

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

1923740E

0425

PROMIG 540R

PROMIG 120R



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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 540R is a welding system designed for robotic and automated welding. It consists of Promig 540R 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 panel:

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 fieldbus signal covering all automated requirements.

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.

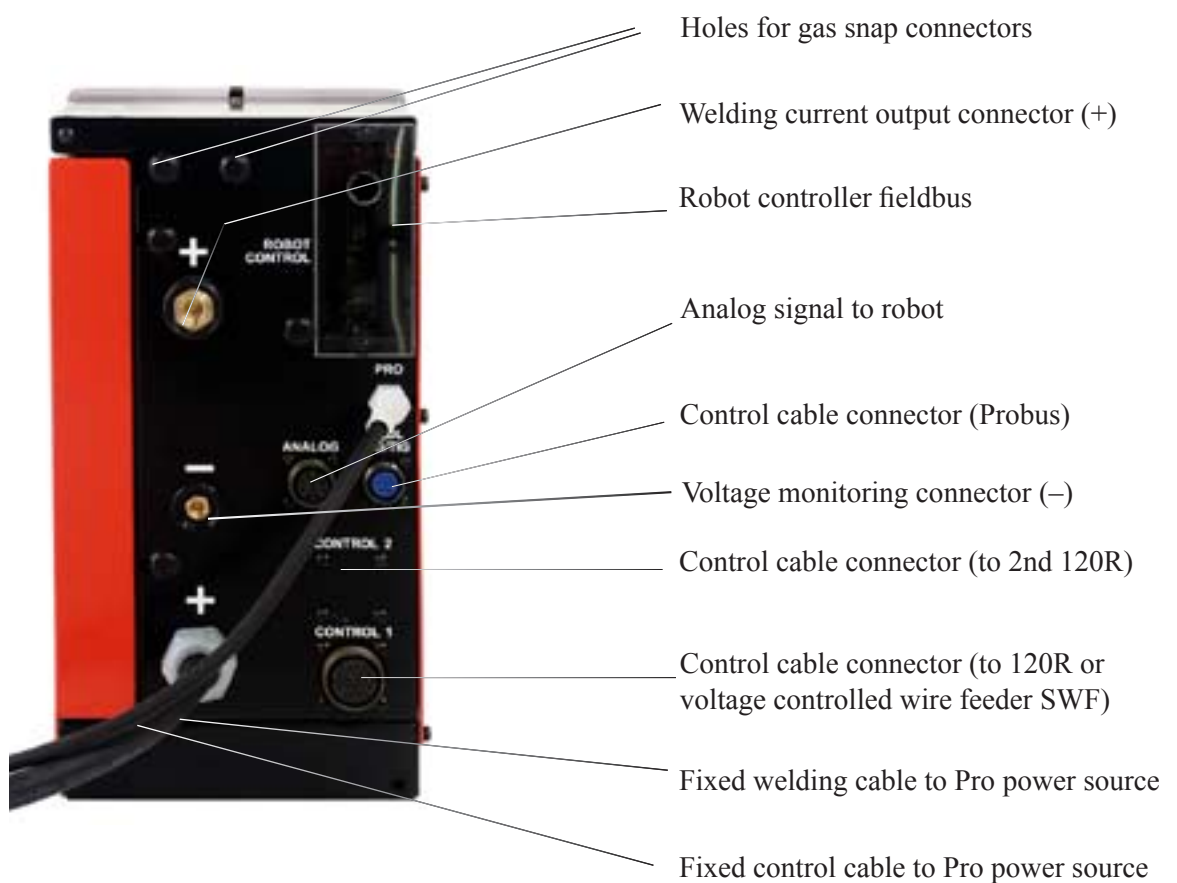
Welding fumes

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

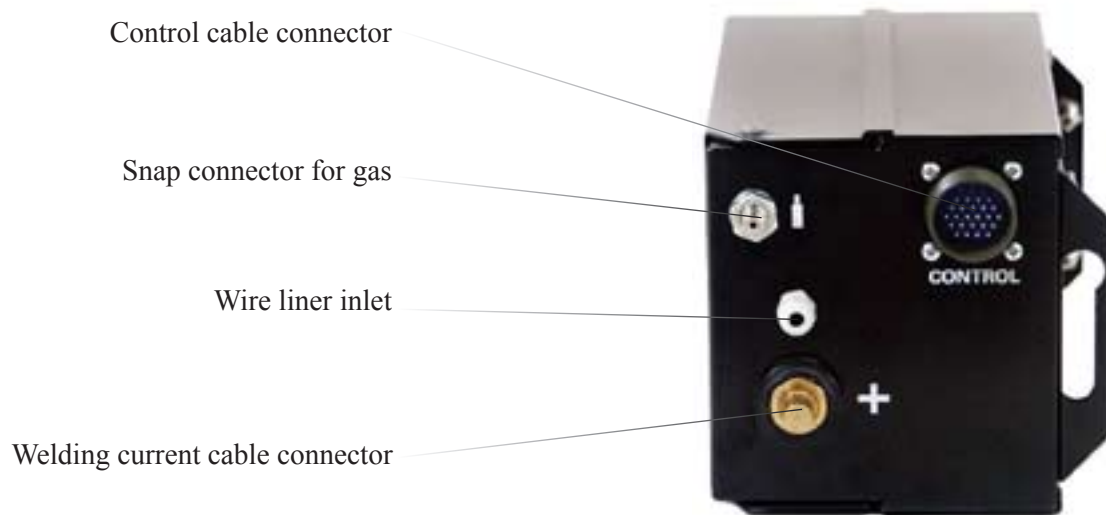
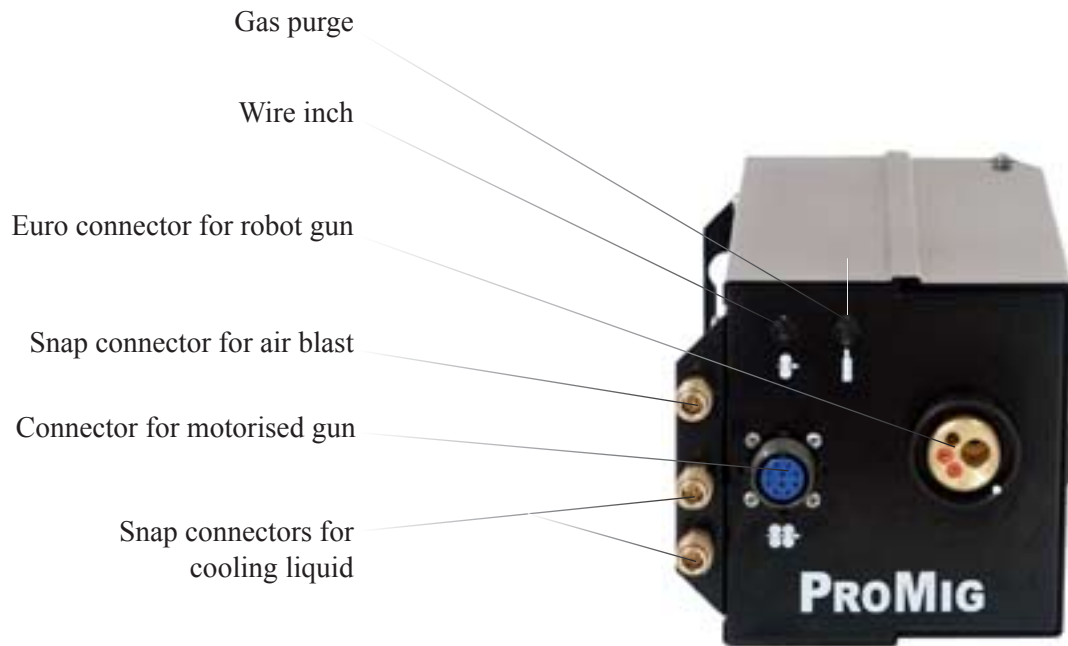
2. INSTALLATION

