

LINC FEED 45

OPERATOR'S MANUAL



ENGLISH



Lincoln Electric Bester Sp. z.o.o.
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Declaration of conformity



Lincoln Electric Bester Sp. z o.o.

Declares that the welding machine:

K14072-1 LINC FEED 45

conforms to the following directives:

2014/35/EU , 2014/30/EU

and has been designed in compliance with the
following standards:

EN 60974-5:2013, EN 60974-10:2014

A handwritten signature in black ink, appearing to be 'Piotr Spytak', is written over a faint, light-colored circular stamp or watermark.

20.04.2016

Piotr Spytak
Operations Director

Lincoln Electric Bester Sp. z o.o., ul. Jana III Sobieskiego 19A, 58-263 Bielawa, Poland

12/05



THANKS! For having chosen the **QUALITY** of the Lincoln Electric products.

- Please Examine Package and Equipment for Damage. Claims for material damaged in shipment must be notified immediately to the dealer.
- For future reference record in the table below your equipment identification information. Model Name, Code & Serial Number can be found on the machine rating plate.

Model Name:
Code & Serial number:
Date & Where Purchased:

ENGLISH INDEX

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WARNING

This equipment must be used by qualified personnel. Be sure that all installation, operation, maintenance and repair procedures are performed only by qualified person. Read and understand this manual before operating this equipment. Failure to follow the instructions in this manual could cause serious personal injury, loss of life, or damage to this equipment. Read and understand the following explanations of the warning symbols. Lincoln Electric is not responsible for damages caused by improper installation, improper care or abnormal operation.

	<p>WARNING: This symbol indicates that instructions must be followed to avoid serious personal injury, loss of life, or damage to this equipment. Protect yourself and others from possible serious injury or death.</p>
	<p>READ AND UNDERSTAND INSTRUCTIONS: Read and understand this manual before operating this equipment. Arc welding can be hazardous. Failure to follow the instructions in this manual could cause serious personal injury, loss of life, or damage to this equipment.</p>
	<p>ELECTRIC SHOCK CAN KILL: Welding equipment generates high voltages. Do not touch the electrode, work clamp, or connected work pieces when this equipment is on. Insulate yourself from the electrode, work clamp, and connected work pieces.</p>
	<p>ELECTRICALLY POWERED EQUIPMENT: Turn off input power using the disconnect switch at the fuse box before working on this equipment. Ground this equipment in accordance with local electrical regulations.</p>
	<p>ELECTRICALLY POWERED EQUIPMENT: Regularly inspect the input, electrode, and work clamp cables. If any insulation damage exists replace the cable immediately. Do not place the electrode holder directly on the welding table or any other surface in contact with the work clamp to avoid the risk of accidental arc ignition.</p>
	<p>ELECTRIC AND MAGNETIC FIELDS MAY BE DANGEROUS: Electric current flowing through any conductor creates electric and magnetic fields (EMF). EMF fields may interfere with some pacemakers, and welders having a pacemaker shall consult their physician before operating this equipment.</p>
	<p>CE COMPLIANCE: This equipment complies with the European Community Directives.</p>
	<p>FUMES AND GASES CAN BE DANGEROUS: Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. To avoid these dangers the operator must use enough ventilation or exhaust to keep fumes and gases away from the breathing zone.</p>
	<p>ARC RAYS CAN BURN: Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing. Use suitable clothing made from durable flame-resistant material to protect you skin and that of your helpers. Protect other nearby personnel with suitable, non-flammable screening and warn them not to watch the arc nor expose themselves to the arc.</p>
	<p>WELDING SPARKS CAN CAUSE FIRE OR EXPLOSION: Remove fire hazards from the welding area and have a fire extinguisher readily available. Welding sparks and hot materials from the welding process can easily go through small cracks and openings to adjacent areas. Do not weld on any tanks, drums, containers, or material until the proper steps have been taken to insure that no flammable or toxic vapors will be present. Never operate this equipment when flammable gases, vapors or liquid combustibles are present.</p>
	<p>WELDED MATERIALS CAN BURN: Welding generates a large amount of heat. Hot surfaces and materials in work area can cause serious burns. Use gloves and pliers when touching or moving materials in the work area.</p>
	<p>SAFETY MARK: This equipment is suitable for welding operations carried out in an environment with increased hazard of electric shock.</p>



CYLINDER MAY EXPLODE IF DAMAGED: Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators designed for the gas and pressure used. Always keep cylinders in an upright position securely chained to a fixed support. Do not move or transport gas cylinders with the protection cap removed. Do not allow the electrode, electrode holder, work clamp or any other electrically live part to touch a gas cylinder. Gas cylinders must be located away from areas where they may be subjected to physical damage or the welding process including sparks and heat sources.

Installation and Operator Instructions

Read this entire section before installation or operation of the machine.

Location and Environment

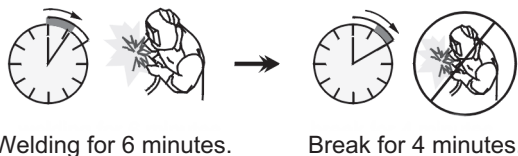
This machine will operate in harsh environments. However, it is important that simple preventative measures are followed to assure long life and reliable operation:

- Do not place or operate this machine on a surface with an incline greater than 15° from horizontal.
- Do not use this machine for pipe thawing.
- This machine must be located where there is free circulation of clean air without restrictions for air movement to and from the air vents. Do not cover the machine with paper, cloth or rags when switched on.
- Dirt and dust that can be drawn into the machine should be kept to a minimum.
- This machine has a protection rating of IP23. Keep it dry when possible and do not place it on wet ground or in puddles.
- Locate the machine away from radio controlled machinery. Normal operation may adversely affect the operation of nearby radio controlled machinery, which may result in injury or equipment damage. Read the section on electromagnetic compatibility in this manual.
- Do not operate in areas with an ambient temperature greater than 40°C.

Duty cycle and Overheating

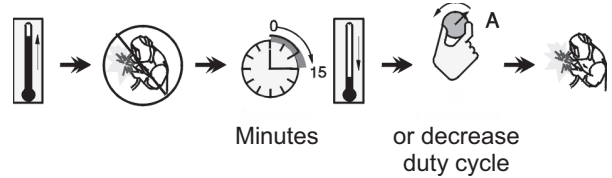
The duty cycle of a welding machine is the percentage of time in a 10 minute cycle at which the welder can operate the machine at rated welding current.

