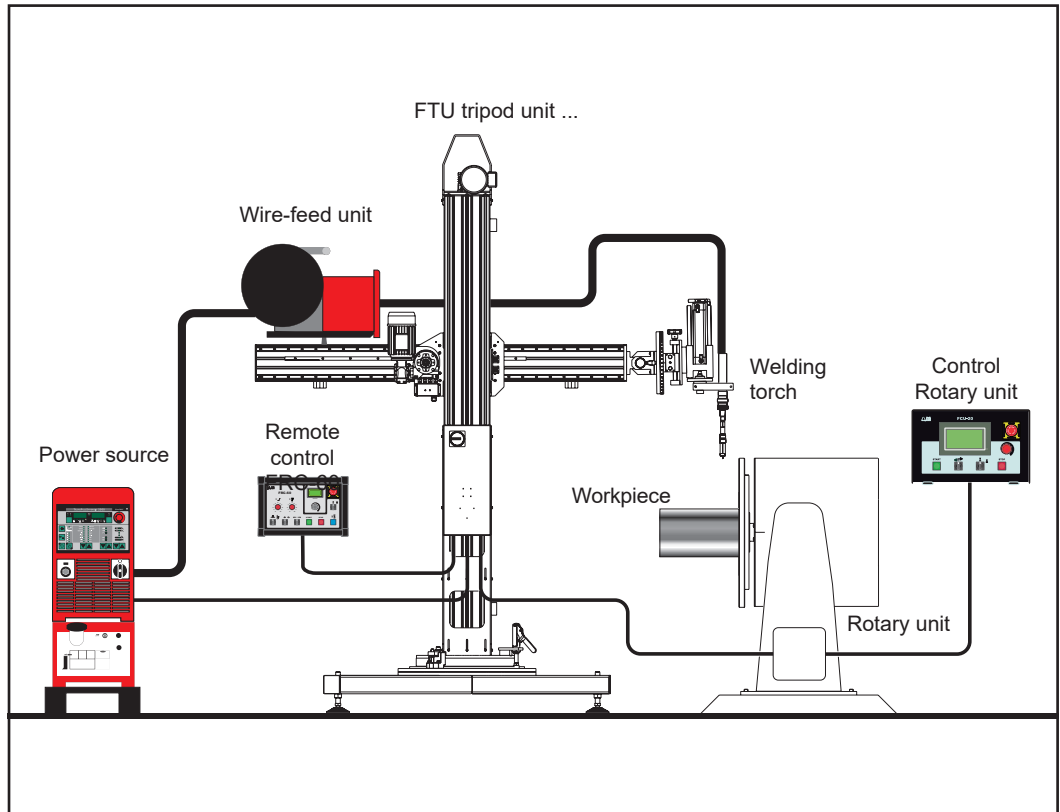


Use as a welding axis

"Offset welding axis" application

This application involves mechanised overlay welding on pipes. The FRC-60 remote control works alongside a higher-level rotary unit controller. Its function is to preset the parameters on the tripod unit. Welding is performed with the workpiece in either a horizontal or vertical position. The welding path is set by means of adjustable limit positions on the tripod unit.

The FRC-60 remote control positions the welding torch relative to the workpiece by means of a motor. Overlay welding is started by the rotary unit controller. For each complete revolution the welding torch is shifted by 1 step. The direction and duration of the offset is defined on the remote control. Welding finishes when the limit position is reached.



"Offset welding axis" application

Control elements and connections

Safety



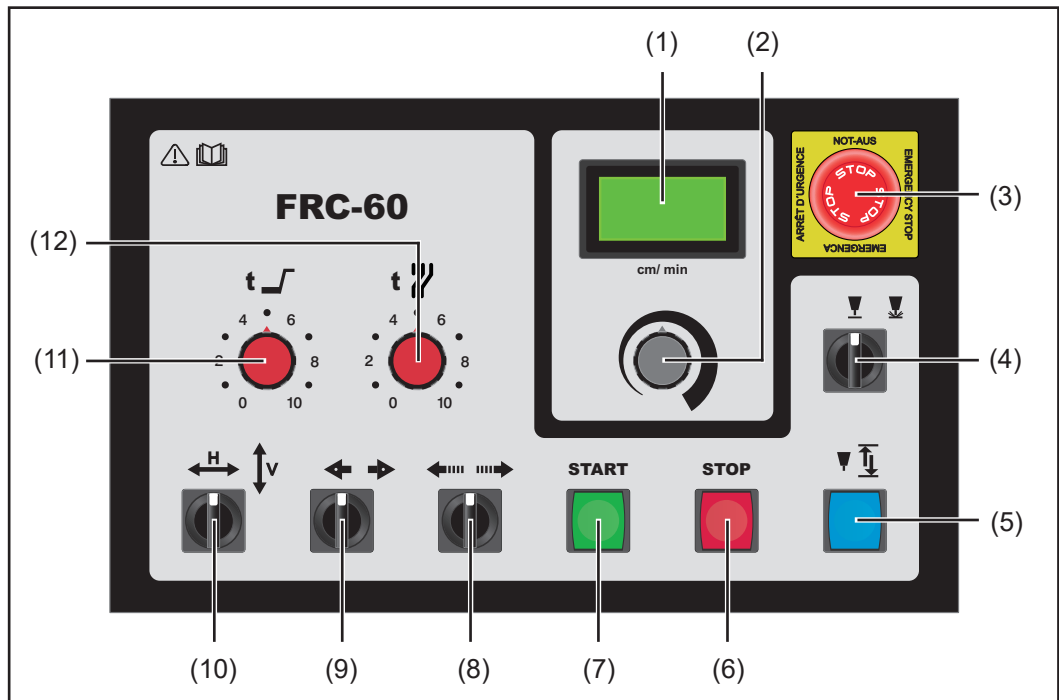
WARNING!

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 operating instructions for the system components

FRC-60 remote control, front view



FRC-60 control panel

(1) Traverse speed digital indicator

... indicates the current traverse speed of the tripod unit in cm/min. The digital display has green background lighting which is permanently on.

