

LF 52D

OPERATOR'S MANUAL



ENGLISH





- 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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Technical Specifications

NAME		INDEX	
LF 52D		K14335-1	
INPUT			
Input Voltage U ₁	Input Amperes I ₁	EMC Class	
40Vdc	4Adc	A	
RATED OUTPUT			
Duty Cycle 40°C (based on a 10 min. period)		Output Current	
100%		420A	
60%		500A	
OUTPUT RANGE			
Welding Current Range		Peak Open Circuit Voltage	
5 ÷ 500A		113Vdc or Vac peak	
DIMENSION			
Weight	Height	Width	Length
17 kg	516 mm	302 mm	642 mm
WIRE FEED SPEED RANGE / WIRE DIAMETER			
WFS Range	Drive Rolls	Drive roll diameter	
1.5 ÷ 22 m/min	4	Ø37	
Solid Wires	Aluminum Wires	Cored Wires	
0.8 ÷ 1.6 mm	1.0 ÷ 1.6 mm	0.9 ÷ 1.6 mm	
OTHERS			
Protection Rating		Maximum Gas Pressure	
IP23		0,5 MPa (5 bar)	
Operating Temperature		Storage Temperature	
from -10°C to +40°C		from -25°C to 55°C	

Electromagnetic Compatibility (EMC)

01/11

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

EMC classification of this product is class A in accordance with electromagnetic compatibility standard EN 60974-10 and therefore the product is designed to be used in an industrial environment only.

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.










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><small>Optical radiation emission Category 2 (EN 12191)</small></p>	<p>ARTIFICIAL OPTICAL RADIATION: According with the requirements in 2006/25/EC Directive and EN 12198 Standard, the equipment is a category 2. It makes mandatory the adoption of Personal Protective Equipments (PPE) having filter with a protection degree up to a maximum of 15, as required by EN169 Standard.</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>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.</p>
	<p>MOVING PARTS ARE DANGEROUS: There are moving mechanical parts in this machine, which can cause serious injury. Keep your hands, body and clothing away from those parts during machine starting, operating and servicing.</p>
	<p>SAFETY MARK: This equipment is suitable for supplying power for welding operations carried out in an environment with increased hazard of electric shock.</p>

The manufacturer reserves the right to make changes and/or improvements in design without upgrade at the same time the operator's manual.

Introduction

LF 52D is digital wire feeder which has been designed to work with Lincoln Electric power sources:

- POWERTEC® i350S,
- POWERTEC® i420S,
- POWERTEC® i500S,
- SPEEDTEC® 400SP,
- SPEEDTEC® 500SP,
- FLEXTEC® 350x,
- FLEXTEC® 500x.

The CAN protocol is used for communication between the power source and the wire feeder. All signals from the power source are displayed on the User Interface located in the wire feeder machine.

Set of power source and wire feeder allow welding in listed processes:

- GMAW (MIG/MAG),
- FCAW,
- SMAW (MMA),
- GTAW,
- CAG.

The complete package contains:

- Wire feeder.
- USB memory with operator's manual.
- Easy Start.

Recommended equipment, which can be bought by user, was mentioned in the chapter "Accessories".

Installation and Operator Instructions

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

Exploitation conditions

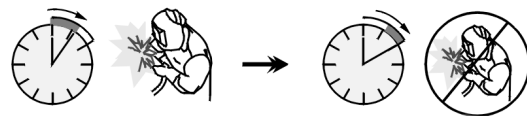
This machine can operate in harsh environments. However, it is important to use the following simple preventive measures that will ensure its long life and reliable operation:

- Do not place or operate this machine on a surface with an incline higher 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. 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 away from the item.
- This machine has a protection rating of IP23. Keep it dry when possible and do not place it on a wet ground or in puddles.
- Locate the machine away from a radio controlled machinery. Normal operation may adversely affect the operation of a 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.

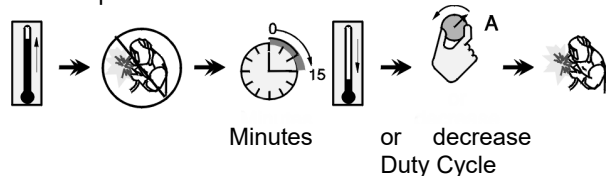
Example: 60% duty cycle



Welding for 6 minutes.

Break for 4 minutes.

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



Input Supply Connection

Check the input voltage, phase, and frequency of the power source that will be connected to this wire feeder. The acceptable level of input voltage is indicated in the section „Technical Specifications" and on the rating plate of the power source. Verify the connection of grounding wires from the power source to the input source.

Controls and Operational Features

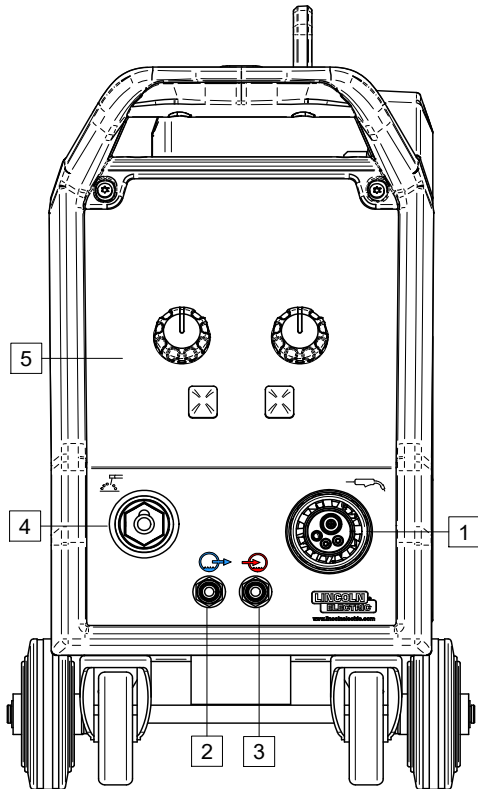


Figure 1

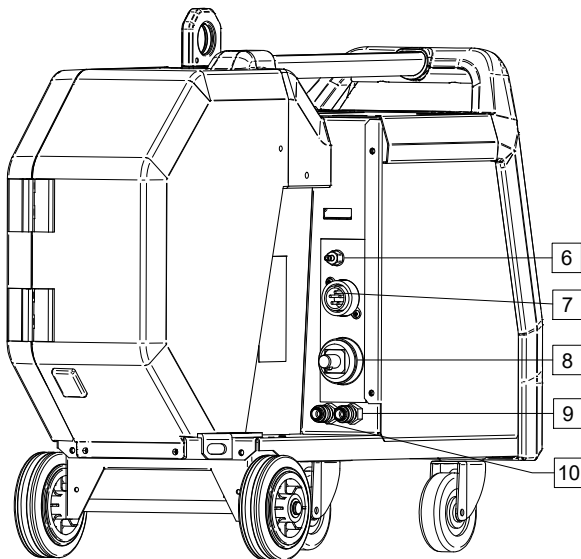







Figure 2

1. **EURO Socket:** For connecting a welding gun (for GMAW, FCAW process). 
2. **Quick Coupling Socket:** Coolant outlet (supplies cool coolant to the welding gun). 
3. **Quick Coupling Socket:** Coolant inlet (takes warm coolant from the welding gun). 





WARNING

Maximum coolant pressure is 5 bar.

4. **Output Socket for SMAW and CAG welding:** For connecting welding cable with an electrode holder. 
5. **U22 User Interface:** See „User Interface” section.
6. **Gas Quick Coupling Socket:** For connecting a gas pipe. 

WARNING

The welding machine supports all suitable shielding gases at a maximum pressure of 5,0 bar.

7. **Control Socket:** 5 pins socket for connecting a control cable. The CAN protocol is used for communication between the power source and wire feeder. 
8. **Current Socket:** For connecting a welding cable. 
9. **Quick Coupling Socket:** Coolant inlet (supplies cool coolant from cooler to the welding machine). 
10. **Quick Coupling Socket:** Coolant outlet (takes warm coolant from welding machine to cooler). 

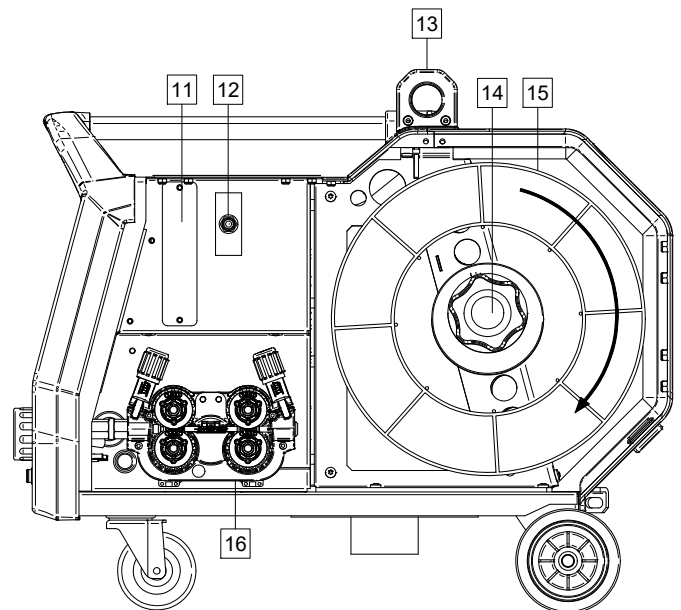


Figure 3

11. **Gas Flow Regulator Plug:** Gas Flow Regulator can be purchased separately. See "Accessories" section.
12. **Switch: Cold Inch / Gas Purge:** This switch allows wire feeding (wire test) and gas flow (gas test) without switching on the output voltage.
13. **Transport Holder:** For the feeder lifting and transporting using a crane.

