

KEMPOMAT 180 was designed for the MIG welding of thin steel plate and light structures. In most cases the work is done within a few metres of the machine and for this reason the power source and the wire feed unit occupy the same housing.

The voltage regulation of the machine is made with one switch. The regulation of the wire feed is stepless, but there is a scale with voltage recommendations which makes the machine easy to use. In the welding of thin sheets and in repairs,

where the sheet quality and fit-ups are poor, the scope of the machine is widened by the cycle arc timer. The scope of use is also widened by the possibility for spot welding.

In addition the machine has a connection for hot-straightening attachment.

KEMPOMAT 180P is equipped with pliers for resistance welding and is different from basic machine concerning connection for voltage and main switch.

TECHNICAL DATA

Mains voltage 3~	V	380/220 or 415 *)
Mains current (100 % duty)	kVA	2,8
Welding current at duty cycle **) 35 %	A	180
60 %	A	140
100 %	A	110
Voltage steps	pc	4
Open circuit voltage with CO ₂	V	18,2/19,7/22,0/25,7
Open circuit voltage with CO ₂ /Ar	V	16,7/18,0/19,8/22,5
Wire feed speed	m/min	0 - 11
Wire sizes	mm	1,0/0,8/0,6
Weight of wire reel	kg	15
Cycle arc-/fusion spot welding times	s	0,1 - 1,5
Shielding gas		CO ₂ or CO ₂ /Ar
Dimensions		
length	mm	815
width	mm	390
height	mm	1010
Weight	kg	85
Temperature class		H (180°C)
The machine complies with the safety regulations set out in VDE 0542 and SEN 8301 standards.		

*) Note! KEMPOMAT 180P with 380 V mains voltage only.

**) According to VDE 0542/7,65 standard:

The duty cycle is the percentage of arcing-time in a 5 min total time.

Example: 3 min welding in a 5 min period = 60 % duty cycle.

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INSTALLATION

Siting

- the machine should be used indoors, away from strong draughts.
- the location should be free from excessive mois-

- ture or grinding dust.
- if the machine has to be covered, the natural cooling air circulation should be ensured.

Lifting of the machine

TAKE OFF THE GAS BOTTLE FROM THE BOTTLE CARRIER BEFORE LIFTING THE MACHINE. For

the lifting there are lifting ears in the reel case of the machine (picture 9).

Connection to the mains *)

The mains cable is led to the machine through the grommet in the back wall of the machine and connected to the mains terminal strip and locked with the clamp (B).

The phase wires to the cable are connected to the connectors L1, L2 and L3. The yellow-green protective earth cable is connected to the earth screw \perp beside the terminal strip. Picture 1.

Connection cable:

Machine	Connection voltage	Connection cable	Fuses
KEMPOMAT 180	380/220 V 3 ~	4 × 1,5 mm ²	10 A delayed
	415 V 3 ~	4 × 1,5 mm ²	10 A delayed
KEMPOMAT 180P	380 V 3 ~	4 × 2,5 mm ²	16 A delayed

Change of connection voltage *)

When the 380/220 V machine is coupled on 220 V, an additional wiring system (A) must be used. The leads are to be connected according to picture 2b or 3b between the contactor and the terminal strip of the main transformer, in addition on the terminal strip of the auxiliary transformer is made a change

in connection according to picture 4b. **From the wiring diagram delivered with the machine you can see the connections more clearly. The 380/220 V machine is coupled on 380 V when it is delivered from factory unless it has otherwise been agreed in writing.**

Change of the shielding gas*)

Construction steel: mixed gas 80 % Ar/20 % CO₂ or CO₂

Construction steel: mixed gas 98 % Ar/2 % O₂

Aluminium: Argon

Flow speed of shielding gas appr. 10 l/min.

On delivery from factory the machine is coupled for

use with CO₂. Other gases require a smaller secondary voltage, which can be changed on the terminal strip of the main transformer according to pictures 3a or 3b. Change of coupling is clearly marked on the terminal strip.

*) **NOTE!** The connection of the primary cable from the mains supply and changes to any internal primary voltage connectors should only be carried out by a competent electrician.

Mounting of the welding gun and filler wire (picture 6)

- connect the welding gun on the central adapter of the machine, **tighten the lock nut with hand**
- **open the press arm above the feed roll**
- **turn the feed roll** so that the wire diameter "0,6—0,8" or "0,8—1,0" is at the back side of the wheel
- **set the filler wire reel onto the hub, lock the wire reel**


NOTE! Wire reels with metal circles may be warped. Control that the reel has enough place to rotate without touching body or other metal parts of the machine.

