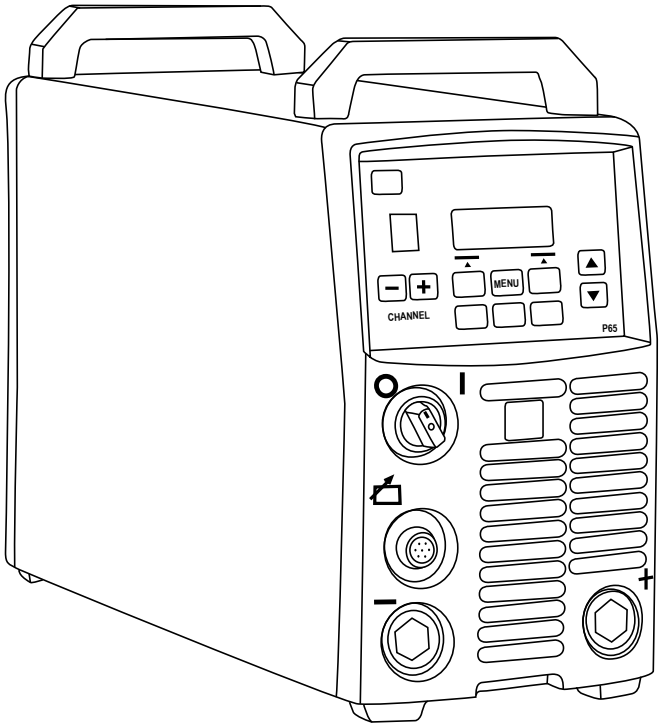
KEMPPI
The Joy of Welding

FastMig Pulse | 350, 450



OPERATING MANUAL

English

FastMig Pulse 350, 450 / © Kemppi Oy / 1110

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1. INTRODUCTION

1.1 GENERAL

Congratulations on choosing the FastMig Pulse welding equipment. Used correctly, Kemppi products can significantly increase the productivity of your welding, and provide years of economical service.

This operating manual contains important information on the use, maintenance and safety of your Kemppi product. The technical specifications of the equipment can be found at the end of the manual.

Please read the manual carefully before using the equipment for the first time. For your own safety and that of your working environment, pay particular attention to the safety instructions in the manual.

For more information on Kemppi products, contact Kemppi Oy, consult an authorised Kemppi dealer, or visit the Kemppi web site at www.kemppi.com.

The specifications presented in this manual are subject to change without prior notice.

Important notes

Items in the manual that require particular attention in order to minimise damage and personal harm are indicated with the '*NOTE!*' notation. Read these sections carefully and follow their instructions.

1.2 ABOUT FASTMIG PULSE PRODUCTS

FastMig™ Pulse 350 and 450 are CC/CV welding power sources designed for demanding professional use. They are suitable for synergic Pulsed MIG/MAG, synergic 1-MIG/MAG, basic MIG/MAG and MMA welding in DC current when connected to FastMig MXF wire feeding units. P65 setup panel is included in the delivery for selecting, setting and managing the welding system prior to and during system use.

FastMig Pulse 350/450 product range offers both technical and commercial welding solutions matching a wide range of applications from sheet metal fabrication to heavy industry segments. Innovative distance wire feeding solutions are also available for use with this product, including SuperSnake GT02S/GT02SW.

Disclaimer

While every effort has been made to ensure that the information contained in this guide is accurate and complete, no liability can be accepted for any errors or omissions. Kemppi reserves the right to change the specification of the product described at any time without prior notice. Do not copy, record, reproduce or transmit the contents of this guide without prior permission from Kemppi.

2. INSTALLATION

2.1 BEFORE USE

The product is packed in specially designed transport cartons. However, before use always make sure the products have not been damaged during transportation.

Check also that you have received the components you ordered and the instruction manuals needed, as described in the Quick start guide pack. Product packaging material is recyclable.

NOTE! When moving the welding machine, always lift it from the handle, never pull it from the welding gun or other cables.

Operating environment

This machine is suitable for both indoor and outdoor use. Always make sure that the air flow to the machine is unrestricted. The recommended operating temperature range is -20 … +40 °C.

Please ensure you read the safety instructions concerning operating environments supplied in this manual.

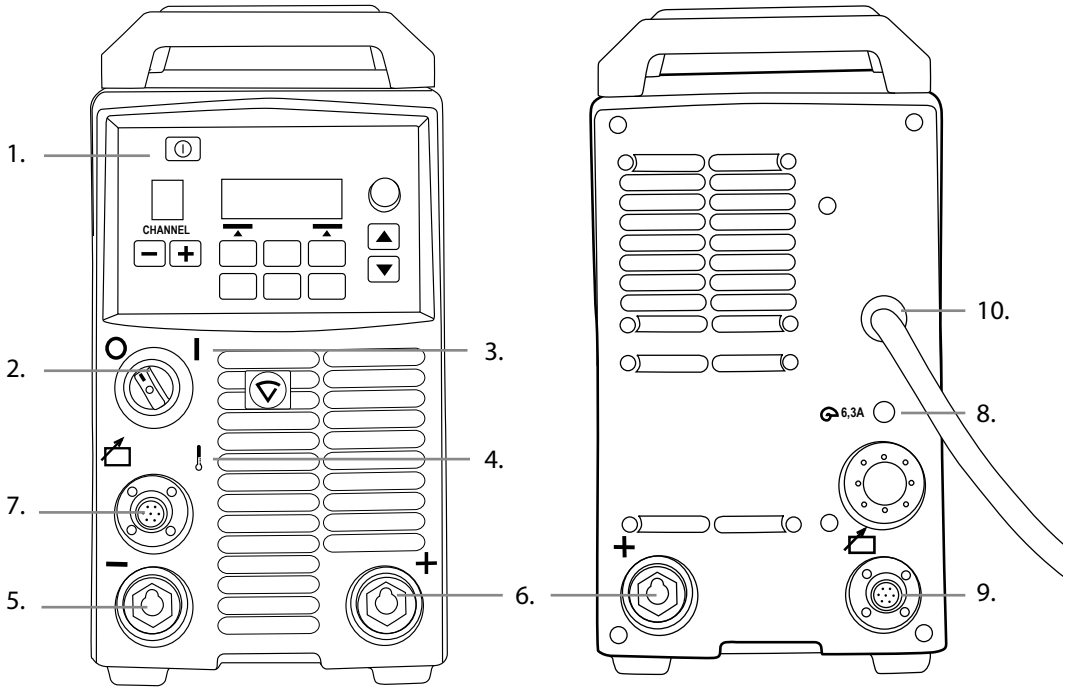
2.2 DISTRIBUTION NETWORK

All regular electrical devices without special circuits generate harmonic currents into distribution network. High rates of harmonic current may cause losses and disturbance to some equipment.