Example: 60% duty cycle:



Excessive extension of the duty cycle will cause the thermal protection circuit to activate.

The machine is protected from overheating by a thermostat. When the machine is overheated the output of the machine will turn "OFF", and the Thermal Indicator Light (on front panel of wire feeder) will turn "ON". When the machine has cooled to a safe temperature the Thermal Indicator light will go out and the machine may resume normal operation. Note: For safety reasons the machine will not come out of thermal shutdown if the trigger on the welding gun has not been released.



Input Supply Connection

Check the input voltage, phase, and frequency of the power source that will be connected to this wire feeder. The allowable input voltage of the power source is indicated on the rating plate of the wire feeder. Verify the connection of grounding wires from the power source to the input source.

Gas Connection

A gas cylinder must be installed with a proper flow regulator. Once a gas cylinder with a flow regulator has been securely installed, connect the gas hose from the regulator to the machine gas inlet connector. Refer to point [1] of the image Figure 2. The wire feeder supports all suitable shielding gases including carbon dioxide, argon and helium at a maximum pressure of 5,0 bar.

Output Connections

Refer to point [9] of the image Figure 1.

Controls and Operational Features

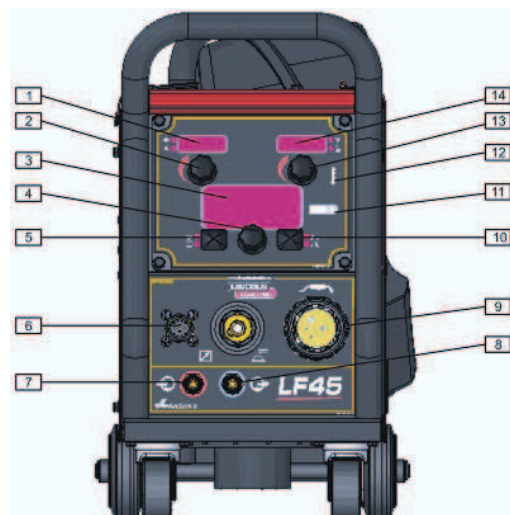


Figure 1.

1. **Left Display Window:** Shows Wire Feed Speed or Amperage.
2. **Left Knob:** Adjusts values in left display.
3. **MSP4 Display Window:** Shows detailed welding and diagnostic information.

4. **Set Knob:** Changes the value on the MSP4 display.
5. **Left Button:** Changes the MSP4 display to show the Weld Mode or Arc Control.
6. **12-pin Connector:** Connector for a remote control and a push-pull gun.
7. **Water Cooling Line:** Warm water from torch.
8. **Water Cooling Line:** Cool water to torch.
9. **EURO Connector.**
10. **Right Button:** Changes the MSP4 display to show Start Options or End Options.
11. **Set-Up:** Lights when feeder is set-up.
12. **Thermal:** Lights when the drive overheats.
13. **Right Knob:** Adjusts values in the right display.
14. **Right Display Window:** Shows Voltage or Trim.

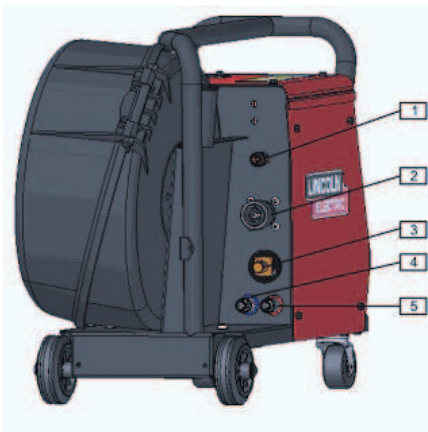


Figure 2.

1. **Gas Connector:** Connection for gas line.
2. **5-pin Connector:** ArcLink connection to power source.
3. **Fast-Mate Adapter:** Input power connection.
- 4 - 5. **Quick Connect Couplings:** If water cooled torches are used, connect water lines from water cooler here. Refer to torch and water cooler guidelines for recommended cooling liquid and flow rates.

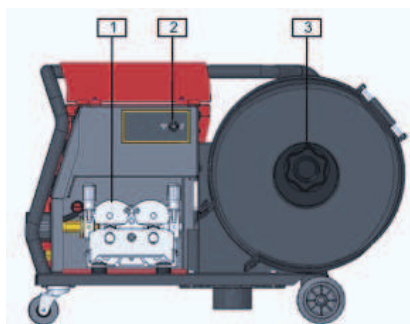


Figure 3.

1. **Wire Drive:** 4-Roll wire drive compatible with 37mm drive rolls.
2. **Cold Inch / Gas Purge Switch:** This switch enables wire feeding or gas flow without turning on output voltage.
3. **Wire Spool Support:** Maximum 15kg spools. Accepts plastic, steel and fiber spools onto 51mm spindle.

⚠ WARNING

The Linc Feed wire feeders must be used with the door completely closed during welding.

Not use handle to move the Linc Feed during work.

Loading the Electrode Wire

Open the side cover of the machine.

Unscrew the fastening cap of the sleeve.

Load the spool with the wire on the sleeve such that the spool turns clockwise when the wire is fed into the wire feeder.

Make sure that the spool locating pin goes into the fitting hole on the spool.

Screw in the fastening cap of the sleeve.

Put on the wire roll using the correct groove corresponding to the wire diameter.

Free the end of the wire and cut off the bent end making sure it has no burr.

⚠ WARNING

Sharp end of the wire can hurt.

Rotate the wire spool clockwise and thread the end of the wire into the wire feeder as far as the Euro socket.

Adjust force of pressure roll of the wire feeder properly.

Adjustments of Brake Torque of Sleeve

To avoid spontaneous unrolling of the welding wire the sleeve is fitted with a brake.

Adjustment is carried by rotation of its screw M10, which is placed inside of the sleeve frame after unscrewing the fastening cap of the sleeve.

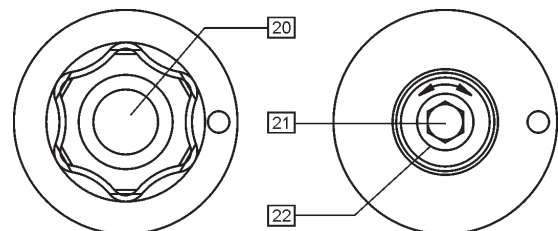


Figure 4.