14. Wire Spool Holder: For wire spool with maximum 16kg weight. Holder allows mounting plastic, steel and fiber spools on the 51mm spindle.

WARNING

Be sure that wire spool case has to be completely closed during welding.

15. Spool with Wire: Not supplied as standard.

16. Wire Drive: 4-rolls wire drive.

WARNING

The wire drive door and wire spool case have to be completely closed during welding.

WARNING

Not use handle to move the machine during work.

User Interface

The LF 52D wire feeder uses the U22 interface based on two separate LED displays for operation.

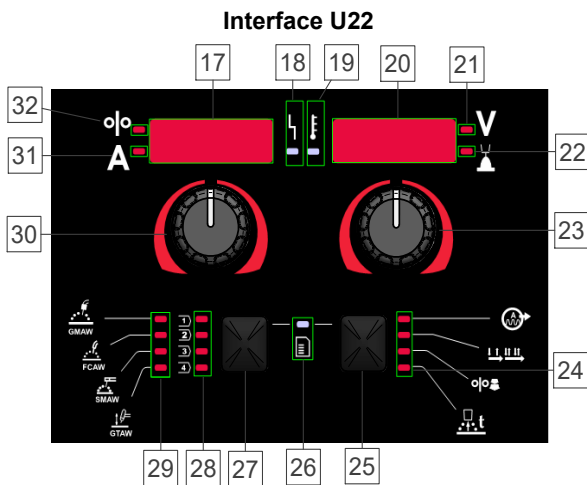


Figure 4

17. Left Display: Shows wire feed speed or welding current. During welding shows the actual welding current value.

18. Status LED: A two color light that indicates system errors. Normal operation is steady green light. Error conditions are indicated, per Table 1.

Note: The status light will flash green for up to one minute when the machine is turned on for the first time. When the power source is powered it can take as long as up to 60 seconds for the machine to be ready to weld. This is a normal situation as the machine goes through the initialization.

Table 1

LED Light Condition	Meaning
	Only machines which using protocol for communication
Steady Green	Power source is operational, and is communicating normally with all healthy peripheral equipment.
Blinking Green	Occurs during power up or a system reset, and indicates the power source is mapping (identifying) each component connect to the system. This behavior occurs for first after power is turned on, or if the system configuration is changed during operation.
Alternating Green and Red	<p>If the status lights are flashing any combination of red and green color, it means that errors are present in the power source.</p> <p>Each digit of the code corresponds to the number of red flashes of the indicator lamp. Individual code digits are flashed in red with a long pause between digits. If more than one code is present, the codes will be separated by green light. Read the error code before the machine is turned off.</p> <p>To clear the errors try to turn off the machine and wait for a few seconds, then turn on again. If the error remains, a it maintenance is required. Please contact the nearest authorized technical service center or Lincoln Electric and report the error code.</p>
Steady Red	Indicate no communication between the power source and device which has been connected to this power source.

19. Thermal Overload Indicator: It indicates that the machine is overloaded or that the cooling is not sufficient.





20. Right Display: Depending on the source welding and the welding program shows the welding voltage in volts or Trim value. During welding shows the actual welding voltage value.

21. LED Indicator: Informs that the value on the right display is in volts unit and during welding, it blinks and the display shows the measured voltage.

22. LED Indicator: Informs that the value on the right display is Trim. Trim is adjustable from 0.50 to 1.50. 1.00 is the nominal setting.
23. Right Control: Adjusts values on the right display.
24. LED Indicator: Quick Access Menu.
25. Right Button: Enables selecting, changing and setting welding parameters. Quick Access Menu.
26. LED Indicator: Indicates that the Settings and Configuration Menu is activated.
27. Left Button: Enables:
 - Checking the active program number. To check the program number, press the left button once.
 - Changing the Welding Process.
28. Welding Programs Indicators (changeable): In the user memory can be stored four user programs. Shine LED indicates that the program is active.
29. Welding Programs Indicators (unchangeable): LED indicates the program for non-synergic process is active. See the table 2.
30. Left Control: Adjusts values on the left display.
31. LED Indicator: Informs that the value on the left display is in ampere units, blinks during welding and the display shows current measured. .
32. LED Indicator: Informs that the wire feed speed is on the left display.

Changing the Welding Process or Program

Table 2 . Unchangeable Welding Programs

Symbol	Process	Program Number		
		Powertec®	Speedtec®	Flextec®
	GMAW (non-synergic)	2	5	10
	FCAW-GS	7	7	81
	SMAW	1	1	1
	GTAW	-	3	3

Note: The list of available programs depends on the power source. If the power source does not support one of four unchangeable programs, the LED indicating this program does not light up.

It is possible to quick recall one of the eight welding programs. Four programs are fixed and cannot be changed - Table 2. Four programs can be changed and assigned to one of four user memory. By default, user memories store the first available welding program.

To change the welding process:

- Press the left button [27]. "Pr" is shown on the left display [17] and the actual program number on the right display [20].
- Again, press the left button [27] the welding programs indicator (28 or 29) will pass to the next program in the sequence shown in Figure 5.

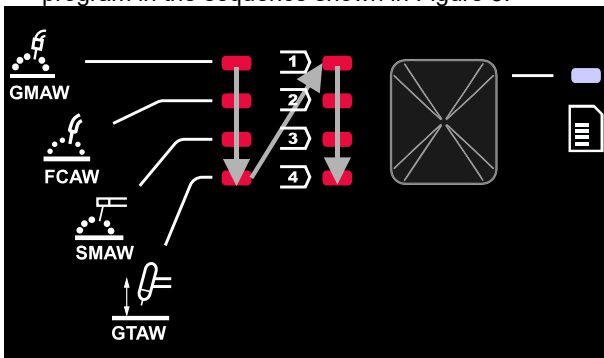


Figure 5

- Press the left button [27] until the LED Indicator (28 or 29) will indicate desired welding program.

WARNING

After the device has been restarted remembers the last selected welding program with its parameters.

User Memory



In user memory only four welding programs can be stored.

To assign the weld program to user memory:

- Use the left button [27] to select the user memory number (1, 2, 3 or 4) - LED Indicator [28] will light up selected memory.
- Press and hold the left button [27] it until LED Indicator [28] will blink.

- Use the right control [23] to select the welding program.
- To save the selected program, press and hold the left button [27] until LED Indicator will stop blinking.

Warning: The list of available programs depends on the power source.

Quick Access Menu

The user has access to the arc parameters as well as start and end process parameters according to Table 3 and 4.

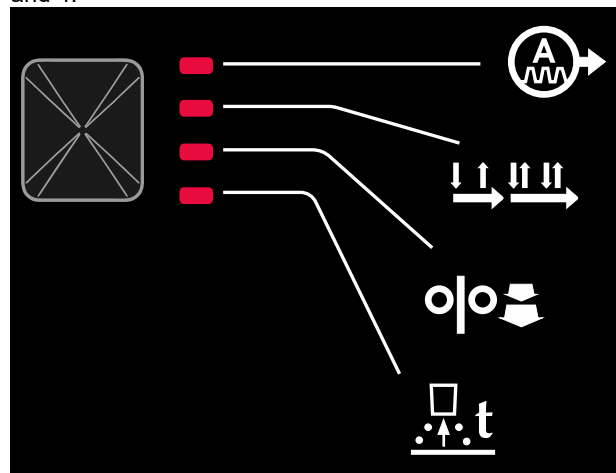


Figure 6

To enter the menu:

- Press the right Button [25] until the LED Indicator [24] illuminates the required parameter.
- Set the parameter value by the right control [23]. The set value is automatically saved.
- The parameter value is shown on the right display [20].
- Press the right button [25] to go to the next parameter.
- Press the left button [27] to exit.

WARNING

Access to the menu is not available under welding, or if there is a fault (status LED [18] is not solid green).

Availability of the parameters in the Quick Access Menu depend on the selected welding program / welding process.

Table 3 Wave Controls









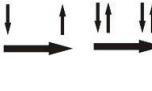





	Parameter	Definition
		<p>Pinch – controls the arc characteristics during short-arc welding. Increasing Pinch value results in a crisper arc (more spatter) while decreasing provides a softer arc (less spatter).</p> <ul style="list-style-type: none"> Regulation range: from -10.0 to +10.0. Default value: 0.
		<p>Frequency - influences the width of the arc and the amount of heat input to the weld.</p> <ul style="list-style-type: none"> Default value: 0. <p>Note: Adjust range depend on the power source.</p>
		<p>Background Current- percentage value of nominal welding current. Adjusts the overall heat input into the weld. Changing the background current changes the shape of the back bead.</p> <p>Note: Adjust range depend on the power source.</p>
		<p>UltimArc™ – for pulse welding programs adjusts the focus or shape of the arc. In consequence of increasing UltimArc™ value the arc is tight, stiff for high speed sheet metal welding.</p> <ul style="list-style-type: none"> Adjust range: from -10 to +10. Default value: 0.
		<p>ARC FORCE - the output current is temporarily increased prevents the electrode from sticking and facilitates the welding process. Lower values will provided less short circuit current and a softer arc. Higher settings will provided a higher short circuit current, more forceful arc and possibly of more spatter.</p> <ul style="list-style-type: none"> Default value: 0. Regulation range: from -10.0 to +10.0
		<p>HOT START - percentage regulation of increasing nominal current value during arc start with electrode. It cause temporarily increased of output current and made easy arc start with electrode.</p> <ul style="list-style-type: none"> Default value: +5. Regulation range: from 0 to +10.0. <p>This parameter is only for SMAW.</p>
		<p>Pulse Period - - influences the width of the arc and the amount of heat input to the weld. If the value of parameters is lower:</p> <ul style="list-style-type: none"> Improves penetration and the microstructure of the weld. The arc is narrower, more stable. Reduces the amount of heat input to the weld. Reduces distortions. Increases welding speed. <p>Note: Adjust range depend on the power source.</p>

Table 4 Process start and end parameters

	Parameter	Definition
		<p>Torch trigger mode (2-step / 4-step) - change the function of the torch trigger.</p> <ul style="list-style-type: none"> • 2 Step trigger operation turns welding on and off as direct response to the trigger. Welding process starts when the torch trigger is press. • 4-Step mode allows to continue welding, when the torch trigger is released. To stop welding, the torch trigger should be pressed again. 4-step model facilitates to make long welds. • Default settings: 2-step
		<p>Run-in WFS – sets the wire feed speed from the time the torch trigger is pressed until an arc is established.</p> <ul style="list-style-type: none"> • Regulation range: from 1,49 m/min (59 in/min) to 3,81 m/min (150 in/min). • Default settings for non-synergic mode: OFF. • Default settings for synergic mode: AUTO mode.
		<p>Burnback Time – amount of time that the welding is continued 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 ignition.</p> <ul style="list-style-type: none"> • Regulation range: from OFF to 0,25 seconds. • Default settings for non-synergic mode: 0,07s. • Default settings for synergic mode: AUTO mode.

