SVM 3052
Rev.00 05-2014

PF42

For use with machines having code number: 50266

SERVICE MANUAL

LINCOLN ELECTRIC EUROPE
www.lincolnelectric.eu

INDEX OF CONTENTS

TECHNICAL SPECIFICATIONS AND ACCESSORIES

NAME			INDEX		
PF42			K14107-1		
INPUT					
Input Voltage U_1		Input Amperes I_1		EMC Class	
40Vdc		4A		A	
RATED OUTPUT					
Duty Cycle 40°C (based on a 10 min. period)			Output Current		
100%			385A		
60%			500A		
OUTPUT RANGE					
Welding Current Range			Peak Open Circuit Voltage		
5 ÷ 500A			113Vdc or Vac peak		
DIMENSION					
Weight		Height	Width		Length
18 kg		460 mm	300 mm		640 mm
WIRE FEED SPEED RANGE / WIRE DIAMETER					
WFS RANGE	Drive roll	Drive roll diameter	Solid wires	Aluminum wires	Cored wires
1 ÷ 22 m/min	4	Ø37	0.8 ÷ 1.6 mm	1.0 ÷ 1.6 mm	0.9 ÷ 1.6 mm
Protection Rating		Maximum gas pressure	Operating Temperature		Storage Temperature
IP23		0,5MPa (5 bar)	from -10°C to +40°C		from -25°C to 55°C

Accessories

K14120-1	KIT - Remote control Kit for PF 40 and 42.
K14126-1	RC 42 - remote control for PF 40 and 42
K14127-1	Cart for PF40/42/44/46.
K14111-1	KIT - Gas Flow Regulator.
K14121-1	Replaceable Front Panel with User Interface, A+.
K14122-1	Replaceable Front Panel with User Interface, B.
K14123-1	Replaceable Front Panel with User Interface, B+.
K14124-1	Case of remote control (PENDANT).
K14132-1	5-PIN/12-PIN adapter.
K14131-1	ArcLink® "T" Connector Kit.
K14128-1	KIT – Lifting Eye.
K14042-1	Adapter for spool type S200.
K10158-1	Adapter for spool type B300.
K363P	Adapter for spool type Readi-Reel®.
K10349-PG-xxM	Source/wire feeder cable (gas). Available in 5, 10 or 15m (Speedtec, Power Wave S350, S500 CE).
K10349-PGW-xxM	Source/wire feeder cable (gas and water). Available in 5, 10 or 15m. (Speedtec, Power Wave S350, S500 CE).
K10348-PG-xxM	Source/wire feeder cable (gas). Available in 5, 10 or 15m (Power Wave 455M, Power Wave 455M/STT, Power Wave 405M).
K10348-PGW-xxM	Source/wire feeder cable (gas and water). Available in 5, 10 or 15m (Power Wave 455M, Power Wave 455M/STT, Power Wave 405M).
KP10519-8	TIG – Euro adapter.

K10513-26-4	TIG Torch LT 26 G (180A DC / 130A AC @ 35%) – 4m.
FL060583010	FLAIR 600 Gouging torch with mounted lead 2,5m.
E/H-400A-70-5M	Welding cable with electrode holder to SMAW process - 5m.

Drive rolls to 4 driven rolls	
	Solid wires:
KP14017-0.8	V0.6 / V0.8
KP14017-1.0	V0.8 / V1.0
KP14017-1.2	V1.0 / V1.2
KP14017-1.6	V1.2 / V1.6
	Aluminum wires:
KP14017-1.2A	U1.0 / U1.2
KP14017-1.6A	U1.2 / U1.6
	Cored wires:
KP14017-1.1R	VK0.9 / VK1.1
KP14017-1.6R	VK1.2 / VK1.6

LINC GUN™	
K10413-36	Gas cooled gun LG 360 G (335A 60%) – 3m, 4m, 5m.
K10413-42	Gas cooled gun LG 420 G (380A 60%) – 3m, 4m, 5m.
K10413-410	Water cooled gun LG 410 W (350A 100%) - 3m, 4m, 5m.
K10413-500	Water cooled gun LG 500 W (450A 100%) - 3m, 4m, 5m.

SAFETY

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.

	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.
	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.
	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.
	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.
	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.
	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.
	CE COMPLIANCE: This equipment complies with the European Community Directives.
	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.
	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.
	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.
	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.
	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.
	SAFETY MARK: This equipment is suitable for supplying power for welding operations carried out in an environment with increased hazard of electric shock.

	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.
	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.

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

Introduction

PF42 is digital wire feeder which has been designed to work with all Lincoln Electric power sources using ArcLink® protocol to communication.