Display unit: cm/ min

Display range: 0.0 - 99.9

(2) Traverse speed potentiometer

... for setting the traverse speed on the tripod unit. This can also be changed while the unit is in motion.

(3) Emergency Stop button

... deactivates the control voltage, stops all tripod unit movements and prevents restarting. The power source arc is broken immediately. All controls are disabled during an emergency stop.

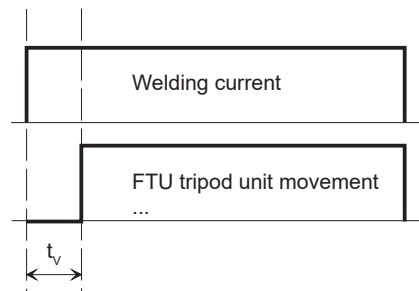


NOTE! The EMERGENCY STOP safety equipment must be checked each time before starting work to ensure it is functioning correctly.

(4) Welding ON/OFF selector switch

... For choosing whether to run the welding sequence with or without welding. This can be done without welding for test purposes.

-
- (5) Pneumatic system on/off button**
... in order for a pneumatic unit to raise or lower the torch (pneumatic torch lowering). The button will be lit when this function is activated.
Important! Press "Stop" button when welding torch is lowered to preselect the welding process. The welding torch is raised and selected for the start of the welding process.
-
- (6) Stop button**
... for stopping a welding process. The welding process can be continued by pressing the "Start" button.
-
- (7) Start button**
... for starting or continuing a welding process.
-
- (8) Manual Move button**
... for precision manual positioning. If this button is held down in one direction for longer than three seconds, it automatically switches to high speed mode.
-
- (9) Traverse direction selector switch**
... for specifying the traverse direction for the selected axis.
-
- (10) H/V axis selector switch**
... for switching the horizontal/vertical axes. Switching to the other axis can even be done while the torch is moving.
-
- (11) Start-up delay potentiometer**



... for setting the time between arc ignition and the start of welding movement (FTU tripod unit ...).

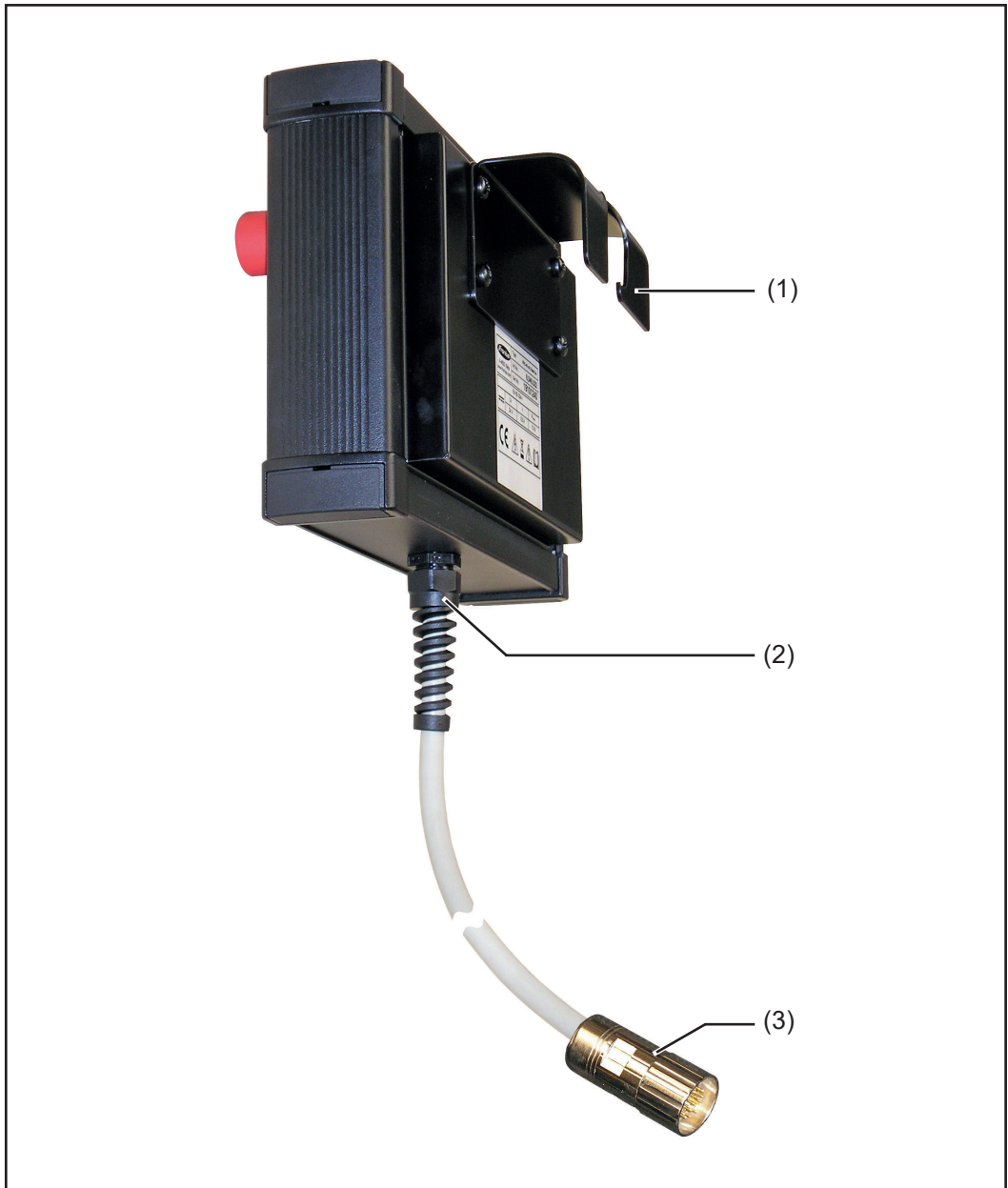
Unit: 0.5 s

Setting range: 0 - 10

t_v ...Start-up delay

-
- (12) Offset potentiometer**
... for setting offset time on the tripod unit. When overlay welding, for each complete revolution of the rotary unit, the welding torch is switched to the specified direction for the specified length of time. This can also be changed while the unit is in motion.
- Unit: 0.5 s
Setting range: 0 - 10
-

FRC-60 remote control, rear view



FRC-60 rear view

(1) remote control holder

... for attaching the remote control to the remote control holder on the tripod.