- release the wire end from the reel and cut off the

ent wire end. SEE THAT THE WIRE REEL DOES NOT GET RELEASED

- straighten about 20 cm of the wire and make sure that the end is not sharp. A sharp end could damage the liner and the contact tip of the welding gun
- thread some wire into the liner of the welding gun
- see to that the wire is placed correctly onto the feed roll and close the press arm of the feed rolls
- **choose the contact tip according to the filler wire, 0,6, 0,8 or 1,0**

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- turn the main switch to position I, the selecting switch for welding method to position  and set the wire feed speed at a low value
- keep the hose of the welding gun straight and press the switch of the gun, until the wire end comes out of the contact tip
- the pressure adjustment of the feed rolls (6 in picture 6) must be set so that the wire is fed evenly into the liner and small restriction of the

- wire can be made without the feed rolls slipping. NOTE! Excessive pressure will cause flattening of the filler wire and loosening of the wire coating and undue wear of the rolls
- regulate the braking of the wire reel hub (picture 3) so that the reel stops rotation at the same time as the feed rolls, in other words the wire may not be loosened on the reel.

OPERATION

SETTINGS (picture 5)

Main switch I/O

- Position I voltage is coupled
 Position II (only KEMPOMAT 180P) voltage is coupled on pliers for resistance welding. MIG welding does not operate in this position.

Earth cable

The welding characteristics of the machine are greatly influenced by the welding choke. The selection of the optimum choke value is combined with connection of the earth cable.

- Connection I This connection is used when welding thin sheets (under 1 mm).
- Connection II This connection is used when welding thicker sheets and in spot welding.



This connection is used only in hot straightening.

The earth connection from the weld plant should at all times be made directly onto the piece to be welded. The contact between the earth connection and the job should be as large and as flat as possible and all rust and paint on the workpiece should be removed.

The settings of the welding voltage and wire feed speed

are on the same scale. The wire feed speed scale is marked for both 0,6 and 0,8 mm wires. On the scale are numbers for the wire feed corresponding to the number selected on the voltage switch.

The wire feed speed can be adjusted steplessly so that it can be finely-adjusted to obtain the best welding result.

The set position is correct for carbon dioxide (CO₂) or gas mixture, provided that the machine is coupled for shielding gas in question. (See: Change of shielding gas.)




Example: The selection of the welding values with e.g. ø 0,8 mm wire is made as follows:

- the selection of the required current, e.g. 80 A and after this the dial is set to position 80 A. See picture 7.
- the voltage switch is set to the corresponding number, or to position 2.

DO NOT ADJUST THE VOLTAGE DURING WELDING.

Selecting switch for welding method

With the selecting switch for welding method it is possible to select the wire feed for three different welding methods:

-  continuous welding
-  cycle-arc welding
-  spot/plug welding

Setting of the welding timer

Setting stepless 0,1 - 1,5 s

1. For wire feed time in cycle-arc welding
2. For welding time in spot/plug welding

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WELDING —

Continuous welding

- a normal welding method with a continuous wire feeding

Cycle-arc welding ■■■

- in this welding method the wire is fed in cycles.

In cycle-arc welding the feed of the filler wire is controlled by the timer. The feeding is divided into the working and pause cycles. The time for the working cycle (welding) is adjusted with a welding timer and the pause cycle is fixed 0,3 s.

The welding is made during the working cycle. During the pause cycle the wire feed is stopped and the arc will extinguish. During the pause

cycle the molten pool will cool down. The arc will extinguish again at the beginning of the following working cycle, when the filler wire makes contact with the molten pool.

The welding current is switched on and the shielding gas supply will remain on during the pause cycle.

- this is used on thin sheet to avoid burn-through and reduce distortion.

Fusion spot welding ●●●

- a welding method with one wire feed cycle

MIG spot welding or fusion spot welding is made from one side of the sheets placed one upon another so that the high welding current penetrates through the upper sheet (max. 1,5 mm) also a part of the lower sheet.

When welding sheets of unequal thickness the welding is made on side of the thinner sheet.

Thicker sheets can be welded together by having a hole in the top sheet and directing the wire into the hole - this is known as "plug welding".

Spot welding requires no extreme pressure; the sheets are pressed against each other with the

studs of the spot welding nozzle.