20. Fastening cap.
21. Adjusting screw M10.
22. Pressing spring.

Turning the screw M10 clockwise increases the spring tension and you can increase the brake torque.

Turning the screw M10 counterclockwise decreases the spring tension and you can decrease the brake torque.

After finishing of adjustment, you should screw in the fastening cap again.

Adjusting of Pressure Roll Force

WARNING

ELECTRIC SHOCK can kill.

- Turn the input power OFF at the welding power source before installation or changing drive rolls and/or guides.
- Do not touch electrically live parts.
- When inching with the gun trigger, electrode and drive mechanism are "hot" to work and ground and could remain energized several seconds after the gun trigger is released.
- Do not operate with covers, panels or guards removed or open.
- Only qualified personnel should perform maintenance work.

Pressure force is adjusted by turning the adjustment nut clockwise to increase force, counterclockwise to decrease force.

The pressure arm controls the amount of force the drive rolls exert on the wire. Proper adjustment of pressure arm gives the best welding performance. Set the pressure arm as follows:

- Aluminum wires: between 1 and 3
- Cored wires: between 3 and 4
- Steel, Stainless wires: between 4 and 6

WARNING

If the roll pressure is too low the roll will slide on the wire. If the roll pressure is set too high the wire may be deformed, which will cause feeding problems in the welding gun. The pressure force should be set properly. Decrease the pressure force slowly until the wire just begins to slide on the drive roll and then increase the force slightly by turning of the adjustment nut by one turn.

Inserting Electrode Wire into Welding Torch

Connect the proper welding torch to the Euro socket, the rated parameters of the torch and of the welding source shall match.

Remove the gas diffuser and contact tip from the welding torch.

Switch the Cold Inch / Gas Purge switch [2] (see Figure 3.) in the position "Cold Inch" and keep in this position until the electrode wire leaves the contact tip of the welding torch.

Set the wire feeding speed in the position of about 10m/min by the Left Knob [2] (see Figure 1.).

WARNING

Take precaution to keep eyes and hands away from the end of the torch while feeding wire.

WARNING

Once the wire has finished feeding through the welding gun turn the machine "OFF" before replacing to contact tip and gas diffuser.

Changing Driving Rolls

The machine is equipped with drive rolls for the wire of 1.0 and 1.2mm (factory default). For others wire sizes, is available the proper drive rolls kit (see chapter Accessories for ordering the desired kit). Below is the drive rolls replacement procedure:

- Switch off the machine.
- Release the pressure roll lever [32].
- Unscrew the fastening cap [33].
- Open the protection cover [34].
- Change the drive rolls [35] with the compatible ones corresponding to the used wire.

WARNING

For wires with the diameter greater than 1.6mm, the following parts are to be changed:

- The guide tube of the feeding console [36] and [37].
- The guide tube of the Euro socket [38].
- Replace and tighten the protection cover [34] to the drive rolls.
- Screw the protection cover by fastening screws [33].

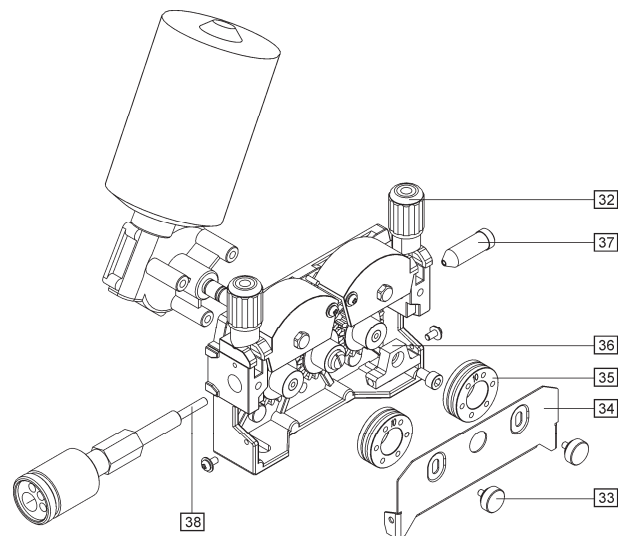


Figure 5.

Making A Weld With Waveform Technology Power Sources

WARNING

The serviceability of a product or structure utilizing the welding programs is and must be the sole responsibility of the builder/user. Many variables beyond the control of The Lincoln Electric Company affect the results obtained in applying these programs. These variables include, but are not limited to welding procedure, plate chemistry and temperature, weldment design, fabrication methods and service requirements. The available range of a welding program may not be suitable for all applications, and the build/user is and must be solely responsible for welding program selection.

The steps for operating the Power Source will vary depending upon the user interface of the welding system. The flexibility of the Power Source lets the user customize operation for the best performance.

- First, consider the desired welding process and the part to be welded. Choose an electrode material, diameter, shielding gas and process (GMAW, SMAW, etc.)
- Second, find the program in the welding software that best matches the desired welding process. The standard software shipped with the Power Source encompasses a wide range of common processes and will meet most needs. All adjustments are made on the user interface. Because of the different configuration options your system may not have all of the following adjustments.

Regardless of availability, all controls are described below.

SMAW (Stick) Welding

SMAW is most often used for outdoor construction, pipe welding and general repairs. The wire feeder speed controls Amperage, Output Control and Arc Force. During SMAW welding, the wire feeder sets the weld parameters and the wire drive remains idle. The “Volts”-“Trim” control is used to turn the power Source Output ON or OFF (See Figure below)

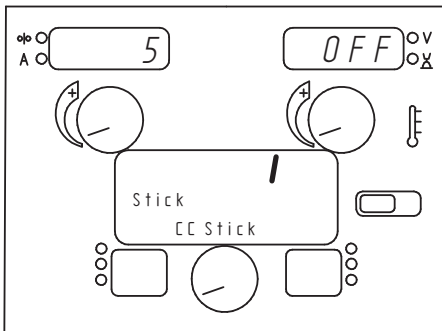


Figure 6. SMAW (Stick) Welding Display

GTAW (TIG) Welding

The SpeedTec is excellent for Touch Start TIG welding. The wire feeder speed controls Amperage. During SMAW welding, the wire feeder sets the weld parameters and the wire drive remains idle. The “Volts”-“Trim” control is used to turn the power Source Output ON or OFF (See Figure below)

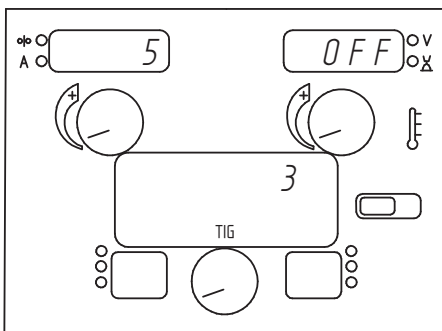


Figure 7. GTAW (TIG) Welding Display

GMAW (MIG) Synergic Welding

Display

Synergic CV programs feature an ideal voltage best suited for most procedures. Use this voltage as a starting point and adjust if needed for personal preferences.