Setting and Configuration Menu

To access the menu, press the left [27] and the right [25] buttons simultaneously.

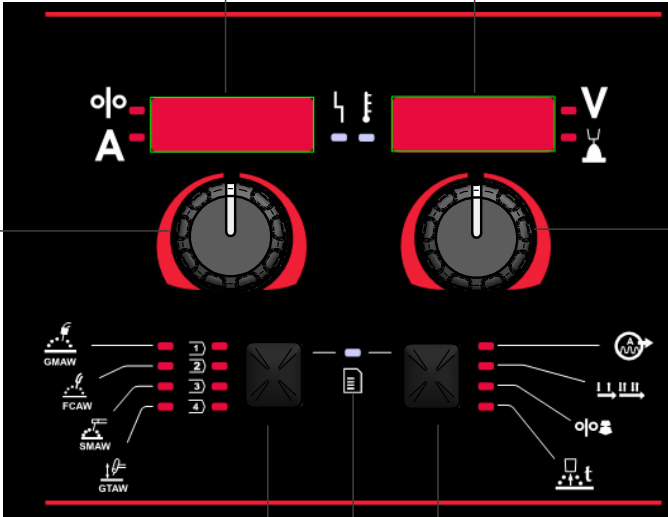
Parameter Selection Mode – the Parameter Name on the left display [17] blinking.

Parameter Change Value Mode – the parameter value on the right display [20] blinking.

WARNING

To exit the menu with changes saved, press the left [27] and the right [25] buttons simultaneously. After one minute of inactivity the Menu without saving will also exit.

Table 5 Interface Components and functions when the Settings and Configuration Menu is active.

		Functions of Interface Components
 <p data-bbox="518 1151 619 1178">Figure 7</p>	<p>17. Parameter Name.</p> <p>20. Parameter Value.</p> <p>23. Changing Parameter Value.</p> <p>25. Entering to parameter.edition. Confirm Parameter Value change.</p> <p>26. Setting and Device Configuration Menu is active.</p> <p>27. Cancellation / Exit.</p> <p>30. Parameter Selection.</p>	

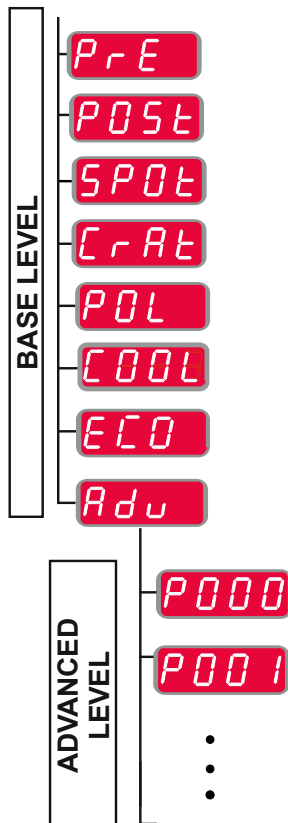


Figure 8

User has access to two menu levels:

- Basic Level – basic menu which is connected with settings of Welding Parameters.
- Advanced Level – advanced menu, configure device menu.







Note: The availability parameters in the Setting and Configuration Menu depend on the selected welding program / welding process.

Note: After the device has been restarted remembers the last selected welding program with its parameters.

Basic Menu (settings related to the welding's parameters)

The Basic Menu includes the parameters described in Table 6.

Table 6 The default settings of Basic Menu

Parametr	Definicja
	<p>Preflow Time – time that shielding gas flows after the torch trigger was pressed before prior to wire feeding.</p> <ul style="list-style-type: none"> • Regulation range: from 0 seconds (OFF) to 25 seconds. • Default settings for non-synergic mode: 0,2s. • Default settings for synergic mode: AUTO mode.
	<p>Postflow Time – time that shielding gas flows after stop welding.</p> <ul style="list-style-type: none"> • Regulation range: from 0 seconds (OFF) to 25 seconds. • Default settings for non-synergic mode: 0,5s. • Default settings for synergic mode: AUTO mode.
	<p>Spot Timer – adjusts the time welding will continue even if the trigger is still pulled. This option has no effect in 4-Step Trigger Mode.</p> <ul style="list-style-type: none"> • Regulation range: from 0 second (OFF) to 120 seconds. • Default settings: OFF. <p>Note: Spot Timer has no effect in 4-Step Trigger Mode.</p>
	<p>Crater Procedure controls the WFS (or value in ampere) and Volts (or Trim) for a specified time at the end of the welding after the trigger was released. During the crater time, the machine will ramp up or down from the Weld Procedure to the Crater Procedure.</p> <ul style="list-style-type: none"> • Adjust time range: from 0 seconds (OFF) to 10 seconds. • Default settings: OFF. <p>Crater parameters:</p> <ul style="list-style-type: none"> • Crater time • Wire feed speed or welding current. • Voltage in volts or Trim value. <p>To set a crater for a selected process:</p> <ul style="list-style-type: none"> • Press the right button [25]. • "SEC" appears on the left display [17]. • On the right display [20] the value in seconds flashes. • Set the crater time with the right control [23]. • Confirm the setting of the crater time with the right button [25]. • The left display [17] shows the value of the wire feed speed or welding current, the right display [20] shows the voltage in volts or the Trim value. • Set the value on the left display [17] by the left control [30]. • Set the value on the right display [20] with the right control [23]. • Confirm the settings - press the right button [25].
	<p>Polarization – Used for configuration of the work and electrode sense leads:</p> <ul style="list-style-type: none"> • "Positive" (default) = Most GMAW welding procedures use Electrode Positive welding. • "Negative" = Most GTAW and some inner shield procedures use Electrode Negative welding.
	<p>Cooler – option is available when cooler is connected. This function allows following cooler modes:</p> <ul style="list-style-type: none"> • FILL – Filling. • AUTO – Automatic mode. • On – Cooler on in the continuous mode. • Off – Cooler off. <p>Refer cooler instruction manual for more details.</p> <p>Note: Not apply to Flextec® 350x i Flextec® 500x.</p>



Green Mode – is a power management feature that enables welding equipment to switch to low power state and reduce power consumption while is not using.

Note: Not apply to **Flextec® 350x** i **Flextec® 500x**.

Display Configuration Settings:

- Standby
- Shutdown

Standby – this option allows you to reduce energy consumption to the level below 50W when the welding equipment is unused.

- Default value: OFF.

To set the time for Standby option:

- Press right control [23] to enter in to Standby menu
- By the right control [23] set require time from 10-300min range or Off this function.
- Press right control [23] to confirm.
- When machine is under Standby mode any action on user interface or trigger activates normal work of welding machine.

Shutdown – this option allows you to reduce energy consumption to the level below 10W when the welding equipment is unused.

- Default value: OFF.

To set the time when Shutdown option will be turn on:

- Press right control [23] to enter in to Shutdown menu
- By the right control [23] set require time from 10-300min range or Off this function.
- Press right control [23] to confirm.
- Operating system inform you 15s before activate Shutdown Mode by time counter.

Note: When machine is under Shutdown mode it is required to switch the machine off and on to activate normal operation.

Note: Under Standby and Shutdown displays are disableb.

Advanced Menu – Device Configuration Menu.








Note: To access to advanced menu:







- In Base Menu select the Advanced Menu (Adv).
- Use the right button to confirm the selection.

Advanced Menu (Device Configuration Menu)

The Advanced Menu includes the parameters described in Table 7.

