

# KEMPOTIG AC/DC

9939

KÄYTTÖOHJE  
BRUKSANVISNING  
OPERATION INSTRUCTIONS  
GEBRAUCHSANWEISUNG  
GEBRUIKSAANWIJZING  
MANUEL D'UTILISATION

1916130

## KEMPOTIG 4500 AC/DC



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 !

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



**KEMPPI**

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Suomi

Svenska

English

Deutsch

Nederlands

Français

**Käyttösaätimet, kytkimet ja liittimet**  
**Manöverorgan, brytare och anslutningar**  
**Operation control, switches and connectors**  
**Bedienungselemente, Schalter und Anschlüsse**  
**Bediening, schakelaars en aansluitingen**  
**Commandes, interrupteurs et connecteurs**

**F2** Lisälaitteiden ohjaussulake 8 A hidas  
 Manöversäkring för extra utrustningar 8 A trög  
 Control fuse for accessories 8 A delayed  
 Steuersicherung für Zusatzgeräte 8 A träge  
 Zekering voor hulpapparatuur 8 A traag  
 Fusible auxiliaire 8 A retardé

**F3** Pistorasian sulakkeet 2 A hidas  
**F4** Säkringar för kontaktdosa 2 A tröga  
 Fuses for socket outlet 2 A delayed  
 Sicherungen für Steckdosen 2 A träge  
 Zekeringen voor contactdozen 2 A traag  
 Fusibles pour prises murales 2 A retardé

**H1** Merkkivalo I/O  
 Signallampa I/O  
 Signal lamp I/O  
 Signallampe I/O  
 Signaallamp I/O  
 Témoin lumineux I/O

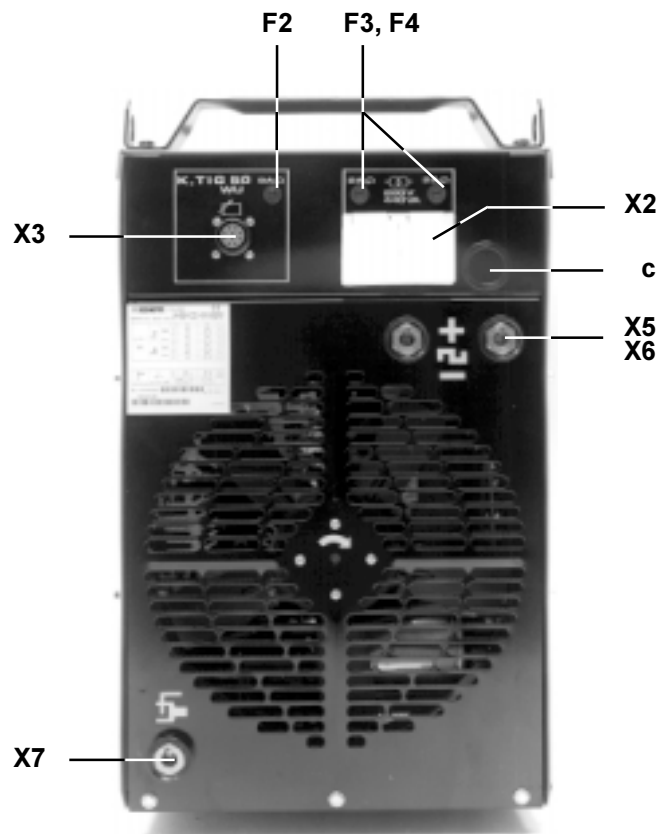
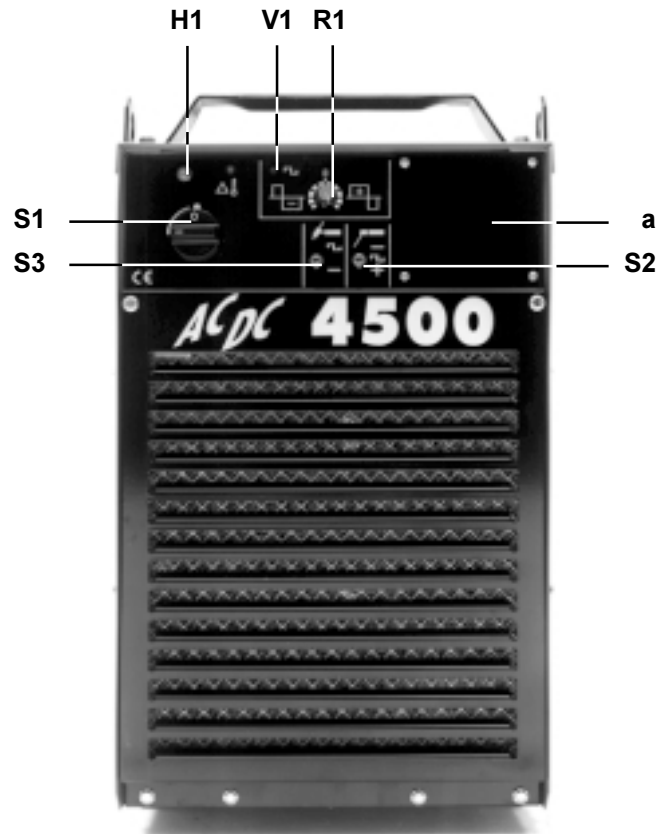
**R1** Vaihtovirtahitsauksen balanssisäätö  
 Balansinställning för AC-svetsning  
 Balance control for AC welding  
 Balanceneinstellung für AC-Schweißen  
 Balansregeling voor wisselstroomlassen  
 Réglage de la balance AC

**S1** Pääkytkin I/O  
 Huvudbrytare I/O  
 Main switch I/O  
 Hauptschalter I/O  
 Hoofdschakelaar I/O  
 Interrupteur principal I/O

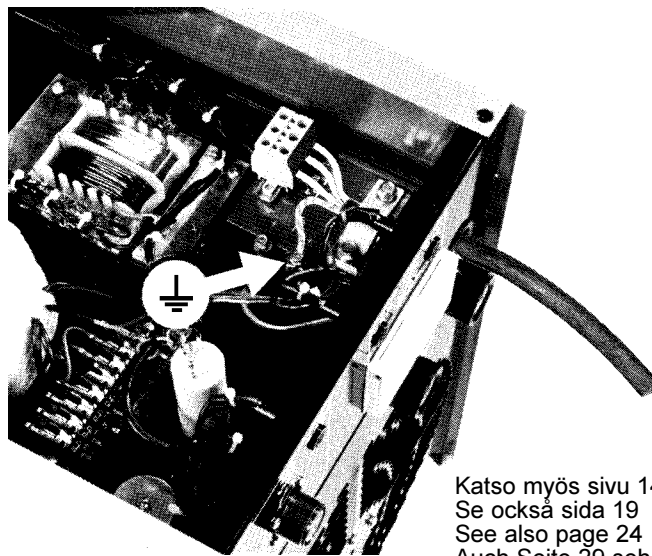
**S2** Puikkohitsauksen virtalajin valintakytkin  
 Väljare för MMA-svetsningens strömart  
 Selecting switch for MMA welding's current type  
 Wahlschalter für Stromtyp des Stabelektroden-  
 schweißens  
 Keuzeschakelaar voor elektrodenlassen (polariteit)  
 Commutateur de sélection du type de courant en  
 soudage à l'électrode

**S3** TIG-hitsauksen virtalajin valintakytkin  
 Väljare för TIG-svetsningens strömart  
 Selecting switch for TIG welding's current type  
 Wahlschalter für Stromtyp des WIG-Schweißens  
 Keuzeschakelaar voor TIG-lassen (polariteit)  
 Commutateur de sélection du type de courant en  
 soudage TIG