(2) Cable gland

... Cable gland with strain relief device and anti-kink protection.

(3) Connecting plug with cable

... for connecting to the tripod unit control box.

Commissioning

Safety



WARNING!

Risk of injury or damage if the equipment is operated incorrectly. Do not use the functions described until you have thoroughly read and understood the following documents:

- these operating instructions
- all operating instructions for the system components

Checking the connections

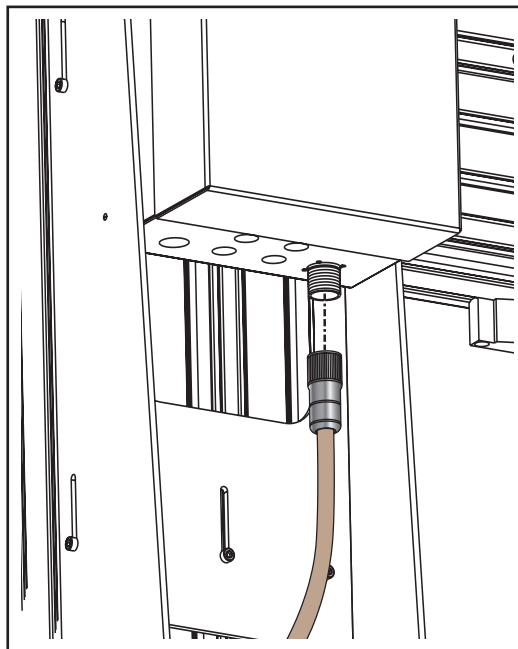
The following activities and work steps apply to the installed system. All connections must be established.

Check the connections to the following system components before commissioning:

- Tripod unit
- Power source
- Cooling circuit
- Gas cylinder
- Wire-feed unit
- Welding torch with hosepack
- Rotary unit (when using offset welding axis)
- Rotary unit controller (when using offset welding axis)

Precise information on the assembly and connection of the system components can be found in the relevant system component operating instructions.

Connecting the remote control



Connect the FRC-60

Important! The connection socket for the FRC-60 remote control is located on the underside of the tripod unit control box.

1. Connect the remote control plug to the connecting socket on the tripod unit control box.
2. Tighten the union nut by hand to fix the torch in place

Switch on system components



WARNING!

Danger of injury when welding torch moves downwards.

When a pneumatic torch lowering unit is used, the torch is lowered when the "Pneumatic ON/OFF" button is actuated. Hands can be crushed or otherwise injured.

- Avoid contact with the torch lowering unit
- Before switching on, make sure that the "Pneumatic ON/OFF" button on the FRC-60 remote control is unlocked.

Important! There are no fixed rules for the sequence in which the system components are switched on. They can be switched on in any order.

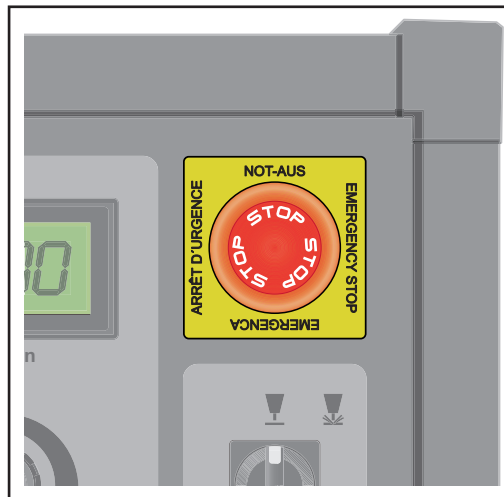
Turn the main switch to the "1" position (ON) on the following system components:

- Tripod unit control box
- Power source
- Wire-feed unit (if power is not supplied from the power source)
- Rotary unit controller (when using offset welding axis)

Checking the EMERGENCY STOP safety equipment



NOTE! The EMERGENCY safety equipment must be checked each time before starting work to ensure it is functioning correctly.



Emergency Stop button

1. Press the EMERGENCY STOP button on the FRC-60 remote control.
2. Check the following points:
 - Control voltage on the tripod unit control is deactivated
 - All other control elements on the remote control are deactivated
 - All movements have stopped
 - Any active arc is immediately broken
 - Compressed air supply is switched off

Positioning the welding torch



NOTE! The workpiece must be aligned and located in its welding position. You should check this before positioning the torch.

Use the FRC-60 remote control for the positioning operation:

1. Configure the following tripod unit settings:
 - Traverse axis
 - Traverse direction
 - Traverse speed
2. Press the MANUAL MOVE button and move the welding torch to the workpiece.

Important! If the button is held down for longer than three seconds then the torch will switch over to high speed. This high speed is preset by the system and cannot be altered.

Positioning the welding torch (continued)

3. Switch over the "H/V axis" selector switch. The opposite axis will now be activated.
4. Press the MANUAL MOVE button and continue the positioning process.
Continue positioning the welding torch using the respective axes until it is correctly positioned.

Lowering and setting up the welding torch



WARNING!

Danger of injury when welding torch moves downwards.