Table 7 The default settings of Advanced Menu

Parametr	Definicija
	<p>The Menu Exit – enables exit from menu. Note: This parameter cannot be edited. To exit from menu:</p> <ul style="list-style-type: none"> In Advanced Menu select P000. Confirm the selection, push the right button.
	<p>Wire Feed Speed (WFS) units – enables change WFS units:</p> <ul style="list-style-type: none"> CE (factory default) = m/min; US = in/min.
	<p>Crater Delay - this option is used to skip the Crater sequence when making short tack welds. If the trigger is released before the timer expires, Crater will be bypassed and the weld will end. If the trigger is released after the timer expires, the Crater sequence will function normally (if enabled).</p> <ul style="list-style-type: none"> OFF (0) to 10.0 seconds (default = OFF)
	<p>Display Trim as Volts Option – determines how Trim is displayed:</p> <ul style="list-style-type: none"> "Yes" = all trim values are displayed as a voltage; "No" = the trim is displayed in the format defined in the weld set. <p>Note: This option may not be available on all machines. The power source must support this functionality, or this option will not appear in the menu.</p>
	<p>Arc Start/Loss Error Time - This option can be used to optionally shut off output if an arc is not established, or is lost for a specified of time. Error 269 will be displayed if the machine times out. If the value is set to OFF, machine output will not be turned off if an arc is not established or arc is lost. The trigger can be used to hot feed the wire (default). If a value is set, the machine output will shut off if an arc is not established within the specified amount of time after the trigger is pulled or if the trigger remains pulled after an arc is lost. To prevent nuisance errors, set Arc Start/Loss Error Time to an appropriate value after considering all welding parameters (run-in wire feed speed, weld wire feed speed, electrical stick out, etc).</p> <ul style="list-style-type: none"> OFF (0) to 10.0 seconds (default = Off) <p>Note: This parameter is disabled while welding in Stick, TIG or Gouge.</p>
	<p>Display Workpoint as Amps Option – determines how workpoint is displayed:</p> <ul style="list-style-type: none"> "No" (factory default) = the workpoint is displayed in the format defined in the weld set. "Yes" = all workpoint values are displayed as an amperage. <p>Note: This option may not be available on all machines. The power source must support this functionality, or this option will not appear in the menu.</p>
	<p>Feedback Persist – determines how feedback values are displayed following a weld:</p> <ul style="list-style-type: none"> "No" (factory default) – last recorded feedback values will blink for 5 seconds following a weld, then return to present display mode. "Yes" – last recorded feedback values will blink indefinitely following a weld until a Control or Button is touched, or an arc is struck.

	<p>Sense From Studs - Use this option for diagnostic purposes only. When power is cycled, this option is automatically reset to False.</p> <ul style="list-style-type: none"> • "No" = Voltage sensing is automatically determined by the selected weld mode and other machine settings. • "Yes" = Voltage sensing is forced to "studs" of the power source. <p>Note: This option may not be available on all machines. The power source must support this functionality, or this option will not appear in the menu.</p>
	<p>Brightness Control - enables the brightness level.</p> <ul style="list-style-type: none"> • Adjust range: from 1 to +10, where 5 is default.
	<p>Restore Factory Settings – to restore Factory Settings:</p> <ul style="list-style-type: none"> • Use the right button to confirm the selection. • Use the right control to select "YES". • Use the right button to confirm the selection. <p>Note: After the device has been restarted the P097 is "NO".</p>
	<p>Show Test Modes– uses for calibration and tests. To use the Test Modes:</p> <ul style="list-style-type: none"> • On the right display is shown "LOAD". • Use the right button to confirm the selection. • On the right display is shown "DONE" <p>Note: After the device has been restarted the P099 is "LOAD".</p>
 	<p>View Software Version Info – used for viewing the software versions for user interface.</p> <p>To read the software version:</p> <ul style="list-style-type: none"> • In Advanced Menu select P103. • Confirm the selection, push the right button. • The displays will show the software version. <p>Note: P103 is a diagnostic parameter, to read only.</p>

Welding GMAW, FCAW-GS and FCAW-SS Process in non-synergic mode

Table 8. GMAW and FCAW non-synergic Welding Programs

Process	Gas	Program Number		
		Powertec®	Speedtec®	Flextec®
GMAW	ArMIX	2	5	10
	CO ₂	3		
	Ar	4		
FCAW-GS	ArMIX	7	7	81
	CO ₂	8		
FCAW-SS	-	6	6	80

Note: The list of available programs depends on the power source.

In non-synergic mode wire feed speed and welding voltage are independent parameters and must be set by the user.

Procedure of beginning welding of GMAW, FCAW-GS or FCAW-SS process:

- Connect a recommended Lincoln Electric power source (see "Accessories" chapter).
- Place the welding set close to the work area, in the place that minimize exposure to weld spatter and guarantee avoid sharp bends of torch cable.
- Determine the wire polarity for the wire to be used. Check data sheet of wire to determine the wire polarity.
- Connect output the gun to GMAW, FCAW-GS or FCAW-SS process to Euro Socket [1].
- Connect the work lead to output sockets of the power source and lock it.
- Connect the work lead to the welding piece with the work clamp.
- Install the proper wire.
- Install the proper drive roll.
- Manually push the wire into the gun's liner.
- Make sure, if it is needed (GMAW, FCAW-GS process), that the gas shield has been connected.
- Turn the input power ON.
- Insert the wire into the welding gun.



WARNING

Keep the gun cable as straight as possible when loading electrode through cable.



WARNING

Never use defected gun.

- Check gas flow with Gas Purge Switch [12] – GMAW and FCAW-GS process.
- Close the wire drive door.
- Close the spool wire case.
- Select the right welding program. Non-synergic programs are described in the Table 8.

Note: The list of available programs depends on the power source.

- Set the welding parameters.
- The welding machine is now ready to weld.



WARNING

The wire drive door and wire spool case have to be completely closed during welding.



WARNING

Do not kink or pull cable around sharp corners.

- By applying the principle of occupational health and safety at welding, welding can be begun.

For 5, 6 and 7 program can set:

- Wire Feed Speed, WFS
- The welding voltage
- Burnback Time
- Run-in WFS
- Preflow Time/ Postflow Time
- Spot Time
- 2-Step/4-Step
- Crater
- Polarity
- Wave Control:
 - Pinch

Pinch controls the arc characteristics during short-arc welding. Increasing Pinch Control results in a crisper arc (more spatter) while decreasing provides a softer arc (less spatter).

- Adjust range: from -10 to +10.
- Default value: 0.

Welding GMAW and FCAW-GS Process in synergic mode CV

Table 9. Exemplify GMAW and FCAW-GS synergic programs for POWERTEC®

Wire material	Gas	Wire diameter [mm]						
		0.8	0.9	1.0	1.2	1.32	1.4	1.6
Steel	CO ₂	11		13	15			19
Steel	ArMIX	10		12	14	16	17	18
Stainless	ArMIX	25		26	27			
Aluminum AISi	Ar				30			32
Aluminum AIMg	Ar				31			33
Metal Core	ArMIX			20	21		22	23
Cored Wire	CO ₂				42			
Cored Wire	ArMIX			40	41			
Si Bronze	Ar	35		36				

Table 10. Exemplify GMAW and FCAW-GS synergic programs for SPEEDTEC®

Material drutu	Gaz	Wire diameter [mm]						
		0.8	0.9	1.0	1.2	1.32	1.4	1.6
Steel	CO ₂	93		10	20			105
Steel	ArMIX	94		11	21	156	25	107
Stainless	ArMIX	61		31	41			
Aluminum AISi	Ar				71			73
Aluminum AIMg	Ar				75			77
Metal Core	ArMIX				81		83	85
Cored Wire	ArMIX				91			
Si Bronze	Ar	190		191				

Table 11. Exemplify GMAW and FCAW-GS synergic programs for FLEXTEC®

Wire material	Gas	Wire diameter [mm]						
		0.030	0.035	0.040	0.045	3/64	0.052	1/16
Steel	CO ₂	12	15	18	21		24	
Steel	ArMIX	11	14	17	20		23	26
Stainless	ArMIX	30	34		38			41
Stainless	Ar/He/CO ₂	31	35		39			
Aluminum AISi	Ar		48			50		52
Aluminum AIMg	Ar		54			56		58
Metal Core	ArMIX				70		72	74
Cored Wire	CO ₂				83		85	87
Cored Wire	ArMIX				82		84	86




Note: The list of available programs depends on the power source.

In synergic mode, the welding voltage is not set directly by user. The correct welding voltage will be set by the machine's software.

Optimal voltage value is related to the input data:

- Wire Feed Speed, WFS.

If it is needed, the welding voltage can be adjusted by the right control [23]. When the right control is rotated, the display will show a positive or negative bar indication if the voltage is above or below the optimal voltage.

- Voltage setup above optimal value 
- Voltage setup at optimal value 
- Voltage setup below optimal value 

Additionally can manually set:

- Burnback
- Run-In WFS
- Preflow Time/ Postflow Time
- Spot Time
- 2-Step/4-Step
- Crater
- Polarity
- Wave Control:
 - Pinch

Pinch controls the arc characteristics during short-arc welding. Increasing Pinch Control results in a crisper arc (more spatter) while decreasing provides a softer arc (less spatter).

- Adjust range: from -10 to +10.
- Default value: 0.

Welding High Penetration Speed (HPS) Process in synergic mode

Table 12 Exemplify synergic programs for HPS

Wire material	Gas	Wire diameter [mm]						
		0.8	0.9	1.0	1.2	1.32	1.4	1.6
Steel	ArMIX			117	127			

Note: The list of available programs depends on the power source.

In synergic mode, the welding voltage is not set directly by user. The correct welding voltage will be set by the machine's software.

Optimal voltage value is related to the input data:

- Wire Feed Speed, WFS.

HPS is a modified welding process designed by Lincoln Electric that combines the advantages of the spray and short arc modes.

Lower welding voltage than in the classic spray arc mode cause lower energy and more concentrated arc.

Advantages:

- The possibility of welding with long stick out.
- Concentrated arc that increases penetration.
- Reduction of workpiece distortion (lower voltage = input less energy into the weld).
- Increased productivity (higher welding speed and reduced requirements for preparing the material for welding).

If it is needed, the welding voltage can be adjusted by the right control [23]. When the right control is rotated, the right display [20] will show a positive or negative bar indication if the voltage is above or below the optimal voltage.