**V1** Balanssisädön / vaihtovirtahitsauksen merkkivalo  
 Signallampa för balansinställning / AC-svetsning  
 Signal lamp for balance control / AC welding  
 Signallampe für Balanceneinstellung / AC-  
 Schweißen  
 Signaallamp voor balansregeling wisselstroomlassen  
 Témoin lumineux du réglage de la balance en sou-  
 dage CA



**Verkkokaapelin kytkentä**  
**Anslutning av nätkabel**  
**Connection of mains cable**  
**Anschluss des netzkabels**  
**Aansluiting van netkabel**  
**Raccordement du câble d'alimentation**

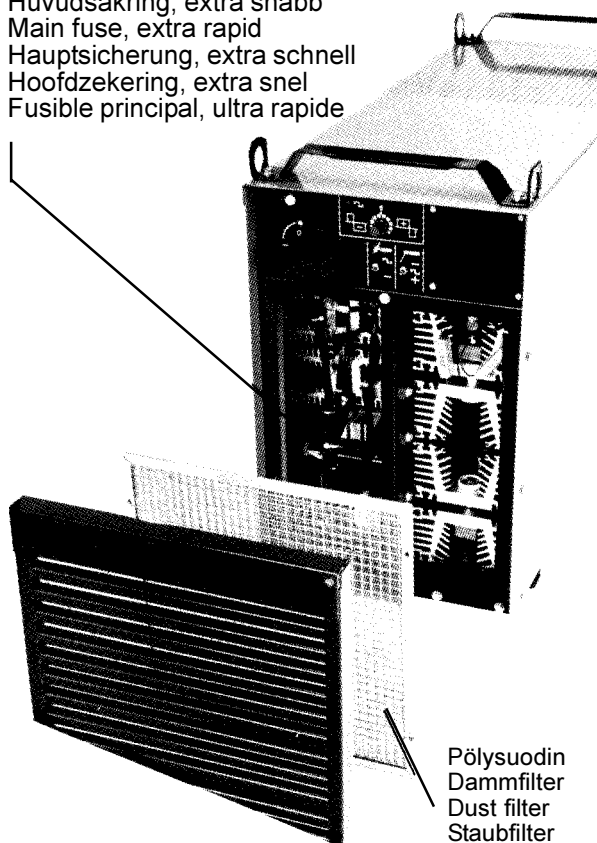


Katso myös sivu 14  
 Se också sida 19  
 See also page 24  
 Auch Seite 29 sehen  
 Zie ook pag. 34  
 Voir également page 39

- X2** Pistorasia Schuko 220 V, 440 VA  
 Kontaktdosa Schuko 220 V, 440 VA  
 Socket outlet Schuko 220 V, 440 VA  
 Steckdose Schuko 220 V, 440 VA  
 Contactdozen Schuko 220 V, 440 VA  
 Prise Schuko 220 V, 440 VA
- X3** Ohjauskaapeliliitin Kempotig 50 / WU / kauko-  
 säädin  
 Anslutning för manöverkabel Kempotig 50 /  
 WU / fjärreglage  
 Connector for control cable Kempotig 50 / WU /  
 remote controller  
 Anschluß für Steuerkabel Kempotig 50 / WU /  
 Fernregler  
 Aansluiting voor stuurstroom-kabel Kempoti-  
 g 50 / WU / afstandsbediening  
 Connecteur du câble de commande Kempoti-  
 g 50 / WU / commande à distance
- X5** Hitsauskaapeliliitin Kempotig 50 / puikonpidin  
**X6** Anslutning för svetskabel Kempotig 50 /  
 elektrodhållare  
 Connector for welding cable Kempotig 50 /  
 electrode holder  
 Anschluß für Schweißkabel Kempotig 50 /  
 Elektrodenhalter  
 Aansluiting voor laskabel Kempotig 50 / elekt-  
 rodenhouder  
 Connecteur du câble de soudage Kempotig 50 /  
 porte-électrode
- X7** Paluuvirtakaapeliliitin työkappale / Kempotig 50  
 Återledaranslutning arbetsstycke / Kempotig 50  
 Return cable connector work piece / Kempotig 50  
 Rückleitungskabelanschluß Werkstück / Kem-  
 potig 50  
 Werkstukkabel werkstuk / Kempotig 50  
 Connect. du câble de masse / Kempotig 50
- a** Asennusluukku PSM  
 Montagelucka PSM  
 Inspection cover PSM  
 Montageluke PSM  
 Montageluik PSM  
 Emplacement pour PSM
- c** Verkkokaapelin läpivienti  
 Genomföring av nätkabel  
 Inlet of mains cable  
 Durchführung des Netzkabels  
 Invoer van netkabel  
 Entrée du câble d'alimentation

**Pölysuotimen irroitus**  
**Lossning av dammfilteret**  
**Removal of dust filter**  
**Lösung des Staubfilters**  
**Verwijderen van stoffilter**  
**Changement du filtre antipoussière**

- F1** Pääsulake, erikoisnopea  
 Huvudsäkring, extra snabb  
 Main fuse, extra rapid  
 Hauptsicherung, extra schnell  
 Hoofdzekering, extra snel  
 Fusible principal, ultra rapide



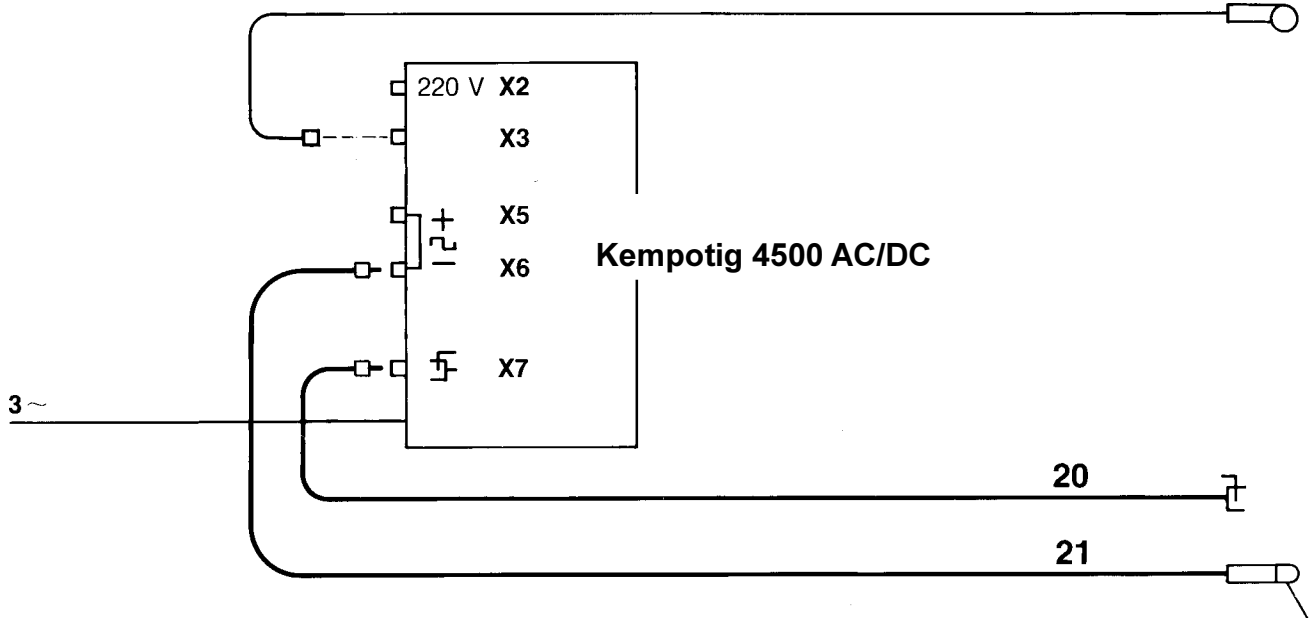
Pölysuodin  
 Dammfilter  
 Dust filter  
 Staubfilter  
 Stoffilter  
 Filtre antipoussière

