

# FU 11

9907

**KÄYTTÖOHJE  
BRUKSANVISNING  
OPERATION INSTRUCTIONS  
GEBRAUCHSANWEISUNG  
GEBRUIKSAANWIJZING  
MANUEL D'UTILISATION**

**1923590**



Lue ja perehdy tähän ohjeeseen ennen hitsauskoneen käyttöönottoa !

Läs noga igenom denna bruksanvisningen före bruket av svetsmaskinen !

Read carefully these instructions before you use the welding machine !

Bitte, lesen Sie diese Gebrauchsanweisungen vor Gebrauch der Schweißmaschine !

Lees deze gebruiksaanwijzing aandachtig door voor u de lasmachine in gebruik neemt !

Veillez lire et appliquer ces instructions avant utilisation de la machine !



**KEMPPPI**

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# Käyttösaätimet ja liittimet

## Funktionsreglage och anslutningar

### Operation control and connectors

### Bedienungselemente und Anschlüsse

### Bedieningselementen en aansluitingen

### Commandes et connecteurs

Langansyöttönopeuden lähisäätö  
Panelreglage för trådmatningshastighet  
Local control for wire feed speed  
Nahreglung für Drahtvorschubgeschwindigkeit  
Paneelregeling voor draadaanvoersnelheid  
Commande locale de la vitesse de dévidage

Säätötavan valintakytkin (lähi-/kaukosäätö)  
Väljare för reglagemetod (panel-/fjärreglering)  
Control mode selecting switch (local/remote control)  
Wahlschalter für Regelungsmethode (Nah-/Fernregelung)  
Keuzeschakelaar voor bediening (paneel-/afstandsbediening)  
Sélecteur du mode de commande (commande locale/à distance)

Hitsauspistoolin liitännä EURO  
Svetspistolens anslutning EURO  
Connection of welding gun EURO  
Anschluß der Schweißpistole EURO  
Aansluiting voor laspistool EURO  
Connecteur torche EURO

Jälkivirta-ajan säätö  
Inställning av efterbrinntid  
Burn back time adjustment  
Einstellung für Rückbrandzeit  
Instelling voor afbrandvertraging  
Réglage de la durée du retard d'arc

Langansyötön kokeilu  
Test för trådmatning  
Wire inch  
Testen des Drahtvorschubs  
Testen draadanvoer  
Avance-fil manuelle

Kaasun kokeilukytkin  
Testbrytare för gasflöde  
Gas purge switch  
Testschalter der Gasströmung  
Testschakelaar voor gasstroombouton  
Bouton test gaz