- Preset voltage above ideal voltage



- Preset voltage at ideal voltage



- Preset voltage below ideal voltage



Additionally can manually set:

- Burnback
- Run-In WFS
- Preflow Time/ Postflow Time
- Spotweld
- 2-Step/4-Step
- Crater
- Polarity
- Wave Control
 - Pinch

Pinch controls the arc characteristics during short-arc welding. Increasing Pinch Control results in a crisper arc (more spatter) while decreasing provides a softer arc (less spatter).

- Adjust range: from -10 to +10.
- Default value: 0.

Welding Speed Short Arc (SSA) Process in synergic mode

Table 13. Exemplify synergic programs for SSA FOR SPEEDTEC®

Wire material	Gas	Wire diameter [mm]						
		0.8	0.9	1.0	1.2	1.32	1.4	1.6
Steel	ArMIX	97		15	24			
Stainless	ArMIX	65		35	45			

Note: The list of available programs depends on the power source.

In synergic mode, the welding voltage is not set directly by user. The correct welding voltage will be set by the machine's software.

Optimal voltage value is related to the input data:

- Wire Feed Speed, WFS.

Speed Short Arc (SSA) provides greater comprehensiveness during steel and stainless welding. Up to fast arc control during increasing the wire feeding speed, standard short arc naturally shifts to SSA mode, extending the range of the short arc to higher current and prevents the globular mode, which is characterized by high spattering and higher energy than short arc.

Advantages:

- Reduction of welded material distortions (less energy introduced into the weld).
- Wider range of feeding speed with maintaining the short arc.
- Reduction of spattering in comparison to standard CV mode.
- Fume reduction in comparison to the standard CV mode (up to 25% less).

If it is needed, the welding voltage can be adjusted by the right control [23]. When the right control is rotated, the right display [20] will show a positive or negative bar indication if the voltage is above or below the optimal voltage.

- Preset voltage above ideal voltage



- Preset voltage at ideal voltage



- Preset voltage below ideal voltage



Additionally can manually set:

- Burnback
- Run-In WFS
- Preflow Time/ Postflow Time
- Spotweld
- 2-Step/4-Step
- Crater
- Polarity
- Wave Control
 - Pinch

Pinch controls the arc characteristics during short-arc welding. Increasing Pinch Control results in a crisper arc (more spatter) while decreasing provides a softer arc (less spatter).

- Adjust range: from -10 to +10.
- Default value: 0.

Welding GMAW-P Process in synergic mode

Table 14. Exemplify GMAW-P programs for SPEEDTEC®

Wire material	Gas	Wire diameter [mm]						
		0.8	0.9	1.0	1.2	1.32	1.4	1.6
Steel	ArMIX	95		12	22	157	26	108
Stainless	ArMIX	66		36	46			56
Metal Core	ArMIX						84	
Aluminum AISi	Ar				72			74
Aluminum AIMg	Ar			152	76			78
Cored Wire	ArMIX				92			

Table 15. Exemplify GMAW-P programs for FLEXTEC®

Wire material	Gas	Wire diameter [mm]						
		0.030	0.035	0.040	0.045	3/64	0.052	1/16
Steel	ArMIX		16	19	22		25	27
Stainless	ArMIX		36		40			42
Aluminum AISi	Ar		49			51		53
Aluminum AIMg	Ar		55			57		59
Metal Core	ArMIX				71		73	75

Note: The list of available programs depends on the power source.

Synergic GMAW-P (Pulsed MIG) welding is ideal for low spatter, out of position. During pulse welding, the welding current continuously switches from a low level to a high level and then back again. Each pulse sends a small droplet of molten metal from the wire to the weld puddle.

Wire Feed Speed is the main control parameter. As the Wire Feed Speed is adjusted, the power source adjusts the waveform parameters to maintain good welding characteristics.

Trim is used as a secondary control – the right display. The Trim setting adjusts the arc length. Trim is adjustable from 0.50 to 1.50. 1.00 is the nominal setting.



Figure 9

Increasing the Trim value increases the arc length. Decreasing the Trim value decreases the arc length.

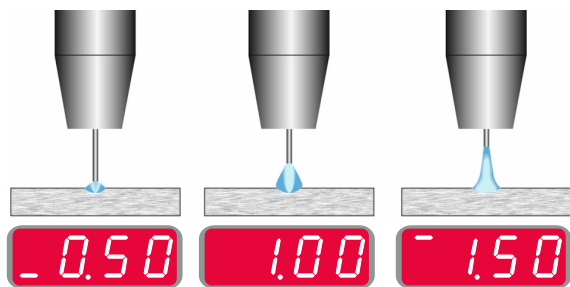


Figure 10

When Trim is adjusted, the power source automatically recalculates the voltage, current and time of each part of the pulse waveform for the best result.

Additionally can manually set:

- Burnback
- Run-In WFS
- Preflow Time/ Postflow Time
- Spot Time
- 2-Step/4-Step
- Crater
- Polarity
- Wave Control:
 - UltimArc™

UltimArc™ – for pulse welding programs adjusts the focus or shape of the arc. In consequence of increasing UltimArc™ value the arc is tight, stiff for high speed sheet metal welding.

- Adjust range: from -10 to +10.
- Default value: 0.

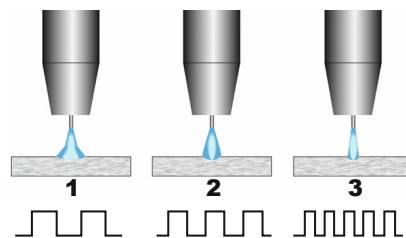


Figure 11

1. UltimArc™ Control "-10.0": Low Frequency, Wide.
2. UltimArc™ Control OFF: Medium Frequency and Width.
3. UltimArc™ Control "+10.0": High Frequency, Focused.

Welding Soft Silence Pulse (SSP™) Process in synergic mode

Table 16. Exemplify synergic programs for SSP.

Wire material	Gas	Wire diameter [mm]						
		0.8	0.9	1.0	1.2	1.32	1.4	1.6
Steel	ArMIX			13	23			
Stainless	ArMIX			39	49			

Note: The list of available programs depends on the power source.

SSP™ is a modified especially pulse process characterized by a very soft and silent arc. This process is dedicated to welding stainless steel materials and provide much better wetting of the welded edge than the standard pulse.

Soft and quieter characteristic of the arc than standard pulse process, makes welding more enjoyable and less tiring. Additionally the stability afforded by this transfer allows to weld in all positions.

During pulse welding, the welding current continuously switches from low to high level in the loop. Each pulse delivers a small drop of molten metal from the wire to the welding pool.

Wire Feed Speed is the main control parameter. As the Wire Feed Speed is adjusted, the power source adjusts the waveform parameters to maintain good welding characteristics.

Trim is used as a secondary control – the value of parameter in the upper right side of display. The Trim setting adjusts the arc length. Trim is adjustable from 0.50 to 1.50. 1.00 is the nominal setting.



Figure 12

Increasing the Trim value increases the arc length. Decreasing the Trim value decreases the arc length.

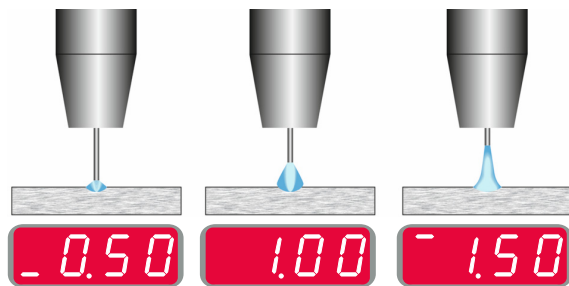


Figure 13

When Trim is adjusted, the power source automatically recalculates the voltage, current and time of each part of the pulse waveform for the best result.

Additionally can manually set:

- Burnback
- Run-In WFS
- Preflow Time/ Postflow Time
- Spotweld
- 2-Step/4-Step
- Crater
- Polarity
- Wave Control
 - Frequency

Frequency – for pulse welding adjusts the focus or shape of the arc. In consequence of increasing UltimArc™ Control value the arc is tight, stiff for high speed sheet metal welding.

- Adjust range: from -10 to +10
- Default value: 0.

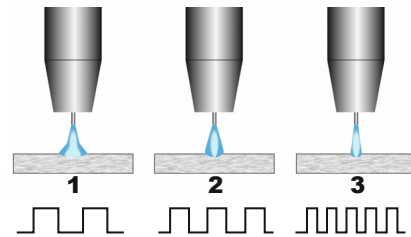


Figure 14

1. Frequency Control "-10.0": Low Frequency, Wide.
2. Frequency Control OFF: Medium Frequency and Width.
3. Frequency Control "+10.0": High Frequency, Focused.

Welding SMAW (MMA) Process

Table 17 SMAW Welding Programs







Process	Program number		
	Powertec®	Speedtec®	Flextec®
SMAW	1		

Note: The list of available programs depends on the power source.

Procedure of beginning welding of SMAW process:

- Connect Lincoln Electric source to wire feeder (mentioned in Introduction chapter).
- Determine the electrode polarity for the electrode to be used. Consult the electrode data for this information.
- Depending on the polarity of using electrode, connect the work lead and the electrode holder with lead to output sockets and lock them. See the Table 18.

Table 18.

POLARITY	DC (+)	Output Socket		
		The electrode holder with lead to SMAW	[4]	
	Power connection lead	Power source		
	Work lead	Power source		
POLARITY	DC (-)	The electrode holder with lead to SMAW	[4]	
		Power connection lead	Power source	
		Work lead	Power source	

- Connect the work lead to the welding piece with the work clamp.
 - Install the proper electrode in the electrode holder.
 - Turn the input power ON.
 - Set the SMAW welding program.
- Note:** The list of available programs depends on the power source.
- Set the welding parameters.
 - The welding machine is now ready to weld.
 - By applying the principle of occupational health and safety at welding, welding can be begun.