**Lisälaitteet ja kaapelit, Extra utrustningar och kablar,  
Accessories and cables, Zusatzgeräte und Kabel,  
Accessoires en kables, Accessoires et câbles**



- 20** Paluuvirtakaapeli  
Återledare  
Return current cable  
Stromrückleitungskabel  
Werkstukkabel  
Câble de masse
- 21** Puikkohitsauskaapeli  
Kabel för MMA-svetsning  
Cable for MMA welding  
Kabel für Stabelektrodenschweißen  
Kabel voor elektrodenlassen  
Câble pour soudage à l'électrode

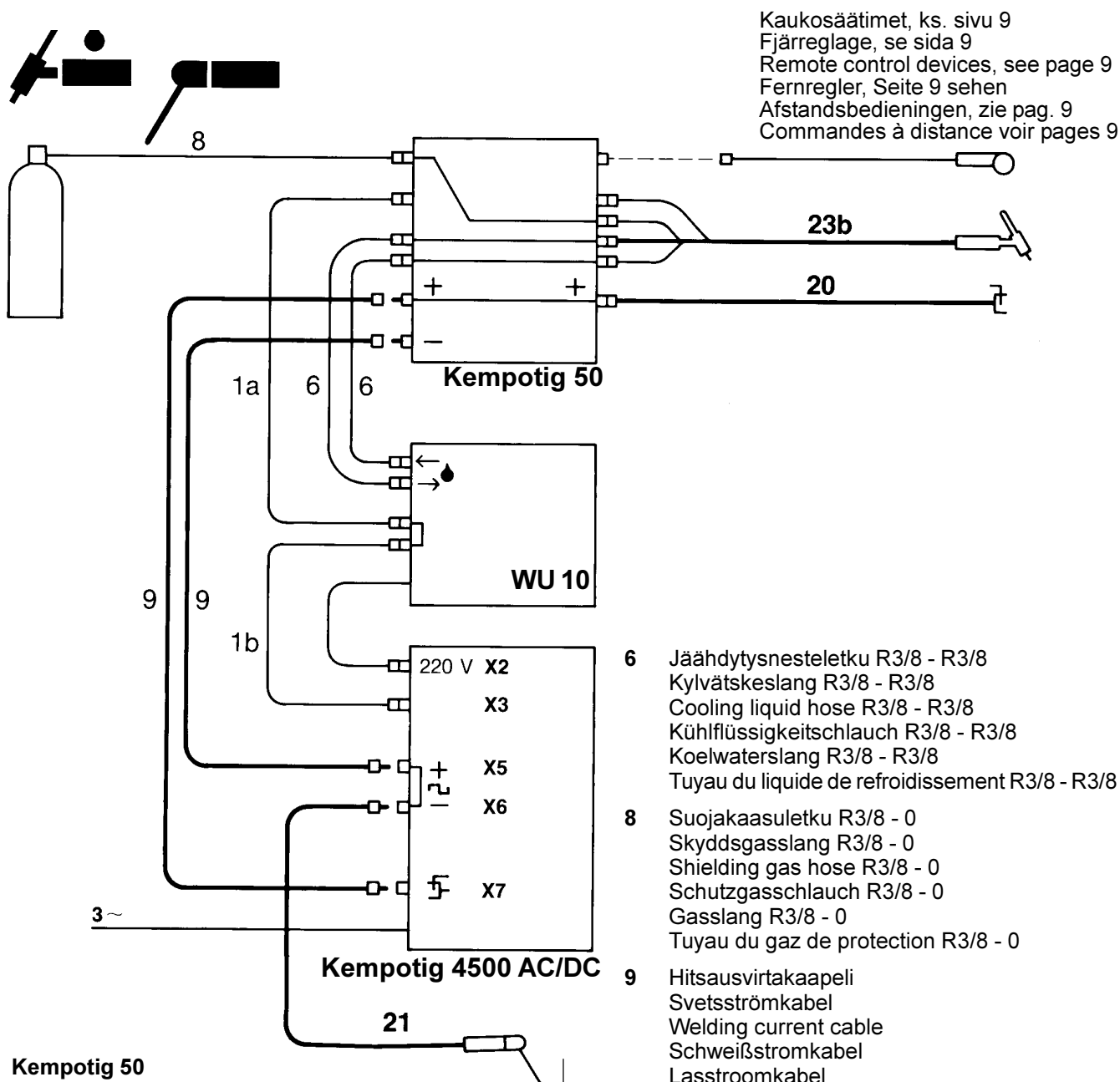
Kaukosäätimet, ks. sivu 9  
Fjärreglage, se sida 9  
Remote control devices, see page 9  
Fernregler, Seite 9 sehen  
Afstandbedieningen, zie pag. 9  
Commandes à distance voir pages 9



**Kempotig 4500 AC/DC**

20 / 5 m ..... 70 mm<sup>2</sup> ..... 6184711  
20 / 10 m ..... 70 mm<sup>2</sup> ..... 6184712

21 / 5 m ..... 70 mm<sup>2</sup> ..... 6184701  
21 / 10 m ..... 70 mm<sup>2</sup> ..... 6184702



Kaukosäätimet, ks. sivu 9  
Fjärrreglage, se sida 9  
Remote control devices, see page 9  
Fernregler, Seite 9 sehen  
Afstandsbedieningen, zie pag. 9  
Commandes à distance voir pages 9

### Kempotig 50

TIG-kipinäsytytyslaite  
TIG-tändningsenhet  
TIG ignition unit  
WIG-Zündeinheit  
TIG-hoogfrequentunit  
Dispositif d'amorçage TIG

### WU 10

Nestejäähdytyslaite  
Kylvätskeanläggning med cirkulationssystem  
Cooling water circulation unit  
Wasserkreislaufgerät  
Waterkoelunit  
Dispositif de circulation d'eau de refroidissement

W4 = 1a + 1b + 6 + 6 + 8 + 9 + 9

1a Ohjauskaapeli 10-nap. järjestelmä

1b Manöverkabel 10-poligt system  
Control cable 10 poles system  
Steuerkabel 10-poliges System  
Stuurstroombekabel 10-polig systeem  
Câble de commande - 10 pôles

6 Jäähdytysnesteletku R3/8 - R3/8  
Kylvätskeslang R3/8 - R3/8  
Cooling liquid hose R3/8 - R3/8  
Kühlflüssigkeitschlauch R3/8 - R3/8  
Koelwaterslang R3/8 - R3/8  
Tuyau du liquide de refroidissement R3/8 - R3/8

