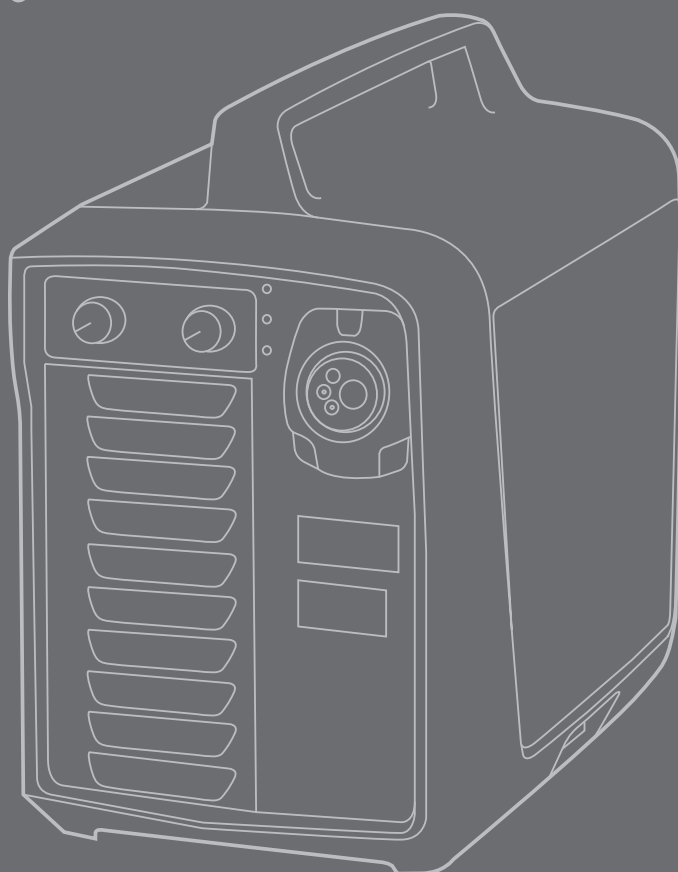


FitWeld

Evo 300



OPERATING MANUAL

English

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1. INTRODUCTION

1.1 General

Congratulations on choosing the FitWeld welding machine. Used correctly Kemppi welding machines can increase your productivity and provide years of economical service.

This user manual contains important information on the use, maintenance and safety of your Kemppi product. The technical specifications of the device can be found at the end of the manual. Please read the operating manual and the safety instructions booklet carefully before using the equipment for the first time. For your safety and that of your working environment, pay particular attention to the safety instructions in the manual.

For more information on Kemppi products, contact Kemppi Oy, consult an authorised Kemppi dealer, or visit the Kemppi Web site at www.kemppi.com.

The specifications presented in this manual are subject to change without prior notice.

NOTE! Items in the manual that require particular attention in order to minimise damage and personal harm are indicated with this symbol. Read these sections carefully and follow their instructions.

Disclaimer

While every effort has been made to ensure that the information contained in this guide is accurate and complete, no liability can be accepted for any errors or omissions. Kemppi reserves the right to change the specification of the product described at any time without prior notice. Do not copy, record, reproduce or transmit the contents of this guide without prior permission from Kemppi.

1.2 About welding

FitWeld Evo 300 is suitable for many MIG/MAG welding applications, but its quick ignition and high efficiency make it especially fast, safe and economic for tack welding of steel materials. It can be used for welding with ferrous, stainless steel and aluminium filler materials.

FitWeld Evo 300 is designed for use in demanding environments. It has wire feed cabinet illumination to facilitate wire adjustment in dark conditions, and its case is made of reinforced fibre plastic.

Tack welding with the MIG/MAG process

Tack welding is used during the fabrication and fitting process, using spot-like welds to establish the joints before primary welding.

Using MIG/MAG process for tack welding makes this phase fast and efficient. It is also a safer compared to traditional MMA tack welding.

2. USING THE MACHINE

2.1 Before use

The product is packed in cartons designed specifically for them. However, always make sure before use that the products have not been damaged during transportation.

