Operation instructions • english
Gebrauchsanweisung • deutsch
Gebruiksaanwijzing • nederlands
Manuel d’utilisation • français

1923640E
0544

PROMIG

520R, 120R

KEMPPI
The Joy of Welding

CONTENTS

1. PREFACE

1.1. INTRODUCTION

Congratulations on having purchased this product. Properly installed Kemppi products should prove to be productive machines requiring maintenance at only regular intervals. This manual is arranged to give you a good understanding of the equipment and its safe operation. It also contains maintenance information and technical specifications. Read this manual from front to back before installing, operating or maintaining the equipment for the first time. For further information on Kemppi products please contact us or your nearest Kemppi distributor.

Specifications and designs presented in this manual are subject to change without prior notice.

In this document, for danger to life or injury the following symbol is used: ⚠

Read the warning texts carefully and follow the instructions. Please also study the Operation safety instructions and respect them when installing, operating and servicing the machine.

1.2 PRODUCT INTRODUCTION

Promig 520R is a welding system designed for robotic and automated welding. It consists of Promig 520R with inbuilt robot interface and a robot arm mounted feed unit Promig 120R. These two units are connected with an intermediate cable assembly.

Manual control is possible using interchangeable control panels:

MC: basic controls and displays for MIG welding, Five pre-selectable memory channels.

ML: basic controls and displays for MIG welding, Synergic MIG / Pulsed MIG welding modes.

MXE: Synergic MIG/MAG and Pulsed MIG in the most demanding welding environment. MMA welding is also possible.

Welding operation is controlled by microprocessor. The wire feed motor includes an amplified tachometer feedback system to ensure accurate wire feed speed. The interface stage handles 37 I/O signals covering all automated requirements.

There are three models of PROMIG 520 R. Each model has different versions according to the robot type.

1) PROMIG 520 R – basic model is to be used with control panels ML and MC.

2) PROMIG 520 R –MXE is designed for use with MXE panel. MXE has 63 memory channels.

3) PROMIG 520 R –SWF utilises (instead of PROMIG 120 R) an external voltage controlled wire feeding unit.

1.3. OPERATION SAFETY

Please study these Operation safety instructions and respect them when installing, operating and servicing the machine.

Welding arc and spatters

Welding arc hurts unprotected eyes. Be careful also with reflecting arc flash. Welding arc and spatter burn unprotected skin. Use safety gloves and protective clothing.

Danger for fire or explosion

Pay attention to fire safety regulations. Remove flammable or explosive materials from welding place. Always reserve sufficient fire-fighting equipment on welding place. Be prepared for hazards in special welding jobs, e.g. for the danger of fire or explosion when welding container type work pieces. Note! Fire can break out from sparks even several hours after the welding work has been finished!

Mains voltage

Never take welding machine inside a work piece (eg. container or truck). Do not place welding machine on a wet surface. Always check cables before operating the machine. Change defect cables without delay. Defect cables may cause an injury or set out a fire. Connection cable must not be compressed, it must not touch sharp edges or hot work pieces.

Welding power circuit

Isolate yourself by using proper protective clothing, do not wear wet clothing. Never work on a wet surface or use defect cables. Do not put MIG gun or welding cables on welding machine or on other electric equipment. Do not press MIG gun's switch, if the gun is not directed towards a work piece.