Hands can be crushed or otherwise injured.
Avoid contact with the torch lowering unit



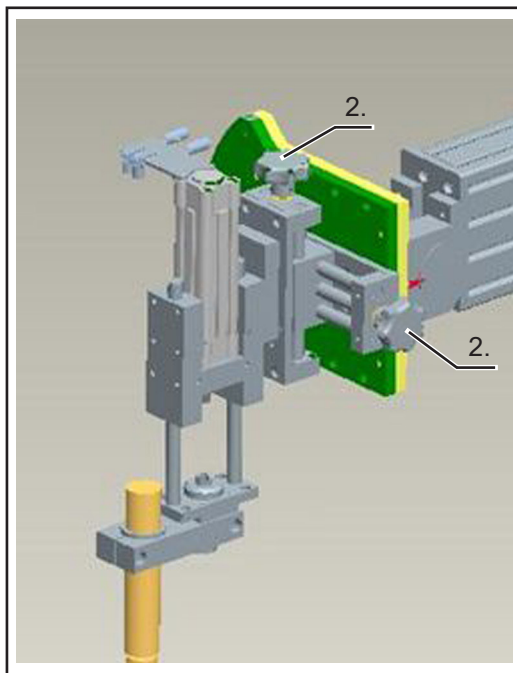
CAUTION!

Danger of the welding torch colliding with the workpiece.

If the torch is not moved back far enough it may collide with the workpiece.

- Before lowering the welding torch, first make sure that it is positioned far enough back.
- Bear in mind the extension stroke of the torch lowering unit being used.

1. Press the "Pneumatic" button. Welding torch is lowered.



Setting up the welding torch

2. Turn the adjusting dial on the relevant mechanical adjustment unit (FGU, FSU) until the correct welding torch position is reached.

3. Press Stop button. The welding torch is raised slightly and the torch lowering unit is selected for the welding process.

Loading a welding program

Load the relevant welding program on the control panel for the power source. More detailed information on managing welding programs can be found in the operating instructions for the power source.

Important! When an analogue power source is used, the requisite welding parameters must be set manually on the power source.

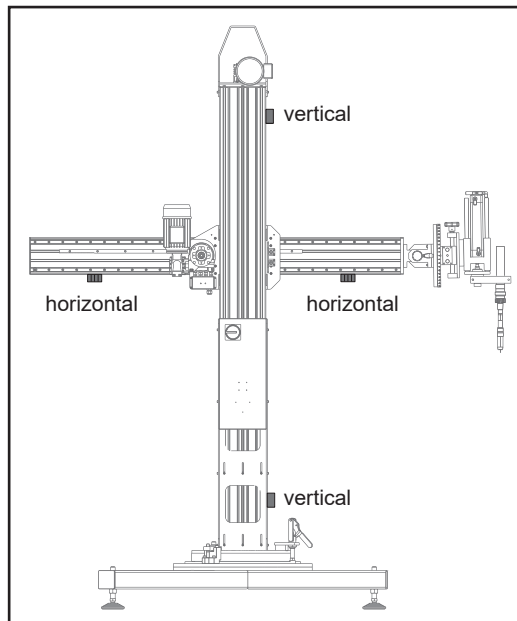
Information about the welding programs: A relevant welding program should be created for each workpiece. This contains a list of welding parameters that is saved under a specific program number (JOB number). These programs can be reloaded at any time, and corrected as required. The programs are managed from the power source control panel.

Defining parameters for the tripod unit

The following parameters should be defined on the FRC-60 remote control for the welding process:

- Traverse axis
- Traverse direction
- Traverse speed
- Start-up delay
- Offset (when using offset welding axis)
- Pneumatic ON/OFF
- Welding ON/OFF

Set up the welding path on the tripod unit according to the length or height of the workpiece. Reposition the vertical or horizontal contact cams depending on the welding direction.



Contact cams on the tripod unit

Important! Each contact cam is secured with two size 5 cheese-head screws fitted on the inside.

1. Undo the cheese-head screws using a hollow hexagon wrench
2. Move the contact cam to the desired position
3. Tighten the cheese-head screws

Carrying out a test run

Perform a test run to check that all system components work together correctly. This is carried out without an arc and thus allows every movement to be checked:



WARNING!

Risk of injury from moving machine parts.

The moving tripod unit or rotating rotary unit can cause serious injuries if body parts are snagged by machine parts.

- Ensure there is no-one in the danger area of the machine before starting the procedure
- Avoid contact with these machine parts

1. Turn the Welding ON/OFF selector switch to OFF
2. Press START button on FRC-60 remote control. To stop the process early press the STOP button.

Important! If an offset welding axis is used, start the test run by pressing the START button on the rotary unit controller.

3. Carry out a visual check during the test run
4. If required, make any corrections (welding torch position, workpiece, contact cam, etc.)

Starting the welding process



WARNING!

Risk of injury from moving machine parts.

The moving tripod unit or rotating rotary unit can cause serious injuries if body parts are snagged by machine parts.

- Ensure there is no-one in the danger area of the machine before starting the procedure
- Avoid contact with these machine parts

Start the welding process:

1. Turn the Welding ON/OFF selector switch to ON
2. Press START button on FRC-60 remote control. To stop the process early press the STOP button.

Important! If an offset welding axis is used, start the welding process by pressing the START button on the rotary unit controller.

The welding process stops automatically once the relevant contact cam is reached.

Troubleshooting

General

In the event of faults, note that the function of the entire system depends on many additional components that are also potential sources of problems.



NOTE! Repairs may only be carried out by qualified experts or by Fronius service personnel.

Safety

WARNING!



An electric shock can be fatal.

Before opening the unit

1. Switch the device mains switch to the "O" position
2. Unplug the device from the mains
3. Put up an easy-to-understand warning sign to stop anybody inadvertently switching it back on again



WARNING!

Failure to connect a correctly-dimensioned earth lead may result in serious injury or damage.

The housing screws provide an adequate PE conductor connection for earthing the housing.

They must NOT be replaced by any other screws that do not provide a reliable PE conductor connection.