Check also that you have received the components you ordered and the instruction manuals needed, as described in the Quick start guide. Product packaging material is recyclable.

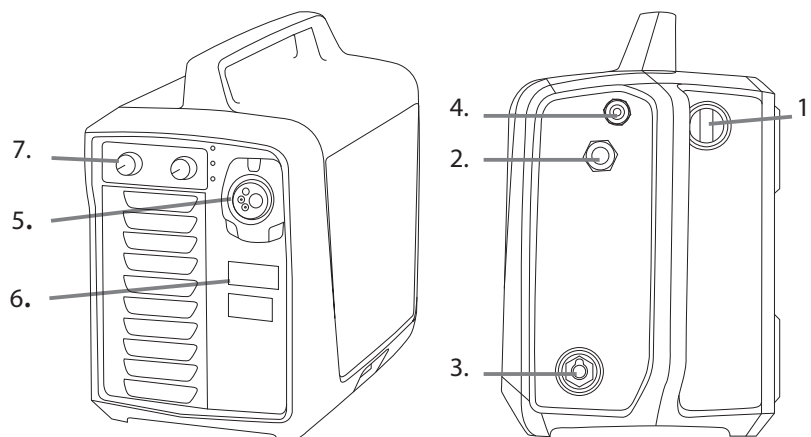
Please also read the Safety Instructions included with the package before use.

NOTE! When moving the welding machine, always lift it from the handle, never pull it from the welding gun or other cables.

Operating environment

This machine is suitable for both indoor and outdoor use. Always make sure that the air flow in the machine is unrestricted. The recommended operating temperature range is -20 ... +40 °C.

2.2 Machine introduction



1. ON/OFF
2. Mains supply cable
3. Earth return cable
4. Shielding gas connector
5. EURO gun connector
6. Meter displays
7. Control knobs

2.3 Distribution network

All regular electrical devices without special circuits generate harmonic currents into distribution network. High rates of harmonic current may cause losses and disturbance to some equipment.

This equipment complies with IEC 61000-3-12 provided that the short-circuit power S_{sc} is greater than or equal to 1.9 MVA at the interface point between the user's supply and the public supply network. It is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment is connected only to a supply with a short-circuit power S_{sc} greater than or equal to 1.9 MVA.

2.4 Connecting cables

Before you can start welding with FitWeld Evo 300, you must connect the machine to the mains power supply, attach the welding gun and the earth return cable and the shielding gas supply. You must also equip the machine with a filler wire spool suitable for your welding application.

For quick help about starting with FitWeld, please refer to the Quick Guide delivered with the product information package.

2.4.1 Connecting to mains

FitWeld Evo 300 is connected to a 3-phase network using the mains cable supplied with the machine. The cable is not equipped with a wall plug, so you must install a suitable plug before you use the machine for the first time.

Check also that the mains cable complies with the local electrical regulations, and replace the cable if necessary. See 'Technical specifications'.

NOTE! The mains cable or wall plug may be installed or replaced only by an electrical contractor or installer authorised to perform such operations.

2.4.2 Earth return cable

For creating a closed electric circuit needed in welding, you must connect the earth return cable to the connector located on the back of the FitWeld. The other end of this cable will be connected to the workpiece before welding.

NOTE! When attaching the earth return clamp to the work piece, remember to clean the work piece surface so as to achieve safe and undisturbed operation.

2.4.3 Shielding gas

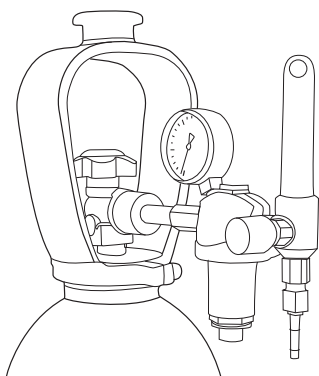
Secure the snap connector of the shielding gas hose to the gas connector on the back of the FitWeld machine. Connect the other end of the gas hose to a gas cylinder's control valve or to the shielding gas distribution network at your worksite.