FastMig™ Pulse 350 and 450:

This equipment complies with IEC 61000-3-12 provided that the short-circuit power S_{sc} is greater than or equal to 5.5 MVA at the interface point between the user's supply and the public suply network. It is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment is connected only to a supply with a short-circuit power S_{sc} greater than or equal to 5.5 MVA.

2.3 MACHINE INTRODUCTION



1. Setup panel 'Arc Wizard P65'
2. Main switch I/O – On/Off
3. Signal lamp I/O – On/Off
4. Warning lamp for thermal protection
5. Welding cable connection - negative pole
6. Welding cable connection + positive pole
7. Control cable connection
8. Fuse – 6,3 A delayed
9. Control cable connection
10. Mains power cable

2.4 POSITIONING OF THE MACHINE

Place the machine on a sturdy, level surface that is dry and does not allow dust or other impurities to enter the machines cooling air flow. Preferably site the machine to a suitable carriage unit so it is above floor level.

Notes for positioning the machine

- The surface inclination may not exceed 15 degrees.
- Ensure the free circulation of the cooling air. There must be at least 20 cm of free space in front of and behind the machine for cooling air circulation.
- Protect the machine against heavy rain and direct sunshine.

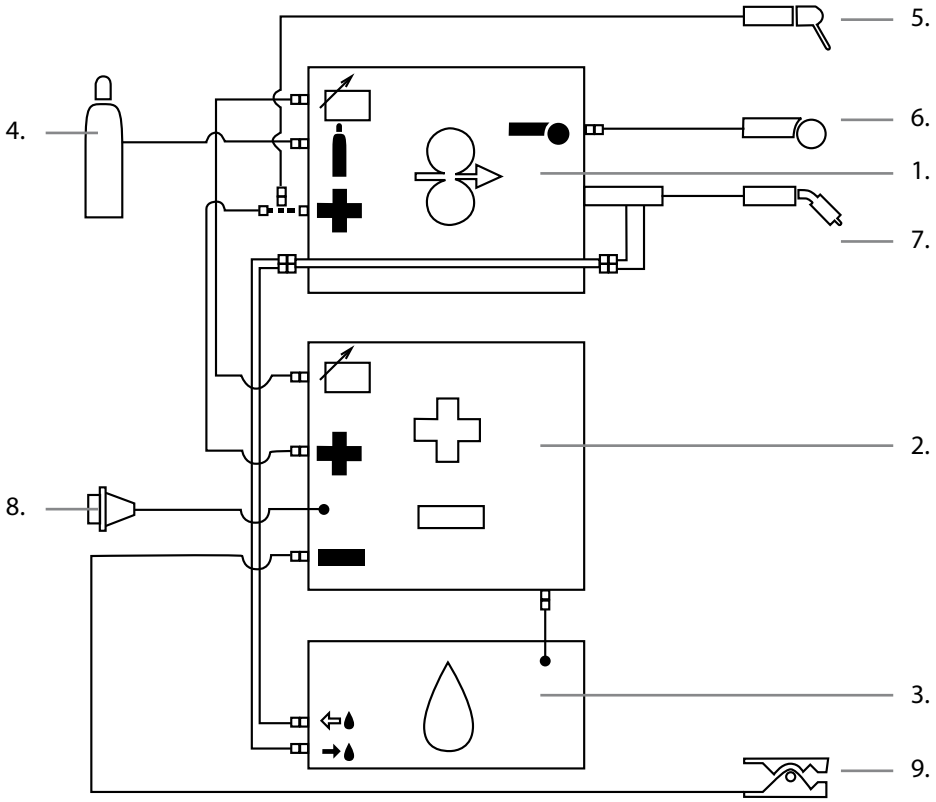
The machine is not allowed to be operated in the rain as the protection class of the machine, IP23S, allows preserving and storing outside only.

NOTE! Never aim the spray of sparks from a grinding machine toward the equipment.

2.5 CONNECTING CABLES

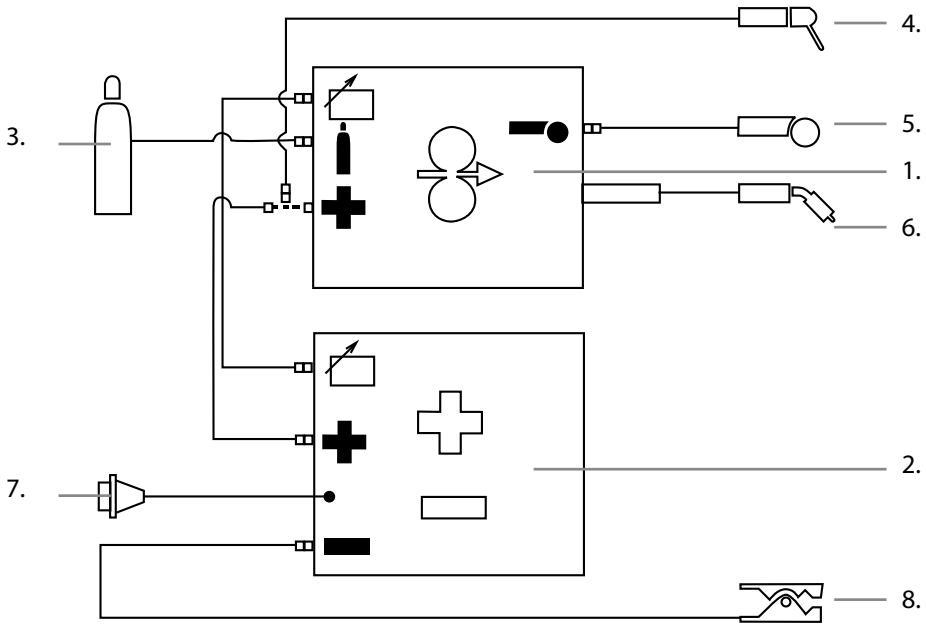
NOTE! Always check before use that the interconnecting cable, shielding gas hose, earth return lead/clamp, and mains cable is in a serviceable condition. Ensure that connectors are correctly fastened. Lose connectors can impair welding performance and damage connectors.

2.5.1 Water cooled system: FastMig Pulse + MXF + FastCool 10



1. MXF wire feed unit
2. FastMig Pulse power source
3. FastCool water cooler and power connection
4. Gas supply
5. MMA electrode holder
6. Remote control device
7. Liquid cooled welding Gun
8. Power cable
9. Earth return lead and clamp

2.5.2 Gas cooled system: FastMig Pulse + MXF



1. MXF wire feed unit
2. FastMig Pulse power source
3. Gas supply
4. MMA electrode holder
5. Remote control device
6. Air cooled welding Gun
7. Power cable
8. Earth return lead and clamp

2.5.3 Connecting to mains power

FastMig power sources are delivered as standard with 5 meters of mains power cable. No mains plug is fitted at the Kemppi factory.