For program number 1 can be set:

- Welding current
- Switch on / switch off the output voltage on the output lead
- Wave Controls:
 - ARC FORCE
 - HOT START

ARC FORCE - the output current is temporarily increased prevents the electrode from sticking and facilitates the welding process.

Lower values will provided less short circuit current and a softer arc. Higher settings will provided a higher short circuit current, more forceful arc and possibly of more spatter.

- Default value: 0.
- Regulation range: from -10.0 to +10.0

HOT START – percentage regulation of increasing nominal current value during arc start with electrode. It cause temporarily increased of output current and made easy arc start with electrode.

- Default value: +5.
- Regulation range: from 0 to +10.0.

Welding GTAW / GTAW-PULSE

Process

Arc ignition can be achieved only by lift TIG method (contact ignition and lift ignition).

Table 19. The Welding Programs

Process	Program Number		
	Powertec®	Speedtec®	Flextec®
GTAW	-	3	
GTAW-P	-	8	-

Note: The list of available programs depends on the power source.

Procedure of beginning welding of GTAW/GTAW-PULSE process:

- Connect Lincoln Electric power source that is using for communication CAN protocol.
- Connect GTAW torch to Euro Socket [1].

Note: To connect GTAW torch, adapter TIG-EURO has to be purchased (See "Accessories" chapter).

- Connect the work lead to output sockets of the power source and lock it.
- Connect the work lead to the welding piece with the work clamp.
- Install the proper tungsten electrode in the GTAW torch.
- Turn the input power ON.
- Set the GTAW or GTAW-PULSE welding program.

Note: The list of available programs depends on the power source.

- Set the welding parameters.
- The welding machine is now ready to weld.

Note: Arc Ignition is achieved by touching the work piece with the electrode and lifting it by a few millimeters – contact ignition and lift ignition.

- By applying the principle of occupational health and safety at welding, welding can be begun.

For program number 3 can be set:

- Welding current]
- Switch on / switch off the output voltage on the output lead

Note: It does not work in the 4-Step.

- Postflow Time
- 2-Step / 4-Step
- Crater
- Wave Control:
 - HOT START

For program number 8 can be set:

- Welding current
- Switch on / switch off the output voltage on the output lead

Note: It does not work in the 4-Step.

- Postflow Time
- 2-Step / 4-Step
- Crater
- Wave Control:
 - Pulse Period
 - Background current

HOT START – percentage regulation of increasing nominal current value during arc start with electrode. It cause temporarily increased of output current and made easy arc start with electrode.

- Default value: +5.
- Regulation range: from 0 to +10.0.

This parameter is only for SMAW.

Pulse Period influences the width of the arc and the amount of heat input to the weld. If the value of parameters is lower:

- Improves penetration and the microstructure of the weld.
- The arc is narrower, more stable.
- Reduces the amount of heat input to the weld.
- Reduces distortions.
- Increases welding speed.

Note: Adjust range depend on the power source.

Background Current - percentage value of nominal welding current. Adjusts the overall heat input into the weld. Changing the background current changes the shape of the back bead.

Note: Adjust range depend on the power source.

Gouging

Table 20. The Welding Program – gouging

Process	Program number		
	Powertec®	Speedtec®	Flextec®
Gouging	9		

Note: The list of available programs depends on the power source.

For program number 9 can be set:

- Gouging current
- Switch on / switch off the output voltage on the output lead

Loading the Wire Spool

Spools of wire with a maximum weight of 16 kg can be used without an adapter. Holder allows mounting plastic, steel and fiber spools on the 51mm spindle.

It is possible to use other spools after using the appropriate adapter, which can be purchased separately (see "Accessories" chapter).

Loading the Electrode Wire

- Turn the input power OFF.
- Open the spool wire case.
- Unscrew the locking nut of the sleeve [14].
- Load the spool wire on the sleeve so that the spool turns clockwise when the wire is feed into the wire feeder.
- Make sure that the spindle brake pin goes into the fitting hole on the spool.
- Screw in the locking nut of the sleeve.
- Open the wire drive door.
- Put on the wire roll with 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 brake locking nut.

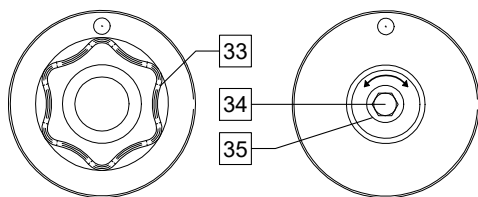


Figure 15

- 33. Locking Nut.
- 34. Adjusting Screw M10.
- 35. Pressing Spring.

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

Turning the M10 screw anticlockwise decreases the spring tension and decrease the brake torque.

After finishing of adjustment, you should screw brake locking nut again.

Adjusting Pressure Roll Force

The pressure arm controls the amount of force the drive rolls exert on the wire. Pressure force is adjusted by turning the adjustment nut clockwise to increase force, counterclockwise to decrease force. Proper adjustment of pressure arm gives the best welding performance.

WARNING

If the roll pressure is too weak, the roll will slide on the wire. If the roll pressure is set too heavy the wire may be deformed, which cause feeding problems in the welding. The pressure force should be set properly. For this purpose 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

- Turn the welding machine off.
- Depending of welding process connect proper welding torch to the euro socket [1]. Rated parameters of the torch and welding machine should be matched.
- Depends on type of gun must be remove the nozzle from the gun and contact tip or protection cap and contact tip.
- Turn the welding machine on.
- Hold the Cold Inch/Gas Purge Switch [12] or use torch trigger until wire appear over threaded end of the gun.
- When the Cold Inch Switch [12] or torch trigger is released the spool of wire should not unwind.
- Adjust wire spool brake accordingly.
- Turn the welding machine off.
- Install a proper contact tip.
- Depending on the welding process and the type of the gun, install the nozzle (GMAW process) or protection cap (FCAW process).

WARNING

Take precaution to keep eyes and hands away from the end of the gun while the wire is being come out of the threaded end.

Changing Driving Rolls

WARNING

Turn the input power off before installation or changing drive rolls.

Wire Feeders **LF 52** is equipped with drive roll V1.0/V1.2 for steel wire. For others wires and sizes it is required to install proper drive rolls kit (see "Accessories" chapter) and follow instruction:

- Turn the input power OFF.
- Unlock 4 rolls by turning 4 Quick-Change Carrier Gear [40].
- Release the pressure roll levers [41].
- Change the drive rolls [34] corresponding to the used wire.

WARNING

Be sure that the gun liner and contact tip are also sized to match the selected wire size.

WARNING

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

- The guide tube of the feeding console [37] and [38].
- The guide tube of the Euro Socket [36].
- Lock 4 new rolls by turning 4 Quick-Change Carrier Gear [40].
- Insert the wire through the guide tube, over the roller and through the guide tube of Euro Socket into liner of gun. The wire can be pushed into the liner manually for a few centimeters, and should feed easily and without any force.
- Lock the pressure roll levers [41].

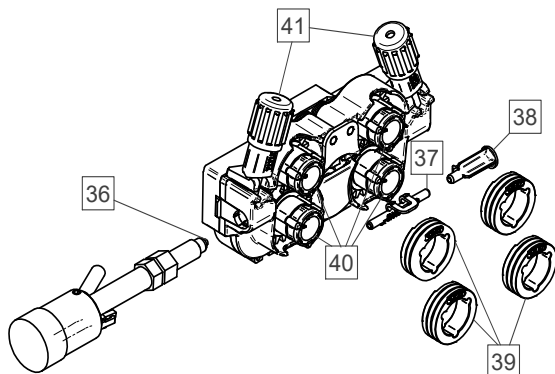


Figure 16

Gas Connection

WARNING



- CYLINDER may explode if damaged.
- Always fix the gas cylinder securely in an upright position, against a cylinder wall rack or purpose-made cylinder cart.
- Keep cylinder away from areas where it may be damaged, heated, or electrical circuits to prevent possible explosion or fire.
- Keep cylinder away from welding or other live electrical circuits.
- Never lift welder with cylinder attached.
- Never allow welding electrode to touch cylinder.
- Build up of shielding gas may harm health or kill. Use in a well-ventilated area to avoid gas accumulation.
- Close the gas cylinder valves thoroughly when not in use to avoid leaks.

WARNING

The welding machine supports all suitable shielding gases at a maximum pressure of 5,0 bar.

WARNING

Before use, make sure that the gas cylinder contains gas suitable for the intended purpose.

- Turn off input power at the welding power source.
- Install a proper gas flow regulator to the gas cylinder.
- Connect the gas hose to the regulator using the hose clamp.
- The other end of the gas hose connect to the gas connector on the power source rear panel or directly to the quick connector located on the rear panel of the wire feeder]. More details you will find in power source instruction manual.
- Connect by dedicated interconnection cable (see „Accessories“ chapter) wire feeder and power source.
- Turn on input power at the welding power source.
- Open the gas cylinder valve.
- Adjust the shielding gas flow of the gas regulator.
- Check gas flow with Gas Purge Switch [12].

WARNING

To weld GMAW process with CO₂ shielding gas, CO₂ gas heater should be used.

Transport and Lifting



! WARNING

Falling equipment can cause injury and damage to unit.

During transporting and lifting with a crane, adhere to the following rules:

- For lifting a suitable lifting equipment capacity.
- Dedicated handle [13] can be used to lifting and transporting using a crane only. This solution enables welding while lifting the feeder.