Make sure that you are using the correct type of shielding gas for the welding application.

The shielding gas used for steel wires is carbon dioxide or a mixture of argon and carbon dioxide. The shielding gas used for stainless steel filler wires is a mixture of argon and carbon dioxide (2%). For aluminium filler wires use pure argon shielding gas.

The thickness of the parent material, joint type and welding power define the required shielding gas flow rate.

To connect the shielding gas hose to a suitable regulator for MIG/MAG welding



1. Connect the shielding gas hose to the gas cylinder's control valve and tighten the connector (connector is not supplied in the package).
2. Adjust the shielding gas flow rate with the control valve screw.
3. Always close the cylinder valve after use.

NOTE! The shielding gas flow rate set from the gas cylinder regulator must exceed the flow rate measured at the welding gun, if GasGuard function is active. If the flow rate and pressure are the same, the gas indicator light will shine on the control panel and welding is prevented.

See also instructions and warnings about adjusting the FitWeld's gas flow rate later in this manual.

2.4.4 Welding gun

Connect the welding gun cable to the Euro adapter socket located on the front panel and hand tighten only. Do not over tighten the collar.

The welding gun leads the filler wire, shielding gas and electric current to the weld piece. When you press the welding gun trigger, shielding gas will flow and filler wire will begin to feed.

The arc will ignite when the filler wire touches the weld piece. If no ignition, check that the earth return cable is connected and the clamp has good contact to the work piece.

2.5 Installing filler wire

With FitWeld Evo 300 you can use up to 200 mm diameter wire spools and the following filler wire types:

- solid wires
- flux-cored wires
- self-shielded flux-cored wires
- stainless steel wires
- aluminium wires.

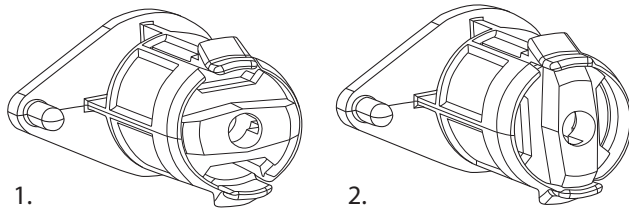
When choosing the filler wire, remember that the wire must have approximately the same melting point as the base material to be welded.

NOTE! When changing the filler wire, always check that the feed rolls, their groove shape and size and the wire liner inside the welding cable are suitable for the wire you are using. Also check that you are using right polarity for the filler wire.

2.5.1 Mounting the wire spool

NOTE! The liner and the feed rolls are colour-coded. See that you are using feed rolls that match the colour of the wire liner inside the welding gun cable. See the table of feed rolls and wire liners later in this chapter.

With FitWeld Evo 300 you can use wire spools with a diameter of 200 mm maximum.

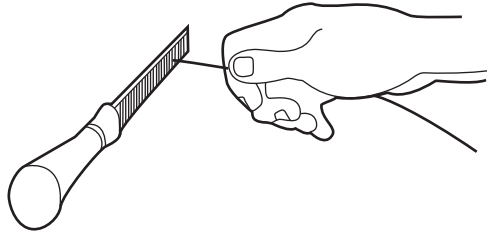


To mount the wire spool:

1. Turn the locking knob of the spool holder so that the locking clips are opened (1).
2. Check the rotating direction of the wire spool and push the spool into its place so that it rotates in the right direction.
3. Turn the locking knob of the spool holder to close the locking clips (2).

2.5.2 Feeding in the welding wire

NOTE! Remember to remove the sharp cut tip of the filler wire before loading the wire to the welding gun, so preventing damage to the liner inside the welding gun cable. This is particularly important for soft filler wires such as aluminium. It will also improve feed quality and increase the service life of your gun liner.



For reliable performance only use Kemppi gun liner materials specially developed for use with Kemppi machines.

For information on recommended liners and wire feed rolls selection, please see the relevant sections later in this chapter. Be careful not to let the wire unwind from the spool.