Basic requirements for the system to work

- Connections established between separate system components
- System components are supplied with electricity and the mains voltage for each component complies with the rating plate
- Pneumatic system is supplied with compressed air at the correct pressure (see tripod unit rating plate)

Possible errors in "Welding axis" application

No movements possible

All control elements on the remote control are inoperative, digital traverse speed indicator is dark

Cause: no connection to the tripod unit

Remedy: check connecting lead and control box connection - union nut must be securely tightened

Cause: no power supply or tripod unit control box switched off

Remedy: check mains connection, check circuit breaker (13 A), switch on tripod unit control box

Cause: the Emergency Stop protection feature of the FRC-60 remote control was activated because of an emergency

Remedy: rectify emergency stop situation and reset emergency stop button

Possible errors in "Welding axis" application
(continued)

Tripod unit moves but arc does not ignite

After the START button is pressed, the tripod unit carries out the welding movement but the arc does not ignite

- Cause: welding is deactivated (test mode)
Remedy: Turn the Welding ON/OFF selector switch to ON
- Cause: no start signal on the power source
Remedy: check control line to power source
- Cause: fault on the power source - error message on display
Remedy: address the error message that is displayed - see power source operating instructions
- Cause: special function activated on the power source
Remedy: select normal mode

Arc ignites but tripod unit does not move

After the START button is pressed, the arc ignites but the tripod unit does not move

- Cause: "Start-up delay" setting too high
Remedy: use potentiometer to adjust the start-up delay setting
- Cause: frequency inverter malfunction
Remedy: 1. Switch off control box
2. Wait 15 seconds
3. Switch control box back on

Possible errors in "Offset welding axis" application

No offset movement

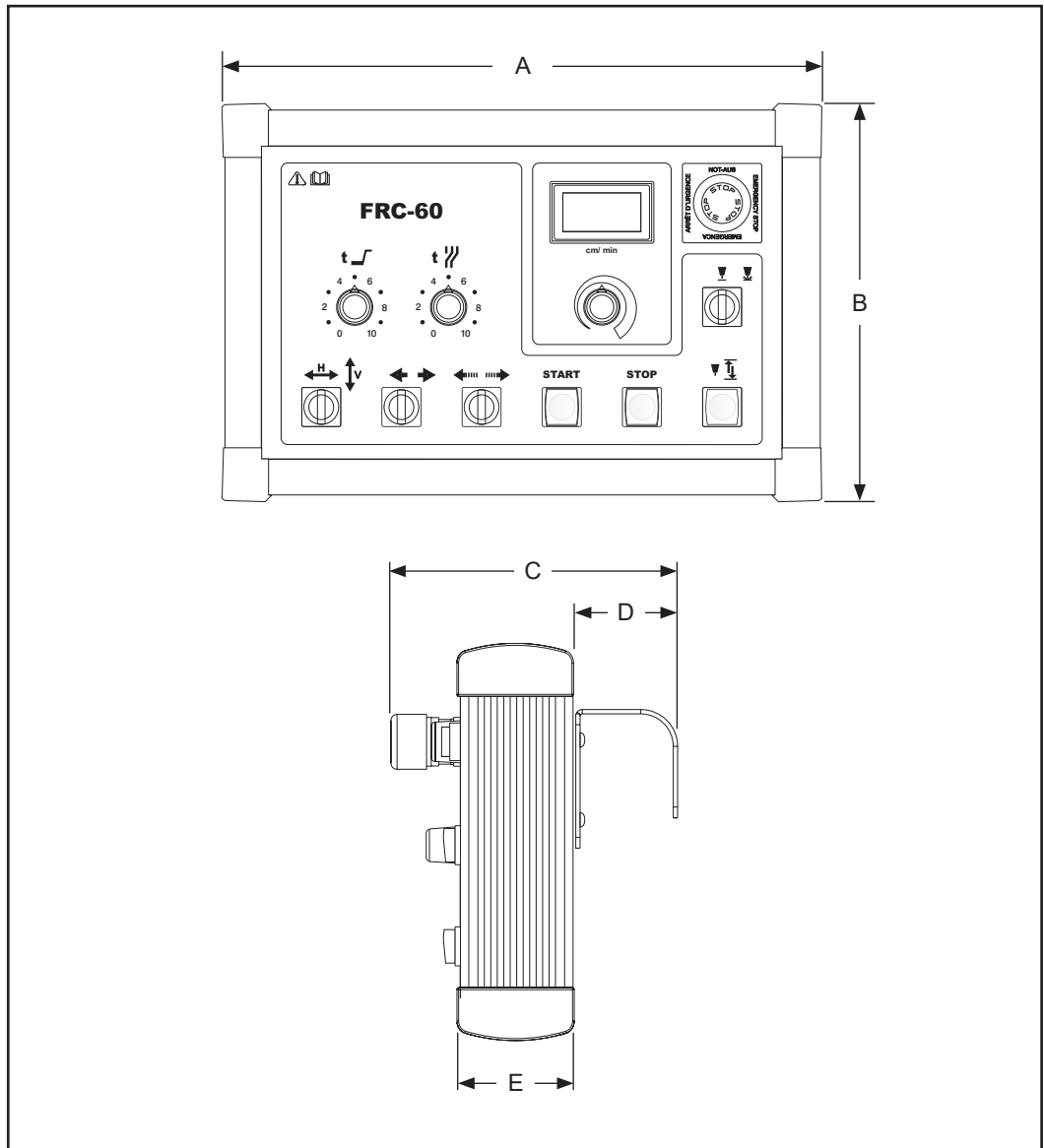
Welding torch not offset at the end of the entire revolution

- Cause: offset time or traverse speed of torch too low
Remedy: use appropriate potentiometer to adjust the setting
- Cause: Emergency Stop protection device activated
Remedy: rectify emergency stop situation and reset emergency stop button
- Cause: limit position reached on tripod unit
Remedy: move away from or correct limit position
- Cause: no offset signal from rotary unit - limit switch for 360° damaged or cam moved
Remedy: replace limit switch or adjust cam position
-