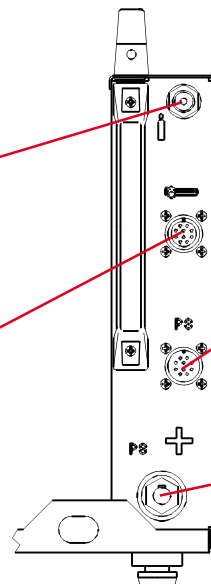
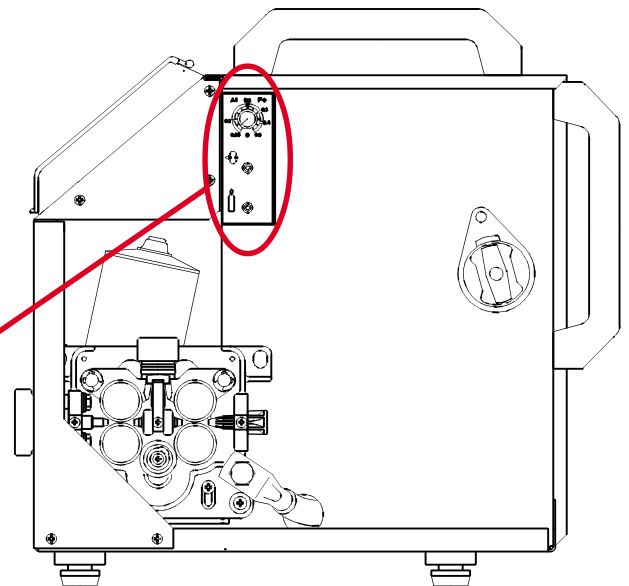
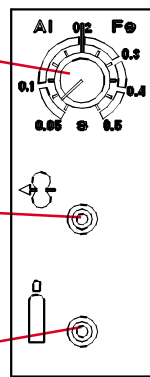
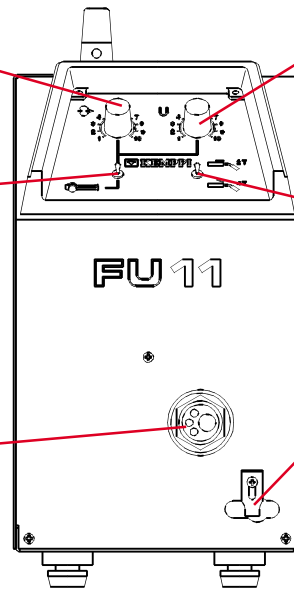
Suojakaasuliitännä  
Skyddsgasanslutning  
Shielding gas connection  
Schutzgasanschluß  
Aansluiting voor beschermgas  
Raccord gaz de protection

Ohjaukskaapeliliitännä (kaukosäädin)  
Anslutning för manöverkabel (Fjärreglage)  
Connection for control cable (Remote control unit)  
Anschluß für Steuerkabel (Fernregleinheit)  
Aansluiting voor stuurstroombouton (Afstandsbediening)  
Connexion du câble de commande (Commande à distance)

Hitsausjännitteen lähisäätö  
Panelreglage för svetspänning  
Local control for welding voltage  
Nahreglung für Schweißspannung  
Paneelregeling voor lasspanning  
Commande locale de la tension de soudage

Käynnistystavan valintakytkin  
Valbrytare för startsätt  
Start mode selecting switch  
Wahlschalter für Startmethode  
Keuzeschakelaar voor startmethode  
Sélecteur du mode de démarrage

Jäähdytysnesteletkujen lukitus  
Låsning av kylvätskeslangar  
Locking of cooling liquid hoses  
Verriegelung der Kühlflüssigkeitsschläuche  
Aansluiting van de koelvloeistofslangen  
Verrouillage des tuyaux du liquide de refroidissement

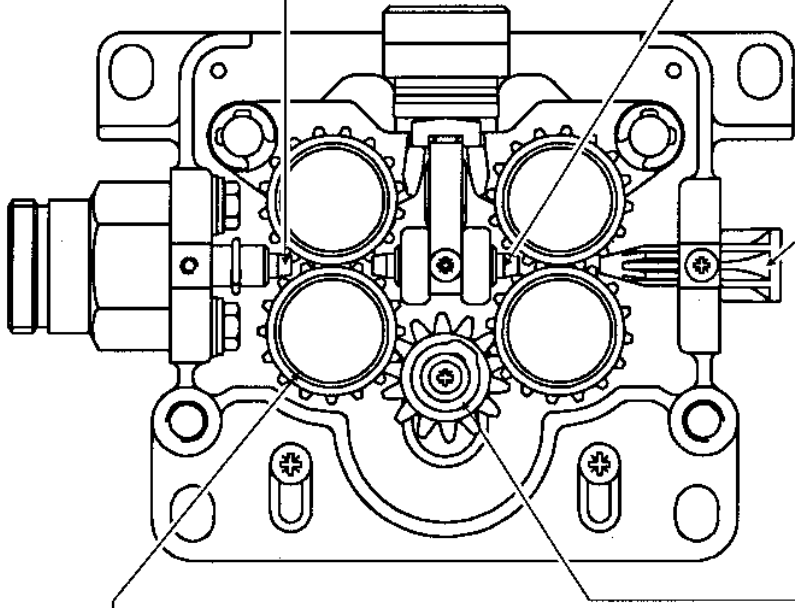


Ohjaukskaapeliliitännä  
Anslutning för manöverkabel  
Connection for control cable  
Anschluß für Steuerkabel  
Aansluiting voor stuurstroombouton  
Connexion du câble de commande