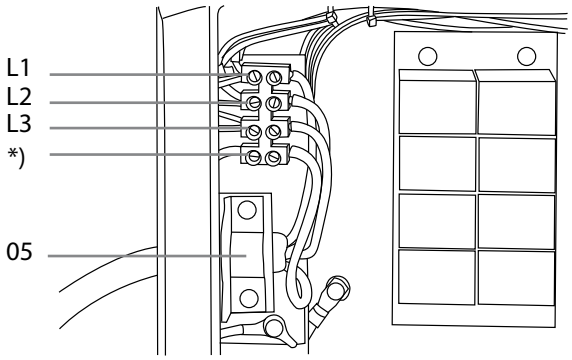
NOTE! If local country based regulations state an alternative power cable is required, the mains cable must be replaced in conformity with the regulations. Connection and installation of the mains cable and plug, should only be carried out by a suitably qualified person.

Remove the machine cover plate to enable mounting of a mains cable. FastMig Pulse power sources can be connected to the mains supply of 400 V 3~ .

If changing the mains cable take into consideration the following:

The cable is entered into the machine through the inlet ring on the rear panel of the machine and fastened with a cable clamp (05). The phase conductors of the cable are coupled to connectors L1, L2 and L3. The earth protection coloured green-yellow is coupled to the marked connector.

If you are using 5-lead cable, do not connect the neutral conductor.



*) In cables of S type there is a protective grounding conductor coloured green-yellow.

2.5.4 Welding and earth return cables

Kemppi always recommend the use of high quality copper cables with a suitable cross-sectional area. Cable size should be selected depending on the intended welding application.

50mm² Copper welding cables may be used for low duty work in basic or Synergic 1-MIG. However when using Pulse MIG/MAG process, and or longer cables, and or higher welding power, voltage loss increases, and therefore smaller cross sectional interconnecting power and return cables will restrict the welding performance of your machine.

- FastMig Pulse 350 – 70 to 90 mm²
- FastMig Pulse 450 – 70 to 90 mm²

The enclosed table shows typical load capacities of rubber insulated copper cables, when ambient temperature is 25 °C and the cable temperature is 85 °C.

Cable	Duty cycle ED			Voltage loss / 10 m
	100 %	60 %	30 %	
50 mm²	285 A	370 A	520 A	0.35 V / 100 A
70 mm²	355 A	460 A	650 A	0.25 V / 100 A
95 mm²	430 A	560 A	790 A	0.18 V / 100 A

Do not overload welding cables due to voltage losses and heating.

NOTE! Always check the serviceability of the earth return cable and clamp. Ensure the metal surface to which the cable is connected is clean from metal oxide or paint. Check the connector to the power source is fastened correctly.

2.5.5 Interconnection with wire feeder

Kemppi provide a choice of interconnection cable sets for different environments. Only materials that meet the demands of Kemppi's international markets are used in their construction.

Used correctly, Kemppi cables sets ensure high welding performance and serviceability.

Before use, always ensure the cable set is in good condition and that connectors are correctly fastened. Loose connections reduce welding performance and may result in damage to connectors due to heating effects.

For correct connection and configuration of cable sets, please refer to schematic drawings: 2.5.1 and 2.5.2

NOTE! FastMig 350/450 power sources are designed to be used ONLY with MXF wire feed units.

3. OPERATION CONTROL

3.1 MAIN SWITCH I/O

When you turn the on/off switch into I -position, the pilot warning lamp is illuminated and the machine is ready for use. Always turn the machine on and off with the power source mains switch. Never use the mains plugs as a switch.

3.2 PILOT LAMPS

The pilot lamps of the machine report its operational state:

The green pilot lamp when lit, indicates that the machine is switched on and ready for use, and that it is connected to the mains supply with the power source main switch in the I-position.

When lit, the orange lamp indicates that the thermal protection circuit has been activated due to higher than normal working loads that exceed the rated duty cycle. The cooling fan will continue to run and cool the machine down. When the lamp is off the machine is again ready to weld.

3.3 OPERATION OF COOLING FAN

FastMig Pulse power sources incorporate two simultaneously operating fans.

- The fan is started momentarily when the main switch is placed into position - I.
- The fan will start during welding as the machine reaches operational temperature, and it will run for 1 to 10 minutes after the welding has stopped, depending on the welding cycle completed.

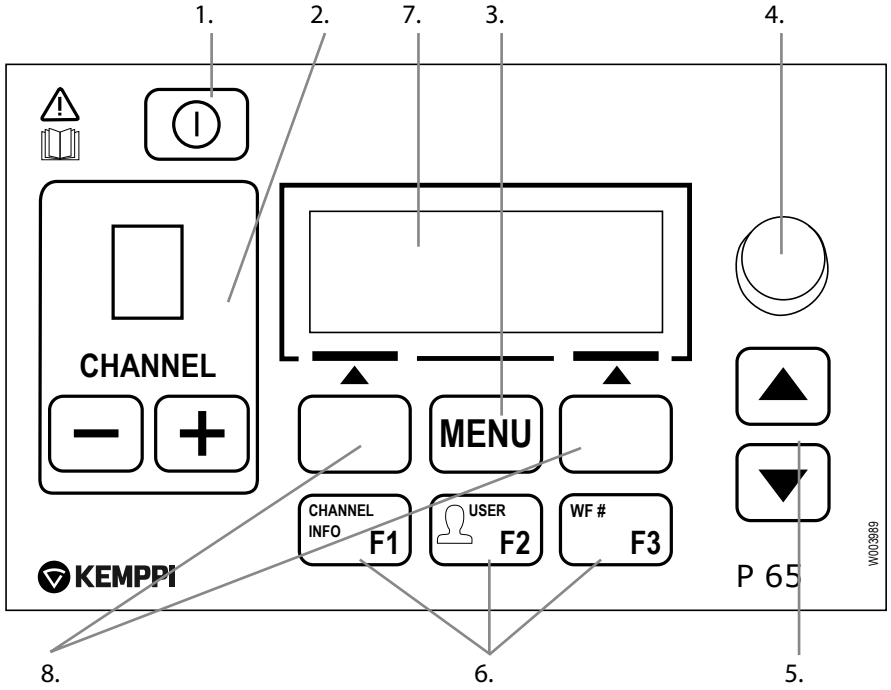
3.4 MANUAL METAL ARC WELDING

FastMig Pulse power source can be used for MMA electrode welding by connecting the FastMig MXF wire feeding unit and PF function panel. MMA function is optional in FastMig Pulse equipment, and therefore can be activated by purchasing the appropriate licence for the MMA process. Please see ordering number codes. FastMig Pulse power source will not support the MMA process without an MXF wire feeder connected.

4. USING THE MACHINE

Welding applications vary, so the equipment must adapt. FastMig Pulse features Arc Wizard P65 interface, a clear and logical LCD menu display. Arc Wizard menu allows the operator to refine, adapt and manage the arc process and system function before, during and after welding.