Digital wire feeder allows the welding:
- GMAW (MIG/MAG)
- FCAW-GS / FCAW-SS
- SMAW (MMA)
- GTAW (arc ignition using lift TIG)

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.

Location and Environment

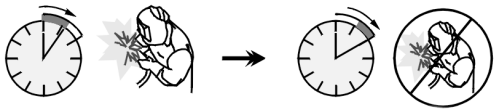
This machine will operate in harsh environments. However, it is important that simple preventative measures are followed to assure long life and reliable operation.

- 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.
- 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

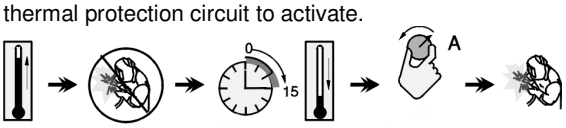
The duty cycle of a welding machine is the percentage of time in a 10 minute cycle at which the welder can operate the machine at rated welding current.

Example: 60% duty cycle



Welding for 6 minutes. Break for 4 minutes.

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



Minutes or decrease Duty Cycle

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 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.

Controls and Operational Features

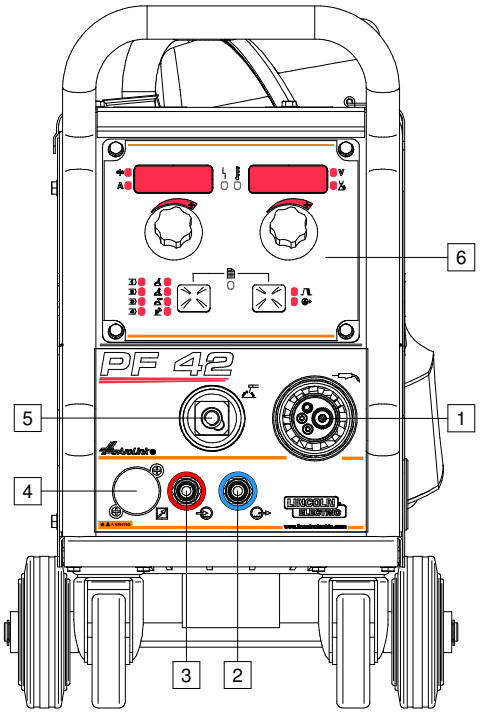


Figure 1

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

WARNING

Maximum coolant pressure is 5 bar.

4. Remote Control Connector Plug: To install Remote Control Kit. This connector allows connection Remote Control. See "Accessories" chapter.
5. Output Socket for the Welding Circuit: For connecting an electrode holder with lead.
6. User Panel.

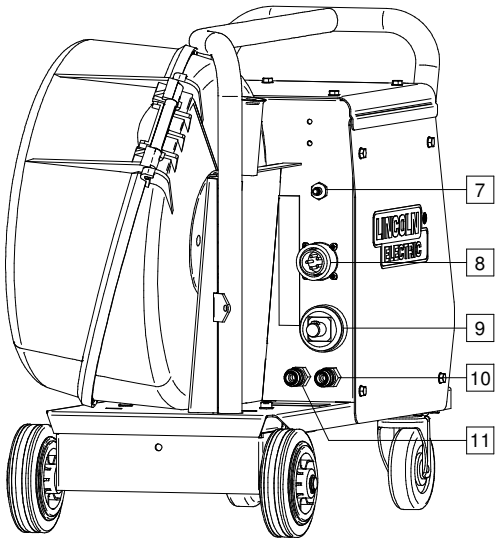


Figure 2.

7. Gas Connector: Connection for gas line.

WARNING

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

8. Control Receptacle: 5 pins receptacle for wire feeder connection. To communication wire feeder with power source is used ArcLink® protocol.
9. Current Socket: Input power connection.
10. Quick Connect Coupling: Coolant outlet (takes warm coolant from welding machines to cooler).
11. Quick Connect Coupling: Coolant inlet (supplies cool coolant from cooler to the welding machines).

WARNING

Maximum coolant pressure is 5 bar.

To ensure failure-free work and right flow of coolant, use only coolant that is recommended by the manufacturer of welding gun or cooler.