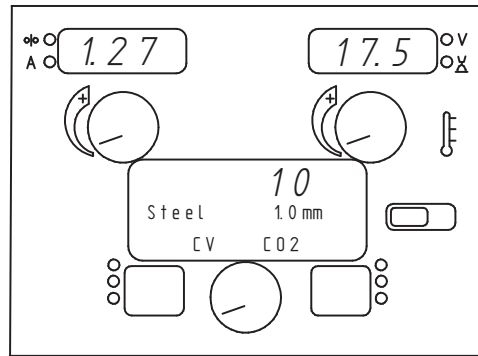
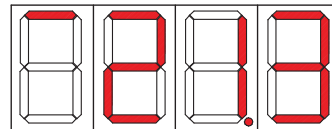


Figure 8. GMAW (MIG) Synergic Welding Display

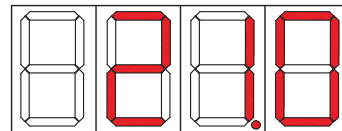
Synergic CV Voltage Display

When the voltage knob is rotated, the display will show an upper or lower bar indicating if the voltage is above or below the ideal voltage.

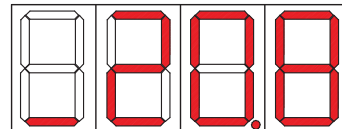
- Preset voltage above ideal voltage (upper bar displayed)



- Preset voltage at ideal voltage (no bar displayed)



- Preset voltage below ideal voltage (lower bar displayed)



MSP4 Operation

Left Button:

		Weld Mode			
Electrode	Gas	Wire Size			
		0.8	1.0	1.2	1.6
Steel	CO2	93	10	20	24
Steel	Ar(mix)	94	11	21	25
Stainless	Ar(mix)	61	31	41	---
Stainless	Ar/He/CO2	63	33	43	---
Alu 4043	Ar	---	148	71	---
Alu 5356	Ar	---	151	75	77
FluxCore	Gas Shld			155	

Arc Control	
Effect Range	Description
Pinch Effect (-10.0 to +10.0)	Pinch controls the arc characteristics when short-arc welding.

Memory	
Effect Range	Description
Job1..Job8	Allows memorizing the selected weld mode.

Right Button:

Start Options	
Effect/Range	Description
Preflow Time 0-25.0 seconds	Adjusts the time that shielding gas flows after the trigger is pulled and prior to feeding.
Run-in WFS Off, 1 to 12 m/min	Run-in sets the wire feed speed from the time the trigger is pulled until an arc is established.
Start Procedure	The Start Procedure controls the WFS, Volts at a specified time at the beginning of the weld. During the start time, the machine will ramp up or down from the Start Procedure to the preset Welding Procedure.

End options	
Effect/Range	Description
Spot Timer 0 to 120.0 seconds	Adjust the time welding will continue even if the trigger is still pulled. This option has no effect in 4-Step Trigger Mode.
Postflow Time 0 to 25.0 seconds	Adjusts the time that shielding gas flows after the welding output turns off.
Burnback	The burnback time is the amount of time that the weld output continues after the wire stops feeding. It prevents the wire from sticking in the puddle and prepares the end of the wire for the next arc start.
Crater Procedure	Crater Procedure controls the WFS and volts for a specified time at the end of the weld after the trigger is released. During the Crater time, the machine will ramp up or down from the Weld Procedure to the Crater Procedure.

2/4 Step Mode	
Effect Range	Description
2-Step, 4-Step	Selects between 2-Step and 4-Step mode of weld.

2- STEP 4- STEP- Trigger Operation

The 2-Step - 4-Step switch changes the function of the gun trigger. 2-Step trigger operation switches the welding output ON-OFF in direct response to the trigger. 4-Step trigger operation provides 'trigger interlock' capability and gives the ability to control the amount of time spent in the arc start and arc crater steps. Press the push button on the case front to toggle between 2-Step and 4-Step operation. The 2-Step, 4-Step trigger has no effect when welding with SMAW or CAG procedures.

2-Step Trigger

2-Step trigger operation is the most common. When the gun trigger is pulled, the welding system (power source and wire feeder) cycles through the arc starting sequence and into the main welding parameters. The welding system will continue to weld as long as the gun trigger is activated. Once the trigger is released, the welding system cycles through the arc ending steps.

4-Step Trigger

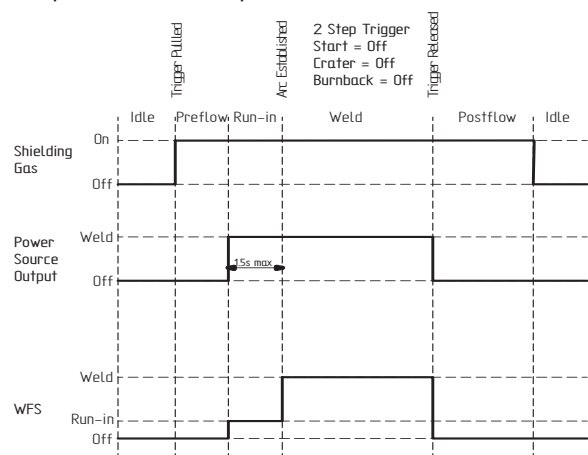
4-Step trigger operation gives the welder additional control in the welding sequence. 4-Step trigger allows the welder to choose the arc start, weld and arc end time. It may also be set-up to work as a trigger interlock.

Example 1:

2 Step Trigger: Simple operation

The simplest trigger operation occurs with a 2 Step trigger and the Start, Crater and Burnback functions all set to OFF (See Figure Below). For this sequence:

- **PREFLOW:** Shielding gas begins to flow immediately when the gun trigger is pulled.
- **RUN-IN:** After preflow time expires, the power source regulates to the welding output and wire is advanced towards the work piece at the Run-In WFS. If an arc is not established within 1.5 seconds, the wire feed speed will jump to the welding wire feed speed.
- **WELD:** The power source output and the wire feed speed continue at the weld settings for as long as the trigger is pulled.
- **POSTFLOW:** As soon as the trigger is released, the power source output and the wire feed speed are turned OFF. Shielding gas continues until the post flow timer expires.