2.1 OPERATION CONTROL AND CONNECTORS

2.1.1. Promig 540R control unit

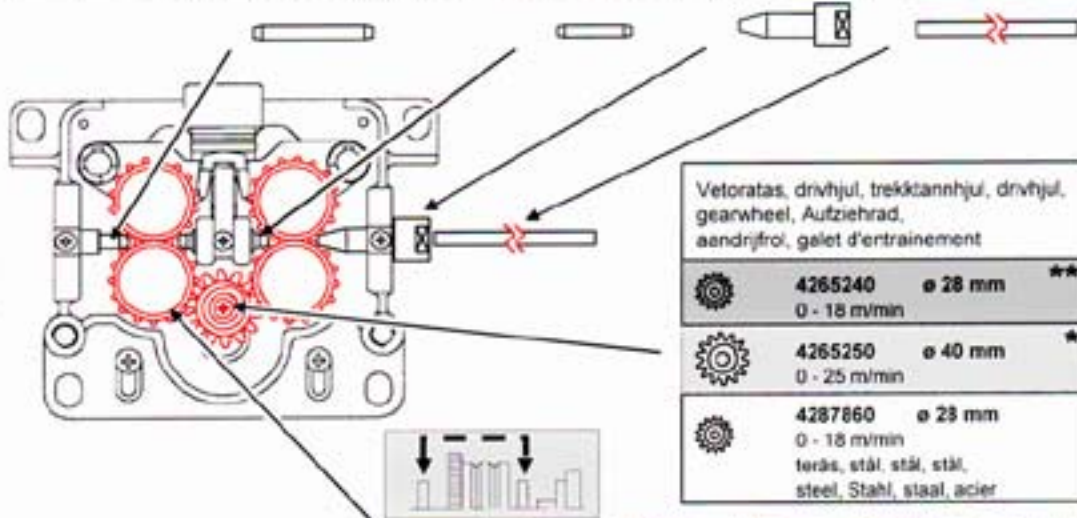


2.1.2. Promig 120R wire feeder



2.3 PARTS OF WIRE FEED MECHANISM

FE MC FC SSFC	0.6 - 0.8 mm	3134140 \varnothing 1,0 Valkoinen, vit, hvit, hvid, white, weiss, wit, blanc	3134120 \varnothing 2,0 ** Oranssi, orange, oransje, orange, orange, orange, orange, orange, orange, orange	4266970 \varnothing 2,0 ** Muovi, plast, plastic, plastic, Kunststoff, plastic, plastique	4188592 \varnothing 2,4 * Keltainen, gul, gul, gul yellow, gelb, geel, jaune
	0.9 - 1.6 mm	3133700 \varnothing 2,0 ** Oranssi, orange, oransje, orange, orange, orange, orange, orange			
SS AL	0.8 - 1.6 mm	3134290 \varnothing 2,0 * Oranssi, orange, oransje, orange, orange, orange, orange, orange	3134300 \varnothing 2,0 * Oranssi, orange, oransje, orange, orange, orange, orange, orange		4279070 \varnothing 3,5 Musta, svart, svart, sort, black, schwarz, zwart, noir



		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, glad, plain, glatt, glad, lisse		3133810 Valkoinen, vit, hvit, hvid, white, weiss, wit, blanc	3133210 ** Punainen, rød, 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, rød, 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		—	3133960 Punainen, rød, rød, rød, red, rot, rood, rouge	—		
Laakeroitu, med kullager, lager, kugleleje, beared, gelagert, gelagerd, avec roulement à 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, glad, plain, glatt, glad, lisse		3138650 Punainen, rød, rød, rød, red, rot, rood, rouge	3137390 Oranssi, orange, oransje, orange, orange, orange, orange, 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, orange, orange	3141130 Keltainen, gul, gul, gul, yellow, gelb, geel, jaune		

4286040

* 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, monteret
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

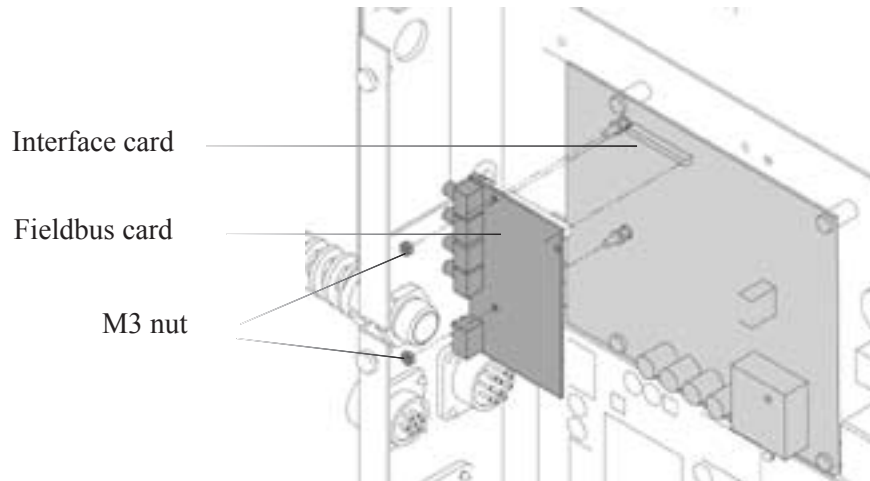
P 40 see air-cooled MIG system

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

4. Installation of the fieldbus card

MXE 6263504, installation instruction 4279220

Open side plate and install fieldbus card by mounting above the interface card with two M3 nut. See mounting instructions.