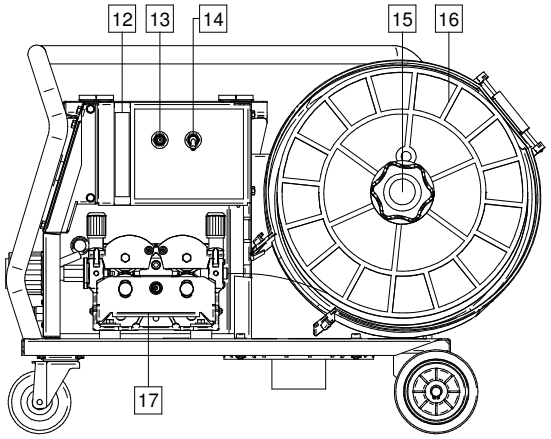


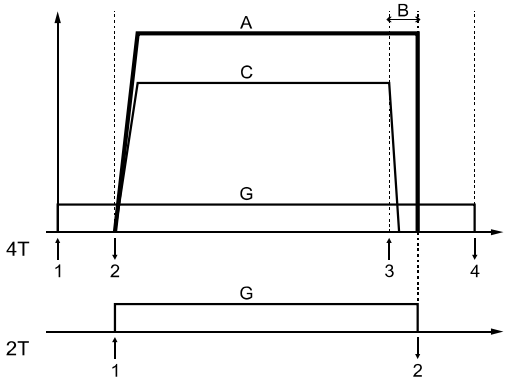
Figure 3

12. Gas Flow Regulator Plug: Gas Flow Regulator can be purchased separately. See "Accessories" chapter.

13. Cold Inch / Gas Purge Switch: This switch enables wire feeding or gas flow without turning on output voltage.

14. Gun Mode Switch: changes the function of the gun's trigger.
    - 2 Step trigger operation turns welding on and off in direct response to the trigger. Welding process is performed when the gun's trigger is pulled.
    - 4-Step mode allows to continue welding, when the gun's trigger is released. To stop welding, the gun's trigger is pulled again. 4-step mode facilitates to making long welds.

The functionality of 2T/4T mode is shown in the Figure 4.



↑ Trigger pressed

↓ Trigger released

A Welding current

B Burnback time (fixed)

C Wire feed

G Gas

Figure 4

Note: 4-Step does not work during Spot Welding.

15. Wire Spool Support: Maximum 15kg spools. Accepts plastic, steel and fiber spools onto 51mm spindle. Also accepts Readi-Reel® type spools onto included spindle adapter.

⚠ WARNING

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

16. Spooled Wire: The machine does not include a spooled wire.

17. Wire Drive: 4-Roll 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. See "Accessories" chapter.

User Panel

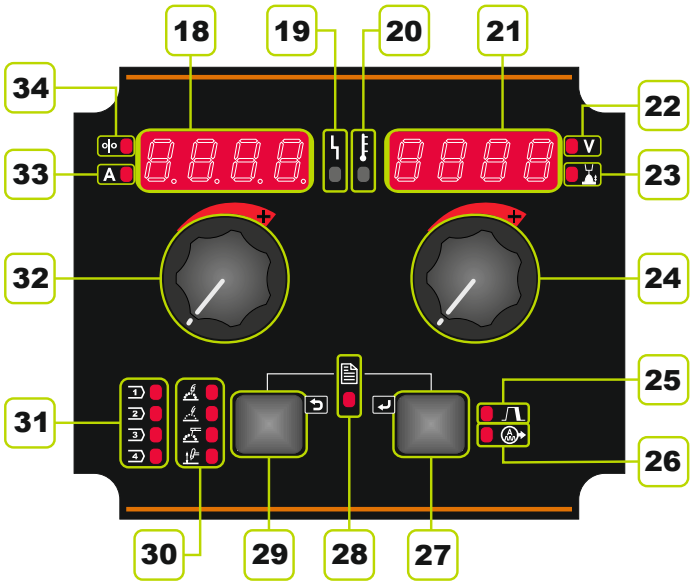


Figure 5.

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

19. 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, and sometimes red and green, for up to one minute when the machine is first turned on. When the power source is powered it can take as long as 60 seconds for the machine to be ready to weld. This is a normal situation as the machine goes through initialization.

Table 1.

LED Light Condition	Meaning Only machines which using ArcLink® protocol for communication
Steady Green	System OK. 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 in the system. Normal for first 1-10 seconds after power is turned on, or if the system configuration is changed during operation.
Alternating Green and Red	If the status lights are flashing any combination of red and green, errors are present in the power source. 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. If occurs, to clear the error try to turn Off the machine, wait for a few seconds, then turn ON again. If the error remains, a maintenance is required. Please contact the nearest authorized technical service center or Lincoln Electric and report the error code read.
Steady Red	Indicate no communication between the power source and device which has been connected to this power source.

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

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

22. LED Indicator: Informs that the value on the right display is in volts unit.

23. 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.