Hitsausvirtaliitännä  
Svetsströmanslutning  
Welding current connection  
Schweißstromanschluß  
Lasstroombaansluiting  
Connexion du courant de soudage


Langansyöttömekanismin osat  
 Delar i trådmatarmekanismen LSL – FU 11  
 Parts of wire feed mechanism LSL – FU 11  
 Teile im drahtvorschubmechanismus LSL – FU 11  
 Onderdelen im het draadaanvoer-mechnisme LSL – FU 11  
 Pieces du mecanisme de devidage LSL – FU 11

Fe Mc Fc	0,6...0,8 (0.030)	∅ 1,0 3134140 valkoinen, vit, white, weiß, wit, blanc	→	∅ 2,0 3134120 * oranssi, orange, orange, orange, oranje, orange	→	∅ 2,0 4267220 * muovi, plast, plastic, Kunststoff, plastic, plastique		
	mm (in)	0,9...1,6 (0.035...1/16)					∅ 2,0 3133700 * oranssi, orange, orange, orange, oranje, orange	∅ 4,0 4270180 muovi, plast, plastic, Kunststoff, plastic, plastique
	1,6...2,4 (1/16...3/32)	∅ 4,0 3134130 sininen, blå, blue, blau, blauw, bleue					∅ 4,0 4267030 messinki, mässing, brass, Messing, messing, laiton	
Sa Al	0,8...1,6 (0.030...1/16)	∅ 2,0 3134290 oranssi, orange, orange, orange, oranje, orange	→	∅ 2,0 3134300 oranssi, orange, orange, orange, oranje, orange	→	∅ 2,0 4267220 muovi, plast, plastic, Kunststoff, plastic, plastique		
	mm (in)	1,6...2,4 (1/16...3/32)					∅ 3,0 3134710 keltainen, gul, yellow, gelb, geel, jaune	∅ 3,0 3134720 keltainen, gul, yellow, gelb, geel, jaune






- \* = kuuluu toimitusvarustukseen
- \* = inkluderad i leveransutrustning
- \* = included in delivery
- \* = ist in der Lieferungs-ausrüstung enthalten
- \* = met de zending meegeleverd
- \* = est compris dans la livraison

vetoratas, drivhjul, gearwheel,  
 Aufziehrad, aandrijfrol,  
 galet d'entraînement



∅ 28 mm  
 4265240 \*  
 0...18 m/min

mm (in)	∅ 0,6 (0.030)	∅ 0,6 ---	∅ 0,9...1,0 (0.035)	∅ 1,2 (0.045... 0.052)	∅ 1,4...1,6 (1/16)	∅ 2,0 (5/64)	∅ 2,4 (3/32)	---	---
Fe Ss Al	sileä, slät, plain, glatt, glad, lisse		3133810 valkoinen, vit, white, weiß, wit, blanc	3133210 * punainen, röd, red, rot, rood, rouge	3133820 keltainen, gul, yellow, gelb, geel, jaune	3133880 musta, svart, black, schwarz, zwart, noir			
Fe Fc	pyälletty, med råffling, knurled, gerillt, groef, cranté		---	3133940 punainen, röd, red, rot, rood, rouge	3133990 keltainen, gul, yellow, gelb, geel, jaune	3134030 musta, svart, black, schwarz, zwart, noir			
Al	U-ura, U-spår, U-groove, U-Nut, U-spoor, gorge U		---	3133960 punainen, röd, red, rot, rood, rouge	---	---			

## Operation safety

### Never watch the arc without a face shield designed for arc welding!

The arc damages unprotected eyes!  
The arc burns unprotected skin!