4.1 ARC WIZARD, SETUP PANEL P65 – LAYOUT



4.2 SETUP PANEL P65 – QUICK GUIDE

The following information details P65 panel operation and set-up. Additional information is also available in the printed 'Quick Guide' for P65 and PF function panels. Quick Guide is included in the delivery package, plus pdf copy recorded to CD.

Introduction to P65 button functions

1. Switch P65 ON/OFF by long pressing on this button (approximately 5 seconds). Also returns channel information display by short press.

NOTE! For true ON/OFF switching of the mains power, use the main switch I/O – ON/OFF located on the front of the power source.

2. Welding channel (job) selection. There are 10 memory channels available per USER channel. There are 10 USER channels . If the channel is empty you can create a new (job) channel by pressing the key below the LCD screen text stating NEW.
3. MENU button for entering the main menu list. Proceed following the LCD screen menu guidance.

P65 main menu list	
Edit Channel	for making changes to existing welding channel
User Identification	for selecting one user out of ten
Weld Data	for checking out the values of the last weld
System Config Menu	for device configuration and information
Language	for selecting your menu language
Select Feeder (WF#)	for selecting another parallel wire feeder as a setup target
MMA on/off	for activating electrode welding (licence needed)

Buttons in different situation (shortcut) include functions depending on menu/task.

4. Potentiometer for making adjustments to selected values
5. Up/down arrow keys for moving vertically in the menu structure
6. Pre-programmed menu shortcut keys
   - F1 for displaying channel information
   - F2 for selecting the USER
   - F3 for selecting another parallel connected wire feeder sub system as a setup target.
7. LCD menu display
8. Soft key buttons. Function according to the menu location/task.

4.3 WELDING PARAMETERS AND FUNCTIONS

4.3.1 Welding parameters (In Edit Channel menu 2/6)

MIG

WFSpeed	0.7 – 25 m/min		0.05 m/min steps when WFSpeed < 5 m/min and 0.1 m/min steps when WFSpeed > 5 m/min
WFS-Max			Set the limit for maximum WFSpeed
WFS-Min			Set the limit for minimum WFSpeed
Voltage	8 – 50V	0.1V steps	Controls the length of the arc
VoltageMax			Set the limit for maximum voltage value
VoltageMin			Set the limit for minimum voltage value
Dynamics	-9 ... +9	Factory setting is 0	Controls the short circuit behaviour of the arc. The lower the value the softer the arc is. The higher the value the rougher the arc is.

1-MIG

WFSpeed	0.7 – 25 m/min *		0.05 m/min steps when WFSpeed < 5 m/min and 0.1 m/min steps when WFSpeed > 5 m/min
WFS-Max			Set the limit for maximum WFSpeed
WFS-Min			Set the limit for minimum WFSpeed
FineTuning	-9 ... +9	Factory setting is 0 (= curve point)	Adjusts the arc voltage of the curve within certain limits. In other words, it adjusts the length of the arc within certain limits
FineTuningMax	-9 ... +9	0.5 steps	Set the limit for maximum arc length
FineTuningMin	-9 ... +9	0.5 steps	Set the limit for minimum arc length
Dynamics	-9 ... +9	Factory setting is 0	Controls the short circuit behaviour of the arc. The lower the value the softer the arc is. The higher the value the rougher the arc is.

PULSE MIG

WFSpeed	0.7 – 25 m/min *		0.05 m/min steps when WFSpeed < 5 m/min and 0.1 m/min steps when WFSpeed > 5 m/min
WFS-Max			Set the limit for maximum WFSpeed
WFS-Min			Set the limit for minimum WFSpeed
FineTuning	-9 ... +9	Factory setting is 0 (= curve point)	Adjusts the base current of the curve in certain limits. In other words, it adjusts the length of the arc in certain limits.
FineTuningMax	-9 ... +9	0.5 steps	Set the limit for maximum arc length
FineTuningMin	-9 ... +9	0.5 steps	Set the limit for minimum arc length
Dynamics	-9 ... +9	Factory setting is 0	Controls the short circuit behaviour of the arc. The lower the value the softer the arc is. The higher the value the rougher the arc is.
Pulse Current	-10% ... +15%	Factory Setting is 0%	Reduces the pulse current of the curve at the maximum 10% and raises it at the maximum 15%.

DOUBLE PULSE MIG

WFSpeed	0.7 – 25 m/min *		0.05 m/min steps when WFSpeed < 5 m/min and 0.1 m/min steps when WFSpeed > 5 m/min
WFS-Max			Set the limit for maximum WFSpeed
WFS-Min			Set the limit for minimum WFSpeed
FineTuning	-9 ... +9	Factory setting is 0 (= curve point)	Adjusts the base current of the curve in certain limits. In other words, it adjusts the length of the arc in certain limits.
FineTuningMax	-9 ... +9	0.5 steps	Set the limit for maximum arc length
FineTuningMin	-9 ... +9	0.5 steps	Set the limit for minimum arc length
Dynamics	-9 ... +9	Factory setting is 0	Controls the short circuit behaviour of the arc. The lower the value the softer the arc is. The higher the value the rougher the arc is.
Pulse Current	-10% ... +15%	Factory setting is 0%	Reduces the pulse current of the curve at the maximum 10% and raises it at the maximum 15%
DPulseAmp	0.1 – 3.0 m/min	Factory setting is CURVE	Adjusts the amplitude of the WFSpeed in 0.1 m/min steps. Value comes from Welding Curve.
DPulseFreq	0.4 – 8.0 Hz	Factory setting is CURVE	Adjusts the frequency of the double pulse in 0.1 Hz steps. Value comes from Welding Curve.

WISEROOT / WISETHIN

WFSpeed	0.7 – 14 m/min *		0.05 m/min steps when WFSpeed < 5 m/min and 0.1 m/min steps when WFSpeed > 5 m/min
WFS-Max			Set the limit for maximum WFSpeed
WFS-Min			Set the limit for minimum WFSpeed
BaseCurrent	-50 ... +50		Adjusts the base current of the curve – the arc length – within certain limits.
BaseCurrentMax	-50 ... +50	1% steps	Set the limit for maximum "arc length"
BaseCurrentMin	-50 ... +50	1% steps	Set the limit for minimum "arc length"
FormingPulse	-30 ... +30		Adjusts the forming pulse current of the curve in certain limits. In other words, it controls arc pressure.
FormingPulseMax	-30 ... +30	1% steps	Set the limit for maximum forming pulse current
FormingPulseMin	-30 ... +30	1% steps	Set the limit for minimum forming pulse current
StartTime	-9 ... +9	Factory setting is 0	Set how long arc behaves like normal synergic MIG/ MAG prosess after the arc start. It gives heat for the arc start.
StartVoltage	-30 ... +30	Factory setting is 0	Set the arc voltage which is used during StartTime. In other words, it adjusts the length of the arc during StartTime.