NOTE! When feeding the welding wire into the gun, be sure that you are not pointing the gun at anyone and that there isn't anything in front of the gun.

To feed the wire from the spool to the welding gun:

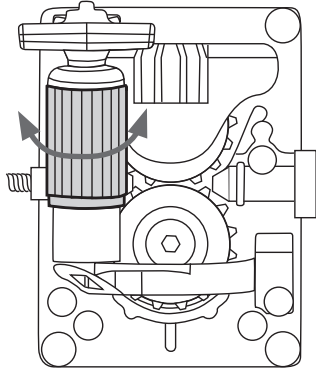
1. Open the pressure arm of the GT02 mechanism and lift the top roll clear on its pivot.
2. Draw some loose wire from the spool and carefully push it through the bronze wire guide at the back of the mechanism. Push the wire over the feed roll groove and through the front wire guide until it comes out from the Euro connector by about 150mm.
3. Replace the top feed roll over the wire and close the pressure arm.
4. Cut away any deformed wire section and dress the sharp wire tip as described above.
5. Connect the welding gun and tighten the collar.
6. Press the welding gun trigger and allow the filler wire to feed through the gun cable to the contact tip.

Check once again that the wire is still properly in the grooves of both feed roll pairs. Now the FitWeld Evo is ready to weld.

2.5.3 Setting the pressure of the feed rolls

To make filler wire run smoothly into the wire liner and to the welding gun you can adjust the pressure of the feed rolls of the GT02 WireDrive mechanism.

Turn the orange coloured pressure adjustment knob in a clockwise direction to increase the pressure applied to the welding filler wire, and anti-clockwise to decrease it.



There is a graduation scale marked on the aluminium arm above the orange adjustment knob. The more pressure applied, the greater the number of graduation marks visible.

For hard steel and stainless steel filler wires, make sure there is sufficient pressure applied, so avoiding filler wire slippage in the feed rolls.

NOTE! Too much pressure may flatten the filler wire, damage its coating, cause friction and excessive wear to drive roll bearings and therefore reduced life.

For aluminium filler wires select the correct feed roll type from the chart supplied and adjust for the minimum pressure necessary for reliable filler wire drive.

NOTE! Slight slippage is recommended in the case of aluminium filler wires. This ensures that the soft wire is not deformed and flattened and that the feed rolls skid over the soft wire if gets stuck on the gun contact tip.

For Aluminium and Stainless Steel filler wires, always use Kemppi DL Chili gun liners. These liners are especially developed by Kemppi and significantly reduce friction losses, so improving welding performance.

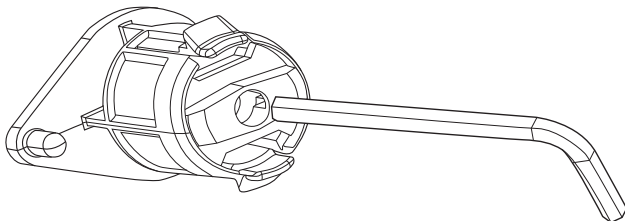
2.5.4 Setting the spool brake force

To prevent the filler wire from uncoiling on overrun following use at high feed speeds, you can change the brake force of the welding spool.

Adjust the spool brake force through the hole in the spool locking mechanism with the Allen key supplied and mounted below the wire drive mechanism.

Increase the force by turning the Allen key clockwise and decrease it by turning it anticlockwise.

NOTE! Do not over tighten, and reduce the pressure for light filler wire types.



2.5.5 Wire guide tubes and wire feed rolls

Make sure that you select appropriate wire feed rolls/groove type, welding gun contact tip and wire liner for the filler wire used.

Kemppi feed rolls and gun liners are colour-coded in order to make identification easy.