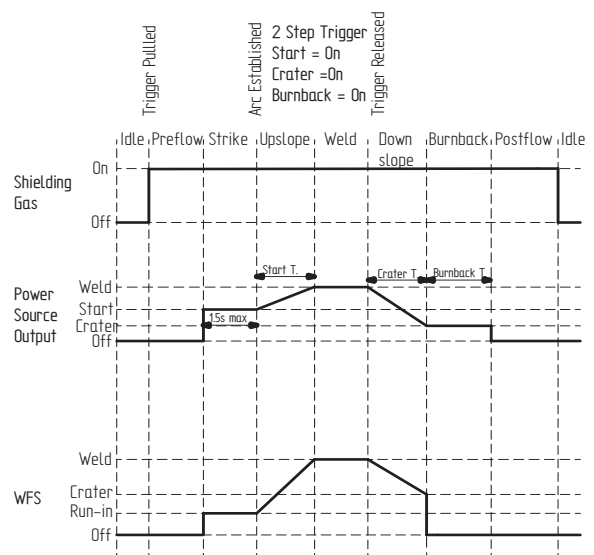
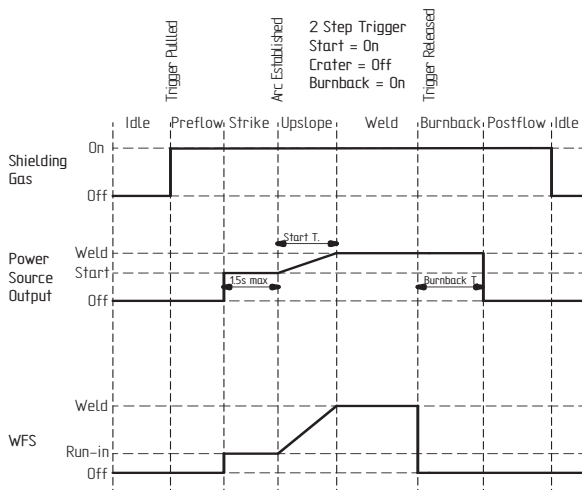


Example 2:

2 Step Trigger: Improved Arc Start and Arc End.

Tailoring the arc start and arc end is a common method for reducing spatter and improving weld quality. This can be accomplished with the Start and Burnback functions set to a desired values and Crater set to OFF (See Figure Below). For this sequence:

- **PREFLOW:** Shielding gas begins to flow immediately when the gun trigger is pulled.
- **RUN-IN:** After preflow time expires, the power source regulates to the start output and wire is advanced towards the work piece at the Run-In WFS. If an arc is not established within 1.5 seconds, the power source output and wire feed speed skips to the weld settings.
- **START & UPSLOPE:** Once the wire touches the work and an arc is established, both the machine output and the wire feed speed ramp to the weld settings throughout the start time. The time period of ramping from the start settings to the weld settings is called UPSLOPE.
- **WELD:** After upslope, the power source output and the wire feed speed continue at the weld settings.
- **BURNBACK:** As soon as the trigger is released, the wire feed speed is turned OFF and the machine output continues for the burnback time.
- **POSTFLOW:** Next, the machine output is turned OFF and shielding gas continues until the post flow timer expires.



Example 3: 2 Step Trigger: Customized Arc Start, Crater and Arc End.

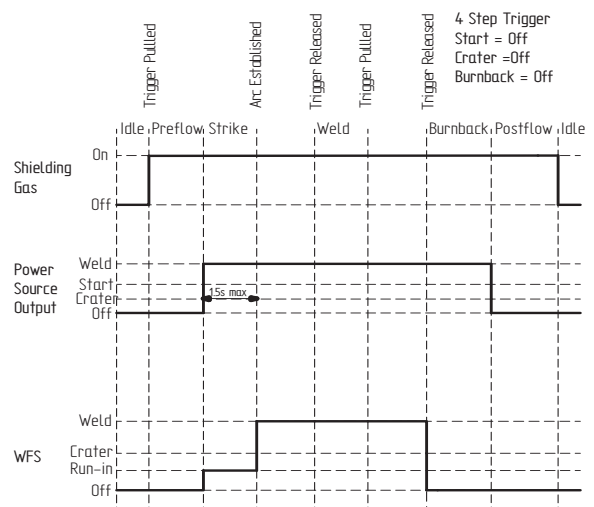
Sometimes it is advantageous to set specific arc start, crater and arc ending parameters for the ideal weld. Many times when welding aluminum crater control is necessary to make a good weld. This is done by setting Start, Crater and Burnback functions to desired values (See Figure Below). For this sequence:

- **PREFLOW:** Shielding gas begins to flow immediately when the gun trigger is pulled.
- **RUN-IN:** After preflow time expires, the power source regulates to the start output and wire is advanced towards the work piece at the Run-In WFS. If an arc is not established within 1.5 seconds, the power source output and wire feed speed skips to the weld settings.
- **START & UPSLOPE:** Once the wire touches the work and an arc is established, both the machine output and the wire feed speed ramp to the weld settings throughout the start time. The time period of ramping from the start settings to the weld settings is called UPSLOPE.
- **WELD:** After upslope, the power source output and the wire feed speed continue at the weld settings.
- **CRATER & DOWNSLOPE:** As soon as the trigger is released, the wire feed speed and power source output ramp to the crater settings throughout the crater time. The time period of ramping from the weld settings to the crater settings is called DOWNSLOPE.
- **BURNBACK:** After the crater time expires, the wire feed speed is turned OFF and the machine output continues for the burnback time.
- **POSTFLOW:** Next, the machine output is turned OFF and shielding gas continues until the post flow timer expires.