### Be careful for reflecting radiation of arc!

### Protect yourself and the surroundings against the arc and hot spray!

### Remember general fire safety!

Pay attention to the fire safety regulations. Welding is always classified as a fire risk operation. Welding where there is flammable or explosive material is strictly forbidden. If it is essential to weld in such an area remove inflammable material from the immediate vicinity of the welding site. Fire extinguishers must always be on site where welding is taking place. Note! Spars may cause fire many hours after completion of welding.

### Watch out for the mains voltage!

Take care of the cables - the connection cable must not be compressed, touch sharp edges or hot work pieces. Faulty cables are always a fire risk and highly dangerous. Do not locate the welding machine on wet surfaces. Do not take the welding machine inside the work piece (i.e. in containers, cars etc.)

### Ensure that neither you nor gas bottles or electrical equipment are in contact with live wires or connections!

Do not use faulty welding cables. Isolate yourself by using dry and not worn out protective clothes. Do not weld on wet ground. Do not place MIG gun or the welding cables on the power source or other electrical equipment. Don't press on mig gun switch, if the gun is not directed towards work piece.

### Watch out for the welding fumes!

Ensure that there is sufficient ventilation. Follow special safety precautions when you weld metals which contain lead, cadmium, zinc, mercury or beryllium.

### Note the danger caused by special welding jobs!

Watch out for the fire and explosion danger when welding container type work pieces.

## Terms of guarantee

KEMPPI OY provides a guarantee for products manufactured and sold by them if defects in manufacture and materials occur. Guarantee repairs must be carried out only an Authorized KEMPPI Service Agent. Packing, freight and insurance costs to be paid by third party. The guarantee is effected on the day of purchase. Verbal promises which do not comply with the terms of guarantee are not binding on guarantor

### Limitations on guarantee

The following conditions are not covered under terms of guarantee: defects due to fair wear and tear, non-compliance with operating and maintenance instructions, connection to incorrect or faulty supply voltage (including voltage surges outside equipment spec.), incorrect gas pressure, overloading, transport or storage damage, fire or damage due to natural causes i.e. lightning or flooding.

This guarantee does not cover direct or indirect travelling costs, daily allowances or accomodation.

Note: Under the terms of the guarantee, Welding torches and their consumables, feed, drive rollers and feeder guide tubes are not covered.

Direct or indirect damage due to a defective product is not covered under the guarantee.

The guarantee is void if changes are made to the product without approval of the manufacturer, or if repairs are carried out using non-approved spare parts.

The guarantee is also void if repairs are carried out by non-authorized agents.

### Guarantee period

The guarantee is valid for one year from date of purchase, provided that the machine is used for single-shift operation.

The guarantee period for double and treble shift operation is six months and four months respectively.

### Undertaking guarantee repairs

Guarantee defects must be informed to KEMPPI or authorised KEMPPI Service Agents within the guarantee period. Before any guarantee work is undertaken, the customer must provide proof of purchase and serial number of the equipment in order to validate the guarantee.

The parts replaced under the terms of the guarantee remain the property of KEMPPI.

Following the guarantee repair, the guarantee of the machine or equipment, repaired or replaced, will be continued to the end of the original guarantee period.

## English

FU 11 is 4-roll driven light weight wire feeder unit, designed for demanding professional use. The FU 11 is suitable to be used with the MULTISYSTEM power sources.




### Technical data

		FU 11
Working voltage		30 VAC 50/60 Hz
Connection power		120 VA
Loading capacity	60 % ED	500 A
	100 % ED	390 A
Operation principle		4-roll drive
Diameter of feed roll		32 mm
Wire feed speed		0...18 m / min
Filler wires	∅ Fe, Ss	0,6...2,4 mm
	∅ Cored wire	0,8...2,4 mm
	∅ Al	1,0...2,4 mm
Wire reel	max. weight	20 kg
	max. size	∅ 300 mm
Gun connector		Euro
Operation temperature range		-20...+40 °C
Storage temperature range		-40...+60 °C
Degree of protection		IP 23 *)
Dimensions without handles	length	440 mm
	width	220 mm
	height	400 mm
Weight		11,8 kg

\*) Concerns electronic components.