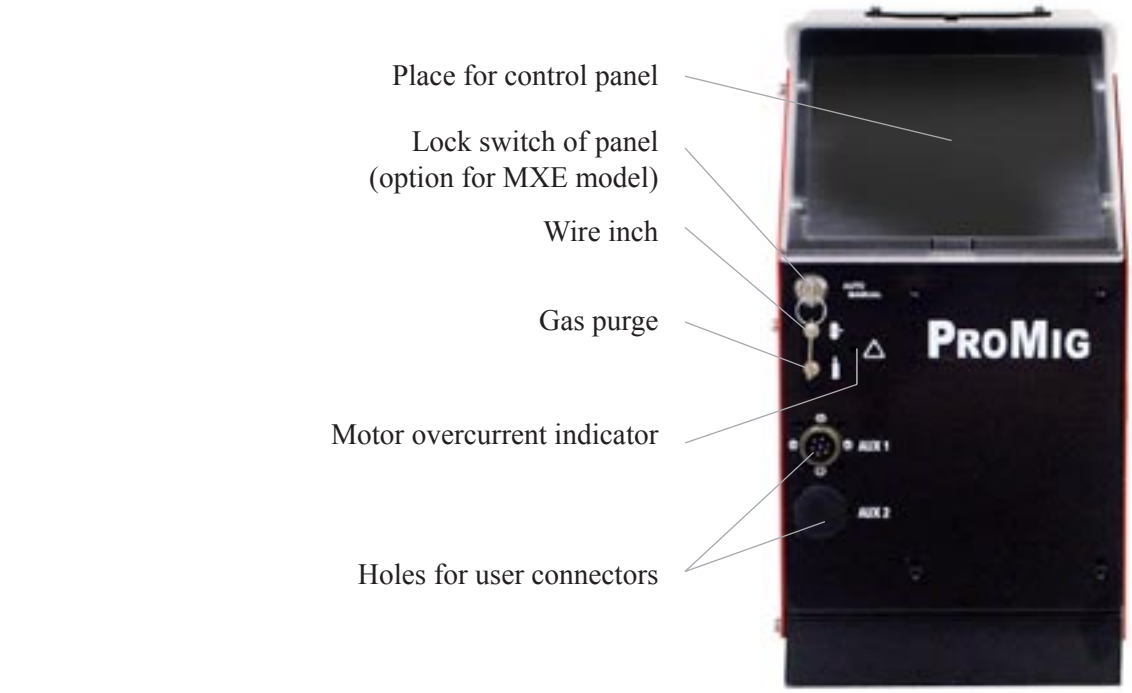
Welding fumes

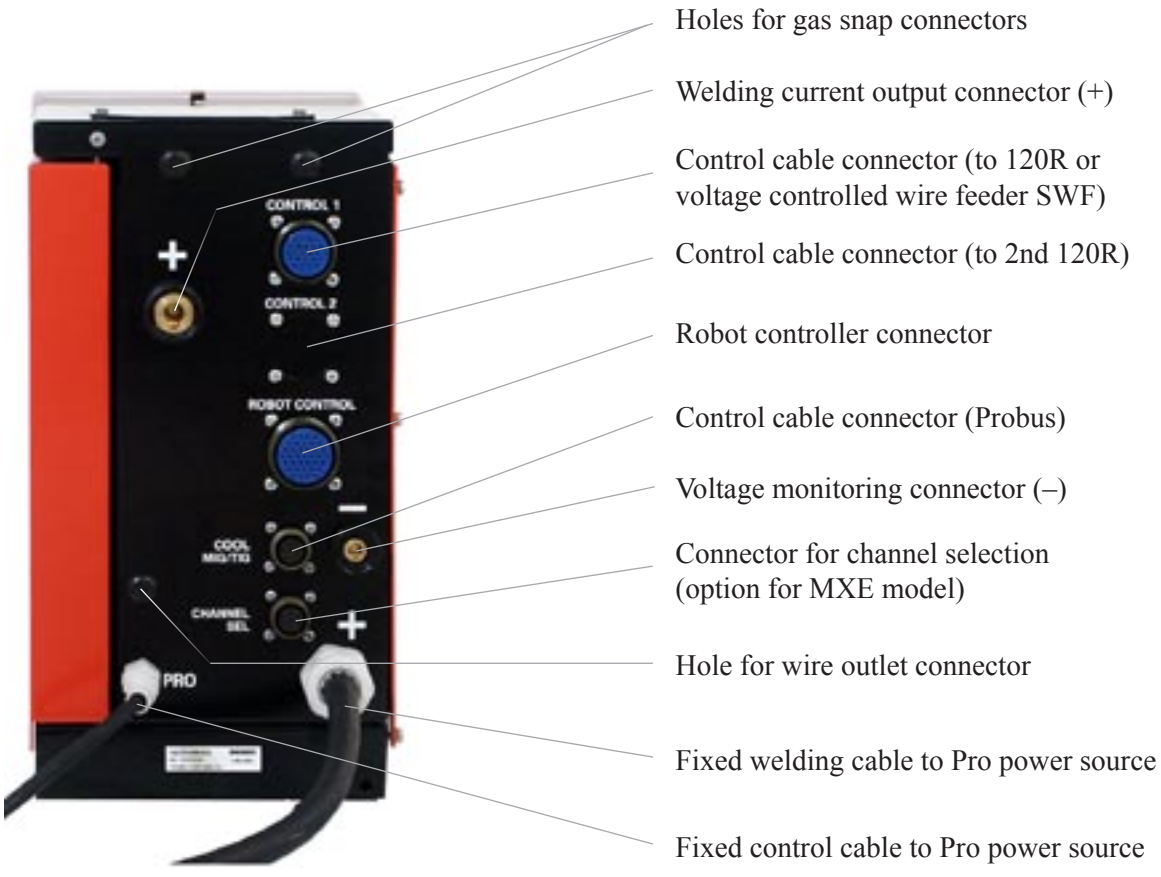
Take care that there is sufficient ventilation during welding. Take special safety precautions when welding metals which contain lead, cadmium, zinc, mercury or beryllium.