Technical data

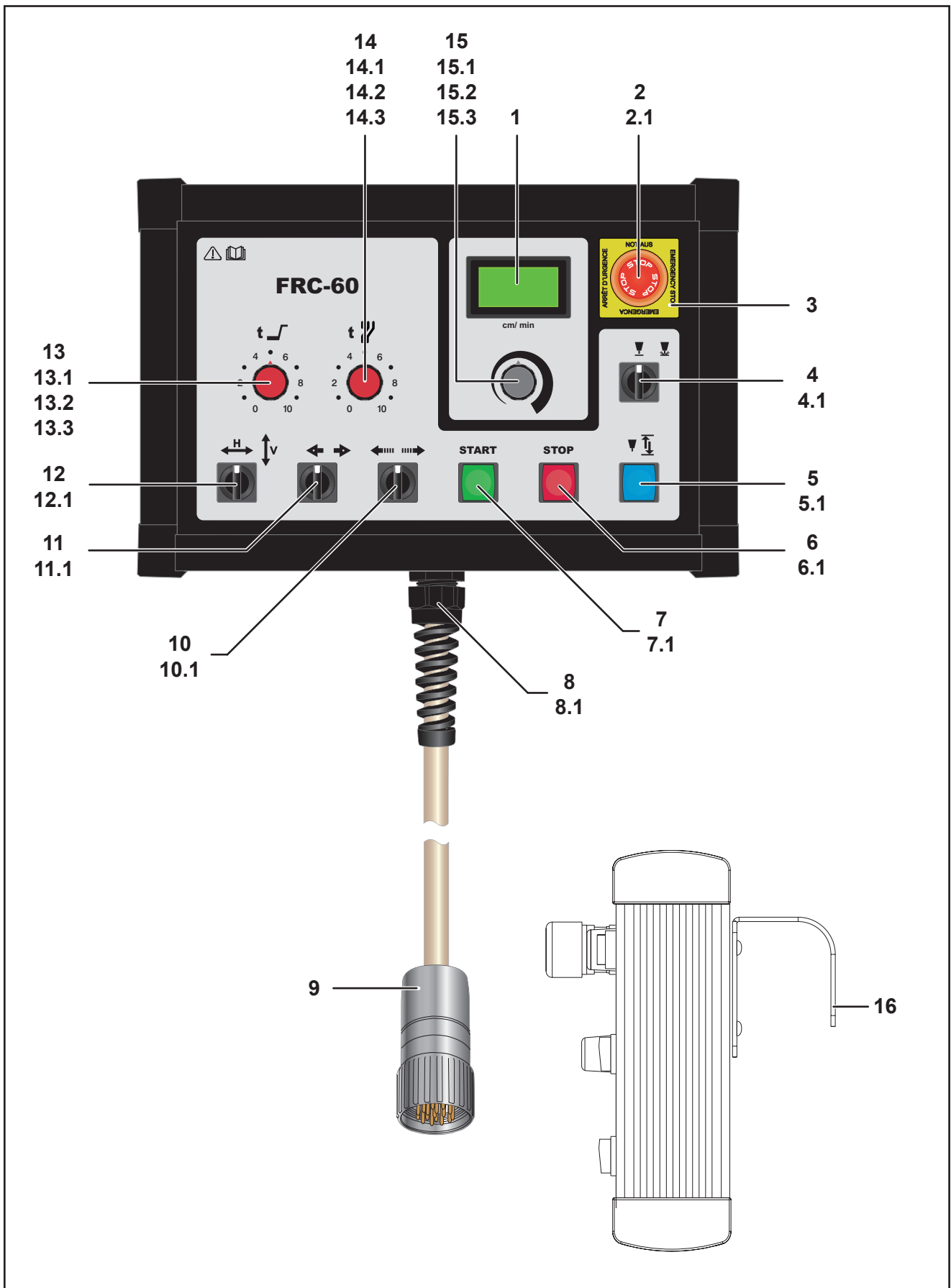
FRC-60 technical data

Supply voltage	24 V DC voltage
Current input	200 mA
Power consumption	5 VA
Housing components	Aluminium
Colour	powder coating, black
Dimensions	
A	280 mm
B	185 mm
C	145 mm
D	65 mm
E	55 mm
Weight	2 kg
Connecting cable length	3 m
No. of pins on connecting plug	17
Suitable types of tripod unit	FTU 900-500 FTU 900-1000 FTU 1200-1000 FTU 1600-1500



FRC-60 remote control, dimensions

Spare parts overview



Spare parts for FRC-60 remote control

Ordering details



NOTE! Only trained technicians may change parts and may only do so after having read the installation and dismantling instructions supplied.

When ordering spare parts for the FRC-60 remote control you should provide the following data:

- Exact designation of the spare part
- Associated item number as per spare parts list
- Model name of the device
- Serial number (shown on the rating plate)

Spare parts list

Item	Designation	Number	Item no.
	FRC-60 with 3 m cable	1	8,045,128
1	Traverse speed digital indicator	1	38,0102,0019
2	Emergency Stop button	1	38,0002,0056
2.1	N.C. contact element	2	38,0002,0091
3	Emergency Stop adhesive labels	1	38,0002,0060
4	Welding ON/OFF selector switch	1	38,0002,0095
4.1	N.O. contact element	1	38,0002,0090
5	Pneumatic system ON/OFF button	1	38,0002,0094
5.1	N.O. contact element	1	38,0002,0090
6	Stop button	1	38,0002,0093
6.1	N.O. contact element	1	38,0002,0090
7	Start button	1	38,0002,0092
7.1	N.O. contact element	1	38,0002,0090
8	Cable gland	1	42,0407,0481
8.1	Lock nut	1	38,0004,0047
9	Connecting plug with cable	1	38,0100,0201
10	Manual Move button	1	38,0002,0097
10.1	N.O. contact element	2	38,0002,0090
11	Traverse direction selector switch	1	38,0002,0095
11.1	N.O. contact element	1	38,0002,0090
12	H/V axis selector switch	1	38,0002,0095
12.1	N.O. contact element	1	38,0002,0090
13	Start-up delay potentiometer	1	41,0001,0481
13.1	Adjusting knob	1	42,0406,0099
13.2	Pointer dial	1	42,0406,0109
13.3	Cover	1	42,0406,0213
14	Offset potentiometer	1	41,0001,0481
14.1	Adjusting knob	1	42,0406,0099
14.2	Pointer dial	1	42,0406,0109
14.3	Cover	1	42,0406,0213
15	Traverse speed potentiometer	1	41,0001,0586
15.1	Adjusting knob	1	42,0406,0099
15.2	Pointer dial	1	42,0406,0139
15.3	Cover	1	42,0406,0107
16	Remote control holder	1	BE58,0355,0308

Circuit diagrams

1 2 3 4 5 6 7 8

Project : FRC-60
 Order : 8,046,027
 Customer : Referenz
 Drawn by : NH
 Date : 27.10.13
 CAD Version : ECSCAD 2013

Only qualified personnel is authorized to install, start up, repair or service the units.