5. Connecting cables

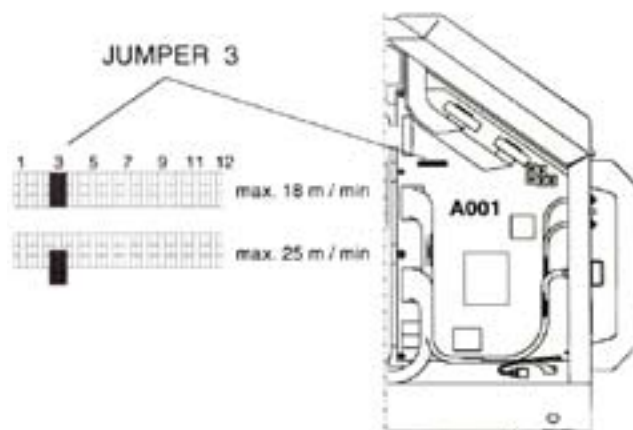
Connect cables according to paragraph "UNITS, ACCESSORIES, CABLES".

6. Max. wire feed speed

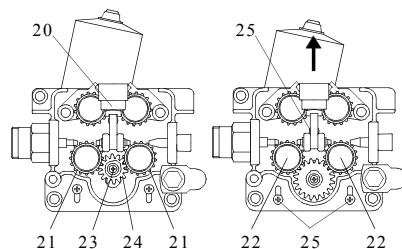
By delivery, the max. wire feed speed is 18 m/min, which is enough for most welding applications. If you need a higher speed, you can increase the wire feed speed to 25 m/min by replacing the gear wheel on motor shaft. The high ratio wheel (*D40*) is delivered with the feed unit.

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 540R indicates overloading of wire feed motor. Operation of signal lamp is as follows (also see error codes):

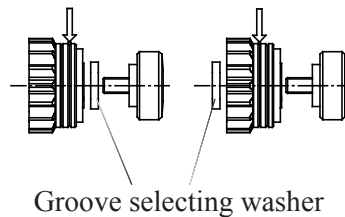
Wire feed motor is slightly overloaded e.g. due to a blocked gun. At a predetermined load the error signal lamp starts to blink.

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.



- 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

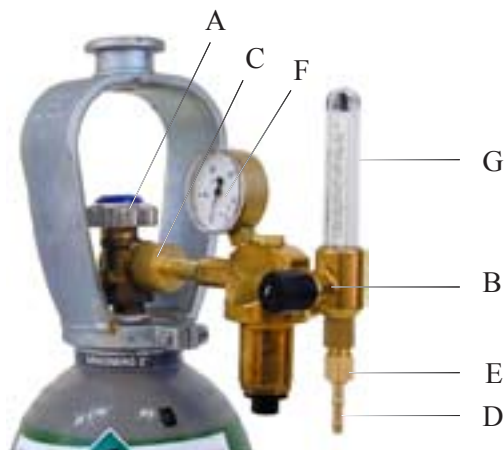
⚠ Handle gas bottle with care. There is a risk for injury if gas bottle or bottle valve is damaged!

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 simultaneously.

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. 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

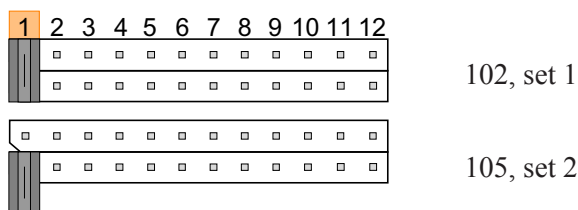
Gas valve is mounted inside the feeder unit but it can also be moved into the control unit where there is a place for it.

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

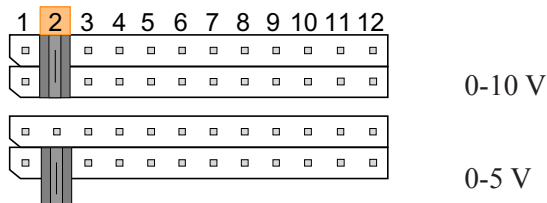
Inside the control unit there is a 20 kg MIG wire spool system.