Wire guide tubes				
	ø mm		outlet tube	inlet tube
Ss, Al, (Fe, Mc, Fc) plastic			SP003963	SP003962
Fe, Mc, Fc metal			SP003881	W003536

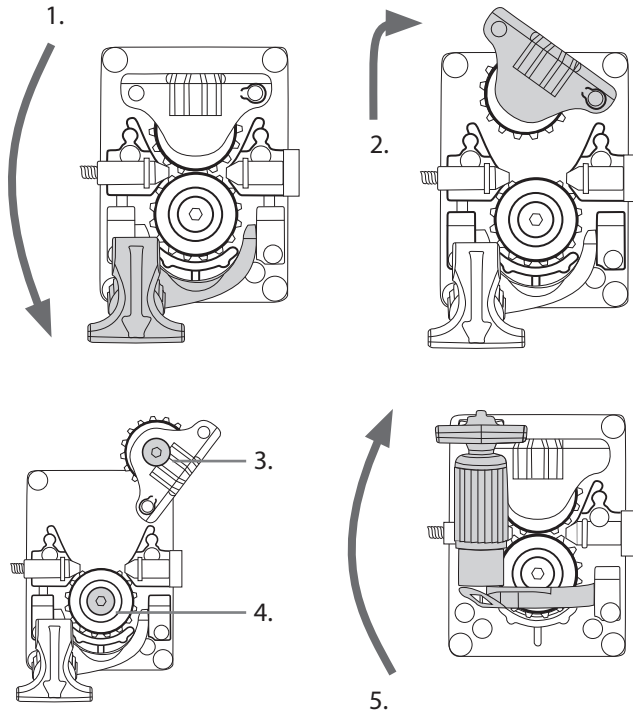
Wire feed rolls, plastic				
	ø mm		lower	upper
Fe, Ss, (Al, Mc, Fc) V-groove V	0.8 – 0.9		W001047	W001048
	1.0		W000675	W000676
	1.2		W000960	W000961
Fc, Mc, (Fe) V-groove, knurled V≡	1.0		W001057	W001058
	1.2		W001059	W001060
Al, (Fc, Mc, Ss, Fe) U-groove U	1.0		W001068	W001067
	1.2		W001070	W001069

Wire feed rolls, metal				
	ø mm		lower	upper
Fe, Ss, (Al, Mc, Fc) V-groove V	0.8 – 0.9		W006074	W006075
	1.0		W006076	W006077
	1.2		W004754	W004753
Fc, Mc, (Fe) V-groove, knurled V≡	1.0		W006080	W006081
	1.2		W006082	W006083
Al, (Fc, Mc, Ss, Fe) U-groove U	1.0		W006088	W006089
	1.2		W006090	W006091

2.5.6 Changing the feed rolls

To change the feed rolls:

1. Pull and release the pressure tension arm via the aluminium head above the orange plastic adjuster.
2. Lift the upper feed roll on its pivot to the maximum open position.
3. Pull out mounting pin of the upper feed pressure roll and replace the roll with a new one.
4. Open the locking screw of the lower feed roll and replace the roll with a new one.
5. Return the upper pressure feed roll to its down position and replace the locking arm latch.
6. Adjust the pressure tension as instructed in the earlier section.



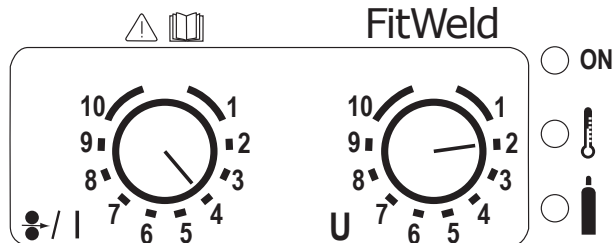
When using hard, flux-cored filler wires you should select a knurled feed roll to achieve better grip.

2.6 Controlling welding functions

With FitWeld Evo 300 you can easily control welding parameters, change the welding polarity and gun operating mode.

The control panel provides two adjustment knobs. You can set the desired welding voltage and wire feed speed before or during welding, so easily tuning the desired arc performance to the weld.