The product meets conformity requirements for CE marking.


### Assembly of MIG equipment

 = Instruction     = Warning     = Prohibition

The connections of the FU 11 are shown on page 4.

Cablings between different power sources and the FU are described in the operation instructions of the MULTISYSTEM power sources. The cablings of the FU 11 are carried out in the same way like in the FU 10, 20 and 30 wire feeder units.

The FU 11 can be mounted to the MULTISYSTEM trolleys in the same way like the FU 10, 20 and 30 wire feeder units. The FU 11 can be installed to boom using the metal lift hook (3135870), which is mounted to the plastic handle.

 Wire feeder unit must be mounted to boom in such a way that its chassis is **galvanic separated** both from swing arm and boom.

Suspension angle of wire feeder unit can be changed by moving fixing point in handle.

### Installation

#### Accessories corresponding to wire diameter

The wire feed rolls are available with plain groove, knurled groove and with U groove for different purposes.

##### Feed rolls with plain groove:

Universal feed roll for welding of all kinds of wires.

##### Feed rolls with knurled groove:

Special feed roll for cored wires and steel wires.

##### Feed rolls with U groove:

Special feed roll for aluminium wires.

The wire feed rolls have two grooves for different filler wire diameters. Correct wire groove is selected by moving selecting washer (**28**) from one side to another in feed roll.

Feed rolls and wire guide tubes of wire feeder unit have colour codes in order to make identification easier (see table on page 5).

In delivery the the FU 11 is equipped with red feed rolls with plain groove and with orange wire guide tubes for welding filler wires of 0.9-1.2 mm (0.035", 0.045" and 0.052").

feed rolls	
colour	filler wire ∅ mm (inch)
white	0.6 and 0.8 (0.030)
red	0.9/1.0 and 1.2 (0.035, 0.045 and 0.052)
yellow	1.4, 1.6 and 2.0 (1/16 and 5/64)
black	2.4 (3/32)
guide tubes	
colour	filler wire ∅ mm (inch)
orange	0.6-1.6 (0.024-1/16)
blue	over 1.6 (over 1/16)

For very heavy welding with 1.0-1.2 mm filler wires we recommend you to use the following feed rolls **with ball bearing**, where there are deviating from other feed rolls two similar grooves:

- 3138650 red, with plain groove, for 1.0 mm wires
- 3137390 orange, with plain groove, for 1.2 mm wires
- 3137380 orange, with knurled groove, for 1.2 mm wires

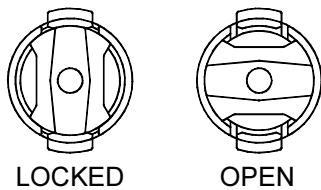
## Mounting of MIG welding gun

In order to ensure trouble-free welding check in operation instructions of gun used by you that wire guide tube and contact tip of gun are according to manufacturer's recommendation suitable to be used for wire feed diameter and type in question. Too tight a wire guide tube might cause for wire feeder unit a bigger stress than normally as well as disturbances in wire feed.

- Screw snap connector of gun tight that there won't come any voltage losses on connecting surface.
- Loose connection will heat gun and wire feeder unit.

When you are using liquid-cooled gun, mount cooling liquid hoses in such a way that the ones with the red code always are connected to the corresponding red counter-connectors and the blue ones correspondingly to the blue counter-connectors.