Example 4: 4 Step Trigger: Trigger Interlock

The 4 step trigger can be configured as a trigger interlock. Trigger interlock adds to the welder's comfort when making long welds by allowing the trigger to be released after an initial trigger pull. Welding stops when the trigger is pulled a second time and then released, or if the arc is interrupted (See Figure Below). For this sequence:

- **PREFLOW:** Shielding gas begins to flow immediately when the gun trigger is pulled.
- **RUN-IN:** After preflow time expires, the power source regulates to the welding output and wire is advanced towards the work piece at the Run-In WFS. If an arc is not established within 1.5 seconds, the wire feed speed will jump to the welding wire feed speed.
- **WELD:** The power source output and the wire feed speed continue at the weld settings. Welding continues when the trigger is pulled a second time.
- **POSTFLOW:** As soon as the trigger is released for the second time, the power source output and the wire feed speed are turned OFF. Shielding gas flows until the post flow timer expires.

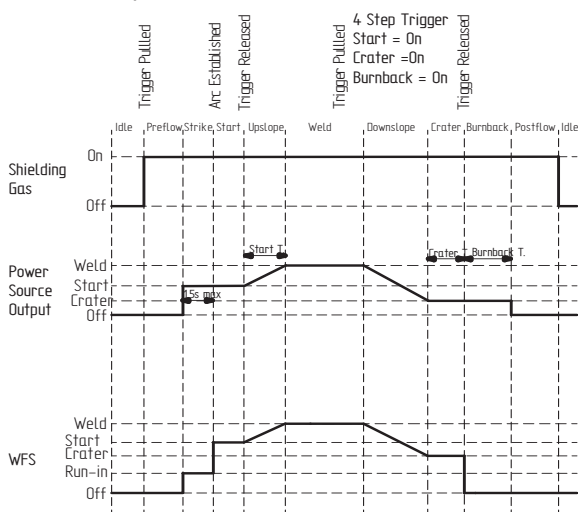


Example 5: 4 Step Trigger: Manual control of Start and Crater

times with Burnback ON

The 4 step trigger sequence gives the most flexibility when the Start, Crater and Burnback functions are active. This is a popular choice when welding aluminum because extra heat may be needed during Start and less heat desired during crater. With 4 step trigger, the welder chooses the amount of time to weld at the Start, Weld and Crater settings by using the gun trigger. Burnback reduces the occurrence of wire to sticking into the weld pool at the end of a weld and conditions the end of the wire for the next arc start (See Figure Below). For this sequence:

- **PREFLOW:** Shielding gas begins to flow immediately when the gun trigger is pulled.
- **RUN-IN:** After preflow time expires, the power source regulates to the start output and wire is advanced towards the work piece at the run-in WFS. If an arc is not established within 1.5 seconds, the power source output and wire feed speed skips to the weld settings.
- **START:** The power source welds at the start WFS and voltage until the trigger is released.
- **UPSLOPE:** During upslope, the power source output and the wire feed speed ramp to the weld settings throughout the start time. The time period of ramping from the start settings to the weld settings is called UPSLOPE.
- **WELD:** After upslope, the power source output and the wire feed speed continue at the weld settings.
- **DOWNSLOPE:** As soon as the trigger is released, the wire feed speed and power source output ramp to the crater settings throughout the crater time. The time period of ramping from the weld settings to the crater settings is called DOWNSLOPE.
- **CRATER:** During CRATER, the power source continues to supply output at the crater WFS and voltage.
- **BURNBACK:** When the trigger is released, the wire feed speed is turned OFF and the machine output continues for the burnback time.
- **POSTFLOW:** Next, the machine output is turned OFF and shielding gas continues until the post flow timer expires.



SET-UP FEATURES MENU

The Setup Menu gives access to the set-up configuration. Stored in the set-up configuration are user parameters that generally need to be set only at

installation. The parameters are grouped as follows:

- P.1 through P.99 Unsecured Parameters (always adjustable).
- P.101 through P.199 Diagnostic Parameters (always read only).
- P.501 through P.599 Secured Parameters (accessible only through a p.c. or palm application).

To access the set-up menu, press the right and left buttons of the MSP4 panel simultaneously. Note that the set-up menu cannot be accessed if the system is welding, or if there is a fault (The status LED is not solid green). Change the value of the blinking parameter by rotating the SET knob.

After changing a parameter it is necessary to press the right hand button to save the new setting. Pressing the left button will cancel the change. To exit the set-up menu at any time, press the right and left buttons of the MSP4 panel simultaneously. Alternately, 1 minute of inactivity will also exit the setup menu.

Unsecured Parameters.

P.0 Press the left button to exit the set-up menu.

P.1 WFS units

- Metric = m/min wire feed speed units
- English = in/min wire feed speed units (default)

P.2 Arc Display Mode

- Amps = The left display shows Amperage while welding. (default)
- WFS = The left display shows Wire Feed Speed while welding.

P.4 Trigger Memory Recall

- Enable = Selecting memories 2 through 6 with quick trigger pulls is enabled when the optional dual procedure/memory panel is installed. To recall a memory with the gun trigger, quickly pull and release the trigger the number of times that correspond to the memory number. For example, to recall memory 3, quickly pull and release the trigger 3 times. Trigger memory recall can only be performed when the system is not welding.
- Disable = Memory selection is performed only by the buttons on the optional dual procedure/memory panel (default).

P.5 Trigger Procedure Change

- Quick Trigger = Allows switching between Procedure A and procedure B while welding. The optional dual procedure/memory panel is required. To operate:
 - Select procedure "GUN" on the memory panel.
 - Start the weld by pulling the gun trigger. The system will weld with procedure A settings.
 - While welding, quickly release and then pull the gun trigger. The system will switch to procedure B settings.
 - Release the trigger to stop welding. When the next weld is made, the system will start again with procedure A.
- Integral TrigProc = Use Integral Trigger + Procedure Switch when using a Lincoln Dual Schedule gun. When in 2-step, the system operates identical to the External Switch selection. To operate in 4-step:
 - Select procedure "GUN" on the memory panel.

- Start the weld by pulling the gun trigger. The system will weld with procedure A settings.
- While welding, quickly release and then pull the gun trigger. The system will switch to procedure B settings.
- Release the trigger to stop welding. When the next weld is made, the system will start again with procedure A.
- External Switch = Dual Procedure selection may only be performed by the memory panel button or a dual procedure gun (default).