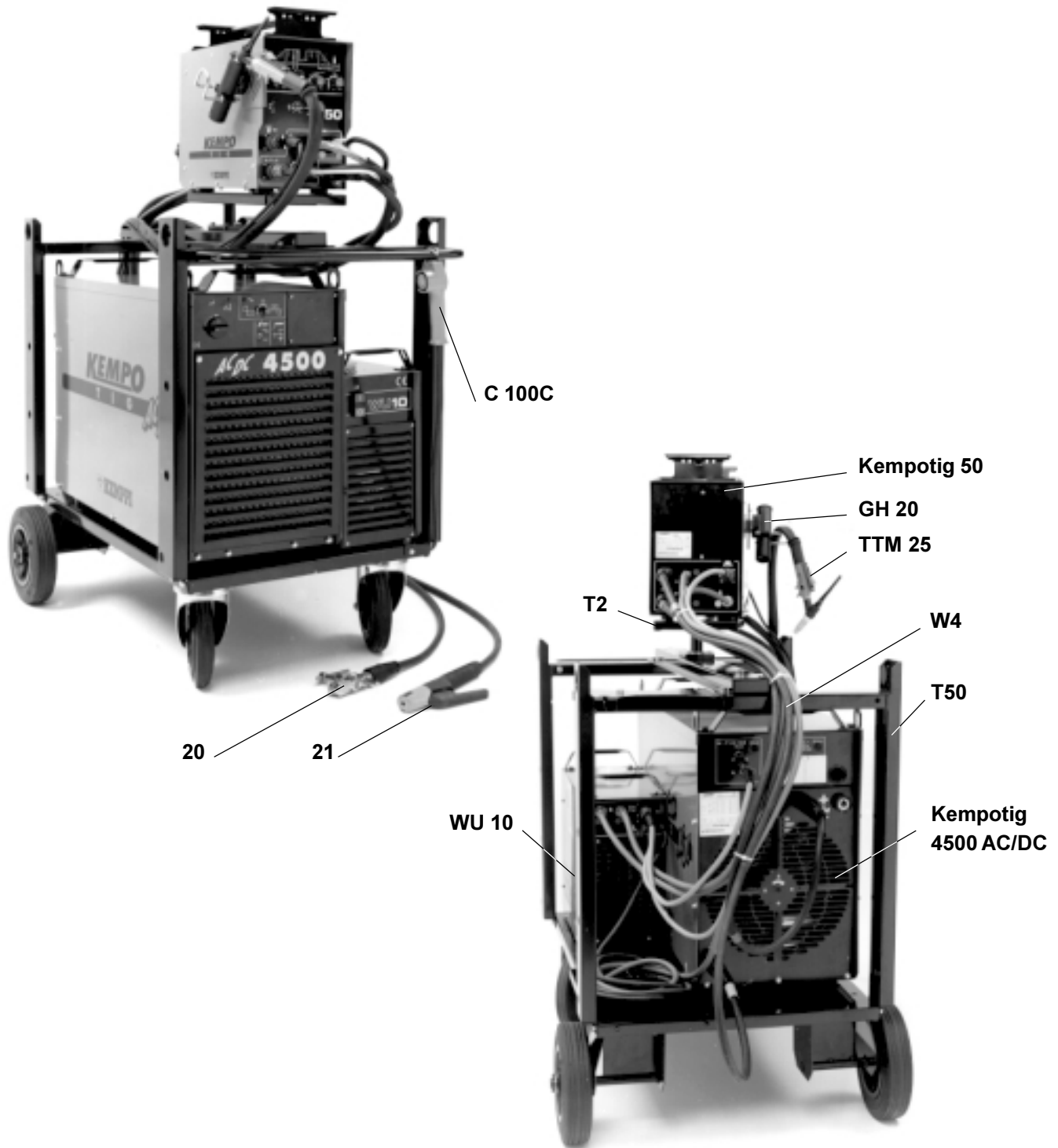
8 Suojakaasuletku R3/8 - 0  
Skyddsgasslang R3/8 - 0  
Shielding gas hose R3/8 - 0  
Schutzgasschlauch R3/8 - 0  
Gasslang R3/8 - 0  
Tuyau du gaz de protection R3/8 - 0

9 Hitsausvirtakaapeli  
Svetsströmkabel  
Welding current cable  
Schweißstromkabel  
Lasstroombekabel  
Câble courant de soudage

20 Paluuvirtakaapeli  
Återledare  
Return current cable  
Stromrückleitungskabel  
Werkstukkabel  
Câble de masse

21 Puikkohitsauskaapeli  
Kabel för elektrodsvetsning  
Cable for MMA welding  
Kabel für Elektrodenschweißen  
Kabel voor elektrodenlassen  
Câble pour soudage à l'électrode

23b TIG-poltin nestejäähdytteinen  
TIG-brännare vätskekyld  
TIG torch liquid-cooled  
WIG-Brenner flüssigkeitsgekühlt  
TIG-toorts watergekoeld  
Torche TIG refoïdie eau



<b>T2</b> .....	<b>6185235</b>
<b>T50</b> .....	<b>6185245</b>
<b>WU 10</b> .....	<b>6262010</b>
<b>Kemptig 4500 AC/DC</b> .....	<b>6164500</b>
<b>Kemptig 50</b> .....	<b>6271224</b>
<b>GH 20</b> .....	<b>6256020</b>
<b>C 100C</b> .....	<b>6185410</b>
W4 / 1,85 m .....	6271873
/ 5 m 70 mm <sup>2</sup> .....	6271875
/ 10 m 70 mm <sup>2</sup> .....	6271877
20 / 5 m 70 mm <sup>2</sup> .....	6184711
/ 10 m 70 mm <sup>2</sup> .....	6184712
21 / 5 m 70 mm <sup>2</sup> .....	6184701
/ 10 m 70 mm <sup>2</sup> .....	6184702



# Kaukosäätö, Fjärreglering, Remote control, Fernregelung, Afstandbediening, Commandes à distance

## C 100C, C 100D

Puikko-/TIG-hitsausvirran karkeasäätö (R61), muistias-  
teikko 1-10, ja hienosäätö +/- (R62)

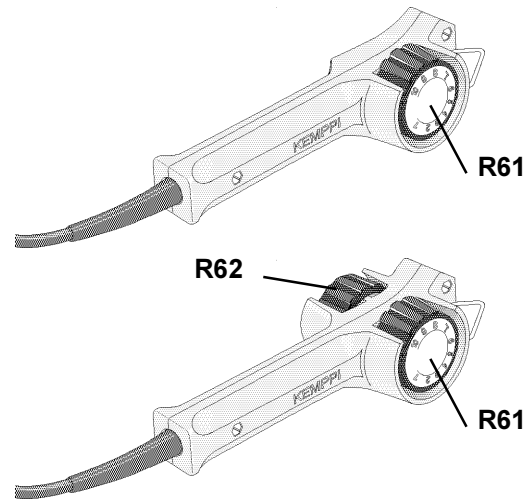
Grovinställning (R61), minneskala 1-10, och fininställ-  
ning +/- (R62) för MMA/TIG svetsström.

Rough control (R61), memory scale 1-10, and fine control  
+/- (R62) for MMA/TIG welding current.

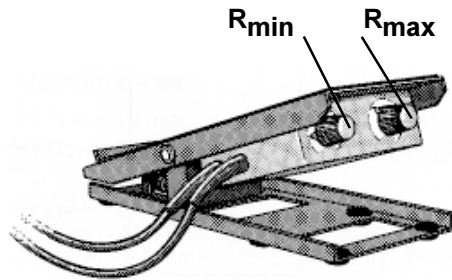
Grobeinstellung (R61), Speicherskala 1-10, und  
Feineinstellung +/- (R62) für Elektroden-/WIG-Schweiß-  
strom.

Grofregeling (R61), schaal 1-10, en fijnregeling +/- (R62)  
voor lasstroom elektroden- / TIG-lassen.

Premiers réglages (R61), échelle de mémoire 1-10, et  
réglage fin +/- (R62) du courant de soudage Electrode/  
TIG.