24. Right Control: Adjusts values on the right display.

25. LED Indicator: Informs that the Crater Procedure is activated.

26. LED Indicator: Informs that the Wave Control Procedure is activated.

27. Right Button: Enables scrolling, changing and setting welding parameters:
    - Crater
    - Wave Controls

28. LED Indicator: Indicates that the Settings and Configuration Menu is activated.

29. Left Button: Enables:
    - Checking the program number assigned to active memory. To check the program number, press the Left Button ones.
    - Changing the Welding Process.

30. Welding Programs Indicators (unchangeable): LED indicates the unchangeable program for non-synergic process is active. See the table 2.

31. Welding Programs Indicators (changeable): In the user memory can be stored four user programs. LED indicates that the changeable program is active. See the table 3.

32. Left Control: Adjusts values on the left display.

33. LED Indicator: Informs that the value on the left display is in ampere units.

34. LED Indicator: Informs that the wire feed speed is on the left display.

Welding Process Change

It is possible to quick recall of 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 - Table 3.

Table 2. Unchangeable Welding Programs [30]

Symbol	Process	Program Number
	GMAW (non-synergic)	5
	FCAW-GS	7(155)
	SMAW	1
	GTAW	3

Note: The list of available programs depends on the power source. If the power source does not operate the one of four unchangeable programs, the LED [30] indicating this program does not light up.

Table 3. Changeable Welding Programs [31]

Symbol	Process	Program Number
	Synergic GMAW Ø1.0, Steel, MIX	11
	Synergic GMAW Ø1.2, Steel, MIX	21
	Synergic GMAW Ø1.2, AlMg, Ar	75
	Synergic GMAW Ø1.0, Stainless, MIX	31

Note: The list of available programs depends on the power source. If the power source does not operate the program form table 3, the first available welding program is loaded in lieu of an unsupported welding program.

To change the welding process:

- Press the Left Button [29]. "Pr" is shown on the left display and the program number on the Right [21].
- Again, press the Left Button [29] the weld program indicator (30 or 31) will jump to the next in the sequence shown in Figure 6.

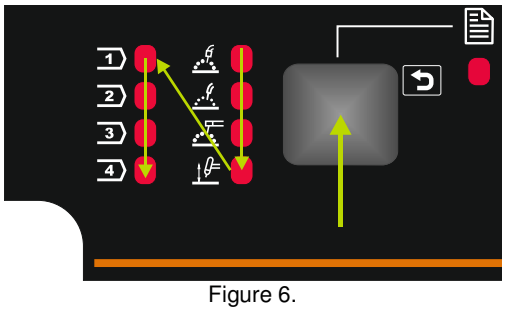


Figure 6.

- Press the Left Button [29] until the LED Indicator (30 or 31) will not indicate the target, the active welding program.

WARNING

When the input power is switched again on, last welding process and settings will be recalled.

The assignment of the weld program to the user memory

In user memory only four welding programs can be stored.

To assign the weld program to user memory:

- Use the Left Button [29] to select the user memory number (1, 2, 3 or 4) - the LED Indicator [31] will indicate the selected memory.
- Press the Left Button [29] and hold it until LED Indicator [31] will not blink.
- Use the Left Control [32] to select the weld program.
- To save the selected program, press the Left Button [29] and hold it until LED Indicator [31] will be blink. **Warning:** The list of available programs depends on the power source.

Welding Parameters

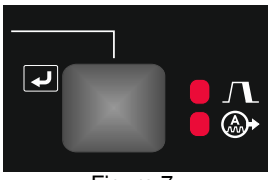


Figure 7.

From the User Panel the parameters specified in the Table 4 can be set:

Table 4.

	Crater	
	Wave Controls:	
	• Pinch	PInC
	• Frequency	FrEq
	• Peak Current	PEAK
	• Background Current	bACK
	• Tailout	tAIL
	• UltimArc™	ULTI
	• ARC FORCE	ArC
	• HOT START	HOt

Note: The availability parameters depend on the selected welding program.

Crater

Crater Procedure controls the WFS / value in ampere units and Volts / Trim 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.

The Crater Settings Procedure is assigned to the Right Button.

Note: The Crater Settings Procedure will be available if in the Settings and Configuration Menu the Crater Procedure (CrAt) is "ON". Otherwise, The Crater Settings Procedure is ignored.

If the Crater Settings Procedure is available, the Crater Parameters can be set, such as:

- Crater Time
- Wire Feed Speed or value in ampere units
- The welding voltage in volts units or Trim.