P.6 Push Pull Gun, Stall Factor Adjustment

The stall factor controls the stall torque of the push motor when using a push-pull gun. The wire feeder is factory set to not stall unless there is a large resistance to feeding wire. The stall factor can be reduced to stall more easily and possibly prevent bird nesting. However, low stall factors can cause motor stalling while welding which results in the wire burning back to the tip. If you are experiencing bird nests, check for other feeding problems before adjusting the stall factor. Default value for the stall factor is 75, with a range of 5 - 100. To change the stall factor:

- Use the VOLTS/TRIM knob to adjust the stall factor. Increasing the stall factor raises the motor torque and decreasing the stall factor lowers the motor torque. Do not increase the stall factor more than necessary. A high stall factor may increase the occurrence of bird nesting and a low stall factor may cause the wire to burn back to the tip.
- Press the right hand button to save the new setting.

P.7 Push Pull Gun, Gun Offset Adjustment

The pushpull gun offset calibration adjusts the wire feed speed calibration of the pull motor. The procedure should only be performed when other possible corrections do not solve the push-pull feeding problems. A rpm meter is required to perform the pull gun motor offset calibration. To perform the calibration procedure:

- Release the pressure arm on both the pull and push wire drives.
- Set the wire feed speed to 200 rpm.
- Remove wire from the pull wire drive.
- Hold the rpm meter to the drive roll in the pull gun.
- Pull the trigger on the push-pull gun.
- Measure the rpm of the pull motor. The rpm should be between 115 and 125 rpm. If necessary, decrease the calibration setting to slow the pull motor, or increase the calibration setting to speed up the motor. The calibration range is -30 to +30, with 0 as the default value.
- Press the right hand button to save the new setting.

P.8 TIG Gas Control (Two Settings)

- 1. "Valve (manual)", the internal solenoid will not actuate while TIG welding, gas flow is manually controlled by an external valve.
- 2. "Solenoid (auto)", the internal gas solenoid will turn on and off automatically while TIG welding as follows:
 - Preflow time will not be accessible from the MSP4.
 - Postflow time will be available in the MSP4 "End Options" and have a range of OFF to 10.0 seconds.

- The postflow time value is maintained when switching between MIG and TIG modes.
- When machine output on/off is controlled via the right encoder, gas flow will not start until the tungsten touches the work piece, gas flow will stop after the postflow time when the arc is broken.
- When machine output on/off is controlled via an arc start switch or foot Amptrol, gas will begin flowing when the output is turned on and stop flowing after the postflow period after the output is turned off.

P.9 Crater Delay

Use the crater delay to skip the Crater sequence when making short tack welds. If the trigger is released before the Crater Delay Timer ends, then the Crater sequence is skipped. If the trigger is released afterwards, the Crater sequence functions normally.

- Values = OFF to 10.0 seconds (OFF is default).

P.11 Set Timers

This menu is used to adjust timer values for Upslope, Downslope and Restrike. Press the right button to enter the Set Timer menu. Rotate the knob to select the timer to adjust and then press the right button. Adjust the value of the timer by rotating the knob. Press the left MSP4 button to set the value and exit. Continue to adjust other timers as necessary, and then press the left button to exit the Set Timer menu.

P.12 Travel Options

This menu is used to change the travel options for a travel carriage, including starting and ending functions. The right MSP4 button to enter the Travel Options menu and rotate the encoder to select either starting or ending options. Press the right MSP4 button to select the option. Press the left MSP4 button to set the value and exit. Rotate the encoder to select other options, or press the left MSP4 button to exit the menu.

P.13 Adjust Arc Force

Use this menu to adjust Arc Force values for Start, Weld and Crater. Press the right MSP4 button to enter the menu and rotate the knob to choose either Start, Weld or Crater. Press the right MSP4 button and then rotate the knob to the desired value. Press the left MSP4 button to set the value and exit. Continue to adjust Arc Force for other states, and then press the left MSP4 button to exit the menu.

P.14 Reset Consumable Weight

This parameter only appears with systems using Production Monitoring. Use this parameter to reset the initial weight of the consumable package.

P.16 Push-Pull Gun Knob

- Gun Pot Enabled = The wire feed speed is always controlled by the potentiometer on the push-pull gun (default).
- Gun Pot Disabled = The wire feed speed is always controlled by the left display knob on the feeder.
- Gun Pot Proc A = When in procedure A, the wire feed speed is set by the push-pull gun potentiometer. When in procedure B, the wire feed speed is set by the left display knob on the feeder.

P.25 Joystick Configuration

The new analog and digital gun controls have a joystick to allow the user to change various weld settings at the

gun rather than having to go to the user interface. P.25 can be used to change the behavior of the joystick. In all configurations, the up and down joystick positions will adjust the wire feed speed, while welding and while not welding. P.25 is used to reconfigure the behavior of the left and right joystick positions.

- When P.25 is set to "Trim/Volts/etc.", the left and right joystick positions will adjust Arc Length Trim, Arc Voltage, Power or STT Background Current based on the selected weld mode. For example, when a non-synergic STT weld mode is selected, the left and right joystick positions will adjust Background Current. When a Power mode is selected, the left and right joystick positions will adjust the Power (kW).
- When P.25 is set to "Memory+Trim/etc.", the left and right joystick positions will select a user memory while not welding and adjust Trim/Voltage/Power/STT Background Current while welding.
- When P.25 is set to "Procedure A/B", the left and right joystick positions will be used to select procedure A and B, while welding and while not welding. The left joystick position selects procedure A, the right joystick position selects procedure B.

Diagnostic Parameters

P.80 Sense from Studs

Use this parameter for diagnostic purposes only. When power is cycled, P.80 is automatically reset to False.

- False = Sensing for the electrode (67) and work (21) is determined by the DIP switches of the system.
- True = Sensing for the electrode (67) and work (21) is measured at the studs of the power source and the DIP switch settings are overridden.

P.99 Show Test Modes

Many weld tables include special modes for testing and servicing the welding system. Set this parameter to YES to show all test modes. When the power source is turned off, the Show Test Modes parameter automatically reverts back to "NO".

P.100 View Diagnostics

Diagnostics are only used for servicing the Power Wave system.

- Yes = Shows P.101 through P.500 in the SETUP menu.
- No = Only P.0 through P.100 are shown in the SETUP menu.

P.101 Event Logs

Press the right MSP4 button to view the Event Logs. Rotate the encoder to select the object to read and then press the right MSP4 button. Various software information will appear about key system events. Press the left MSP4 button to exit.

P.102 Fatal Logs

Press the right MSP4 button to view the Fatal Logs. Rotate the encoder to select the module to read and then press the right MSP4 button. Various software information will appear about critical module actions. Press the left MSP4 button to exit.