- the gas nozzle is changed for a spot welding nozzle with studs. Cut-off the studs so that the free wire length is 5 - 8 mm.
- the selecting switch for welding method to position ●●●, the voltage switch to position 4 and the wire feed speed to position 4 ●●●.
- the welding time to give the required depth of penetration is adjusted with the welding timer potentiometer.

Fusion spot welding with KEMPOMAT 180 machines is possible only with \varnothing 0,8 mm wire.


"HOT-STRAIGHTENING"

Hot-straightening is made in the same way as the hot-straightening with gas welding plants.


When using the hot-straightening attachment it must be noted that machine must not be loaded with higher values than the following:

voltage steps 1 - 2 60 % duty cycle
voltage steps 3 - 4 35 % duty cycle

- take off from the welding gun the gas nozzle and contact tip with its holder. Put the carbon holder of the straightening equipment in place of the contact tip holder (Picture 10).

- connect the earth cable onto the connection. 
Do not use the hot-straightening equipment when the earth cable is in connections I or II.
- set the wire feed speed to zero and shut off the shielding gas
- turn the selecting switch for welding method to position —, start the machine and set a suitable current with the voltage switch
- the switch of the gun operates in the same way as in welding.

RESISTANCE WELDING, KEMPOMAT 180P only

Main switch position II 

- voltage will be coupled on pliers for resistance welding
- read separate operation instructions for pliers

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KEMPOMAT 180C

Differing from the basic model, the KEMPOMAT 180C is equipped with remote control connection for wire feed speed.

Selecting switch for local/remote control

In the local control position of the switch the wire feed speed is adjusted from the potentiometer on the front panel of the machine.

In the remote control position of the switch the

wire feed speed is adjusted from the remote control unit which is connected to the remote control connection.

Remote control unit

As the remote control unit can be used only the C 100C control unit.

MAINTENANCE

The frequency of maintenance must take into account the amount of use and the environment. Proper use and rational preventive maintenance ensure the most troublefree use of the machine without any unforeseen interruptions.

Basic maintenance should be carried out at least

twice a year for the following:

- welding gun
- wire feed mechanism
- power source unit

In addition the welding gun requires daily cleaning and service.

Welding gun

Due to high temperature and wear the welding end of the gun requires most attention.

Gas nozzle

- clean the gas nozzle often during the day
- at the same time check the insulators of the gas nozzle

Weld spatter from the arc will build-up on the gas nozzle and prevent the free flow of shielding gas. Severe spatter build-up can lead to short-circuiting between the nozzle and the contact tip causing severe damage.

Contact tip

- clean the spatter on the contact tip
- the condition of the tip should be checked weekly

An enlarged or blocked contact tip should be changed for a new one.

Liner

- the liner should be cleaned and checked at least each time a new wire reel is fitted to the machine. Dry compressed air is blown through the liner, blowing should be preferably made from the neck end.

Wire feed mechanism

Check the following:

- groove of the roll. If the groove is worn this will cause disturbances in the wire feed
- that the wire runs straight. The liner of the multi-function adapter must be as near the feed rolls as possible, without touching them, and the wire

- must run straight from the hole of the liner to the groove of the feed roll
- function of the brake of the wire reel hub; the brake band must be lubricated lightly.

Clean the unit of dust and dirt.

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Power source unit

Switch off the machine from the mains before all cleaning, service and reparations in the power source unit.

- clean the interior parts and components of the machine with dry compressed air
- check the condition of all electrical connections
 - * the oxidized parts must be cleaned
 - * the loose parts must be tightened
- possible faults have to be repaired immediately

WHEN CLEANING WITH COMPRESSED AIR, ALWAYS PROTECT YOUR EYES WITH PROPER EYE PROTECTION.

IN CASE OF PROBLEMS CONTACT THE KEMPPI WORKS IN LAHTI, FINLAND OR YOUR KEMPPI-DEALER.

GUARANTEE

The machines produced and products represented by Kemppi Oy are guaranteed against defects in material or manufacture. Within the limits of the guarantee the defective part will be replaced by a new one, or when possible, repaired free of charge. The guarantee is valid for one year provided that the machine is used in one-shift work. The guarantee does not compensate for damage

due to improper use, neglect or normal wear. Possible travelling costs or freight or postage charges are not covered by the Kemppi guarantee. Guarantee repairs shall be carried out only by Kemppi authorised representative. In case guarantee repair is demanded a certificate about validity of guarantee has to be presented.

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