2. INSTALLATION

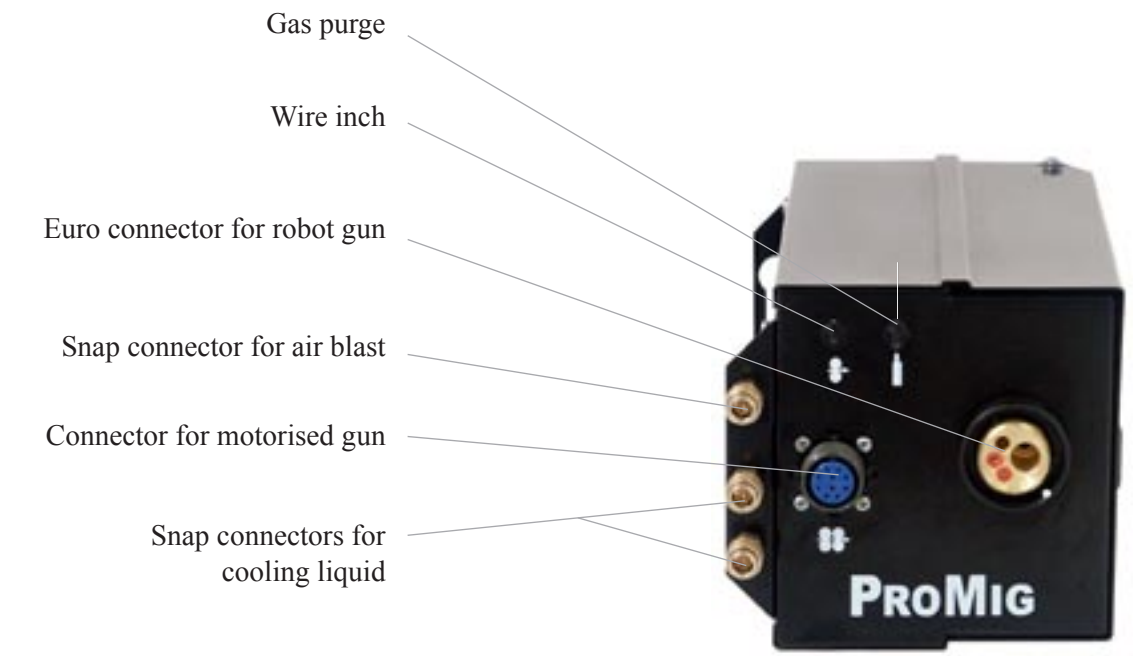
2.1. OPERATION CONTROL AND CONNECTORS

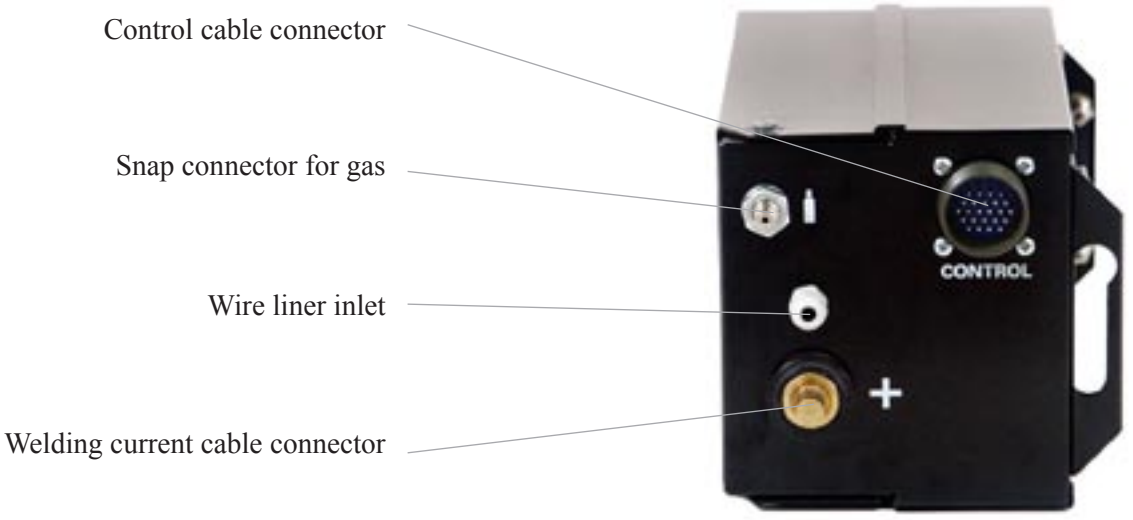
2.1.1. Promig 520R control unit





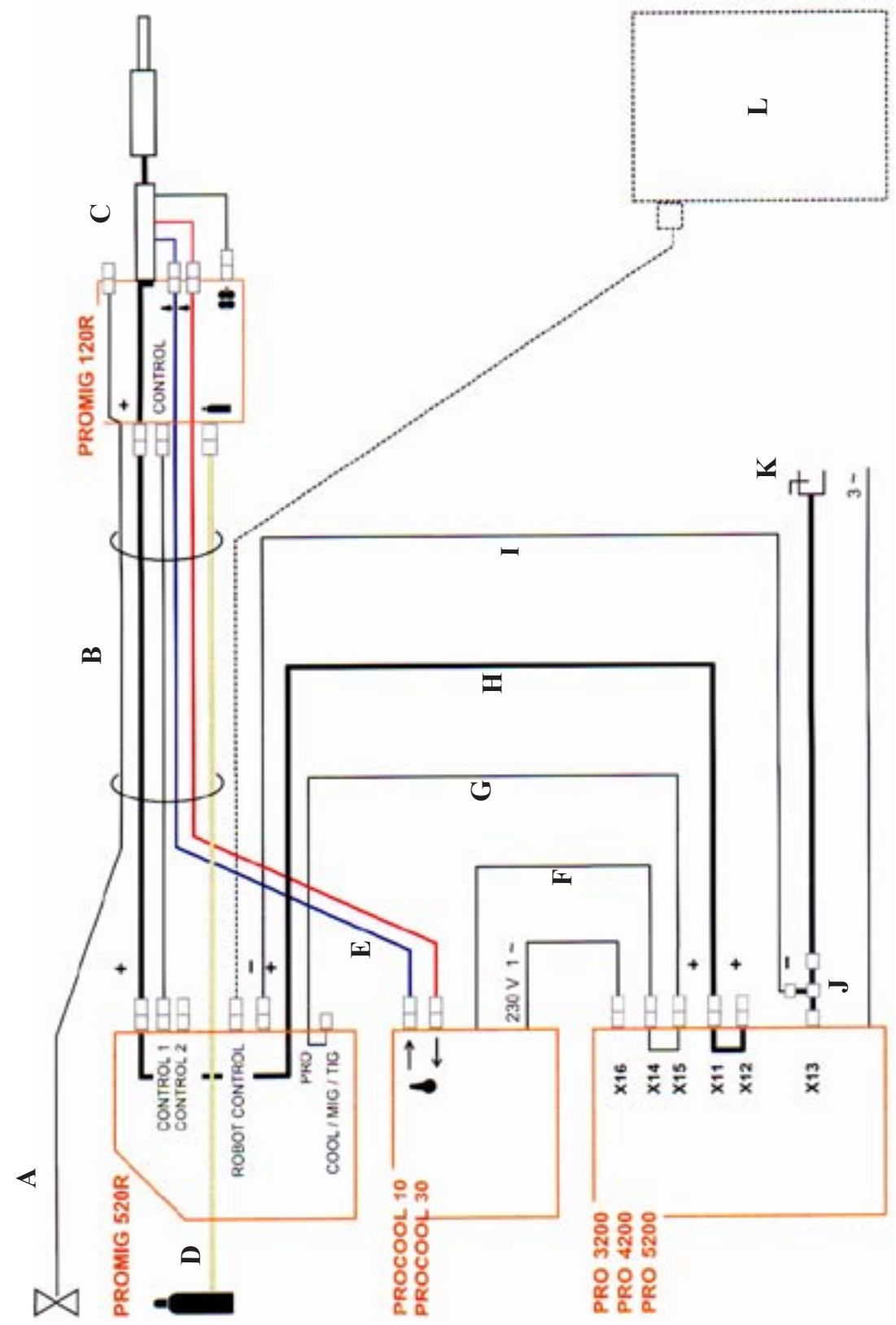
2.1.2. Promig 120R wire feeder



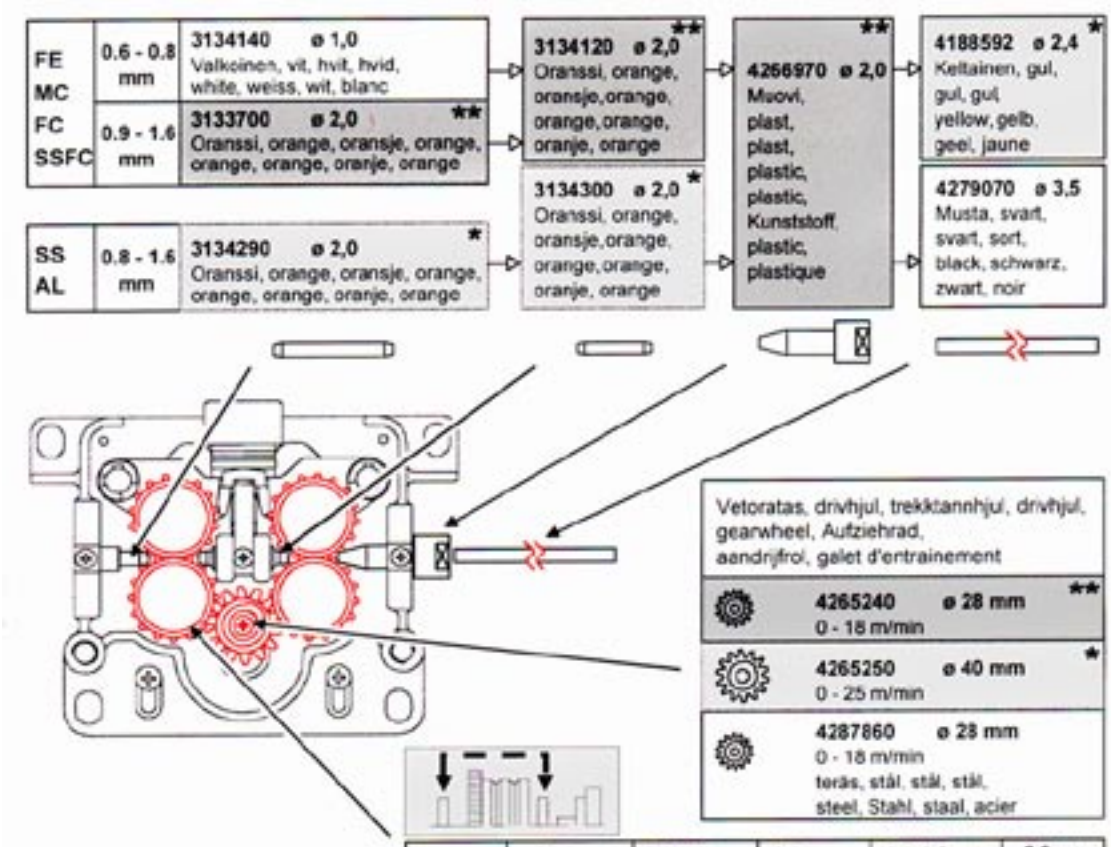


2.2. UNITS, ACCESSORIES, CABLES

A Air hose
B Intermediate cable assembly
C Air blast
D Shielding gas hose
E Cooling liquid hoses
F Control cable
G Control cable
H Welding current cable
I Voltage monitor cable
J Branch connector
K Earth cable
L Robot control



2.3. PARTS OF WIRE FEED MECHANISM



		0.6 mm	0.8 mm 0.030"	0.9-1.0 mm 0.035"	1.2 mm 0.045-52"	1.4-1.6 mm 1 / 16"	2.0 mm (5 / 64")
FE SS AL	Sileä, slät, slett, glat, plain, glatt, glad, lisse	3133810 Valkoinen, vit, hvit, hvid, white, weiss, wit, blanc		3133210 ** Punainen, röd, rød, rød, red, rot, rood, rouge		3133820 Keltainen, gul, gul, gul, yellow, gelb, geel, jaune	
FE FC	Pyälletty, räfflat, riflet, riflet, knurled, gerillt, gekarteld, cranté	—		3133940 Punainen, röd, rød, rød, red, rot, rood, rouge		3133990 Keltainen, gul, gul, gul, yellow, gelb, geel, jaune	
AL	U-ura, U-spår, U-spor, U-spor, U-groove, U-Nut, U-groef, gorge U	—		3133950 Punainen, röd, rød, rød, red, rot, rood, rouge		—	
Laakeroitu, med kullager, lager, kugleleje, beared, gelagert, gelagerd, avec roulement á billes		1.0 mm 0.035"	1.0 mm 0.035"	1.2 mm 0.045-52"	1.2 mm 0.045-52"	1.6 mm 1 / 16"	1.6 mm 1 / 16"
FE SS AL	Sileä, slät, slett, glat, plain, glatt, glad, lisse	3138650 Punainen, röd, rød, rød, red, rot, rood, rouge		3137390 Oranssi, orange, oransje, orange, orange, orange, oranje, orange		3141120 Keltainen, gul, gul, gul, yellow, gelb, geel, jaune	
FE FC	Pyälletty, räfflat, riflet, riflet, knurled, gerillt, gekarteld, cranté	—		3137380 Oranssi, orange, oransje, orange, orange, orange, oranje, orange		3141130 Keltainen, gul, gul, gul, yellow, gelb, geel, jaune	