Perform electrical installation according to the pertinent regulations (e.g. line cross sections, fusing, protective conductor connection).

wiring colours

mains voltage :
 N :
 PE :
 Control voltage AC :
 Control voltage DC :
 External voltage :
 analogue voltage :

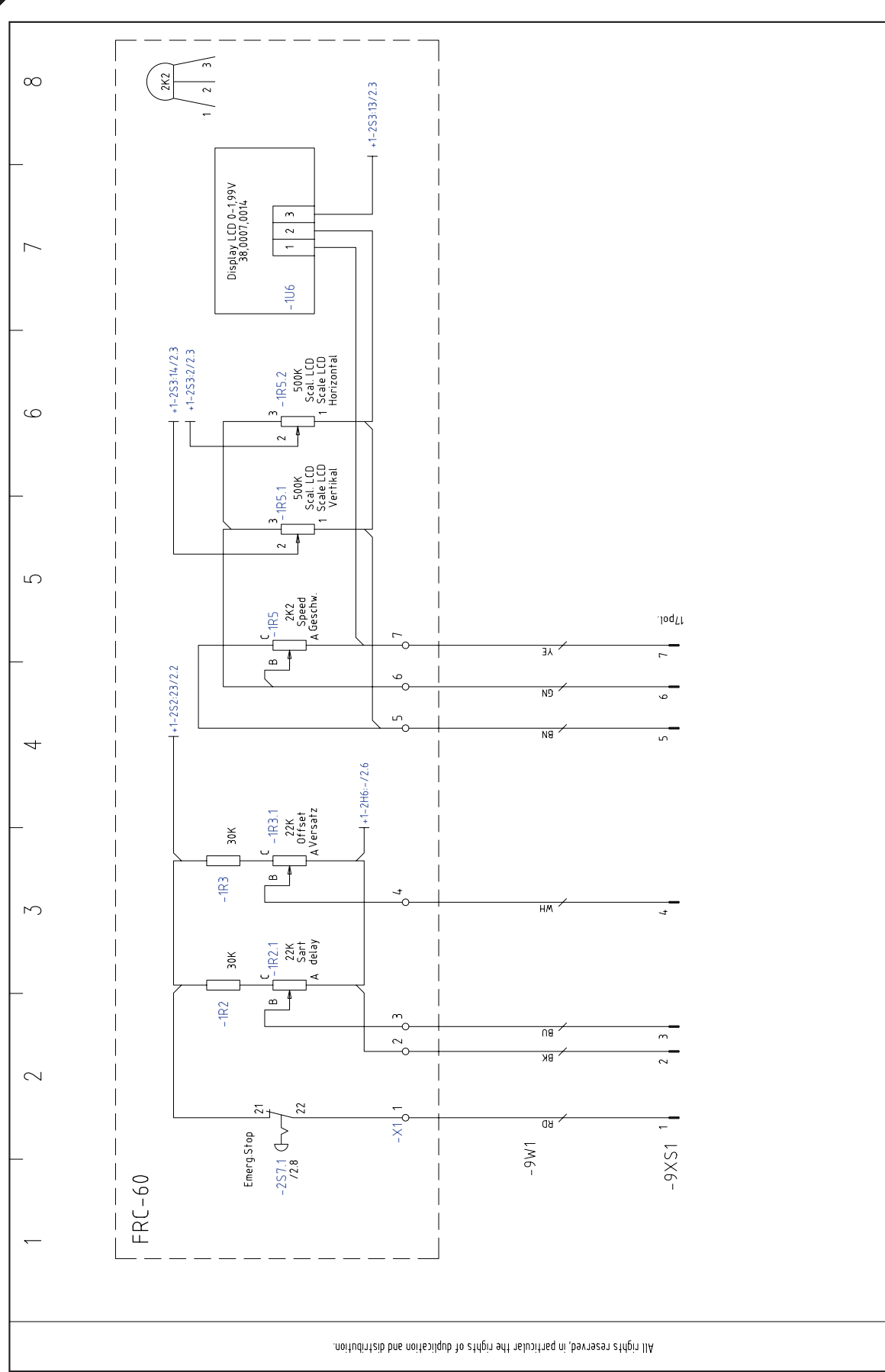
Power supply connection :
 Control voltage :

- PE
- PE+N
- PEN
- Transformer
- Transformer + Rectifier
- directly picked off



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Revision	Sheet	Name	Sheet	Name	Description	Cover
a					FRC-60	+ 1
b	Drawer	27.10.13	NH		Order	
c	Checker	27.10.13	NH		8,046,027	Customer Referenz
d						Sheet 1
						3
						Sh



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Revision	Date	Name	Date	Name
a				
b				
c				
d				