* Different welding curves may further restrict the value range further.

MMA PROCESSES

Current	14 – 350A/450A		Welding current
CurrentMax	14 – 350A/450A		Set the limit for maximum current value
CurrentMin	14 – 350A/450A		Set the limit for minimum current value
ArcForce	-9 ... +9	Factory setting is 0	Controls the short circuit behaviour of the arc. The lower the value the softer the arc is. The higher the value the rougher the arc is.

4.3.2 Welding functions

OTHER PROCESSES (In Edit Channel menu 3/6)

2T/4T	2T, 4T, MATCHLOG or USER	Factory setting is USER => USER can freely choose the switching logic	Set switching logic
HotStart	ON, OFF or USER	Factory setting is USER => USER can freely choose is the HotStart ON or OFF	
HotStartLevel	-50 ... +100 %	1 % steps. Factory setting 40%	
Hot 2T Time	0 – 9.9 s	0.1 s steps. Factory setting 1.2 s	
CraterFill	ON, OFF, USER	Factory setting is USER => USER can freely choose is the CraterFill ON or OFF	
CraterStart	10 – 250%	Factory setting is 100%	Set the level of the curve where the crater filling will start
CraterFillEnd	10 – 250 %, not higher than start	1 % steps. Factory setting 30%	Set the level of the curve where the crater filling will end.

CraterTime	0.0 – 10.0 s	0.1 s steps. Factory setting 1.0 s	CrateFill Slope Time
Crater 4T Timer	On or OFF	Factory setting is OFF	ON: if 4T is selected crater filling will last at least time that has been ad-justed by CraterTime or as long as trigger is pressed. OFF: if 4T is selected crater filling will last as long as trigger is pressed.
Creep Start	10 – 99%	1% steps. OFF, CURVE (OFF = 100%)	Factory setting is CURVE (Creep Start value comes from Welding Curve).
StartPower	-9 ... +9	Factory setting is 0	Adjusts arc ignition

WISEROOT / WISETHIN

2T/4T	2T, 4T, MATCHLOG or USER	Factory setting is USER => USER can freely choose the switching logic	Set switching logic
HotStart	ON, OFF or USER	Factory setting is USER => USER can freely choose is the HotStart ON or OFF	
HotStartLevel	-50 ... +100 %	1 % steps. Factory setting 40%	
Hot 2T Time	0 – 9.9 s	0.1 s steps. Factory setting 1.2 s	
CraterFill	ON, OFF, USER	Factory setting is USER => USER can freely choose is the CraterFill ON or OFF	
CraterStart	10 – 250%	Factory setting is 100%	Set the level of the curve where the crater filling will start.
CraterFillEnd	10 – 250%, not higher than start	1 % steps. Factory setting 30%	
CraterTime	0.0 – 10.0 s	0.1 s steps. Factory setting 1. 0 s	
Crater 4T Timer	On or OFF	Factory setting is OFF	ON: if 4T is selected crater filling will last at least time that has been ad-justed by CraterTime or as long as trigger is pressed. OFF: if 4T is selected crater filling will last as long as trigger is pressed.
Creep Start	10 – 99%	1% steps. OFF, CURVE (OFF = 100%)	Factory setting is CURVE (Creep Start value comes from Welding Curve).

ADVANCED FUNCTIONS

WisePenet	ON or OFF		Penetration control selection
Penet%(123A)	-30 ... +30 %	Factory setting: 0 %	Wise penetration percent setting. Set penetration Current.
WiseFusion	ON or OFF		WiseFusion selection
WiseFusion%	10 – 60 % or CURVE	Factory setting is CURVE	When WISE FUSION is ON it controls the amount of short circuits in the arc. The lower the value there will be less short circuits in the arc. The higher the value there will be more short circuits in the arc.
MatchLog Menu			
—> MinilogLevel	-99 ... +125	Factory setting: 20 %	Set the "MiniLog level"

SYSTEM CONFIG MENU (In Main menu 4/7)

Water Cooling	Water Cooler control: OFF / AUTO / ON.	Factory setting: AUTO	OFF: Water Cooler always OFF. AUTO: Water Cooler automatic control ON. Water Cooler starts when welding starts and is turned off after a delay when welding stops. ON: Water Cooler is always ON.
Cable Length	Cable length: 10m – 100m, 5m steps.	Factory Setting: 10m	Welding cable loop length setting for optimising arc control.
FineCalib	Fine Tuning Calibration Point: 0V/100A – 10V/100A, 1V steps.	Factory Setting: 1.0V/100A	Compensation for varying cable resistance.
System Clock		System Clock Settings	
Device Information	System Device information: DevSW: Unit Software Version. SysSW: System Software Version (Base software version). BootSW: Boot Software Version. SW Item: Software Item Number (IFS number). Serial: Device Serial number. Prog: Programmer name Date: Programming date.		
Restore Settings	User 1 (one of ten users) Channel: Selected user can restore to his backup memory channels one by one. Other users' memory channels remain untouched. Setup settings remain untouched.		
	User 1 (one of ten users) All Channels: Selected user can restore all of his backup memory channels (0-9) at one time. Other users' memory channels remain untouched. Setup settings remain untouched.		
	Restore To Factory: All channels (of all users) are removed. All users' backup channels are removed. All setup settings are set to defaults.		
Licence Menu	**Licence Code** allows you to enter the licence code: - Up/Down arrows are used to select the code number position. - Pulse encoder is used to select the code number (0-255) to be entered. - Soft key button on the right is used to activate the licence number (after all numbers have been entered). In case the code was wrong the earlier view will be displayed. **Licence Timers** allows you to check the remaining time of the time-based Wise features.		