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* kuuluu toimitusvarustukseen
ingår vid leverans
inkludert i leveransen
inkluderet ved levering
included in delivery
ist im Lieferumfang enthalten
met de zending meegeleverd
compris dans la livraison

* * kuuluu toimitusvarustukseen asennettuna
ingår vid leverans, monterad
inkludert i leveransen, montert
inkluderet ved levering, monteret
included in delivery, mounted
ist im Lieferumfang enthalten, montiert
met de zending meegeleverd, gemonteerd
compris dans la livraison, monté

2.4. ASSEMBLY OF MIG SYSTEM

Assemble the units according to the mounting instructions delivered with the unit.

1. Installation of power source

Read paragraph “INSTALLATION” in operation instructions for PRO power sources and install accordingly.

2. Mounting of PRO power source to transport wagon

P 20 see air-cooled MIG system
P 30W see liquid-cooled MIG system
P 40 see air-cooled MIG system

3. Put PROMIG onto the power source and lock it with bolts to handles of power source.

4. Mounting of PROMIG control panel

MC	6263501	see mounting instructions 4270950
ML	6263502	see mounting instructions 4270950
MXE	6263504	see mounting instructions 4279220

5. Connecting cables

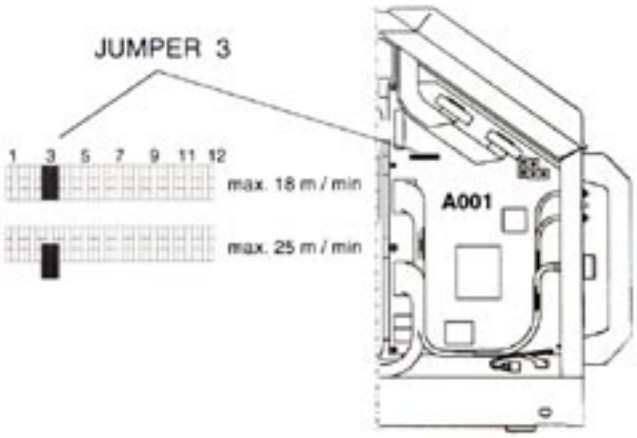
Connect cables according to paragraph ”UNITS, ACCESSORIES, CABLES”.

6. Max. wire feed speed

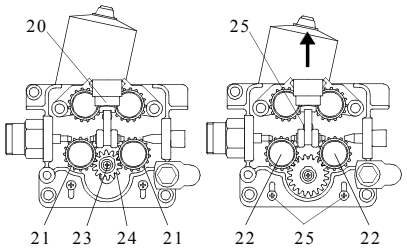
By delivery, the max. wire feed speed is 18 m/min, which is enough for most welding applications. If you need a higher speed, you can increase the wire feed speed to 25 m/min by replacing the gear wheel on motor shaft. The high ratio wheel (*D40*) is delivered with the feed unit.

Changing the maximum wire feed speed:

– Open side plate and remove JUMPER 3 on control card A001. This alters the tacho feedback ratio to 0 - 25 m/min.



– Open tightening lever (20). Remove lower feed rolls (21). Release screw (23) and its washer. Remove gear wheel D28 (24) from motor shaft.
– Loosen screws (25) (3 pcs) by one twist. Mount D40 gear wheel onto motor shaft. Screw the screw (23) with its washer back.
– Put feed rolls (21) back on their shafts.
– Lift motor so that tooth gap between gear wheel and both lower feed rolls is approx. 0,2 mm.
– Tighten screws (25). Check gear teeth gaps, if necessary put the motor into a better position. Screw on mounting screws of feed rolls (22).



⚠ **Too small a clearance between drive wheel and feed rolls will overload the motor. Too large a clearance causes rapid wearing of feed rolls' drive wheel.**

3. INSTALLATION OF MIG SYSTEM

3.1. ACCESSORIES CORRESPONDING TO WIRE DIAMETER

PROMIG wire feed rolls are available with plain groove, knurled groove and with U groove.

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.

PROMIG wire feed rolls have two grooves. Correct wire groove is selected by moving selecting washer from over to underneath the feed rolls. Move also drive wheel with the black plastic washer.

Feed rolls and wire guide tubes of wire feed unit have colour codes to make identification easier.

3.2. MOUNTING OF MIG GUN

To ensure trouble-free welding, check in welding gun operating instructions that wire liner and contact tip are correct for wire feed diameter and wire type. Too tight a wire liner might cause disturbances in wire feed, and motor overload (this is also a symptom of liner blockage).

Ensure that the welding gun connector is tight.

When you are using liquid-cooled gun, mount water hoses according to the diagram.

Error signal lamp of PROMIG 520R indicates overloading of wire feed motor. Operation of signal lamp is as follows (also see error codes):

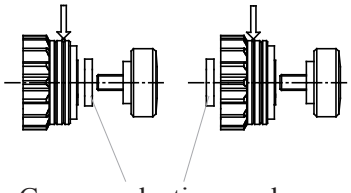
Wire feed motor is slightly overloaded e.g. due to a blocked gun. At a predetermined load the error signal lamp starts to blink.

If the load is too great the system will shut down (wire feed) and the display panel will indicate Err 9.

Error code 9, followed by blinking signal lamp is cleared by next start if error condition is no longer present or motor is not overheated any more.

3.3. AUTOMATIC WIRE FEED TO GUN

Automatic wire feed in PROMIG wire feed units makes changing of wire reel more rapid. When changing the reel, feed rolls need not be released as the wire will pass directly through.



Groove selecting washer

- Make sure that groove of feed roll matches the diameter of welding wire used. Feed roll groove is selected by moving the groove selecting washer from top to bottom or vice versa.
- Straighten the wire at a length of about 20 cm and see that its end has no sharp edges (file off if necessary). A sharp edge may damage the wire guide tube and contact tip of welding gun.

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

- Feed wire through wire cone until it touches the feed rolls. Do not release pressure of feed rolls!
- Press wire inch switch and feed wire until wire goes through both sets of rolls.
- Keep inch switch pressed until wire has come through contact tip.

3.4. ADJUSTMENT OF PRESSURE

Adjust feed roll pressure with the control screw (20) so that some resistance may be applied to the wire without slipping at the feed rolls.

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

3.5. BURN BACK TIME

The system includes an electronic burn back control which is pre-set.

3.6. GROUND CABLE

Use at least 70 mm2 cables. Thinner cross-sectional areas cause overheating of connectors and poor Pulsed MIG performance.

Never use a damaged welding gun!