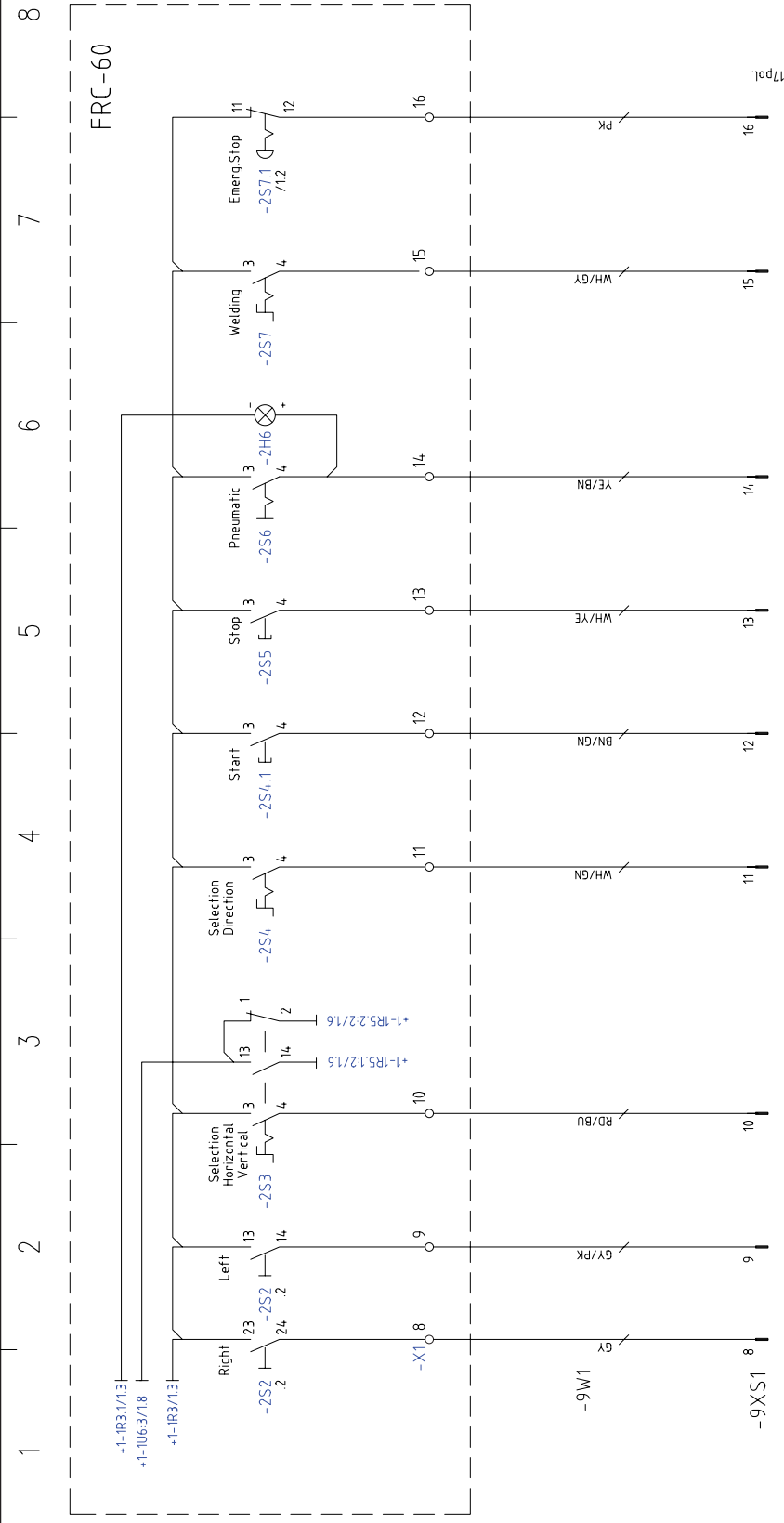
Drawer	27.10.13	NH
Checker	27.10.13	NH

FERNREGLER Remote Control		Description FRC-60	
		Order 8,046,027	
		Customer Referenz	

Sheet 1	1
Sheet 2	2
Sheet 3	3
Sheet 4	4
Sheet 5	5
Sheet 6	6
Sheet 7	7
Sheet 8	8



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Revision	Date	Name	Date	Name	Description	Order	Customer Reference	Sheet	Sh.
a			27.10.13	NH	FRC-60			1	1
b		Drawer	27.10.13	NH				2	
c		Checker	27.10.13	NH		8,046,027		2	
d									



EU-Declaration of conformity



EU-KONFORMITÄTSERKLÄRUNG 2016 EU-DECLARATION OF CONFORMITY 2016 DÉCLARATION UE DE CONFORMITÉ, 2016

Wels-Thalheim, 2016-04-20

Die Firma

Manufacturer

La compagnie

FRONIUS INTERNATIONAL GMBH

Froniusplatz 1, 4600 Wels

erklärt in alleiniger Verantwortung,
dass folgendes Produkt:

Hereby certifies on its sole
responsibility that the following
product:

se déclare seule responsable du fait
que le produit suivant:

FRC 60
Steuergerät

FRC 60
Control unit

FRC 60
Appareil de commande

auf das sich diese Erklärung
bezieht, mit folgenden Richtlinien
bzw. Normen übereinstimmt:

which is explicitly referred to by this
Declaration meet the following
directives and standard(s):

qui est l'objet de la présente
déclaration correspondent aux
suivantes directives et normes:

Richtlinie 2014/30/EU
Elektromag. Verträglichkeit

Directive 2014/30/EU
Electromag. compatibility

Directive 2014/30/UE
Électromag. Compatibilité

Richtlinie 2011/65/EU
RoHS

Directive 2011/65/EU
RoHS

Directive 2011/65/UE
RoHS

Europäische Normen inklusive
zutreffende Änderungen
EN 61000-6-2:2005
EN 61000-6-4:2007

European Standards including
relevant amendments
EN 61000-6-2:2005
EN 61000-6-4:2007

Normes européennes avec
amendements correspondants
EN 61000-6-2:2005
EN 61000-6-4:2007

Die oben genannte Firma hält
Dokumentationen als Nachweis der
Erfüllung der Sicherheitsziele und
die wesentlichen Schutzanforder-
ungen zur Einsicht bereit.

Documentation evidencing
conformity with the requirements of
the Directives is kept available for
inspection at the above
Manufacturer.

En tant que preuve de la satisfaction
des demandes de sécurité la
documentation peut être consultée
chez la compagnie susmentionnée.

Dokumentationsverantwortlicher:
(technische Dokumentation)

person responsible for documents:
(technical documents)

responsable documentation:
(technique documentation)

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CE 2016

ppa. Mag. Ing. H. Hackl
Member of Board
Chief Technology Officer



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