## Mounting and locking of wire reel



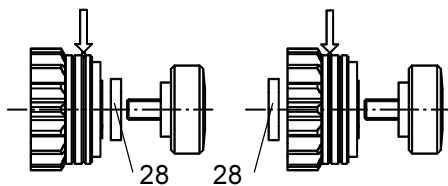
- Release locking nails of wire reel hub by turning locking knob a quarter round.
- Mount the reel at its place. Note rotating direction of reel!
- Lock the reel with locking knob, locking nails of hub remain to outside position and will lock the reel.



Check that in filler wire reel are no parts sticking out, which could e.g. chafe against chassis of the wire feeder unit. Dragging parts might expose chassis of wire feeder unit under voltage.

## Automatic wire feed to gun

Automatic wire feed makes change of wire reel more rapid. In reel change the pressure of feed rolls need not to be released and filler wire goes automatically to correct wire line.



- Make sure that groove of feed roll match the diameter of welding wire used. Feed roll groove is selected by moving the groove selecting washer (28).
- Release the wire end from reel and cut off the bent length. Be careful that the wire does not spill from the reel to sides!

- Straighten about 20 cm of the wire and see that the end of it has no sharp edges (file off if necessary). A sharp edge may damage the wire guide tube and contact tip of the welding gun.
- Draw a bit of loose wire from wire reel. Feed wire through back liner to feed rolls. Don't release pressure of feed rolls!
- Press the gun switch and feed a bit wire until wire goes through feed rolls to gun. See that wire is in grooves of both feed roll pairs!
- Press still the gun switch until wire has come through contact tip.

Automatic feed may sometimes fail with thin wires (Fe, Fc, Ss: 0,6...0,8 mm, Al: 0,8...1,0 mm). Then it might be possible that you must open feed rolls and feed wire manually through feed rolls.

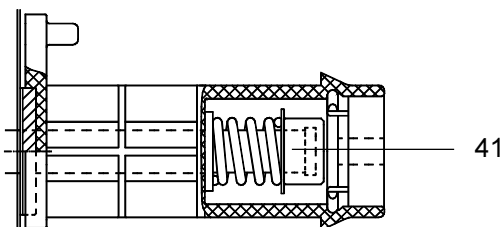
## Adjustment of pressure

Adjust the pressure of feed rolls with the control screw so that the wire is fed into the wire guide tube evenly and allows a little braking when coming out from the contact tip without slipping at the feed rolls.



Excessive pressure causes flattening of the filler wire and damage to the coating. It also causes undue wear of the feed rolls as well as friction.

## Adjustment of tightness of reel brake



Brake force is adjusted through hole in locking device of reel hub by screwing the control screw (41) with screwdriver.

Adjust brake force as so big that the wire is not allowed to become too loose on the reel so that it would spill from the reel when the rotation of the reel stops. Need for brake force is increased with increase of wire feed speed. Since the brake loads for its part the motor, you shouldn't keep it unnecessarily tight.



## Ground cable

Fasten earthing press of ground cable carefully, preferably direct to welding piece. Contact surface of press always should be as large as possible.

### Clean the fastening surface from paint and rust!

Use in your MIG equipment 70 mm<sup>2</sup> copper-cables. Thinner cross-sectional areas might cause overheating of connectors and insulations.

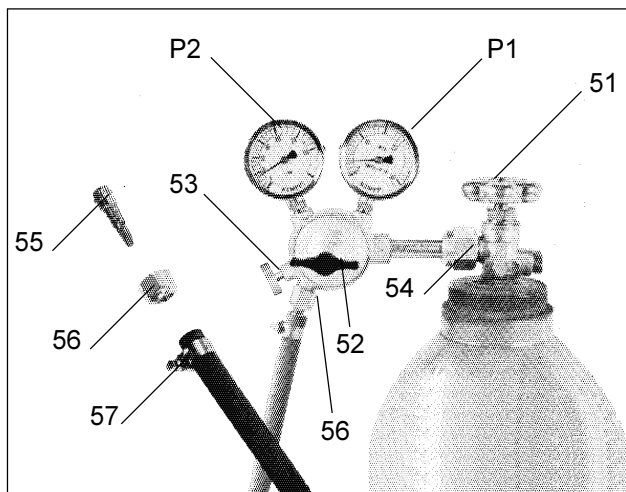
- Make sure that the welding gun in your use is designed for max. welding current needed by you!
- Never use a damaged welding gun!