6. JUMPERS

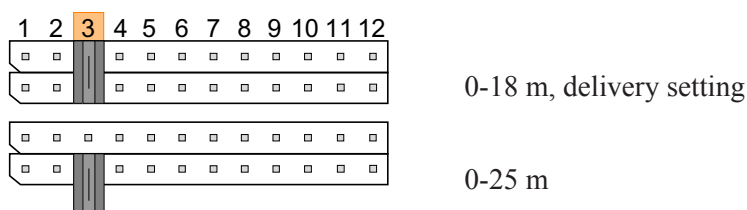
1. Selection of wire feeder address



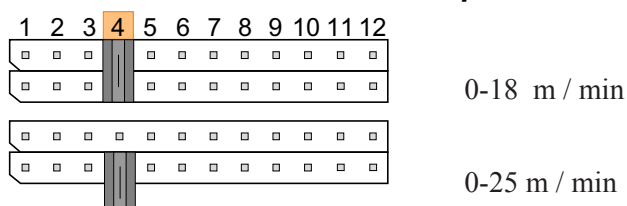
2. Robot control input voltage range for analog channels:



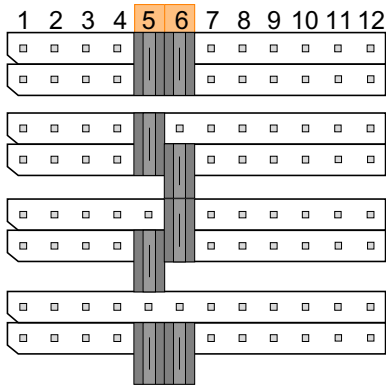
3. Selection of max. wire feed speed for feed unit 1



4. Selection of max. wire feed speed for feed unit 2



5,6 Wire feed and motor pistol selection



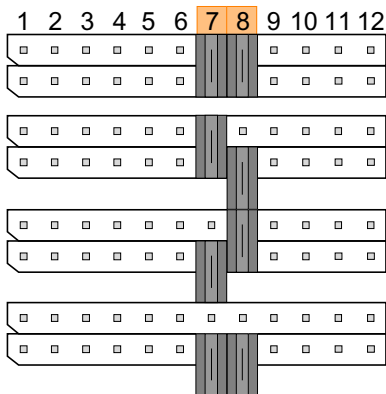
for one feeding unit only

for one feeding unit and motor pistol

for two feeding units (dual)

not used

7,8 Motor pistol selection



Hulftegger (3,3 kohm)

Binzel, water cooled (6,8 kohm)

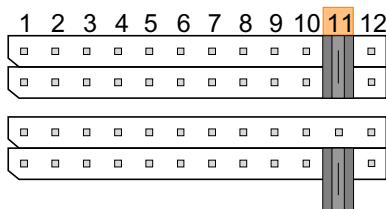
Binzel, gas cooled (10 kohm)

Dinse (22 kohm)

9. Not used

10. Not used

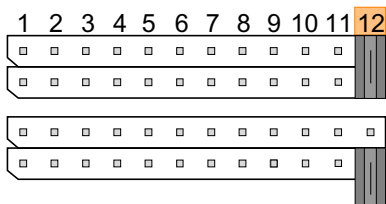
11. Dynamic adjustment for 1-knob and normal MIG



Dynamic adjustment from MXE-control panel
(or without control panel A001/R165)

Dynamic adjustment through fieldbus

12. Gas valve control



Gas valve is controlled by the fieldbus

Gas valve is controlled internally by PROMIG 540R

7. 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 540R) 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 540R - 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 540R is sent. Operation of thermal protection of PRO power source has stopped welding.
- Err 14** Supply overvoltage in Promig 540R.

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

8. SERVICE AND OPERATION DISTURBANCES

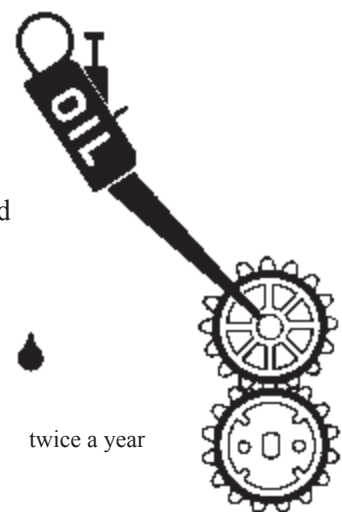
The amount of use and working environment should be taken into consideration when planning the frequency of maintenance of PROMIG. Careful use and preventive maintenance will help to ensure trouble-free operation.