To set Crater for selected program:

- Press the Right Button [27].
- Crater Settings Procedure Indicator [25] lights.
- "SEC" is shown on the Left display.
- On the Right Display is blinking value in seconds.
- Use The Right Control[24] to set Crater Time
- Use The Right Button [27] to confirm Crater Time.
- Wire Feed Speed or value in ampere units is shown on the Left Display [18] and the welding voltage in volts units or Trim on the Right Display [21].
- Use the Left Control [32] to set the value on the Left Display [18].
- Use The Right Control [24] to set the value on the Right Display [21].
- Press the Right Button [27] to confirm the settings.
- LED Indicator [25] stops blinking.

Note: After 5 seconds of inactivity will also exit the Crater Settings Procedure with saving chnages.

Wave Controls

Wave Controls are assigned to the Right Button.

Note: The Wave Controls depend on the Welding Program.

To set the Wave Controls:

- Press the Right Button [27] until LED Indicator [26] will not light – The Wave Control Settings Procedure is active.
- Use the Right Control [24] to set the Wave Control value.
- The Wave Control value is displayed on the Right Display [21].
- Approve the setting – use the Right Button [27].

Setting and Configuration Menu

To access the menu, press the the Left [29] and the Right [27] Buttons simultaneously.
Note: The Menu cannot be accessed if the system is welding, or if there is a fault (status LED is not solid green).

Parameter Selection Mode – the Parameter Name on the Left Display [18] blinking.

Parameter Change Value Mode – the parameter value on the Right Display [21] blinking.

Note: To exit the menu with changes saved, press the Left [29] and the Right [27] Buttons simultaneously.
Note: 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.

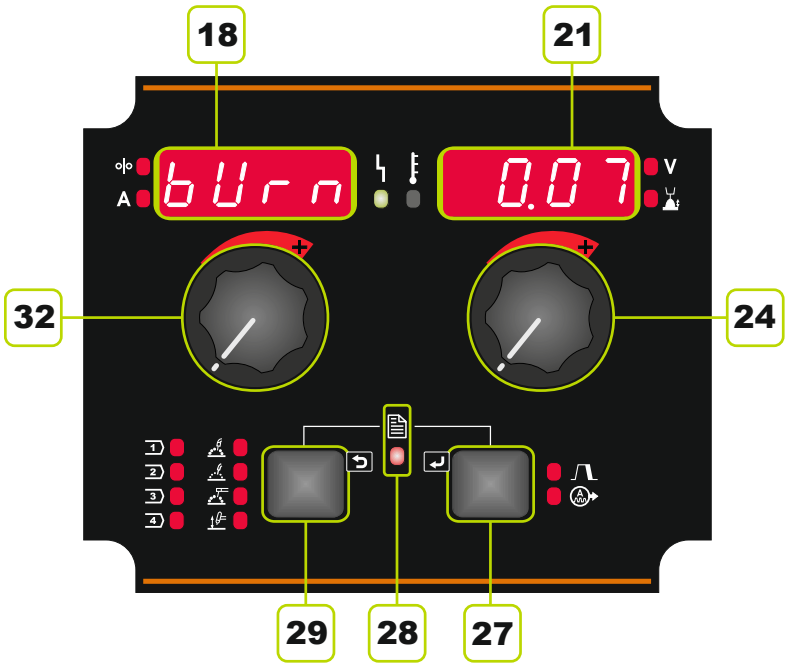


Figure 8.

Functions of Interface Components
18. Parameter Name.
21. Parameter Value.
24. Changing Parameter Value.
27. Entering to Parameters Editing. Confirm Parameter Value change.
28. Setting and Device Configuration Menu is active.
29. Cancelation / Back.
32. Parameter Selection.

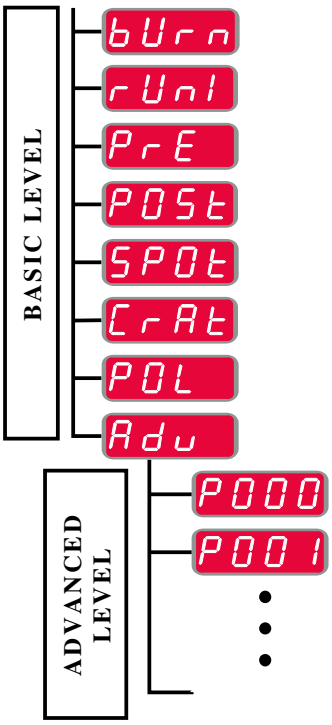


Figure 9

User has access to two menu levels:

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

Note: The availability parameters [18] in the Setting and Configuration Menu depend on the selected welding program / welding process.

Note: After the device has been restarted the user settings are restored.