## C 100F



### Jalkapoljinsäädin TIG-hitsaukseen

- start-toiminto
- hitsausvirran säätö polkimen liikkeellä
- hitsausvirta-alueen rajausta min.- ja max.-potentio-  
metreillä (muistiasteikko 1-10)

### Fotpedalreglage för TIG-svetsning

- start-funktion
- inställning för svetsström med rörelse på pedal
- begränsning av svetsströmmråde med min.- och  
max.-potentiometrar (minneskala 1-10)

### Foot pedal control unit for TIG welding

- start operation
- control for welding current with movement on pedal
- limiting of welding current range with min.- and  
max.-potentiometers (memory scale 1-10)

### Fußpedalregler für WIG-Schweißen

- Start-Funktion
- Einstellung für Schweißstrom mit Bewegung am  
Pedal
- Begrenzung des Schweißstrombereiches mit min.-  
und max.- Potentiometern (Speicherskala 1-10)

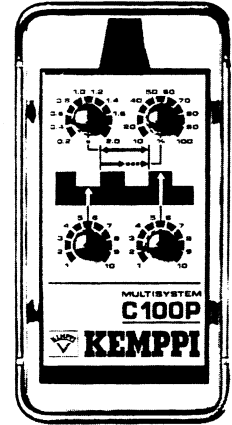
### Voetpedaalregeling voor TIG-lassen

- startfunctie
- lasstroomregeling
- begrenzing van het lasstroombereik met min.- en  
max.-potentiometers (schaal 1-10)

### Commande à pédale pour soudage TIG

- Mise en route
- Réglage du courant de soudage par pressions sur  
la pédale
- Réglage maxi / mini du courant de soudage par  
potentiomètres (échelle de mémoires 1-10)

## C 100P



### Pitkämpulssisäädin

#### TIG-hitsaukseen

- pulssivirran säätö (1-10)
- perusvirran säätö (1-10)
- jakson ajan (taajuuden)  
säätö 0,2-2 s (5-0,5 Hz)
- pulssisuhteen säätö  
10-100 % (100 % vastaa jatkuvaa hitsausta)

### Långpulsreglage för TIG-svetsning

- inställning för pulsström (1-10)
- inställning för grundström (1-10)
- inställning för intervalltid (frekvens) 0,2-2 s (5-0,5 Hz)
- inställning för pulssintermittens 10-100 % (100 %  
motsvarar kontinuerlig svetsning)

### Long pulse unit for TIG welding

- control of pulse current (1-10)
- control of basic current (1-10)
- control of interval time (frequency) 0,2-2 s (5-0,5 Hz)
- control of pulse cycle 10-100 % (100 % corresponds  
to continuous welding)

### Langpulsregler für WIG-Schweißen

- Einstellung für Pulsstrom (1-10)
- Einstellung für Grundstrom (1-10)
- Einstellung für Intervallzeit (Frequenz) 0,2-2 s (5-0,5 Hz)
- Einstellung für Pulsdauer 10-100 % (100 %  
entspricht dem Dauerschweißen)

### Pulsregeling voor TIG-lassen

- instelling van pulsstroom (1-10)
- instelling van basistroom (1-10)
- instelling van intervalltijd (frequentie) 0,2-2 s (5-0,5 Hz)
- instelling van pulstijd 10-100 % (100 % komt  
overeen met continue lassen)

### Unité de pulsation pour soudage TIG

- réglage du courant haut (1-10)
- réglage du courant bas (1-10)
- réglage de l'intervalle (fréquence) 0,2-2 s (5-0,5 Hz)
- réglage de la durée du courant haut 10-100 %  
(100 % correspond au soudage en continu)

**Mittariyksikkö MU 20D**  
**Mätarenhet MU 20D**  
**Meter unit MU 20D**  
**Messereinheit MU 20D**  
**Meterunit MU 20D**  
**Afficheur digital MU 20D**

**MU 20D** on numeronäyttöinen (LCD) erillinen mittariyksikkö hitsausvirran ja -jännitteen tarkkailuun. MU 20D:tä voidaan käyttää PS / PSS- ja KEMPOTIG 4500 AC/DC-virtalähteiden yhteydessä.

- hitsausvirtanäyttö: 0...1999 A  $\pm 2\%$   $\pm 2$  A DC
- hitsausjännitteenäyttö: 0...199,9 V  $\pm 2\%$   $\pm 0,2$  V DC
- näytöissä taustavalo
- hold-toiminnan avulla voidaan näytön lukema pysäyttää.

Mittarit näyttävät virran ja jännitteen keskiarvoja (DC) / tasasuunnattuja keskiarvoja (AC).

**Huom!** Jännitemittari näyttää koneen napajännitettä. On huomattava, että kaarijännite on jopa useita voltteja alhaisempi kuin napajännite hitsattaessa suurilla virroilla ja pitkillä kaapeleilla.

**MU 20D** är en separat mätarenhet med nummerindikation (LCD) för kontroll av svetsström och -spänning. MU 20D kan användas med strömkällor PS / PSS och KEMPOTIG 4500 AC/DC.

- svetsströmindikation: 0... 1999 A  $\pm 2\%$   $\pm 2$  A DC
- svetsspänningsindikation: 0... 199,99 V  $\pm 2\%$   $\pm 0,2$  V DC
- bakgrundsljus i indikationer
- med hjälp av hold-funktionen kan mätarutslaget få att stannas i rutan

Instrumenten visar medelvärden för spänning och ström (DC) / likriktade medelvärden (AC).

**OBS!** Spänningsmätaren visar maskinens polspänning. Man bör komma ihåg att bågspänningen kan vara flera volt lägre än polspänning när höga svetsströmmar och långa kablar användes.

**MU 20D** is a separate meter unit with digital display (LCD) for the control of welding current and voltage. MU 20D can be used with the power sources PS / PSS and KEMPOTIG 4500 AC/DC.

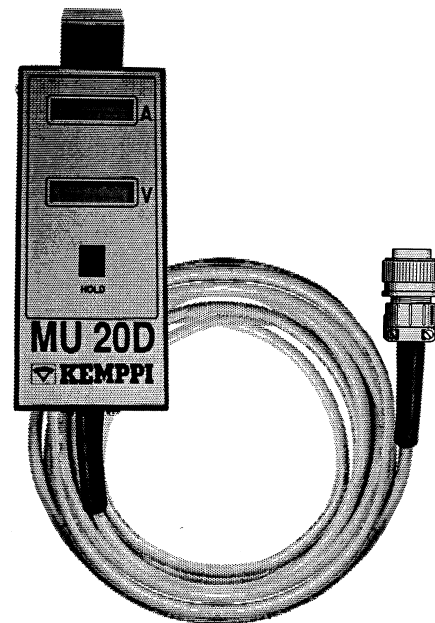
- welding current display: 0... 1999 A  $\pm 2\%$   $\pm 2$  A DC
- welding voltage display: 0... 199,99 V  $\pm 2\%$   $\pm 0,2$  V DC
- background light in displays
- with help of the hold operation the reading can be made to stay in the display.

The metres indicate average values of voltage and current (DC)/rectified average values (AC).

**Note!** The voltage meter shows pole voltage of the machine. Note that arc voltage is even many volts lower than pole voltage in welding with high currents and long cables.

**MU 20D** ist eine separate Messereinheit mit der Zitteranzeige (LCD) für die Kontrolle des Schweißstromes und der schweißspannung. MU 20D kann mit den Stromquellen PS / PSS- und KEMPOTIG 4500 AC/DC gebraucht werden.

- Schweißstromanzeige: 0... 1999 A  $\pm 2\%$   $\pm 2$  A DC
- Schweißspannungsanzeige: 0... 199,9 V  $\pm 2\%$   $\pm 0,2$  V DC



- Hintergrundlicht in Anzeigen
- mit der Hilfe von der Hold-Funktion kann man die Ablesung in der Anzeige stehen lassen.