3.7. SHIELD GAS

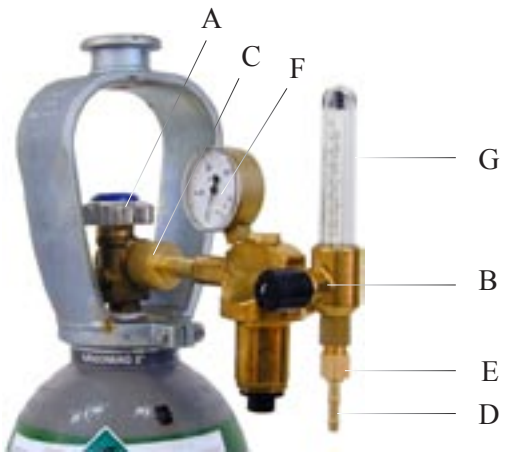
Handle gas bottle with care. There is a risk for injury if gas bottle or bottle valve is damaged!

For welding stainless steels, mixed gases are normally used. Check that the gas bottle valve is suitable for the gas. The flow rate is set according to the welding power used in the job. A suitable flow rate is normally 8 - 15 l/min. If the gas flow is not suitable, the welded joint will be sporous. Contact your local Kemppi dealer for choosing gas and equipment.

3.7.1. Installing gas bottle

Always fasten gas bottle properly in vertical position in a special holder on the wall or on a carriage. Remember to close gas bottle valve after having finished welding.

Parts of gas flow regulator



A Gas bottle valve
B Press regulation screw
C Connecting nut
D Hose spindle
E Jacket nut
F Gas bottle pressure meter
G Gas hose pressure meter

Following installing instructions are valid for most gas flow regulator types:

1. Step aside and open bottle valve (A) for a while to blow out possible impurities.
2. Turn press regulation screw (B) of regulator until no spring pressure can be felt.
3. Close needle valve if there is one in the regulator.
4. Install regulator on bottle valve and tighten connecting nut (C) with a wrench.
5. Install hose spindle (D) and jacket nut (E) into gas hose and tighten with hose clamp.
6. Connect hose with regulator and the other end with wire feed unit. Tighten jacket nut.

7. Open bottle valve slowly. Gas bottle pressure meter (F) shows bottle pressure.Note! Do not use the whole contents of the bottle. Bottle should be filled when bottle pressure is 2 bar.
8. Open needle valve if there is one in the regulator.
9. Turn regulation screw (B) until hose pressure meter (G) shows the required flow (or pressure). When regulating flow amount, power source should be switched on and gun switch pressed simultaniously.

Close bottle valve after having finished welding. If the machine will be out of use for a long time, unscrew pressure regulation screw.

3.8. MAIN SWITCH I/O

When you turn the main switch of PRO power source into position I, pilot lamp next to it is lit and the equipment is ready for welding. The equipment reverts to the welding method used before the main switch was turned to position zero.

Always start and switch off the machine with the main switch, never use the mains plug as a switch.

3.9. OPERATION OF COOLING UNIT

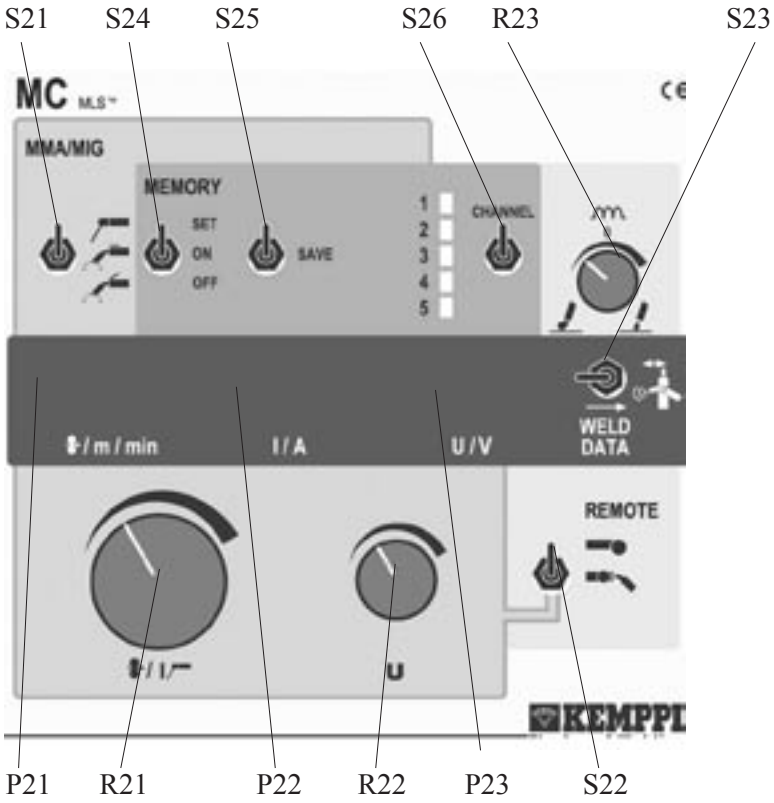
(PROCOOL 10, procool 30)

Operation of cooling unit is controlled so that pump is turned on when welding is started. After welding stop pump is rotating for approx. 5 min, thus cooling the liquid to ambient temperature.

Read in operation instructions for cooling unit the trouble situations in liquid circulation system and protection against damage of gun etc.

4. CONTROL PANEL OPERATIONS

4.1. MC CONTROL PANEL



MIG basic operations

Welding method selection (S21): no function
Control mode selection (S22): local, remote by robot controller
Local controls: wire feed speed (R21), welding voltage (R22)
Controls for MIG welding dynamics (R23)
Digital displays: wire feed speed (P21), current (P22), voltage (P23)
Retrieval of last weld values (S23)

SELECTO operations

SELECTO mode switch S24
OFF: Normal MIG/MAG welding
ON: Welding with memory stored values (5 channels)
SET: Welding parameters selection and storage SAVE (S25), for selected channel CHANNEL 1...5 (S26).

Welding method selecting switch S21

No function: always two-sequence procedure
MIG/MAG welding with two-sequence procedure
1. start on: welding starts
2. start off: welding stops

Control mode selecting switch S22

Local control: Control potentiometers R21 and R22 on panel are operational.
Remote control: Voltage and wire feed speed set values controlled by robot controller
(Switch center = remote position)

Local controls R21, R22

Wire feed speed potentiometer

SELECTO OFF: Local control for wire feed speed 0...18 m/min or 0...25 m/min
SELECTO ON: No operation
SELECTO SET: Local control for wire feed speed 0...18 m/min or 0...25 m/min

Voltage potentiometer

SELECTO OFF: Local control for voltage of PRO power source, 10 V...max. MIG voltage of power source
SELECTO ON: No operation
SELECTO SET: Local control for voltage of PRO power source, 10 V...max. MIG voltage of power source

Control of welding dynamics R23

When you adjust welding dynamics, adjustment value -9...0...9 is shown momentarily in the Voltage display which normally shows set value / welding voltage. Value of dynamics is shown in display for approx. 3 s after adjustment.

Control of MIG welding dynamics:

With MIG welding dynamics control you can influence arc stability.

-9...-1 Softer arc decreasing spatter

0 Default setting for all wires

1...9 Harder arc maximising stability of arc during short circuit and welding of steel with 100 % CO2 shield gas (settings 7...9).