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

Parameter	Definition
	**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. • Factory default, Burnback Time is set at 0,07 seconds. • Adjust range: from 0,01 seconds to 0,25 seconds.
	**Run-in WFS** – sets the wire feed speed from the time the trigger is pulled until an arc is established. • Factory default, Run-in is turned off. • Adjust range: from minimum to maximum WFS.
	**Preflow Time** – adjusts the time that shielding gas flows after the trigger is pulled and prior to feeding. • Factory default, Preflow Time is set at 0,2 seconds. • Adjust range: from 0 seconds to 25 seconds.
	**Postflow Time** – adjusts the time that shielding gas flows after the welding output turns off. • Factory default, Postflow Time is set at 2,5 seconds. • Adjust range: from 0 seconds to 25 seconds.
	**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. • Factory default, Spot Timer is OFF. • Adjust range: from 0 second to 120 seconds. **Note:** Spot Timer has no effect in 4-Step Trigger Mode.
	**Crater Procedure** – turn ON/OFF the Crater Settings Procedure: • ON (factory default) – Crater can be adjusted. The Crater Settings Procedure is assigned to the Right Button. During adjusting Crater, the LED Indicator [25] lights. • OFF – The Crater Settings Procedure is OFF. After press the Right Button, The Crater Settings Procedure is ignored.
	Used in place of DIP switches for configuration of the work and electrode sense leads • "Positive" (default) = Most GMAW welding procedures use Electrode Positive welding. • "Negative" = Most GTAW and some inner shield procedures use Electrode Negative welding.
	**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

	The Menu Exit – enables exit from menu. **Note:** This parameter cannot be edited. To exit from menu: • In Advanced Menu select P000. • Confirm the selection, push the right button.
	Wire Feed Speed (WFS) units – enables change WFS units: • CE (factory default) = m/min; • US = in/min.
	Arc Display Mode - this option selects what value will be shown on the upper left display while welding: • "Amps" (default) = The left display shows Amperage while welding. • "WFS" = The left display shows Wire Feed Speed while welding.
	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). • OFF (0) to 10.0 seconds (default = OFF)
	Remote Control Type - This option selects the type of analog remote control being used. Digital remote control devices (those with a digital display) are configured automatically. • "TIG" = Use this setting while TIG welding with a foot or hand current control device (Amptrol). While TIG welding, the upper left Control on the User Interface sets the maximum current obtained when the TIG amp control is at its maximum setting. • "Stick" = Use this setting while stick welding or gouging with a remote output control device. While stick welding, the upper left Control on the User Interface sets the maximum current obtained when the stick remote is at it's maximum setting. While gouging, the upper left Control is disabled and the gouging current is set on the remote control. • "All" = This setting allows the remote control to function in all weld modes which is how most machines with 6-pin and 7-pin remote control connections operate. • "Joys" (default) = Use this setting while MIG welding with a push MIG gun with a joystick control. Stick, TIG and gouge welding currents are set at the User Interface. **Note:** On machines that do not have a 12-pin connector, the "Joys" settings will not appear.
	Display Trim as Volts Option – determines how Trim is displayed: • "Volt" (factory default) = all trim values are displayed as a voltage; • "Trim" = the trim is displayed in the format defined in the weld set. **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.

	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 amount 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 nor will output be turned off if an 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). To prevent subsequent changes to Arc Start/Loss Error Time, the setup menu should be locked out by setting Preference Lock = Yes using the Power Wave Manager software. • OFF (0) to 10.0 seconds (default = Off) **Note:** This parameter is disabled while welding in Stick, TIG or Gouge.
	Joystick Configuration – this option enables changes of welding voltage, trim or power in kW and Wire Feed Speed (WFS) using joyskick in the gun or remote control: • "ON" (default) = change is possible. • "OFF" = change is not possible.
	Display Workpoint as Amps Option – determines how workpoint is displayed: • "OFF" (factory default) = the workpoint is displayed in the format defined in the weld set. • "ON" = all workpoint values are displayed as an amperage. **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.
	Feedback Persist – determines how feedback values are displayed following a weld: • ON (factory default) – last recorded feedback values will blink for 5 seconds following a weld, then return to present display mode. • OFF – last recorded feedback values will blink indefinitely following a weld until a Control or button is touched, or an arc is struck.
	Brightness Control - enables the brightness level. • Adjust range: from 1 to +10, where 5 is default.
	Restore Factory Settings – to restore Factory Settings: • Use the Right Button to confirm the selection. • Use the Right Control to select "YES". • Use the Right Button to confirm the selection. **Note:** After the device has been restarted the P097 is "NO".
	Show Test Modes? – uses for calibration and tests. To use the Test Modes: • On the Right display is shown "LOAD". • Use the Right Button to confirm the selection. • On the Right display is shown "DONE" **Note:** After the device has been restarted the P099 is "LOAD".
	View Software Version Info – used for viewing the software versions for user interface. To read the software version: • In Advanced Menu select P103. • Confirm the selection, push the right button. • The blinking "UI" inscription appears on the left display and on the right the software version. **Note:** P103 is a diagnostic parameter, to read only.