Die Instrumente zeigen die Mittelwerte des Stromes und der Spannung (DC) / gleichgerichtete Mittelwerte (AC).

**Achtung!** Der Spannungsmesser zeigt die Polspannung der Maschine an. Bitte beachten Sie, daß beim Schweißen mit großen Strömen und langen Kabeln die Lichtbogenspannung sogar mehrere Volt niedriger als die Polspannung ist.

De **MU 20D** is een separate meterunit met een digitale aanwijzing voor het controleren van de lasstroom en lasspanning. De MU 20D kan op de volgende stroombronnen gebruikt worden: PS / PSS en de KEMPOTIG 4500 AC/DC.

- Stroombereik: 0... 1999 A  $\pm 2\%$   $\pm 2$  A DC
- Spanningsbereik: 0... 199,99 V  $\pm 2\%$   $\pm 0,2$  V DC
- Schaalverlichting
- Met behulp van de houdfunctie kunnen de laswaarden in het geheugen opgeslagen worden.

De meters geven de gemiddelde waarde aan van stroom en spanning.

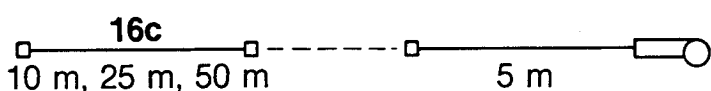
**LET OP!** De voltmeter geeft de spanning op de klemmen van de machine aan. Bedenk dat, bij het lassen met een hoge stroom en bij gebruik van lange kabels, de boogspanning lager is dan de klemspanning.

Le **MU 20D** est un appareil de mesure à affichage numérique du courant et de la tension de soudage. Le MU 20D peut être utilisé avec les sources PS / PSS et KEMPOTIG 4500 AC/DC.

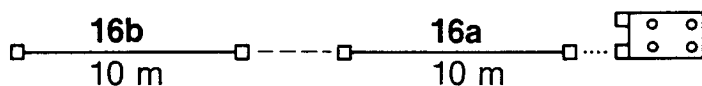
- Affichage du courant de soudage: 0...1999 A  $\pm 2\%$   $\pm 2$  A Courant Continu
- Affichage de la tension de soudage: 0...199,9 V  $\pm 2\%$   $\pm 0,2$  V Courant Continu
- Eclairage de l'écran
- Possibilité de garder affichées les mesures lors des opérations de soudage.

Les afficheurs indiquent les valeurs moyennes de la tension et du courant (DC) / valeurs moyennes rectifiées (AC).

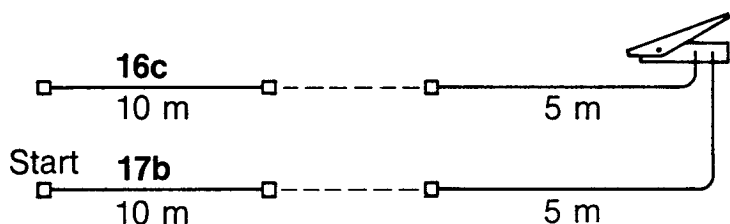
**REMARQUE!** Le voltmètre indique la polarité de la machine. Il faut remarquer que la tension de l'arc pendant le soudage (avec de forts courants et de longs câbles) est inférieure de plusieurs volts par rapport à la tension aux bornes.



**C 100C**  
**C 100D**



**C 100P**



**C 100F**

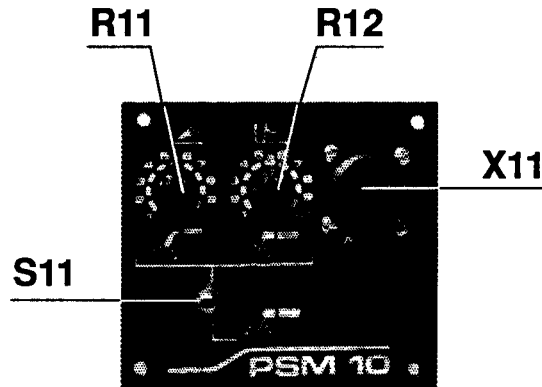
<b>C 100C</b> .....	<b>6185410</b>
<b>C 100D</b> .....	<b>6185413</b>
<b>C 100P</b> .....	<b>6185424</b>
<b>C 100F</b> .....	<b>6185405</b>
<b>PSM 10</b> .....	<b>6185651</b>
<b>16a</b> / 1,5 m .....	6185454
/ 10 m .....	6185455
<b>16b</b> / 10 m .....	6185456
<b>16c</b> / 10 m .....	6185451
/ 25 m .....	6185452
/ 50 m .....	6185453
<b>17b</b> /10 m .....	6185310

- 16a** Kaukosäätökaapeli 7-nap.  
Kabel för fjärreglage 7-pol.  
Cable for remote control 7 poles  
Kabel für Fernregelung 7-pol.  
Kabel voor afstandsbediening 7-polig  
Câble commande à distance 7 pôles
- 16b** Kaukosäätöjatkokaapeli 7-nap.  
Förlängningskabel för fjärreglage 7-pol.  
Extension cable for remote control 7 poles  
Verlängerungskabel für Fernregelung 7-pol.  
Verlengkabel voor afstandsbediening 7-polig  
Rallonge de câble pour commande à distance 7 pôles
- 16c** Kaukosäätöjatkokaapeli 4-nap.  
Förlängningskabel för fjärreglage 4-pol.  
Extension cable for remote control 4 poles  
Verlängerungskabel für Fernregelung 4-pol.  
Verlengkabel voor afstandsbediening 4-polig  
Rallonge de câble pour commande à distance 4 pôles
- 17b** Käynnistysjatkokaapeli  
Startförlängningskabel  
Start extension cable  
Startverlängerungskabel  
Start verlengkabel  
Rallonge câble de démarrage

**PSM-lisätoimintayksiköt**  
**PSM-tillsatsatsenheter**  
**Auxiliary functional units PSM**  
**PsM-zusatzfunktionseinheit**  
**Hulpfunctie-units PSM**  
**Unités de réglage et de contrôle PSM**

**PSM 10**

6185651



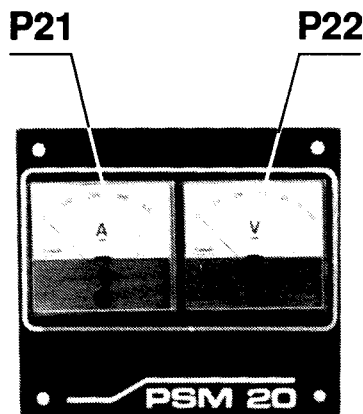
**R11** Ei käytössä  
 Inte i bruk  
 No operation  
 Keine Funktion  
 Geen functie  
 Pas en service

**R12** Aloitusvirran säätö (puikkohitsaus)  
 Inställning för startström (MMA-svetsning)  
 Control of ignition pulse current (MMA welding)  
 Einstellung für Zündstrom (Stabelektroden-schweißen)  
 Startroomregeling (elektrodenlassen)  
 Commande du courant d'amorçage (soudage à l'électrode)

**S11** Normaali-/täppäysominaiskäyrien valintakytkin  
 Väljare för normal-/droppsvetsningkaraktäristika  
 Selecting switch for normal-/point to point welding characteristics  
 Wahlschalter für Normal-/Steppnahtschweiß-Charakteristika  
 Keuzeschakelaar voor normaal-/intervallassen  
 Commutateur de sélection des caractéristiques de soudage normal/point par point

**PSM 20**

6185652



**S12** Normaali MIG-MAG/pulssi-MIG-ominaiskäyrien valintakytkin  
 Väljare för normal MIG-MAG/puls-MIG-svetskaraktäristika  
 Selecting switch for normal MIG-MAG/pulse-MIG welding characteristics  
 Wahlschalter für Normal-MIG-MAG/Puls-MIG-Schweiß-Charakteristika  
 Keuzeschakelaar voor normaal MIG-MAG/puls-MIG-lassen  
 Commutateur de sélection des caractéristiques de soudage MIG-MAG normal / MIG pulsé.