Digital display for wire feed speed, current and voltage P21, P22, P23

/ m / min display

Display shows set value of wire feed speed switching to true value 0.0...18.0 m/min or 0.0...25.0 m/min during welding.

A display

Display shows 0 A (*no welding*) switching to true value of welding current during welding.

V display

Display shows set value of welding voltage and true value during welding.

Note! Display shows terminal voltage of power source. Depending on length and copper cross-section of welding cables real arc voltage and display may differ. See table below.

Cable	50 mm2	70 mm2	95 mm2
Voltage loss/10 m	0,35 V/100 A	0,25 V/100 A	0,18 V/100 A

4.1.1. WELD DATA / GAS TEST

Retrieval of welding parameters to displays

Use of WELD DATA switch retrieves welding parameters, wire feed speed, welding current, welding voltage which were used when welding was stopped last. Welding values are indicated in display for so long you are using the WELD DATA switch, and are stored until you press again the start switch for gun.

Testing the gas flow

A short press on switch starts flow of shielding gas. The shielding gas flows for approximately 20 seconds, or until the switch is pressed again.

4.1.2. SELECTO operations, MC panel

SELECTO is the name for the operation which allows you to store welding parameters. You can save five sets of MIG welding values. Parameters which can be stored are wire feed speed, welding voltage and welding dynamics.

In SELECTO operations there are three different operating modes:

SELECTO OFF: Normal MIG welding with independent adjustments for wire feed speed and voltage, SELECTO functions are not in use.

SELECTO ON: Welding with stored welding values, wire feed speed, welding voltage and welding dynamics. Only the channel selection switch is operational. Channels are selected according to the position of the local remote switch. Channels may be switched either with the CHANNEL switch or through the interface connector by the robot. You can change channels during welding.

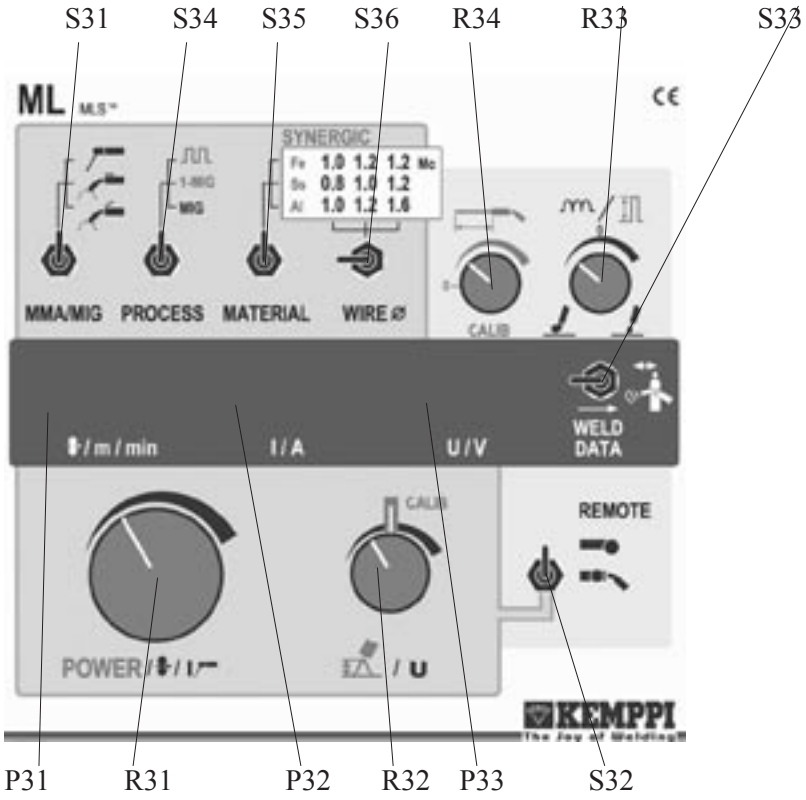
Digital display indicates values for wire feed speed and voltage which are stored on the channel in question. The stored value for welding dynamics can be retrieved by moving the welding dynamics potentiometer.

SELECTO SET: Settings are stored for indicated channel by using the SAVE switch. The values currently set for wire feed speed, voltage and welding dynamics are stored in that memory location.

Programming of memory channel:

1. Select channel 1...5.
2. Set SELECTO mode switch to SET.
3. Find correct values for wire feed speed, voltage and welding dynamics.
4. Store them by using the SAVE switch.
   Note! You can check data which you have stored in memory by setting SELECTO mode switch on position ON, the display will show the values stored in that memory location.
5. Set SELECTO mode switch to position ON and pre-set channels are active.

4.2. ML CONTROL PANEL



MIG basic operations

Welding method selection (S31): no function
Control mode selection (S32): local, remote
Local controls: wire feed speed/welding power/(R31), welding voltage (R32)
Controls for MIG welding dynamics (R33)
Digital displays: wire feed speed (P31), current (P32), voltage (P33)
Retrieval of last actual welding values (S33)

SYNERGIC operations

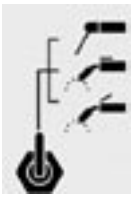
SYNERGIC mode switch S34

MIG Normal MIG welding with independent adjustments for wire feed speed (R31) and voltage (R32).

1-MIG SYNERGIC MIG: MIG welding with parameters which are pre-set according to filler wire (S35, S36). Welding parameters are adjusted with adjustment potentiometers for welding power (R31) and arc length (R32).

SYNERGIC PULSEMIG: Pulsed MIG welding with parameters which are pre-set according to filler wire (S35, S36). Welding parameters are adjusted with adjustment potentiometers for welding power (R31) and arc length (R32).
Gun cable length compensation (R34)

Welding method selecting switch S31



No function: always two-sequence procedure
MIG welding with two-sequence procedure
1. switch pressed: welding starts
2. switch open: welding stops

Control mode selecting switch S32

Local control: Control potentiometers R31 and R32
Remote control: Voltage and wire feed speed set values from robot controller (gun control = remote position)

Local controls R31, R32

Wire feed speed potentiometer

MIG/MAG: Local control for wire feed speed 0...18 m/min or 0...25 m/min
SYNERGIC MIG: Power control
SYNERGIC PULSED MIG: Power control

/ U Voltage / arc length potentiometer

MIG local control for PRO power source welding voltage, 10 V...max MIG voltage of power source
SYNERGIC MIG: Fine control for arc length, shows voltage which has been programmed in proportion to wire feed value. Voltage control range depends on wire feed value.
SYNERGIG PULSED MIG: Fine control for arc length -9...0...9

Control of welding dynamics R33

When you adjust welding dynamics, the adjustment value -9...0...9 is shown in display V, which otherwise shows set value / welding voltage. Value of dynamics is shown in display for approx. 3 s after adjustment.

Control of MIG/MAG welding dynamics:

With the MIG welding dynamic control you can influence arc stability.

-9...-1 Softer arc. Object: minimising spatter

0 Recommendable basic setting for all wires

1...9 Harder arc. Object: e.g. maximising stability of the arc on short circuit and welding of steel with 100 % CO2 shielding gas (settings 7...9).

Control of SYNERGIC MIG welding dynamics:

In SYNERGIC MIG the control of welding dynamics is optimised for wire type you are using. With this control you can influence stability of arc and amount of spatter.

-9...-1 Softer arc. Object: Minimising spatter

0 Recommended default setting

1...9 Harder arc. Object: e.g. maximising stability of the arc on short circuit

NOTE! Control range for MIG welding dynamics -9...0...9 is a relative range according to wire and is different from control range -9...0...9 for dynamics of normal MIG/MAG welding.