Advanced menu, available only from the Power Wave Manager:

Table 8. List of Secured Parameters accessible through Power Wave Manager only.

P501	**Encoder Lockout**	Locks one or both of the upper Controls, preventing the operator from changing wire feed speed, amps, volts or trim. The function of each upper Control depends on the selected weld mode. • "Both Encoders Unlocked" (factory default) = The Left and the Right Control is unlocked. • "Both Encoders Locked" = The Left and the Right Control is locked. • "Right Encoder Locked" = The Right Control is locked. • "Left Encoder Locked" = The Left Control is locked. **Note:** This parameter can only be accessed using PowerWave Manager software.
P504	**Mode Select Panel Lock**	Selects between several Mode Select Panel lockout preferences. When a Mode Select Panel selection is locked and an attempt is made to change that parameter, a message will be displayed on the display indicating the parameter is locked. • "All MSP Options Unlocked" (factory default) = All adjustable parameters on the Mode Select Panel are unlocked. • "All MSP Options Locked" = All Controls and buttons on the Mode Select Panel are locked. • "Start & End Options Locked" = The Start and End parameters on the Mode Select Panel are locked, all others are unlocked. • "Weld Mode Option Locked" = The weld mode cannot be changed from the Mode Select Panel, all others Mode Select Panel settings are unlocked. • "Wave Control Options Locked" = The Wave Control parameters on the Mode Select Panel are locked, all others are unlocked. • "Start, End, Wave Options Locked" = The Start, End and Wave Control parameters on the Mode Select Panel are locked, all others are unlocked. • "Start, End, Mode Options Locked" = The Start, End and Weld Mode Select parameters on the Mode Select Panel are locked, all others are unlocked. **Note:** This parameter can only be accessed using PowerWave Manager software.
P505	**Setup Menu Lock**	Determines if the setup parameters can be modified by the operator without entering a passcode. • "NO" (factory default)= The operator can change any set menu parameter without first entering the passcode even if the passcode is non-zero (0000). • "YES" = The operator must enter the passcode (if the passcode is non-zero) in order to change any setup menu parameters. **Note:** This parameter can only be accessed using PowerWave Manager software.
P506	**Set User Interface Passcode**	Prevents unauthorized changes to the equipment. The default passcode is 0000 which allows full access. A nonzero passcode will prevent unauthorized: Changes to memory limits, saving to memory (if P.502 = Yes). Changes to setup parameters (if P.505 = Yes). **Note:** This parameter can only be accessed using PowerWave Manager software.
P509	**UI Master Lockout**	Locks all user interface controls, preventing the operator from making any changes. **Note:** This parameter can only be accessed using PowerWave Manager software.

Welding SMAW (MMA) Process

Table 9. SMAW Welding Programs

Process	Program
SMAW Soft	1
SMAW Crisp	2
SMAW Pipe	4

Note: Before using the 2 or 4 program, the program had to be assigned to the user memory.
Note: The list of available programs depends on the power source.

Procedure of begin welding of SMAW process:

- Connect Lincoln Electric power sources using ArcLink® protocol to communication to wire feeder.
- 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 10.

Table 10.

			Output Socket	
POLARITY	DC (+)	The electrode holder with lead to SMAW	[5]	
		Power connection lead	Power source	+
		Work lead	Power source	−
	DC (-)	The electrode holder with lead to SMAW	[5]	
		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 and wait until the PF42 will not be ready to work with the power source - Status LED [19] stops blinking and lights steady green light.
- Set the SMAW welding program (1, 2, or 4).
  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 1 or 2 program can set:

- Welding current [32]
- Switch on / switch off the output voltage on the output lead [24]
- Wave Controls:
  - ARC FORCE
  - HOT START

For 4 program can set:

- Welding current [32]
- Switch on / switch off the output voltage on the output lead [24]
- Wave Control:
  - ARC FORCE

ARC FORCE - the output current is temporarily increased to clear short circuit connections between the electrode and the workpiece.
Lower values will provide less short circuit current and a softer arc. Higher settings will provide a higher short circuit current, a more forceful arc and possibly more spatter.

- Adjust range: from -10 to +10.

HOT START – value in percentage of nominal value welding current during arc start current. The control is used to set the level of the increased current and arc start current is made easy.

- Adjust range: from 0 to +10.