**X11** Liitin jännite- ja virtamittaukseen (MU)  
 Anslutning för spännings- och strömmätning (MU)  
 Connector for voltage and current measuring (MU)  
 Anschluß für Messung von Spannung und Strom (MU)  
 Aansluiting voor Volt- en Ampèremeter (MU)  
 Connecteur pour afficheur courant / tension (MU)

**P21** Virtamittari  
 Strömmätare  
 Current meter  
 Meßgerät für Strom  
 Ampèremeter  
 Ampèremètre

**P22** Jännitemittari  
 Spänningsmätare  
 Voltage meter  
 Meßgerät für Spannung  
 Voltmeter  
 Voltmètre

## 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!**

### **Don't use power source for melting of frozen pipes!**

### **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! Sparks 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 the TIG torch or the welding cables on the power source or other electrical equipment.

### **Be careful of TIG ignition pulse voltage!**

Don't press on torch switch, if the torch is not directed towards work piece.

Don't use wet TIG torch.

Do not use damaged TIG torch.

### **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.

## GENERAL

The Kempotig 4500 AC/DC is a multi-purpose power source based on inverter techniques. The Kempotig 4500 AC/DC is suitable for MMA and TIG welding as well as carbon arc gouging with AC and DC.

Welding method		Material		
		Fe	Ss	Al
Puikko	DC: 15 - 450 A	x	x	x
	AC: 20 - 450 A	x	x	-
TIG	DC: 10 - 450 A	x	x	-
	AC: 15 - 450 A	-	-	x

x = yes      - = not used

Fe = steel, Ss = stainless steel, Al = aluminium

### The units recommended to be used with the Kempotig 4500 AC/DC:

TIG high frequency units: Kempotig 50  
 Cooling water circulation unit: WU 10  
 Remote control units: C 100C (MMA / TIG)  
                                   C 100D (MMA / TIG)  
                                   C 100P (lång pulse control unit / TIG)  
                                   C 100F (foot pedal / TIG)  
 Transport units: T50 (option to use two cylinders)

The operation of the Kempotig 50 and WU units are explained in their operation instructions. The fitting of the units to trolleys has been explained in the accompanying fitting instructions.

## INSTALLATION

### Siting the machine

A distance of at least 20 cm between the rear of the machine and any surrounding object must be ensured to allow good circulation of the cooling air through the machine.


Metal and carbon dust are not good to the operation of the machine, so it is very important that the machine is positioned away from the line of particle spray, created by grinding tools etc.

If the machine is used in an outside environment, it is advisable to cover the machine with a waterproof sheet for extra protection, but in no way must the flow of cooling air be obstructed.

### Connection to main supply

(see picture on page 5)

Connection of the connection cable to the mains supply should only be carried out by a competent electrician.

For connection of the mains cable remove the cover of the machine. The cable is entered to the machine through the inlet ring on the rear panel of the machine and fastened with cable clamp. The phase leads of the connection cable are coupled to connections L1, L2 and L3. The earth-protection lead, coloured green-yellow, is coupled to the earthing screw marked thus .

Sizes of the connection cable and fuse rating for the machine at 100% duty cycle loading, are specified in the table below.

Connection voltage	400 V
Fuses (delayed)	35 A
Connection cable	4 × 6 mm <sup>2</sup>

### Tolerance of the mains supply voltage

The Kempotig 4500 AC/DC was designed to operate from a standard 380...415 V (50 / 60 Hz) supply without any alterations or adjustments in connections to the machine.

## OPERATION

### Main switch (S1)

The machine becomes live when the main switch on the fascia panel is turned from the zero position to position I. At the same time the pilot lamp by the main switch is illuminated.

### Operation of the cooling fan

The machine has a thermostatically-controlled cooling fan which does not run until the temperature is reached.

### Idling voltage

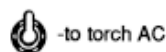
Idling voltage of the machine is always regardless of the selected current type (DC, AC) direct current voltage, approx. 80 V DC.

### Current type pre-selecting for each method (S2-3)

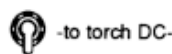
Before you start welding, you have to program required current type for each method (DC-, DC+ tai AC) on the front panel switches (S2-3) of the power source.



S3 TIG



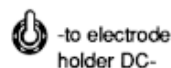
-to torch AC



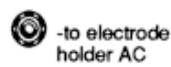
-to torch DC-



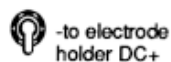
S2 MMA



-to electrode holder DC-



-to electrode holder AC



-to electrode holder DC+


The power source identifies the welding method in use and gives the required current type automatically for the welding method in requestion.

**TIG:** when the start switch of the torch is pressed

**MMA:** when the MMA remote control unit is connected on the control connector on the rear panel of the machine or when in TIG / MMA-, systems there is a change over to MMA welding.

Due to current type pre-selecting for each method, the change over from one method to another of multi-method weldings (TIG / MMA) can be done from the working place without having to touch the wiring or switches of the power source.

### AC balance control (R1)

In AC welding (  ) the length ratio of positive and negative halfcycles is controlled with potentiometer R1.

The balance control doesn't change the frequency of alternating current (AC).

The balance control is in operation both in AC-TIG- and AC-MMA welding and the control is indicated by the green signal light V1.

In AC-TIG welding, the penetration and cleaning of the seam are influenced on by the balance control:



max. penetration (approx. 30 % electrode positive)      max. cleaning (approx. 70 % electrode positive)

The middle position (0) is the recommended initial position for R1.

### Auxiliary voltage supply (X2)

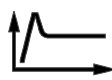
Power supply of the cooling water circulation unit and/or gas preheater 220 V 440 VA 1~. Power supply is protected with 2 A fuses F3 and F4.

## AUXILIARY FUNCTIONAL UNITS PSM

The auxiliary function unit PSM can be mounted fixed on the front panel of the power source (see page 12). Isolate the plug of the power source from the main supply and wait at least 2 minutes before mounting the PSM unit. Follow carefully the mounting instructions delivered with the unit.

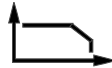
### PSM 10 operations

#### Start current control in MMA welding (R12)

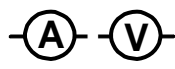
 Start current is automatically controlled with the growth of welding current. The relative level of start current is controlled with the potentiometer R12.

Recommended initial position: approx. 5-6

#### Change of characteristic curve in MMA welding (S11)

 OFF-position: Normal MMA welding  
ON-position: Point to point welding

#### Meter connection (X11)

 To the connector X11 can be connected external meter equipment MU for monitoring of welding current and voltage.

**Note!** The voltage meter shows pole voltage of the machine. Note that arc voltage is even many volts lower than pole voltage in welding with high currents and long cables.

#### Meter unit PSM 20

The unit is designed for the control and measurement of the current and voltage in such cases where the accuracy demand is not high. The accuracy of the meter indications are  $\leq 4\%$  of their full scale indications. The meters indicate the average values of voltage and current. The note in previous paragraph is also valid here.