2.6.1 Control panel functions

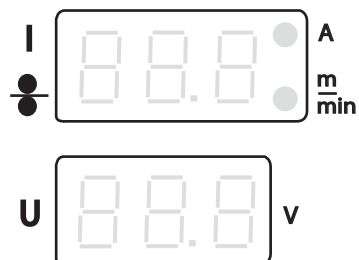


With the left-hand control knob, set the value for filler wire feed speed. The maximum value is 18 meters per minute.

With the right-hand control knob, set the welding voltage. Adjustment range is from 11V to 32V.

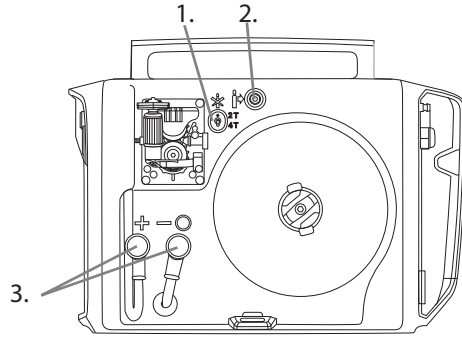
The leds on the front panel indicate the following (from top to bottom):

- Machine is turned on
- Machine is overheated
- Error in shielding gas flow



The leds on the right hand side of the upper meter display indicate the showed variable, either A or m/min. When not welding, the meter displays will show the selected wire feed speed and voltage. When welding, the meter displays will show the actual current and voltage. The parameters can be adjusted during welding and the meter displays will show the new selected value. After welding the meter displays will briefly show an average value of the actual current and voltage.

2.6.2 Controls inside the machine

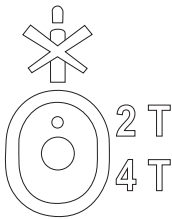


1. Welding gun operation mode switch.
2. Shielding gas adjustment screw.
3. Cable connections for reversing polarity.

2.6.3 Selecting the gun operating mode

With the three position switch (1) you can set the MIG welding gun to two-sequence (2T) or four-sequence (4T) mode with GasGuard feature on.

If you are using self-shielded flux-cored filler wire (gasless wire), you must select the upmost switch position. This position provides 2T operation with GasGuard feature disabled, allowing welding without shielding gas.



To use the welding gun in 2T operating mode:

1. Press the gun trigger down to start welding.
2. Release the gun trigger to stop welding.

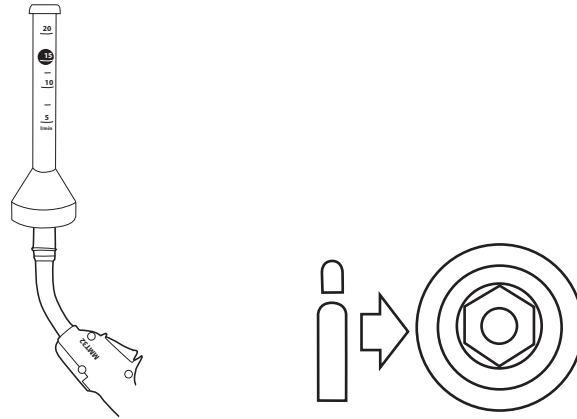
To use the welding gun in 4T operating mode:

1. Press the gun trigger down to start the flow of the shielding gas.
2. Release the trigger to start welding.
3. Press the trigger down again to stop the arc. The shielding gas continues to flow.
4. Release the switch again to stop the flow of the shielding gas.

2.6.4 Adjusting the shielding gas flow

Using a rotameter as shown in the picture, you can adjust the gas flow rate to the gun by turning the shielding gas adjustment regulation valve screw inside the FitWeld Evo 300 wire cabinet.