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.

9. ORDERING NUMBERS

Wire feed units

Promig 540R wire feed control unit	6231540
Promig 120R wire feed unit	6236320

Fieldbus cards

Fieldbus card Interbus s.....	9774120IBC
Fieldbus card Interbus s optical.....	9774120IBO
Fieldbus card Profibus.....	9774120PRF
Fieldbus card Devicenet.....	9774120DEV

Accessories of Promig 540R

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

Cables

Voltage monitor cable.....	4288700
Branch connector.....	9771637
Intermediate cable assembly..... 5 m.....	6260421
..... 10 m	6260425
Earth cable 50 mm ² 5 m	6184511
..... 50 mm ² 10 m	6184512
Earth cable 70 mm ² 5 m	6184711
..... 70 mm ² 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 540R, Promig 120R

Operating voltage (safety voltage)		50 V DC
Rated power		100 W
Max. load	80 % ED	520 A
(nominal values)	100 % ED	400A
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	∅ Fe, Ss	0,6...2,4 mm
	∅ Cored wires	0,8...2,4 mm
	∅ Al	1,0...2,4 mm
Wire reel	max. weight	20 kg
	max. size	∅ 300 mm
Gun connector		Euro
Operation temperature range		-20...+40 °C
Storage temperature range		-40...+60 °C
Degree of protection		IP 23

Promig 540R

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.

KEMPPI OY
PL 13
FIN – 15801 LAHTI
FINLAND
Tel (03) 899 11
Telefax (03) 899 428
www.kemppi.com

KEMPPIKONEET OY
PL 13
FIN – 15801 LAHTI
FINLAND
Tel (03) 899 11
Telefax (03) 7348 398
e-mail: myynti.fi@kemppi.com

KEMPPI SVERIGE AB
Box 717
S – 194 27 UPPLANDS VÄSBY
SVERIGE
Tel (08) 59 078 300
Telefax (08) 59 082 394
e-mail: sales.se@kemppi.com

KEMPPI NORGE A/S
Postboks 2151, Postterminalen
N – 3103 TØNSBERG
NORGE
Tel 33 34 60 00
Telefax 33 34 60 10
e-mail: sales.no@kemppi.com

KEMPPI DANMARK A/S
Literbuen 11
DK – 2740 SKOVLUNDE
DANMARK
Tel 44 941 677
Telefax 44 941 536
e-mail:sales.dk@kemppi.com

KEMPPI BENELUX B.V.
Postbus 5603
NL – 4801 EA BREDA
NEDERLAND
Tel (076) 5717 750
Telefax (076) 5716 345
e-mail: sales.nl@kemppi.com

KEMPPI (UK) Ltd
Martti Kemppi Building
Fraser Road
Priory Business Park
BEDFORD, MK443WH
ENGLAND
Tel 0845 6444201
Fax 0845 6444202
e-mail: sales.uk@kemppi.com

KEMPPI FRANCE S.A.
S.A. au capital de 5 000 000 F.
65 Avenue de la Couronne des Prés
78681 EPONE CEDEX
FRANCE
Tel (01) 30 90 04 40
Telefax (01) 30 90 04 45
e-mail: sales.fr@kemppi.com

KEMPPI GmbH
Otto – Hahn – Straße 14
D – 35510 BUTZBACH
DEUTSCHLAND
Tel (06033) 88 020
Telefax (06033) 72 528
e-mail:sales.de@kemppi.com

KEMPPI SP. z o.o.
Ul. Piłsudskiego 2
05-091 ZĄBKI
Poland
Tel +48 22 781 6162
Telefax +48 22 781 6505
e-mail: info.pl@kemppi.com

KEMPPI SWITZERLAND AG
Chemin de la Colice 4
CH-1023 Crissier/ Lausanne
SUISSE
Tel. +41 21 6373020
Telefax +41 21 6373025
e-mail: sales.ch@kemppi.com

KEMPPI WELDING
MACHINES AUSTRALIA PTY LTD
P.O. Box 404 (2/58 Lancaster Street)
Ingleburn NSW 2565, Australia
Tel. +61-2-9605 9500
Telefax +61-2-9605 5999
e-mail: info@kemppi.com.au