Shape of arc in SYNERGIC PULSED MIG:

In SYNERGIC PULSED MIG control for welding dynamics has an influence on shape of pulsed MIG arc.

-9...-1 Wider pulsed MIG arc. Object: e.g. welding of square butt preparation

0 Recommended basic setting

1...9 Narrow focussed arc. Object: e.g. fillet welds

Digital display for wire feed speed, current and voltage P31, P32, P33

/ m / min display

MIG/MAG with independent controls for wire feed speed and voltage: Display shows set value for wire feed speed and true value 0.0...18.0 m/min or 0.0...25.0 m /min during welding depending on selection of wire feed speed range.

SYNERGIC MIG welding: Display shows set value for wire feed speed and true value during welding.

Wire feed speed min. and max speed.

SYNERGIC PULSED MIG welding: Display shows set value for wire feed speed and true value during welding.

Wire feed speed range depends on wire type min. and max. speed.

I / A display

MIG/MAG welding with independent controls for wire feed speed and voltage: Display shows 0 A before, and true value during welding.

SYNERGIC MIG welding: Display shows 0 A before, and true value during welding.

SYNERGIC PULSED MIG welding: Display shows in setting state the reference mean current value, and true value for welding current during welding.

U / V display

MIG/MAG welding with independent adjustments for wire feed speed and voltage: Display shows pre-set value for welding voltage, and true value during welding.

SYNERGIC MIG welding: Display shows pre-set value for welding voltage, and true value during welding.

When adjusting arch length display shows voltage.

SYNERGIC PULSED MIG welding: In setting state, display shows set value -9...0...9 for arc length, and true value of welding voltage during welding.

Note! Display shows terminal voltage of power source. Depending on length and copper cross-section of welding cables real arc voltage and display may differ (see table below).

Cable	50 mm2	70 mm2	95 mm2
Voltage loss/10 m	0,35 V/100 A	0,25 V/100 A	0,18 V/100 A

When you adjust welding dynamics, display V shows adjustment value for welding dynamics -9...0...9, the value is shown for approx. 3 s after end of adjustment. After that display reverts to show voltage in SYNERGIC MIG and arc length in SYNERGIC PULSED MIG welding.

4.2.1. WELD DATA

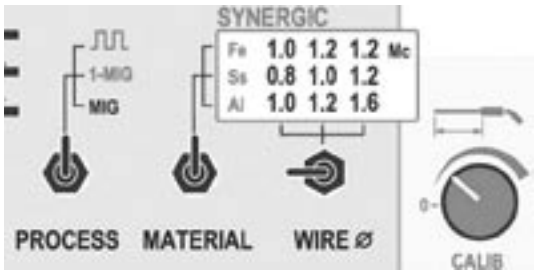
Retrieval of welding parameters to displays

Use of WELD DATA switch retrieves welding parameters, wire feed speed, welding current, welding voltage which were used when welding was stopped last. Welding values are indicated in display for so long you are using the WELD DATA switch and are stored until you press again the start switch of gun.

Testing the gas flow

A short press on the switch starts shielding gas flow. Shielding gas flows for approximately 20 seconds, or until the switch is pressed again.

4.2.2. SYNERGIC operations, ML panel



In SYNERGIC operation, the welder indicates the filler wire type and diameter to be used. The equipment then generates optimal welding settings. In SYNERGIC mode the wire feed potentiometer changes the adjustment for welding power, voltage and dynamics automatically (so called “one knob adjustment”).

In SYNERGIC operation there are three operation modes:

MIG — Normal MIG/MAG welding with independent adjustments for wire feed speed and voltage.
SYNERGIC operation is not active.

1-MIG — SYNERGIC MIG welding with parameters which are optimised according to filler wire parameters. Nine SYNERGIC MIG programs for different filler wires are stored:

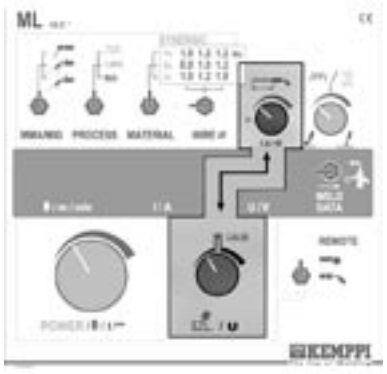
Diameter	*Filler wire*	*Shielding gas*
Welding of steel (Fe)		
ø 1,0 mm	Fe solid wire	Ar + 18 % CO_2
ø 1,2 mm	Fe solid wire	Ar + 18 % CO_2
ø 1,2 mm	Mc cored wire	Ar + 18 % CO_2
Welding of stainless steel (Ss)		
ø 0,8 mm	Ss solid wire	Ar + 2 % CO_2
ø 1,0 mm	Ss solid wire	Ar + 2 % CO_2
ø 1,2 mm	Ss solid wire	Ar + 2 % CO_2
Welding of aluminium (Al)		
ø 1,0 mm	AlMg5, *)AlSi5	Ar
ø 1,2 mm	AlMg5, *)AlSi5	Ar
ø 1,6 mm	AlMg5, *)AlSi5	Ar

In SYNERGIC MIG welding the welding values are adjusted with power potentiometer (normally potentiometer for wire feed speed), arc length potentiometers (normally voltage potentiometer) and welding dynamics potentiometer. Min. and max. power optimised for each wire correspond to min. and max. setting of power adjustment potentiometer.

*) Comes to use with a jumper.

Compensating cable length

Cable length compensation allows the operator to overcome voltage losses which are caused by long interconnecting cables. Cable compensation is adjusted as follows:



If interconnecting cables between wire feed unit and power source are not used, set cable compensation at position zero.
If the zero position does not operate as you want it to, make adjustment check as described in the following.

When using interconnecting cables, do as follows:

1. Adjust arc length at = CALIB, which corresponds to normal arc length.
2. Weld at power level required.
3. Adjust cable compensation potentiometer to give suitable arc length.
4. Check adjustment range for arc length by adjusting arc length -9...0...9.
5. When needed repeat points 2...4.

Cable compensation is adjusted for each cable / MIG welding gun combination only once.

Synergic pulsed MIG, pulsed MIG welding with parameters which are optimised according to filler wire parameters. Nine SYNERGIC PULSED MIG programs for different filler wires are stored:

Diameter	*Filler wire*	*Shielding gas*
Pulsed MIG welding of steel (Fe)		
ø 1,0 mm	solid wire	Ar + 18 CO_2
ø 1,2 mm	solid wire	Ar + 18 CO_2
ø 1,2 mm	metal cored wire	Ar + 18 CO_2
Pulsed MIG welding of stainless steel (Ss)		
ø 0,8 mm	solid wire	Ar + 2 % CO_2
ø 1,0 mm	solid wire	Ar + 2 % CO_2
ø 1,2 mm	solid wire	Ar + 2 % CO_2
Pulsed MIG welding of aluminium (Al)		
ø 1,0 mm	AlMg5	Ar
ø 1,2 mm	AlMg5	Ar
ø 1,6 mm	AlMg5	Ar

In SYNERGIC PULSED MIG welding, welding values are adjusted with power potentiometer (normally potentiometer for wire feed speed), arc length potentiometer (normally voltage potentiometer) and welding dynamics potentiometer. Min. and max. power is optimised for each wire type and corresponds to min. and max setting of power adjustment potentiometer.