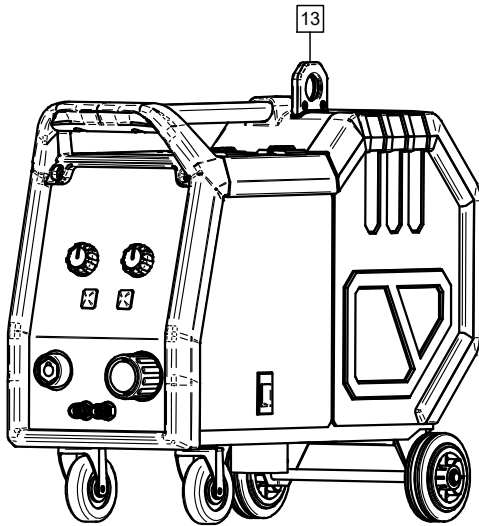


Figure 17

Maintenance

! WARNING

For any repair operations, modifications or maintenances, it is recommended to contact the nearest Technical Service Center or Lincoln Electric. Repairs and modifications performed by unauthorized service or personnel will cause the loss of the manufacturer's warranty.

Any noticeable damage should be reported immediately and repaired.

Routine maintenance (everyday)

- Check condition of insulation and connections of the work leads and insulation of power lead. If any insulation damage exists replace the lead immediately.
- 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 (every 200 working hours but at least once a year)

Perform the routine maintenance and, in addition:

- Keep the machine clean. Using a dry (and low pressure) airflow, remove the dust from the external case and from the cabinet inside.
- If it is required, clean and tighten all weld terminals.

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

! WARNING

Do not touch electrically live parts.

! WARNING

Before the case of machine will be removed, the machine has to be turned off and the power lead has to be disconnected from mains socket.

! WARNING

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

Customer Assistance Policy

The business of The Lincoln Electric Company is manufacturing and selling high quality welding equipment, consumables, and cutting equipment. Our challenge is to meet the needs of our customers and to exceed their expectations. On occasion, purchasers may ask Lincoln Electric for advice or information about their use of our products. We respond to our customers based on the best information in our possession at that time. Lincoln Electric is not in a position to warrant or guarantee such advice, and assumes no liability, with respect to such information or advice. We expressly disclaim any warranty of any kind, including any warranty of fitness for any customer's particular purpose, with respect to such information or advice. As a matter of practical consideration, we also cannot assume any responsibility for updating or correcting any such information or advice once it has been given, nor does the provision of information or advice create, expand or alter any warranty with respect to the sale of our products


Lincoln Electric is a responsive manufacturer, but the selection and use of specific products sold by Lincoln Electric is solely within the control of, and remains the sole responsibility of the customer. Many variables beyond the control of Lincoln Electric affect the results obtained in applying these types of fabrication methods and service requirements.

Subject to Change – This information is accurate to the best of our knowledge at the time of printing. Please refer to www.lincolnelectric.com for any updated information.

Error

Table 21 shows list of basic errors that can appear. To get full list of error codes, please contact with authorize Lincoln Electric service.

Table 21 Error codes

Error code	Symptoms	Cause	Recommended Course of Action
6	Power source is not connected.	The User Interface cannot seem to communicate with the Power Source.	<ul style="list-style-type: none"> Check cable connections between the power source and the user interface.
36	The machine has shut down because it has overheated.	System detected a temperature level beyond the normal system operating limit.	<ul style="list-style-type: none"> Be sure process does not exceed duty cycle limit of the machine. Check the setup for proper air flow around and through the system. Check that the system has been properly maintained, including removal of accumulated dust and dirt from the intake and outlet louvers. When the machine has cooled down to a safe level, the interface signals this by flashing two LEDs next to Button or start welding operation by the torch trigger. 
81	Motor overload, long term.	The wire drive motor has overheated. Check that the electrode slides easily through the gun and cable.	<ul style="list-style-type: none"> Remove tight bends from the gun and cable. Check that the spindle brake is not too tight. Verify the adequacy of the electrode to the welding process. Verify a high quality electrode is being used. Check drive rolls alignment and gears. Wait for the error to reset and the motor to cool (approximately 1 minute).
92	No coolant flow	There is no coolant flow in the cooler after 3 seconds of welding.	<ul style="list-style-type: none"> Make sure there is enough coolant in the tank and that auxiliary power is supplied. Make sure the pump is working. When the trigger is pulled the pump should run.

WARNING

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your Local Lincoln Authorized Field Service Facility for technical troubleshooting assistance before you proceed.

WEEE

07/06



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.

REACH

11/19

Communication in accordance with Article 33.1 of Regulation (EC) No 1907/2006 – REACH.

Some parts inside this product contain:

Bisphenol A, BPA,	EC 201-245-8, CAS 80-05-7
Cadmium,	EC 231-152-8, CAS 7440-43-9
Lead,	EC 231-100-4, CAS 7439-92-1
Phenol, 4-nonyl-, branched,	EC 284-325-5, CAS 84852-15-3

in more than 0,1% w/w in homogeneous material. These substances are included in the "Candidate List of Substances of Very High Concern for Authorisation" of REACH.

Your particular product may contain one or more of the listed substances.

Instructions for safe use:

- use according to Manufacturer instructions, wash hands after use;
- keep out of reach of children, do not put in mouth,
- dispose in accordance with local regulations.

Authorized Service Shops Location

09/16

- The purchaser must contact a Lincoln Authorized Service Facility (LASF) about any defect claimed under Lincoln's warranty period.
- Contact your local Lincoln Sales Representative for assistance in locating a LASF or go to www.lincolnelectric.com/en-gb/Support/Locator.

Electrical Schematic

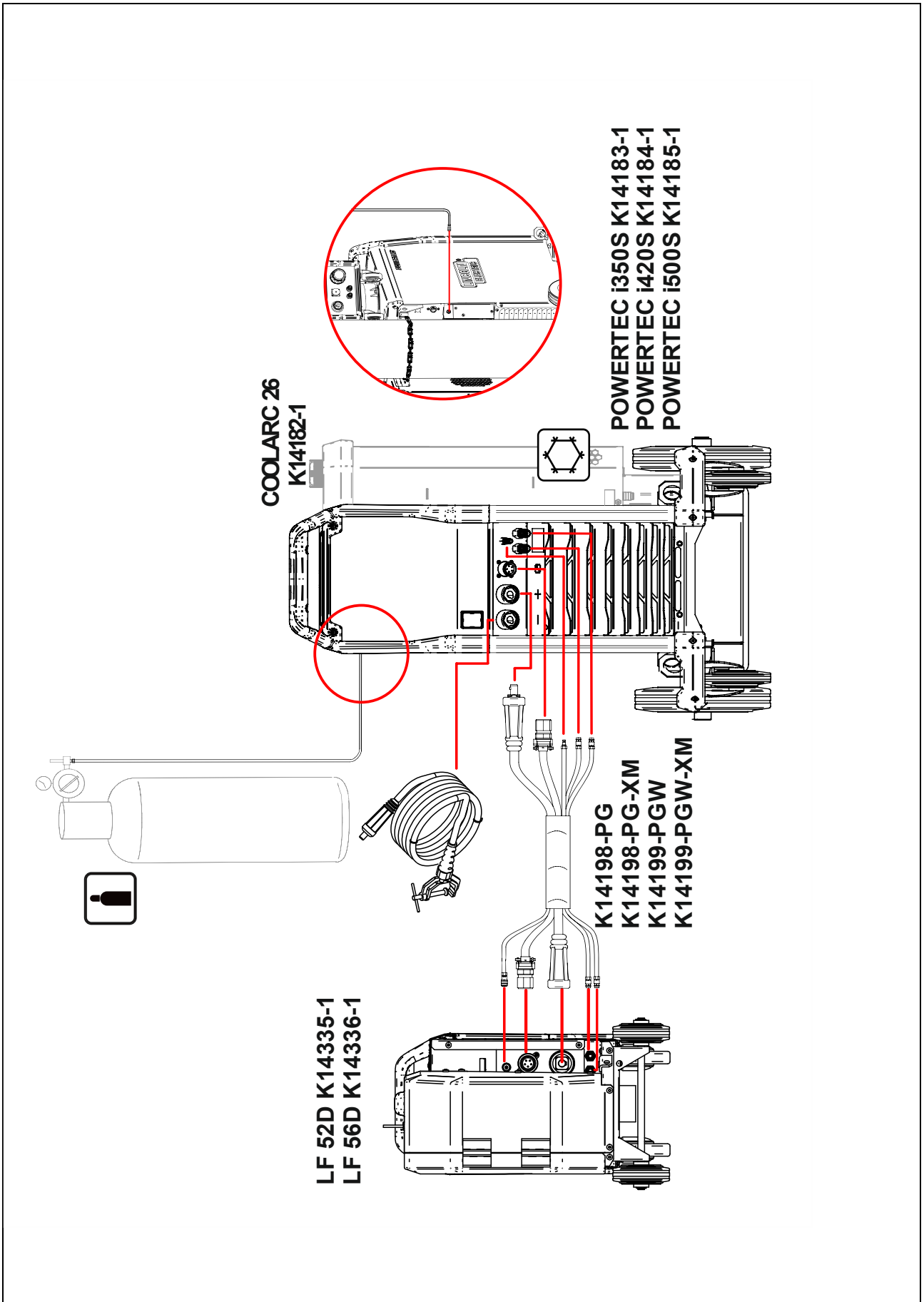
Refer to the "Spare Part" manual supplied with the machine.