WeldData Delay	Adjustment Range: 1s – 60s, 1s steps.	Factory Setting: 20s.	Defines how long the Weld Data is displayed after Welding Ends. Weld Data display is also turned off when pulse encoder is turned or any button is pressed.
Display Delay	Adjustment Range: 1 – 20, 1 steps.	Factory Setting: 10	Defines how long time the information is displayed (like: "Setting Saved" text). This is not always the exact time.
Pre Gas Time	Pre Gas Time setting: 0.0s – 9.9s – CURVE, 0.1s steps.	Factory Settings: CURVE	CURVE: Pre Gas time is read from the Welding Curve. 0.0 – 9.9s: User Pre Gas time setting.
Post Gas Time	Post Gas Time setting: 0.0s – 9.9s – CURVE, 0.1s steps.	Factory Settings: CURVE	CURVE: Pre Gas time is read from the Welding Curve. 0.0 – 9.9s: User Post Gas time setting.
Control	Remote Control Selection: USER / PANEL / REMOTE / GUN.	Factory Settings: USER	This setting affects to Welding panel (PF65 panel) remote control unit selection. USER: PF65 user can freely select the Remote control device. PANEL: PF65 user can not select the remote device. Selection is locked to PANEL. REMOTE: Selection is locked to HAND REMOTE device. GUN: Selection is locked to GUN REMOTE device.
RemoteAutoRecog	Remote Auto Recognition: ON / OFF.	Factory Setting: ON	ON: Remote control units are recognized. Welding panel (PF65) jumps to PANEL selection if the selected remote control unit disappears. If PF65 USER selection is allowed (see Control). OFF: Remote control units are not recognized. Remote device selection remains unchanged if the selected remote control unit disappears
MIG CurrentDisp	ON / OFF	Factory Setting: OFF	ON: Display's amperage (A) preset values OFF: Display's wire feed speed m/min.
WFMotorWarnLev	1.5 – 5.0 A	Factory Setting: 3.5A	The alarm level of wire feed motor current. Check/service wire feed mechanism, adjustment and gun components.
WF End Step *	ON/OFF	Factory Setting: OFF	ON: The filler wire steps forward at the end of the welding cycle. OFF: Filler wire remains static at the end of the welding cycle.
AutoWireInch	ON/OFF	Factory Setting: ON	Automatic SuperSnake Wire Inch feature. When ON, the Wire Inch button drives the filler wire automatically up to SuperSnake.
Gas Guard	ON/OFF	Factory Setting: OFF	Turns the gas guard on and off, provided that one is installed.

* Enabled only in processes with filler wire.

ADMINISTRATOR MENU (In Main menu 2/7, User Identification)

Change PIN Code	Administrator pin code change.	Factory PIN code: 0000	
Ask PIN	PIN code inquiry selection: OFF / StartUp / Menu	Factory Setting: OFF	OFF: No PIN code inquiry. StartUp: Setup panel (P65) always asks for the PIN code when the machine is turned on. PF 65 is not affected and always works without PIN. Menu: Setup panel (P65) asks every time for PIN code when MENU button is pressed and when the display is in channel info mode i.e. in start-up view. PIN code inquiry is made only once when entering the menu. After that the menu button can be pressed any time without PIN inquiry.

BUTTON FUNCTIONS

ON / OFF Button	Short Press: Panel returns to default start-up display view (Channel info display). Long Press: When setup panel (P65) is ON => Setup panel and all PF65 panels are turned OFF. When setup panel is OFF => Setup panel and all PF65 panels are turned ON. Pressed while machine is turning ON: Restore to factory shortcut. Panel will ask confirmation to restore factory setting. If Setup panel is OFF and some other PF65 panel is turned ON the Setup Panel turns also ON and will be linked automatically to this PF panel (WF# function).
F1 Button	F1 button gives further information of selected memory channel. Pressed while machine is turned ON: Restore language selection to English.
F2 Button	F2 button can be used to select user. Selections: 1 – 10, Administrator. If Welding Process is MMA only Administrator is allowed.
F3 Button (WF#)	F3 button can be used to select Wire Feeder. Panel allows selecting only those WF numbers that are found connected on the sys-tem.
Channel +/-	Memory channel selection.
Up/Down Button	Moving Up/Down in menu.
Right/Left selection buttons (Soft Keys)	Button function depends on where in menu you are.

4.3.3 Welding software delivery profile

FastMig Pulse is designed to allow customer specified welding software choice. Following delivery and installation your machine will include welding software specified at the point of order. Detailed in the table below are typical welding curves available. If the delivery specification is focused to a specific project and you wish to up-date the machine in future, you can select additional welding software from the Wise & Match software menu. Order and load these software products to your machine with Kemppi DataGun field program device.

Wise and Match products provide optional welding application solutions. Wise and Match products menu includes special weld process for (1) root pass and (2) thin plate welding, (3) auto power regulation and (4) arc length recognition, (5) system lock function, plus additional base material curves and optional panel function. With Wise & Match you can turn something special into something unique.

1. WiseRoot	6265011
2. WiseThin	9991013
3. WisePenetration	9991000
4. WiseFusion	9991014
5. MatchLog	9991017

WORK PACK. The welding table below details Work Pack delivery option. Additional welding software products can be purchased and added later if required.

Group	N:o	Pulse	1-MIG	Wire ø mm	Material	Gas
Alu	A02	X	X	1.2	AlMg5/AlMgMn	Ar
Alu	A12	X	X	1.2	AlSi5/AlSi12	Ar
Fe	F03	X	X	1	Fe	Ar+18–25%CO_2
Fe	F04	X	X	1.2	Fe	Ar+18–25%CO_2
Ss	S03		X	1	Ss-316/308	Ar+2%CO_2
Ss	S04	X	X	1.2	Ss-316/308	Ar+2%CO_2
Ss	S06	X		1	Ss-316/308	Ar+2%CO_2
Fe	R04		X	1.2	FeFC_Rut	Ar+18–25%CO_2
Fe	M04		X	1.2	FeMC	Ar+18–25%CO_2
Ss	S84		X	1.2	FC-316	Ar+25%CO_2

More welding curves are available by purchasing Kemppi's MatchCurve and MatchCustom product packages.

Kemppi WISE products are welding process solutions. WiseRoot and WiseThin process group curves are listed below.

Group	N:o	WiseRoot	WiseThin	Wire ø mm	Material	Gas
Fe	F01		X	0.8	Fe	Ar+18–25%CO_2
Fe	F02	X	X	0.9	Fe	Ar+18–25%CO_2
Fe	F03	X	X	1	Fe	Ar+18–25%CO_2
Fe	F04	X	X	1.2	Fe	Ar+18–25%CO_2
SS	S03	X	X	1	SS-316/308	Ar+2%CO_2
SS	S04	X	X	1.2	SS-316/308	Ar+2%CO_2
Cu	C03		X	1	CuSi3	Ar
Cu	C13		X	1	CuAl8	Ar
Fe	F21		X	0.8	Fe	CO_2

Fe	F22	X	X	0.9	Fe	CO_2
Fe	F23	X	X	1	Fe	CO_2
Fe	F24	X	X	1.2	Fe	CO_2
Ss	S01		X	0.8	Ss-316/308	Ar+2%CO_2
Ss	S02	X	X	0.9	Ss-316/308	Ar+2%CO_2
Ss	S12	X		0.9	Ss-316/308	Ar+He+CO_2
Ss	S13	X		1	Ss-316/308	Ar+He+CO_2
Ss	S14	X		1.2	Ss-316/308	Ar+He+CO_2

4.4 GETTING STARTED

Step by step for the first time user

First select your language

NOTE! The default menu language is English. In the following steps you will be able to select alternative languages

1. Connect mains power and switch on power source. If this is the initial system activation you may need to press and hold the large orange ON/OFF button on the ARC WIZARD P65 panel. Top left - Long Press (Approximately 5 seconds).
2. Now press button marked 'MENU' to display MAIN MENU listing. There are 7 x items in this MAIN MENU list. As you select each item in the list, the reference number (Bottom middle display) will change e.g. 2/7 or 5/7 etc, showing which menu item you have selected. (You can cycle from first to last or last to first in a loop in all menu lists, if you wish). A black arrow marks your menu item selected.
3. MENU items are selected via the UP-DOWN buttons marked with orange arrows. These buttons are situated underneath the encoder knob to the right of the panel. Move the 'black arrow cursor' up and down the menu lists. Press down arrow button selecting item 5/7 marked LANGUAGE. Press soft key button underneath the word SELECT.
4. Make your language choice as detailed above, and then press the SELECT/SAVE button (right-hand button next to MENU button). Your language choice is now confirmed and will remain selected unless you change it later.