Compensating cable length

See paragraph “SYNERGIC MIG welding”.

4.3. MXE CONTROL PANEL

Operations of MXE control panel are described in manual delivered with MXE.

Exceptions to the operations of MXE in robot use:

- 4T start switch function is not active
- gun remote control is not active
- there are 63 active memory channels

Other functions related to robot use:

MXE panel can be used in normal local control by setting MEMORY OFF and LOCAL. Key switch on machine front is turned to position MANUAL. All adjustments are set with the panel. In this case start and stop of machine can be controlled with robot.

By setting MXE panel to REMOTE mode, wire feed speed/voltage or power/fine control can be regulated with robot via analog lines.

Memory channels can be programmed as described in the operating manual of MXE panel.

When retrieving memory channels, you can choose with robot whether to use wire feed speed/voltage or power/fine control values retrieved from memory, or whether these values are controlled with robot via analog lines (see technical manual).

When controlling memory channels with robot, memory functions are to be set to MEMORY ON mode. Key switch is turned to position AUTO.

Note! On memory channel 0 (= no memory channel selected) machine always retrieves memory channel which was used last.

5. OTHER USER FUNCTIONS

Selection between gas-cooled and water-cooled gun is made using the switch inside the control unit.

Wire inch switch function is in the front of control unit and feeder unit.

- displays main motor current on welding current window and gun motor current on voltage display window
- inch speed is set by local control setting (panel)

Gas purge switch is in the front of control unit and feeder unit.

- gas purge when pressed

Gas valve is mounted inside the feeder unit but it can also be moved into the control unit where there is a place for it.

A gas pressure switch can be mounted inside the control unit.

Inside the control unit there is a 20 kg mig wire spool system.

6. ERROR CODES OF PANELS

Error codes inform the user about welding system malfunctions. They are displayed on MC/ML panels.

Err 1: Robot identification failed. Robot identification is done using XW114 on A003 X8.

Err 2: Power source has been started for MMA or TIG mode.

Err 3: Same as Err 2 but up (+) / down (–) buttons are active on PX panel (optional).

Err 4: Cooling unit (Procool 10 / 30) is not starting (check gas/water switch).

Err 5: Cooling unit (Procool 10 / 30) has a cooling failure (overheating sensor or pressure switch has reacted or unit is missing supply voltage).

Err 6: Water unit (Procool 10 / 30) has been started normally, but wire feed unit (Promig 520R) has lost serial communication link to cooling unit (check interconns).

Err 7: Emergency stop is active. Input relay K2 must be active on A003 to cancel emergency stop (only Promig 520R - KU).

Err 9: Overload of wire feed motor which may be caused by blocked wire guide of gun or by gun cable which is too curved.

Err 10: PRO power supply reports error when start message from Promig 520R is sent. Operation of thermal protection of PRO power source has stopped welding.

Err 14: Supply overvoltage in Promig 520R.

Error code display is cleared by next start if the cause of error code has been eliminated.

7. SERVICE AND OPERATION DISTURBANCES

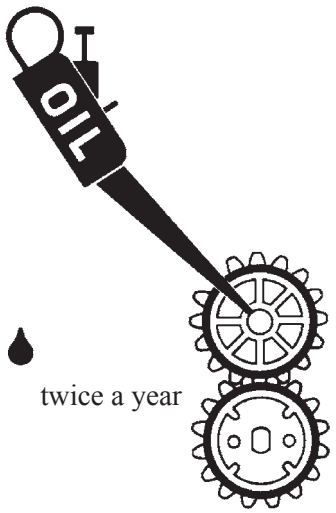
The amount of use and working environment should be taken into consideration when planning the frequency of maintenance of PROMIG. Careful use and preventive maintenance will help to ensure trouble-free operation.

Following maintenance operations should be carried out at least every six months:

Check:

- Feed roll grooves. Excessive wear of grooves causes wire feed problems.
- Wire guide tubes. Badly worn feed rolls and wire guide tubes should be discarded.
- Wire guide tube in the gun should be set as near the feed rolls as possible and the wire must follow a straight line from the end of the tube to the groove of the feed roll.
- Reel brake adjustment.
- Electrical connections:
  * Oxidized couplings must be cleaned
  * Loose couplings must be tightened

Clean dust and dirt from the equipment.



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

In case of problems contact your KEMPPI dealer.

8. DISPOSAL OF THE MACHINE

Do not dispose of electrical equipment together 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 returned to an environmentally compatible recycling facility. As the owner of the equipment, you should get information on approved collection systems from our local representative.

By applying this European Directive you will improve the environment and human health!

9. ORDERING NUMBERS

Wire feed units

Promig 520R wire feed control unit			6231510
Promig 120R wire feed unit			6236320

Accessories of Promig 520R

MC function panel			6263501
ML function panel			6263502
MXE function panel			6263504
Prosync 50 synchronisation set			6263121
Voltage sensor			4289560
Current sensor			4288790
Wire reel hub			4289880

Power sources

Kemppi Pro Evolution 3200			6131320
Kemppi Pro Evolution 4200			6131420
Kemppi Pro Evolution 5200			6131520

Cooling unit

PROCOOL 10			6262012
PROCOOL 30			6262016

Cabels

Voltage monitor cable			4288700
Branch connector			9771637
Intermediate cable assembly	5 m		6260421
	10 m		6260425
Earth cable	50 mm2	5 m	6184511
	50 mm2	10 m	6184512
Earth cable	70 mm2	5 m	6184711
	70 mm2	10 m	6184712

MIG guns for robotic and automated welding

MT-51MW	1,5 m / SK	6255156
MT-51MW	1,5 m / K30	6255157
MT-51MW	3,0 m / SK	6255158
MT-51MW	3,0 m / K30	6255159

Transport wagons

P 20		6185261
P 30W		6185262
P 40		6185264

10. TECHNICAL DATA

Promig 520R, Promig 120R

Operating voltage (safety voltage)		50 V DC
Rated power		100 W
Max. load	60 % ED	500 A
(nominal values)	100 % ED	390 A
Operation principle		4-roll feed
Diameter of feed roll		32 mm
Wire feed speed	I	0...18 m/min
	II	0...25 m/min
Filler wires	ø Fe, Ss	0,6...2,4 mm
	ø Cored wires	0,8...2,4 mm
	ø Al	1,0...2,4 mm
Wire reel	max. weight	20 kg
	max. size	ø 300 mm
Gun connector		Euro
Operation temperature range		-20...+40 oC
Storage temperature range		-40...+60 oC
Degree of protection		IP 23

Promig 520R		
Dimensions (without handle)		
	length	620 mm
	width	230 mm
	height	480 mm
	weight	20 kg

Promig 120R		
Dimensions	length	319 mm
	width	152 mm
	height	167 mm
	weight	8 kg

The products meet conformity requirements for CE marking.

11. 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 by an Authorised Kemppi Service Agent. Packing, freight and insurance costs to be paid by orderer. The guarantee is effected on the date 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 the terms of guarantee: defects due to natural 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 of damage due to natural causes i.e. lightning or flooding.

This guarantee does not cover direct or indirect travelling costs, daily allowances or accommodation. Note: Under the terms of guarantee, welding torches and their consumables, feeder drive rolls 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-authorised agents.

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 guarantee or proof of purchase, and serial number of the equipment in order to validate the guarantee. The parts replaced under the terns of 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.

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