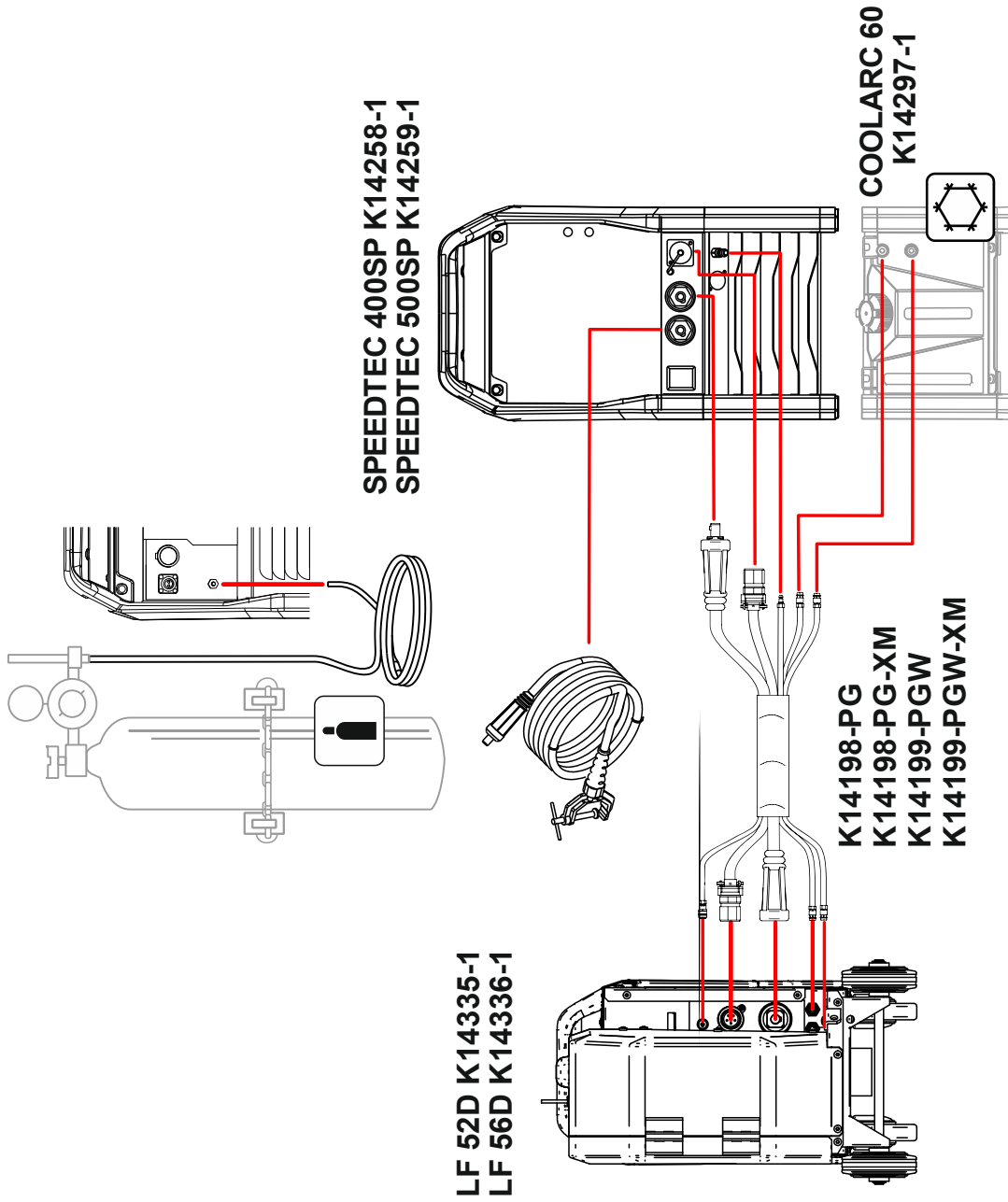
Accessories

OPTIONS & ACCESSORIES	
K14204-1	WIRE FEEDER DRUM QUICK CONNECTOR
K14175-1	GAS FLOW METER KIT (POWERTEC-I)
E/H-400A-70-5M	ELECTRODE HOLDER 400A/70MM ² - 5M
K10158-1	ADAPTER FOR SPOOL TYPE B300
K10158	ADAPTER FOR SPOOL TYPE B300
R-1019-125-1/08R	ADAPTER FOR SPOOL S200
FL060583010	FLAIR 600 GOUGING TORCH WITH MOUNTED LEAD 2,5M
COMPATIBLE POWER SOURCES	
K14258-1	SPEEDTEC [®] 400SP
K14259-1	SPEEDTEC [®] 500SP
K14183-1	POWERTEC [®] i350S
K14184-1	POWERTEC [®] i420S
K14185-1	POWERTEC [®] i500S
K4283-1	FLEXTEC [®] 350x CONSTRUCTION
K4284-1	FLEXTEC [®] 350x STANDARD
K3607-2	FLEXTEC [®] 500x
MIG/MAG WELDING GUNS	
W10429-36-3M	LGS2 360 G-3.0M, AIR -COOLED MIG WELDING GUN
W10429-36-4M	LGS2 360 G-4.0M, AIR-COOLED MIG WELDING GUN
W10429-36-5M	LGS2 360 G-5.0M, AIR -COOLED MIG WELDING GUN
W10429-505-3M	LGS2 505W 3.0M, WATER COOLED-MIG WELDING GUN
W10429-505-4M	LGS2 505W 4.0M, WATER COOLED-MIG WELDING GUN
W10429-505-5M	LGS2 505W 5.0M, WATER COOLED-MIG WELDING GUN
PROMIG MAGNUM	
W000345072-2	PROMIG MAGNUM 370 3M
W000345073-2	PROMIG MAGNUM 370 4.5M
W000345069-2	PROMIG MAGNUM 400W 3M
W000345070-2	PROMIG MAGNUM 400W 4.5M
W000345075-2	PROMIG MAGNUM 500W 3M
W000345076-2	PROMIG MAGNUM 500W 4.5M
ROLL KIT FOR SOLID WIRES	
KP14150-V06/08	ROLL KIT 0.6/0.8VT FI37 4 SZT. GREEN/NIEBIESKI
KP14150-V08/10	ROLL KIT 0.8/1.0VT FI37 4 SZT. BLUE/RED
KP14150-V10/12	ROLL KIT 1.0/1.2VT FI37 4 SZT. RED/ORANGE
KP14150-V12/16	ROLL KIT 1.2/1.6VT FI37 4 SZT. ORANGE/YELLOW
KP14150-V16/24	ROLL KIT 1.6/2.4VT FI37 4 SZT. YELLOW/GREY
KP14150-V09/11	ROLL KIT 0.9/1.1VT FI37 4 SZT.
KP14150-V14/20	ROLL KIT 1.4/2.0VT FI37 4 SZT.
ROLL KIT FOR ALUMINIUM WIRES	
KP14150-U06/08A	ROLL KIT 0.6/0.8AT FI37 4 SZT. GREEN/BLUE
KP14150-U08/10A	ROLL KIT 0.8/1.0AT FI37 4 SZT. BLUE/RED
KP14150-U10/12A	ROLL KIT 1.0/1.2AT FI37 4 SZT. RED/ORANGE
KP14150-U12/16A	ROLL KIT 1.2/1.6AT FI37 4 SZT. ORANGE/YELLOW
KP14150-U16/24A	ROLL KIT 1.6/2.4AT FI37 4 SZT. YELLOW/GREY

ROLL KIT FOR CORE WIRES	
KP14150-V12/16R	ROLL KIT 1.2/1.6RT FI37 4 SZT. ORANGE/YELLOW
KP14150-V14/20R	ROLL KIT 1.4/2.0RT FI37 4 SZT.
KP14150-V16/24R	ROLL KIT 1.6/2.4RT FI37 4 SZT. YELLOW/GREY
KP14150-V09/11R	ROLL KIT 0.9/1.1RT FI37 4 SZT.
KP14150-V10/12R	ROLL KIT 1.0/1.2RT FI37 4 SZT. -ORANGE
WIRE GUIDES	
0744-000-318R	WIRE GUIDE SET BLUE, Ø0,6-1,6
0744-000-319R	WIRE GUIDE SET RED, Ø1,8-2,8
D-1829-066-4R	EURO WIRE GUIDE; Ø0,6-1,6
D-1829-066-5R	EURO WIRE GUIDE; Ø1,8-2,8
INTERCONEXION CABLES	
K14198-PG	CABLE PACK 5PIN G 70MM2 1 M
K14198-PG-3M	CABLE PACK 5PIN G 70MM ² 3M
K14198-PG-5M	CABLE PACK 5PIN G 70MM2 5M
K14198-PG-10M	CABLE PACK 5PIN G 70MM2 10M
K14198-PG-15M	CABLE PACK 5PIN G 95MM2 15M
K14198-PG-20M	CABLE PACK 5PIN G 95MM2 20M
K14198-PG-25M	CABLE PACK 5PIN G 95MM2 25M
K14198-PG-30M	CABLE PACK 5PIN G 95MM2 30M
K14199-PGW	CABLE PACK 5PIN W 95MM2 1 M
K14199-PGW-3M	CABLE PACK 5PIN W 95MM ² 3M
K14199-PGW-5M	CABLE PACK 5PIN W 95MM2 5M
K14199-PGW-10M	CABLE PACK 5PIN W 95MM2 10M
K14199-PGW-15M	CABLE PACK 5PIN W 95MM2 15M
K14199-PGW-20M	CABLE PACK 5PIN W 95MM2 20M
K14199-PGW-25M	CABLE PACK 5PIN W 95MM2 25M
K14199-PGW-30M	CABLE PACK 5PIN W 95MM2 30M

Connection Diagram





Dimension Diagram