New channel job number

FastMig Pulse is designed for production jobs as well as varied specialist operation. Main welding set-up is made through the ARC WIZARD P65 MENU and recorded to a 'Channel (Job) Number' of your choice.

When you want to weld you simply select the corresponding channel (Job) number on the wire feed panel PF65 and weld. Only regular needed controls are present on the wire feed unit panel PF65, making welding easy and convenient.

NOTE! If the machine is new and no welding has been completed before, follow these steps.

A. Switch on power source (May require long press of panel ON/OFF button – 5 sec).
1. Press and select NEW button.
2. Create New Channel – Press SELECT button.
3. Choose weld process and press SELECT button.

B. Then follow the steps from item 4 in the list below.

Editing an existing channel (job) number

1. Press button marked 'MENU' to show MAIN MENU listing.
2. SELECT 'Edit Channel' – Press SELECT button
3. SELECT 'Select Weld Curve' - Press SELECT button
4. Choose and SELECT Process. MIG/1-MIG/Pulse MIG/Double Pulse MIG/ or Curve Number List - Press SELECT button
5. Choose and SELECT material group – Press SELECT button
6. Choose and SELECT material grade – Press SELECT button
7. Choose and SELECT filler wire diameter – Press SELECT button

8. Choose and SELECT shielding Gas – Press SELECT button
9. Choose and SELECT curve – Press SELECT button. (Note: The curve(s) presented in this view are based on your previous selections from items 4 through to 8.)
10. Choose and SAVE memory channel number. Memory channel selections are made using either the White +/- buttons OR Orange UP-DOWN buttons – Press SAVE button

READY TO WELD: Your basic welding selection and set-up is now complete. You are ready to weld, providing you select the corresponding channel 'Job' number on the PF65 wire feed unit panel. Set your welding power and arc length and weld.

NOTE! If you SELECT 'MIG' (i.e. Basic MIG/MAG selection in the above listing) you will automatically jump from item 4 to item 9. When you have saved your channel 'Job' number selection, you will have access to basic MIG/MAG welding on this channel. Voltage and wire feed speed are then selected in the normal way.

Memory 'Job' Channels and User Channels

1. There are 10 x separate MEMORY 'JOB' CHANNELS per Active USER channel.
2. There are 10 x USER channel choices.

So there is a maximum of 100 x channels available for a variety of welding 'Job's, welding projects or multi-operator environments.

Welding parameters can be quickly saved to MEMORY 'Job' CHANNEL Numbers and recalled later or updated later unless 'locked' via the four digits ADMINISTRATOR PIN code lock.

USER channels can be activated through either the MAIN MENU or fast function Key F2, marked USER. Selection process is then standard. SELECT USER number, and use pre recorded channel information OR save and record new channel information.

P65 – Fast Function Keys

The fast function keys, F1, F2 and F3 are short cut keys.

- F1 CHANNEL INFO – Display the basic data recorded to the displayed channel.
- F2 USER – Displays the 'Active' User and allows a new User channel activation.
- F3 WF# – Displays active and selected wire feed unit and allows a new WFU selection. FastMig Pulse allows up to 7 x wire feed units to be connected to one power source.

NOTE! Only one wire feed unit can be active at any one time and must be selected before it will operate.

5. BASIC TROUBLESHOOTING

NOTE! The problems listed and the possible causes are not definitive, but serve to suggest some standard and typical situations that may present during normal environmental use when using the MIG/MAG process with FastMig Pulse.

Problem	Check the following
Machine won't work?	Check mains plug is connected Check mains power distribution is switched on Check the mains fuse and or circuit breaker Check power source 0/I switch is ON Check interconnection cable set and connectors between the power source and wire feed unit are correctly fastened. See the manual schematic Check earth return lead is connected Check function panels are switched on – Orange buttons top left, long press.
Dirty, poor quality weld?	Check shielding gas supply Check and set gas flow rate Check gas type for application Check gun/electrode polarity. Example: Fe solid filler wire: Earth return should be connected to the – pole, wire feed unit to the + pole connector Check correct welding curve selected Check correct Channel (job) number selected on PF65 function panel Check power supply – Phase down?
Variable welding performance?	Check wire feed mechanism is correctly adjusted Check correct drive rolls are fitted Check wire spool overrun tension is correctly adjusted Check gun liner is not blocked. Replace if necessary Check correct gun liner is fitted for the filler wire size and type Check contact tip for size, type and wear Check gun is not over heating in application Check cable connections and earth return clamp Check welding parameter settings.
Filler wire won't feed?	Check wire feed mechanism. Pressure arms are closed? Close and adjust Check welding gun switch function. Check euro gun collar is correctly fastened to euro block Check gun liner is not blocked Check contact tip, size, type, wear Check and try alternative gun.
High spatter volume?	Check welding parameter values Check inductance/Dynamics values •Check cable compensation value if long cables are fitted Check gas type and flow Check welding polarity – cable connections Check filler material selection Check correct welding curve selected Check correct Channel (job) number selection Check filler wire delivery system Check power supply – 3 x phase present?

NOTE! Many of these checks may be carried out by the operator. However certain checks relating to mains power must be completed by an authorised trained electrician.

6. OPERATION DISTURBANCES

Should you experience a malfunction from your machine, please consult the basic troubleshooting text above first, and complete some basic checks.

If the machine malfunction cannot be corrected with these measures, contact your KEMPPI maintenance service workshop.

6.1 OPERATION OF THE OVERLOAD PROTECTION

Yellow thermal protection lamp is lit when the thermostat is operating due to loading beyond the stated duty cycle.

The thermostat will operate, if machine is continuously loaded over rated values or cooling air circulation is blocked.

Internal fans will cool the machine, and when the pilot lamp is not lit the machine is automatically ready for welding.

6.2 CONTROL FUSES

Fuse, 6,3 A delayed, on the rear wall of machine provides protection for auxiliary devices.

Use the same type and rating of fuse as marked beside the fuse adapter. Damage caused by incorrect fuse selection is not covered by the guarantee.

6.3 UNDER AND OVER VOLTAGES IN THE MAINS SUPPLY

Primary circuits of the machine are protected against sudden, transient overvoltages. The machine is designed to withstand 3 x 440 V voltage continuously (see technical data). Ensure that voltage is kept within this admissible limit, especially when the mains supply is provided by a combustion engine generator. If the mains has under voltage (under approx. 300 V) or overvoltage (over approx. 480 V) machine control stops operation automatically.