## Shielding gas

As MIG shielding gas is used carbon dioxide, mixed gases and argon. Shielding gas flow rate is defined by welding current size.

### Gas flow regulator

Gas flow regulator should be suitable for shielding gas used by you. The regulator being in your use might be different from the one in picture, however, following general instructions are valid for all pressure regulators.



#### Before mounting of flow regulator

- Step aside, open cylinder valve (51) somewhat for a moment, in this way you can blow out any dirt that may be in the valve of bottle.
- Screw press regulation screw (52) of regulator outwards so long that no spring pressure can be felt (screw is turning freely).
- Close needle valve (53) if there is one in regulator

#### Connect regulator onto valve of bottle

- Tighten connecting nut (54) preferably with a wrench.
- Put hose spindle (55) of regulator with jacket nuts (56) onto gas hose, connection should be ensured with hose clamp (57)
- Connect hose onto regulator and machine, tighten jacket nuts.

#### Open valve of bottle slowly

- Pressure meter (P1) shows pressure of bottle. Never use up all the gas in the bottle, send the bottle for filling up when bottle pressure still is 2 bar.
- Open needle valve if there is one in regulator
- Screw regulation screw (52) inwards until hose pressure meter (P2) shows flow (or pressure) required. By regulation of flow amount the machine has to be in operation and the gun switch should be pressed on at the same time.

#### Close valve of bottle always after having stopped welding

- If the machine will be unused for a longer time, you should also unscrew pressure regulation screw (52).

## Gas bottle



The gas bottle may explode if it falls!

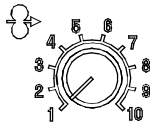
Always fasten gas bottle tightly in vertical position, to wall stand or bottle cart, specially designed for it!

For safety reasons always remove gas bottle from transport stand of machine before lifting or car transport of machine!

## Operation control

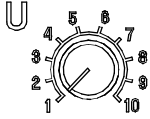
See OPERATION CONTROL AND CONNECTORS page 4.

### Local control of wire feed speed



Stepless control of wire feed speed is 0...18 m/min. The potentiometer is equipped with the memory scale from 1 to 10.

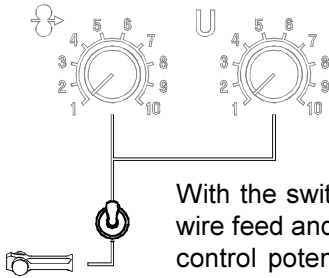
### Local control for welding voltage



Stepless control of power source's voltage. The potentiometer is equipped with the memory scale from 1 to 10.

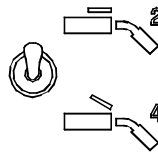
### Control mode selecting switch

(local / remote control)



With the switch is selected, if control of wire feed and voltage is carried out from control potentiometers of the FU 11 or from the remote control unit, which is connected to the machine.

### Start mode selecting switch



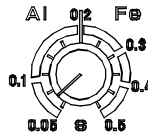
#### 2-sequence procedure

1. Switch pressed: welding starts
2. Switch open: welding stops

#### 4-sequence procedure

1. Switch pressed: shielding gas is flowing
2. Switch open: welding starts
3. Switch pressed: welding stops
4. Switch open: gas flow stops after the burn back time

### Burn back time adjustment

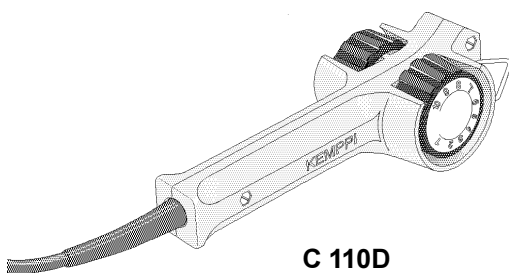


The burn back time is adjusted between 0,05 - 0,5 s.