P.103 Software Version

Press the right MSP4 button to view the software

loaded into each module (p.c. board). Rotate the encoder to select the module to read and then press the right MSP4 button. The panel will display the main software version loaded into the module. Press the left MSP4 button to exit.

P.104 Hardware Version

Press the right MSP4 button to view the hardware version of each module (p.c. board). Rotate the encoder to select the module to read and then press the right MSP4 button. The panel will display the main hardware version loaded into the module. Press the left MSP4 button to exit.

P.105 Welding Software

Press the right MSP4 button to view the welding software version inside the power source. Press the left MSP4 button to exit.

P.106 Ethernet IP Address

Press the right MSP4 button to view the IP address of the Ethernet board. If no Ethernet Board is installed, the display shows "No Enet Found". Press the left MSP4 button to exit.

P.107 Power Source

Press the right MSP4 button to view the type of power source connected to the control box. Press the left MSP4 button to exit.

Maintenance

WARNING

For any maintenance or repair operations it is recommended to contact the nearest technical service center or Lincoln Electric. Maintenance or repairs performed by unauthorized service centers or personnel will null and void the manufacturers warranty.

The frequency of the maintenance operations may vary in accordance with the working environment where the machine is placed.

Any noticeable damage should be reported immediately.

• Routine maintenance

- Check condition of insulation and connections of the work cables and input power supply cable.
- Remove the spatters from the welding gun nozzle. Spatters could interfere with the shielding gas flow to the arc.
- Check the welding gun condition: replace it, if necessary.
- Check condition and operation of the cooling fan. Keep clean its airflow slots.

• Periodic maintenance

Perform the routine maintenance and, in addition:

- Keep clean the machine. Using a dry (and low pressure) airflow, remove the dust from the external case and from inside of the cabinet.
- Check condition of all connections and change if necessary.
- Check and tighten all screws.

WARNING

Mains supply network must be disconnected from the machine before each maintenance and service. After each repair, perform proper tests to ensure safety.

Electromagnetic Compatibility (EMC)

11/04

This machine has been designed in accordance with all relevant directives and standards. However, it may still generate electromagnetic disturbances that can affect other systems like telecommunications (telephone, radio, and television) or other safety systems. These disturbances can cause safety problems in the affected systems. Read and understand this section to eliminate or reduce the amount of electromagnetic disturbance generated by this machine.



This machine has been designed to operate in an industrial area. To operate in a domestic area it is necessary to observe particular precautions to eliminate possible electromagnetic disturbances. The operator must install and operate this equipment as described in this manual. If any electromagnetic disturbances are detected the operator must put in place corrective actions to eliminate these disturbances with, if necessary, assistance from Lincoln Electric.

Before installing the machine, the operator must check the work area for any devices that may malfunction because of electromagnetic disturbances. Consider the following.

- Input and output cables, control cables, and telephone cables that are in or adjacent to the work area and the machine.
- Radio and/or television transmitters and receivers. Computers or computer controlled equipment.
- Safety and control equipment for industrial processes. Equipment for calibration and measurement.
- Personal medical devices like pacemakers and hearing aids.
- Check the electromagnetic immunity for equipment operating in or near the work area. The operator must be sure that all equipment in the area is compatible. This may require additional protection measures.
- The dimensions of the work area to consider will depend on the construction of the area and other activities that are taking place.

Consider the following guidelines to reduce electromagnetic emissions from the machine.

- Connect the machine to the input supply according to this manual. If disturbances occur it may be necessary to take additional precautions such as filtering the input supply.
- The output cables should be kept as short as possible and should be positioned together. If possible connect the work piece to ground in order to reduce the electromagnetic emissions. The operator must check that connecting the work piece to ground does not cause problems or unsafe operating conditions for personnel and equipment.
- Shielding of cables in the work area can reduce electromagnetic emissions. This may be necessary for special applications.

WARNING

The Class A equipment is not intended for use in residential locations where the electrical power is provided by the public low-voltage supply system. There can be potential difficulties in ensuring electromagnetic compatibility in those locations, due to conducted as well as radio-frequency disturbances.



Technical Specifications

INPUT VOLTAGE		WIRE FEED SPEED	
34-44 Vdc		0.75-22 m/min	
RATED OUTPUT AT 40°C			
Duty Cycle (based on a 10 min. period)		Output Current	
100%		385 A	
60%		500 A	
OUTPUT RANGE			
Welding Current Range 5-500 A		Maximum Open Circuit Voltage 113 Vdc or Vac peak	
WIRE SIZES (mm)			
Solid wires 0.6 to 1.6	Cored wires 1.0 to 2.0	Aluminium wires 1.0 to 1.6	
PHYSICAL DIMENSIONS			
Height 440 mm	Width 270 mm	Length 636 mm	Weight 17 Kg
Operating Temperature -10°C to +40°C		Storage Temperature -25°C to +55°C	

WEEE

07/06

English



Do not dispose of electrical equipment together with normal waste!
 In observance of European Directive 2012/19/EC on Waste Electrical and Electronic Equipment (WEEE) 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 protect the environment and human health!

Spare Parts

12/05

Part List reading instructions

- Do not use this part list for a machine if its code number is not listed. Contact the Lincoln Electric Service Department for any code number not listed.
- Use the illustration of assembly page and the table below to determine where the part is located for your particular code machine.
- Use only the parts marked "X" in the column under the heading number called for in the assembly page (# indicate a change in this printing).

First, read the Part List reading instructions above, then refer to the "Spare Part" manual supplied with the machine, that contains a picture-descriptive part number cross-reference.

Electrical Schematic

Refer to the "Spare Part" manual supplied with the machine.

Accessories

K10349-PG-xM	Source wire/feeder cable (gas). Available in 5, 10,15, 20, 25 or 30m.
K10349-PGW-xM	Source wire/feeder cable (gas and water). Available in 5, 10,15, 20, 25 or 30m.
K10158	Plastic adaptor for 15-kg coils (delivered as standard).
K10343	Innershield torch adaptor.

LF 45: Drive rolls and guide tubes 4 driven rolls

KP14017-0.8	Solid wires: 0,6-0,8mm
KP14017-1.0	
KP14017-1.2	
KP14017-1.6	
KP14017-1.6R	Cored wires: 1.0-1.6mm
KP14017-2.4R	
KP14017-1.2A	Aluminum wires: 1,0-1,2mm
KP14017-1.6A	

ECM Electronic



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