6.4 LOSS OF A PHASE IN THE MAINS SUPPLY

Loss of a main power phase causes noticeably poor welding properties. In some cases the machine won't start at all. Loss of a phase can be due to following:

- Blowing of mains supply fuse
- Defective mains cable
- Bad connection of mains power cable on machine terminal block or plug of machine.

7. MAINTENANCE

When considering and planning routine maintenance, please consider the the frequency of machine use and the working environment.

Correct operation of the machine and regular maintenance will help you avoid unnecessary downtime and equipment failure.

NOTE! Disconnect the machine from the mains before handling the electrical cables.

7.1 DAILY MAINTENANCE

- Check the overall condition of the welding gun. Remove welding spatter from the contact tip and clean the gas nozzle. Replace worn or damaged parts. Only use original Kemppi spare parts.
- Check the condition and connection of the welding circuit components: welding gun, earth return cable and clamp, sockets and connectors.
- Check the condition of the feed rolls, needle bearings and shafts. Clean and lubricate bearings and shafts with a small quantity of light machine oil if necessary. Assemble, adjust and test function.

7.2 PERIOD MAINTENANCE

NOTE! Period maintenance should only be carried out by a suitably qualified person. Disconnect the plug of the machine from the mains socket and wait approx.2 minutes (capacitor charge) before removing the cover plate.

Check at least every half year:

- Electric connectors of the machine – clean any oxidized parts and tighten loose connections.

NOTE! You must know the correct tension torques values before starting the reparation of the loose joints.

Clean the inner parts of the machine from dust and dirt e.g. with a soft brush and vacuum cleaner. Also clean the ventilation net behind the front grill.

Do not use compressed air, there is a risk that the dirt will compact even more tightly into gaps of cooling profiles.

Do not use pressure washing devices.

Only an authorized trained electrician should carry out repairs to Kemppi machines.

7.3 SERVICE SHOP MAINTENANCE

Kemppi Service Workshops complete maintenance according to their Kemppi service agreement.

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

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

Software loading

Kemppi Service Workshops can also test and load firm ware and welding software.

8. DISPOSAL OF THE MACHINE

Do not dispose of electrical equipment 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 taken to an appropriate environmentally responsible recycling facility.

The owner of the equipment is obliged to deliver a decommissioned unit to a regional collection centre, per the instructions of local authorities or a Kemppi representative. By applying this European Directive you will improve the environment and human health.

9. ORDERING NUMBERS

FastMig Pulse 350 power source		6150400
FastMig Pulse 450 power source		6150500
FastMig Pulse Setup panel P65	Included with power source	6155300
FastMig MXF 63 wire feeder 200 mm	Work pack profile	6152300EL
FastMig MXF 65 wire feeder 300 mm	Work pack profile	6152100EL
FastMig MXF 67 wire feeder 300 mm	Work pack profile	6152200EL
FastMig MXF 63 wire feeder 200 mm	Project pack custom	6152300
FastMig MXF 65 wire feeder 300 mm	Project pack custom	6152100
FastMig MXF 67 wire feeder 300 mm	Project pack custom	6152200
PF 63 wire feeder panel		6155200
PF 65 wire feeder panel		6155100
Return current cable	5 m, 50 mm^2	6184511
Return current cable	5 m, 70 mm^2	6184711
Cable for MMA welding	5 m, 50 mm^2	6184501
Cable for MMA welding	5 m, 70 mm^2	6184701
Interconnection cable	1.8 m	6260401
Interconnection cable	10 m	6260326
Interconnection cable	15 m	6260325
Interconnection cable	20 m	6260327
Interconnection cable	30 m	6260330
Interconnection cable, water cooled	1.8 m	6260410
Interconnection cable, water cooled	10 m	6260334
Interconnection cable, water cooled	15 m	6260335
Interconnection cable, water cooled	20 m	6260337
Interconnection cable, water cooled	30 m	6260340
Other lengths available		
R30 DataRemote	5 m	6185420
R30 DataRemote	10 m	618542001
Remote control extension cable	10 m	6185481
Cooling unit FastCool 10		6068100
Software installation device DataGun		6265023
Transport unit PM 500		6185291
KV 200 mounting plate		6185249
Gun holder GH 30		6256030

SuperSnake GT02S sub feeder	10 m	6153100
SuperSnake GT02S sub feeder	15 m	6153150
SuperSnake GT02S sub feeder	20 m	6153200
SuperSnake GT02S sub feeder	25 m	6153250
SuperSnake GT02S W sub feeder	10 m	6154100
SuperSnake GT02S W sub feeder	15 m	6154150
SuperSnake GT02S W sub feeder	20 m	6154200
SuperSnake GT02S W sub feeder	25 m	6154250
SuperSnake GT02S sub feeder synchronization unit for FastMig MXF wire feed units		W004030
WiseFusion welding function		9991014
WisePenetration welding function		9991000
WiseRoot welding process		6265011
WiseThin welding process		9991013
MatchLog		9991017
MMA welding process		9991016

10. TECHNICAL DATA

FastMig™ Pulse		350	450
Connection voltage	3~50/60 Hz	400 V -15 %...+20 %	400 V -15 %...+20 %
Rated power	60 % ED		22.1 kVA
	80 % ED	16.0 kVA	
	100 % ED	15.3 kVA	16.0 kVA
Connection cable	H07RN-F	4G6 (5 m)	4G6 (5 m)
Fuse (delayed)		25 A	35 A
Output 40 °C	60 % ED		450 A
	80 % ED	350 A	
	100 % ED	330 A	350 A
Welding current and voltage range	MMA	10 A – 350 A	10 A – 450 A
	MIG	10 V – 50 V	10 V – 50 V
Max. welding voltage MMA		49 V	53 V
Open circuit voltage	MMA	50 V	50 V
	MIG/MAG/Pulse	80 V	80 V
Open circuit power		100 W	100 W
Power factor at max. current		0.85	0.9
Efficiency at max. current		88 %	88 %
Operating temperature range		-20 ... +40 °C	-20 ... +40 °C
Storage temperature range		-40 ... +60 °C	-40 ... +60 °C
EMC class		A	A
Minimun short circuit power S_{sc} of supply network*		5.5 MVA	5.5 MVA
Degree of protection		IP23S	IP23S
External dimensions	L x W x H	590 x 230 x 430 mm	590 x 230 x 430 mm
Weight		36 kg	36 kg
Voltage supply for auxiliary devices		50 V DC / 100 W	50 V DC / 100 W
Fuse (delayed)		6.3 A	6.3 A
Voltage supply for cooling unit		24V DC / 50 VA	24V DC / 50 VA

* See paragraph 2.2.

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