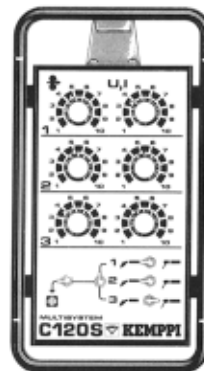
You must possibly adjust the burn back time among others then when you go over to welding of different filler wire types, for example when you go over from steel welding to aluminium welding. The burn back time is adjusted as such that the filler wire doesn't stick to weld piece or burn fastened to contact tip at the end of welding.

## Remote control units

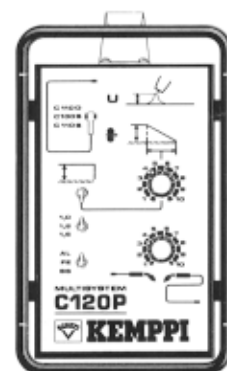
To the machine connector on the front wall of the FU you can connect the MULTISYSTEM remote control units, which are designed for the MIG welding and which have stepless control for wire feed and voltage. By use of the remote control turn the local/remote switch into the remote control position.



C 110D



C 120S



C 120P

### C 110D (order number 6185421)

MIG/MAG remote control unit with controls for wire feed and voltage (memory scale 1–10).

### C 120S (order number 6185427)

The remote control unit, into which you can program three different welding parameters for the MIG/MAG or MMA welding. The parameters are selected from the selecting switch of the C 120S.

**NOTE ! In the MMA welding the MIG gun and the filler wire always are under voltage.**

### C 120P (order number 6185426)

Use is possible only with the PS 5000 or PSS 5000 power sources.

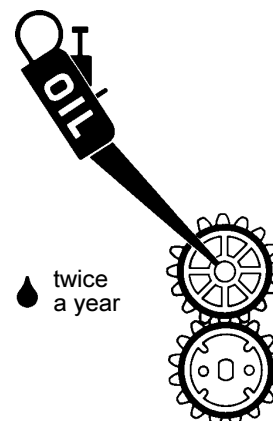
The C 120P is pulsed MIG remote control unit, with which the PS/PSS 5000 MIG equipment can be changed into the pulsed MIG equipment. The use and operation of the C 120P has been described in the operation instructions of the C 120P.

## Service, operation disturbances

The amount of use and the working environment should be taken into consideration when planning the frequency of maintenance of the FU 11. Careful use and preventive maintenance will help to ensure trouble-free operation. The following maintenance operations should be carried out at least every six months:

### Check:

- The wear of the grooves of the feed rolls. Excessive wear of grooves causes problems in wire feed.
  - The wear of the wire guide tubes of the wire feeder unit. Badly worn feed rolls and wire guide tubes should be discarded.
  - The wire guide tube in the gun should be set as near the feed rolls as possible, but not touching them and the wire must follow a straight line from the end of the tube to the groove of the feed roll.
  - Reel brake adjustment.
  - Electric connections
  - \* Oxidized couplings must be cleaned
  - \* Loose couplings must be tightened
- Clean dust and dirt from the equipment.



English



When using compressed air, always protect your eyes with proper eye protection.



In case of problems contact your Kemppi dealer.

**KEMPPI service repair shops make regular maintenance according to agreement.**

**The major points in the maintenance procedure are listed as follows:**

- Cleaning of the equipment
- Checking and maintenance of the welding tools
- Checking of connectors, switches and potentiometers
- Checking of electric connections
- Metering units checking
- Checking of mains cable and plug
- Damaged parts or parts in bad connection are replaced by new ones
- Maintenance testing. Operation and performance values of the equipment are checked, and adjusted when necessary by means of test equipment.