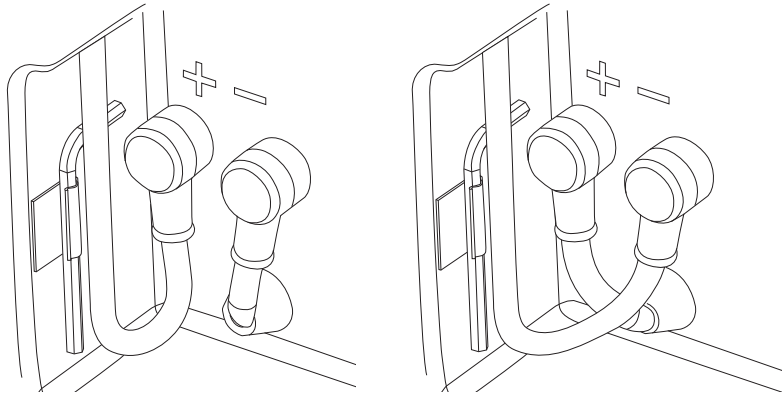
By turning the screw anticlockwise you increase the gas flow to the gun nozzle. Clockwise adjustment will reduce the gas flow rate.



NOTE! The shielding gas flow rate set from the gas cylinder regulator must exceed the flow rate measured at the welding gun. If these rates are the same, the gas indication light will shine on the control panel and welding is prevented.

2.6.5 Reversing polarity

Some filler wires are recommended to be welded with the gun in the negative pole, so the polarity should be reversed. Check the recommended polarity from the filler wire package.



To reverse polarity:

1. Disconnect the machine from the mains.
2. Pull away the rubber covers to expose the terminal pole connections and allow access to the Allen screws.
3. Using the Allen key attached to the wire cabinet wall, unscrew the pole connection bolts. Note the correct order of washers.
4. Interchange the cables.
5. Install the washers in the correct order and tighten the bolts firmly.
6. Replace the rubber covers correctly.

NOTE! The rubber cover must always protect the poles.

2.7 Troubleshooting

Problem	Cause
The machine stops working and the shielding gas indicator is lit.	<p>The maximum flow rate at the gas cylinder is set to a lower value than the flow rate you are trying to set with the FitWeld Evo 300 flow adjustment screw.</p> <ul style="list-style-type: none"> At the gas cylinder's flow regulator, set the flow rate much higher than what you are using in welding. The final adjustment of the gas flow rate is accomplished with the adjustment screw located inside the FitWeld's wire cabin.
Poor welding result	<p>Several factors affect the welding quality.</p> <ul style="list-style-type: none"> Check that the earth return clamp is properly attached, the point of contact is clean and that the cable and its connectors are intact. Check the voltage and wire speed settings on the control panel are correct for the given wire size and type. Check that the shielding gas flow rate at the gun nozzle is correct. Check that the shielding gas is suitable for the filler wire used. Check that the wire feed is constant, and adjust if necessary. Check that the mains voltage is not irregular, too low or too high.
Overheating indicator lit	<p>The device has overheated.</p> <ul style="list-style-type: none"> Ensure that cooling air has unrestricted flow. The machine's duty cycle has been exceeded. Wait for indicator to turn off. Too low or high supply voltage.
The wire does not move or wire feed entangles	<p>Feed rolls, wire liner or contact tips may be defective</p> <ul style="list-style-type: none"> Check that feed rolls are not too tight or too loose. Check that the feed roll groove is not too worn or incorrect size for the filler wire used. Check that the wire liner is the correct size and is not blocked or worn out. Replace if necessary. Check that the contact tip is suitable for the wire used and is not worn out or blocked.
Main switch indicator does not switch on	<p>The machine has no mains voltage</p> <ul style="list-style-type: none"> Check the mains fuses Check the mains cable and the wall plug

If the machine's malfunction can not be corrected with these measures, contact KEMPPI maintenance service.

3. MAINTENANCE

When considering and planning routine maintenance, please consider the frequency of machine use and the working environment.

Correct operation of the machine and regular maintenance will help you avoid unnecessary downtime and equipment failure.

NOTE! *Disconnect the machine from the mains before handling the electrical cables.*

3.1 Daily maintenance

- Check the overall condition of the welding gun. Remove welding spatter from the contact tip and clean the gas nozzle. Replace worn or damaged parts. Only use original Kemppi spare parts.
- Check the condition and connection of the welding circuit components: welding gun, earth return cable and clamp, sockets and connectors.
- Check the condition of the feed rolls, needle bearings and shafts. Clean and lubricate bearings and shafts with a small quantity of light machine oil if necessary. Assemble, adjust and test function.