## ASSEMBLY AND OPERATION OF WELDING EQUIPMENT

The cable connection of the welding equipment combinations for MMA and TIG welding are illustrated on pages 6 - 8. Connect the cables according to the connection diagrams accompanying with the transport units.

**Note!** When the welding equipment has been assembled, no changes in connections of current cables and control cable are necessary in change over of welding method or current type.

**Note!** In multi-method use you have to note that electrode holder and TIG torch which are connected to the equipment, are all live when welding is done with one of methods.


**Note!** Before you start welding, always control that the cooling water circulation unit is switched on and the cooling liquid circulates through the water-cooled torch.

**Note!** In the water-cooled TIG/MMA equipment the cooling water circulation unit has to be switched on also during MMA welding if MMA welding current is controlled from the remote control unit which is connected to the Kempotig 50.

### Use of MMA equipment

Connect the cables as illustrated on page 6.

#### Current type selection

Set switch S2 to required position (-, , +) or select the current type with switch of remote control unit C 110M.



#### Welding current control

Current is controlled from the remote control unit which is connected to the power source (page 9).

### Use of TIG/MMA equipment

Connect the cables as illustrated on page 7.

#### Current type selection

TIG-welding: Set switch S3 to required position (, -)  
MMA welding: Set switch S2 to required position (-, , +)

#### Control of TIG welding current

When the torch switch is pressed, the power source gives the current type set into switch S3 and the current control is done from the remote control unit which is connected to the Kempotig 50.

#### Change of TIG/MMA method and MMA current control

Set the I/O switch of the Kempotig 50 into position zero. The power source is started and gives the pre-selected current type for MMA welding (S2). MMA welding current is controlled from the remote control unit which is connected to the Kempotig 50.

#### Use of balance control switch (R1) in AI-TIG welding

With help of balance control, penetration/cleaning effect of seam is optimised in AI-TIG welding. Before welding, set R1 into middle position (zero). When you turn the potentiometer clockwise, positive half-cycles become longer, cleaning effect becomes more effective, penetration becomes smaller and electrode temperature goes up. When you turn counterclockwise, the effects are opposite.



The balance control also can be used in order to keep the electrode tip shape as the best possible. When the length of positive half-cycle is increased, the electrode tip becomes more ball-shaped.

## OPERATION DISTURBANCES

In order to locate an operation disturbance, the steps in the following instructions should be taken. For operation problem reason may be caused by bad electrical connections in the welding cables or intermediary cables, or by wrong position of one of the control switches of units.

Before finding out the reason for an operation disturbance connect the remote control unit on the control connector of the power source. If a continuous idling noise is generated by the machine, then the cause of the problem is probably outside of the power source.

### Loss of a phase in the mains supply

The overvoltage releasing of the machine may operate if there is a very short (less than 1 s) break in the mains supply. Normal operation is then returned by resetting once with the main switch of the machine.

A very common fault situation is the loss of one phase to the machine. The most common reasons are through-burning of a mains supply fuse, or a bad connection in the plug of the mains connection cable or on the terminal block.

The loss of one phase is not always indicated by the pilot lamp on the front panel of the machine, but it can be recognized by the very poor welding characteristics achieved.

### Operation of the overvoltage releasing

The machine has an overvoltage releasing which stops the operation if the welding pole voltage exceeds 100 V. The operation is restored by resetting with the main switch.

### Operation of the overload protections

The overload protections (thermal protections) of the machine operation if the machine is continuously loaded above the rated values. The protection may also operate if a blocked dust filter prevent the flow of cooling air through the machine.

The machine cannot be returned to operation until it has cooled down to a lower temperature and the operation of the protection has been reset with the main switch.

Take the following steps:

- reset once with the main switch (I → O → I)
- if the machine does not start, wait 10-20 minutes until the cooling fan cools the machine.
- after the cooling down period, a further resetting with the main switch (I → O → I) restores the machine to welding conditions.

### Main fuse of the machine (F1)

Isolate the plug of the machine from the mains supply and wait at least 2 minutes before loosening the front grate. (See page 4).

It is very important that it is replaced with a fuse of same type and rating which is marked on collar of fusebox. Damage caused by a wrong type fuse, is not covered by the guarantee.

### Control fuse (F2)

The Kempotig 50 unit receives its operating voltage from connector on rear panel of the power source. As protection of auxiliary transformer of the power source there is an 8 A slow-blow cartridge fuse beside the connector (see page 4). The fuse is in safety voltage circuit (30 V AC). If the failure of this fuse is apparent, some of the possible causes are as follows:

- damage intermediary cable (short circuit)
- damage remote control unit or its cable.

## MAINTENANCE

The amount of use and the working environment should be taken into consideration when planning the frequency of maintenance of the Kempotig 50. Careful use and preventive maintenance will help to ensure trouble-free operation.

### Cleaning of the dust filter

(see page 5)

The cleaning of the machine's dust filter should be performed at regular intervals, the regularity of which is dependent upon the machine's working environment.

The cleaning is recommended to be done at least once every 3 months when the machine is in constant use.

Isolate the plug of the machine from the mains supply and wait at least 2 minutes before removing the machine's front grate cover. When the dust filter is removed, live parts are exposed, where line AC and high voltage DC are present.

The maintenance is performed as follows:

- Remove the front grate of the machine (2 screws)
- Remove the fastening screws holding the dust filter (2 pc)
- Wash the filter carefully with water and if necessary a detergent based degreasing solvent can be added e.g. dish washing liquid.  
Do not use inflammable liquids.
- Check the condition of the filter. If for example the aluminium filler material has come out from its support frame, or it is damaged in any other way, it has to be replaced with a new one.  
A damage filter can cause a short circuit or other damage in live parts of the machine and serious damage may result.
- Refasten the dry filter in place.  
The screws have to be fitted with locking plates.
- Refasten the front grate to the machine

### Regular maintenance

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

- cleaning of the machine
- maintenance of the dust filter
- checking of the connectors
- checking of the switches and potentiometers
- checking of the condition and mounting of the mains cable and plug
- checking and tightening of the connections inside the machine
- damage parts or parts in bad condition are replaced by new ones
- maintenance testing. Operation and performance values of the machine are checked and adjusted when necessary by means of test equipment.

In the case of operation disturbances, contact an authorized KEMPPi Service Repair Shop. Check the maintenance parts before sending the machine to the service shop.



## TECHNICAL DATA

<b>Kempotig 4500 AC/DC</b>		
Connection voltage	3 ~, 50 / 60 Hz	400 V
Rated power	60 % ED	26,3 kVA
	100 % ED	22,8 kVA
Maximum load	80 % ED	450 A / 38 V
	100 % ED	390 A / 35,6 V
Control ranges	DC	10...450 A
	AC	15...450 A
Welding current control		stepless
Idling voltage		approx. 80 V DC
Frequency of welding current with AC	I > 200 A	45 Hz
	I < 200 A	variable 45...100 Hz
Efficiency		85 % (450 A / 40 V)
Power factor		0,9 (450 A / 40 V)
Idling power		approx. 150 W
Frequency		max. 5 kHz
Storage temperature range		-40...+60 °C
Operation temperature range		-20...+40 °C
Temperature class		B (130 °C)
Degree of protection		IP 23
Allowable control units		C remote control units, Kempotig 50
Auxiliary function units		PSM 10 and 20
Supply voltage for control units		30 V AC (240 VA / 100 % ED)
Supply for cooling water circulation unit (WU), gas preheater		2 x 220 V AC (total 440 VA / 100 % ED)
Dimensions	length	840 mm
	width	360 mm
	height	610 mm
Weight		126 kg

The products meet conformity requirements for CE-marking.