3.2 Maintenance of the wire feed mechanism

It is recommended to service the wire feed mechanism every time the you change the wire spool.

- Check the wear of the feed roll groove and change the feed roll if necessary.
- Clean the welding gun wire guide with compressed air if necessary.

3.2.1 Cleaning the gun wire liner

Pressure of the feed rolls remove metal dust from the filler wire's surface which then travels in the wire liner inside the gun cable. If the wire liner is not cleaned, it gradually clogs up, increasing drag, impairing wire feed performance and weld quality. Ultimately this will causes wire feed malfunctions.

To clean the wire liner:

1. Remove the welding gun from the machine.
2. Remove the welding gun's gas nozzle, contact tip and contact tip adapter.
3. With a pneumatic pistol, blow dry and filtered compressed air through the wire liner.
4. Clean the wire feed mechanism and spool housing with compressed air.
5. Reassemble the welding gun. Firmly tighten the contact tip and contact tip's adapter.

3.2.2 Replacing the wire liner

If the wire liner is too worn or totally clogged, you must replace it according to the instructions in welding gun operating manual.

3.3 Disposal



Do not dispose of electrical equipment with normal waste!

In observance of European Directive 2002/96/EC on waste electrical and electronic equipment, and its implementation in accordance with national law, electrical equipment that has reached the end of its life must be collected separately and taken to an appropriate environmentally responsible recycling facility.

The owner of the equipment is obliged to deliver a decommissioned unit to a regional collection centre, per the instructions of local authorities or a Kemppi representative. By applying this European Directive you will improve the environment and human health.

4. ORDERING CODES

FitWeld Evo 300	
FitWeld Evo 300, GX 303 G 3,5 m	P2103GX
FitWeld Evo 300, GX 303 G 5 m	P2104GX
Earth return cable, 35 mm ² , 5 m	6184311
Shield gas hose, 6 m	W000566

5. TECHNICAL DATA

Connection voltage	3 ~, 50/60 Hz	220 V -10% ... 440 V +10 %
Rated power at max. current		10.8 kVA
Supply current	30 % ED I_{1max}	220 – 230 V: 29 A
	30 % ED I_{1max}	380 – 440 V: 17 A
	30 % ED I_{1eff}	220 – 230 V: 16 A
	30 % ED I_{1eff}	380 – 440 V: 9 A
Output 40 °C	30 % ED	300 A / 29.0 V
	40 % ED	250 A / 26.5 V
	60 % ED	210 A / 24.5 V
	100 % ED	170 A / 22.5 V
Connection cable	H07RN-F	4G1.5 (5 m)
Fuse (delayed)	220 – 230 V	16 A
	380 – 440 V	10 A
Open circuit voltage	220 V AC	42 V DC
	440 V AC	86 V DC
Power factor at max. current	220 – 230 V	0.93
	380 – 440 V	0.94
Efficiency at max. current	220 – 230 V	83 %
	380 – 440 V	84 %
Welding voltage range		11 – 32 V
Wire spool (max. ø)		200 mm
Wire feed mechanism		2-roll feed
Wire feed speed		0 – 18 m/min
Filler wires	Fe solid, Fe cored, Ss	0.8 – 1.2 mm
	Al	1.0 – 1.2 mm
External dimensions	L x W x H	457 x 226 x 339 mm
Weight		15.4 kg
EMC class		A
Minimum short circuit power S_{sc} of supply network*		1.9 MVA
Degree of protection		IP23S
Operating temperature range		-20 °C ... +40 °C
Storage temperature range		-40 °C ... +60 °C
Standards: IEC/EN 60974-1, IEC/EN 60974-5, IEC/EN 60974-10		

* See paragraph 2.3.

For connection options of all gun and torch models and corresponding remote controls, refer to Kemppi Userdoc at <https://kemp.cc/connectivity>.