Gouging

Table 11. The Welding Program - gouging

Process	Program
Gouging	9

Note: Before using the 9 program, the program had to be assigned to the user memory.
Note: The list of available programs depends on the power source.

For 9 program can set:

- Gouging current [32]
- Switch on / switch off the output voltage on the output lead [24]

Welding GTAW / GTAW-PULSE Process

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

Table 12. The Welding Programs

Process	Program
GTAW	3
GTAW-PULSE	8

Note: Before using the 8 program, the program had to be assigned to the user memory.
Note: The list of available programs depends on the power source.

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

- Connect Lincoln Electric power sources using ArcLink® protocol to communication to wire feeder.
- 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 and wait until the PF42 will not be ready to work with the power source - Status LED [19] stops blinking and lights steady green light.
- 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 3 program can set:

- Welding current [32]
- Switch on / switch off the output voltage on the output lead [24]
  Note: It does not work in the 4-Step.
- Postflow Time
- 2-Step / 4-Step
- Crater [27]
- Wave Control [27]:
  - HOT START

For 8 program can set:

- Welding current [32]
- Switch on / switch off the output voltage on the output lead [24]
  Note: It does not work in the 4-Step.
- Postflow Time
- 2-Step / 4-Step
- Crater [27]
- Wave Control [27:
  - Frequency
  - Background current
  - HOT START

HOT START – value in percentage of nominal value welding current during arc start current. The control is used to set the level of the increased current and arc start current is made easy.

- Adjust range: from 0 to +10.

Frequency influences the width of the arc and the amount of heat input to the weld. If the frequency is higher:

- 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 - value in percentage of nominal value 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.

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

During non-synergic mode wire feed speed and welding voltage or work (for the 40 program) are independent parameters and must be set by the user.

Table 13. GMAW and FCAW non-synergic Welding Programs

Process	Program
GMAW, standard CV	5
GMAW, "POWER MODE"	40
FCAW-GS, standard CV	7 or 155
FCAW-SS, Standard CV	6

Note: Before using the 6 or 40 program, the program had to be assigned to the user memory.
Note: The list of available programs depends on the power source.

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

- Connect Lincoln Electric power sources using ArcLink® protocol to communication to wire feeder.
- Place the machine conveniently near the work area in a location to minimize exposure to weld spatter and to avoid sharp bends in the gun cable.
- Determine the wire polarity for the wire to be used. Consult the wire data for this information.
- 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 a sure, if it is needed (GMAW, FCAW-GS process), that the gas shield has been connected.
- Turn the input power ON and wait until the PF42 will not be ready to work with the power source - Status LED [19] stops blinking and lights steady green light.
- 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 [13] – 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 13.
  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

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

⚠ 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 [32]
- The welding voltage [24]
- Burnback Time
- Run-in WFS
- Preflow Time/ Postflow Time
- Spot Time
- 2-Step/4-Step
- Polarity
- Crater [27]
- Wave Control [27]:
  - Pinch

For 40 program can set:

- Wire Feed Speed, WFS [32]
- Power in kW [24]
- Burnback Time
- Run-in WFS
- Preflow Time/ Postflow Time
- Spot Time
- 2-Step/4-Step
- Polarity
- Crater [27]
- Wave Control [27]:
  - Pinch

Pinch controls the arc characteristics when short-arc welding. increasing Pinch Control greater than 0.0 results in a crisper arc (more spatter) while decreasing the Pinch Control to less than 0.0 provides a softer arc (less spatter).

- Adjust range: from -10 to +10.
- Factory default, Pinch is OFF.

Welding GMAW and FCAW-GS Process in synergic mode CV

In synergic mode, the welding voltage is not set by user.
The correct welding voltage will set by the machine's software.
This value was recalled on the basis of data (input data) had been loaded:

- Wire Feed Speed, WFS [32]

Table 14. Exemplify GMAW and FCAW-GS synergic programs

Wire material	Gas	Wire diameter					
		0.8	0.9	1.0	1.2	1.4	1.6
Steel	CO_2	93	138	10	20	24	-
Steel	ArMIX	94	139	11	21	25	107
Stainless	$ArCO_2$	61	29	31	41	-	-
Stainless	$Ar/He/CO_2$	63	-	33	43	-	-
Aluminum AlSi	Ar	-	-	-	71	-	73
Aluminum AlMg	Ar	-	-	151	75	-	77
Metal Core	ArMIX	-	-	-	81	-	-
Cored Wire	CO_2	-	-	-	90	-	-
Cored Wire	ArMIX	-	-	-	91	-	-

Note: Before using the synergic program, the program had to be assigned to the user memory.
Note: The list of available programs depends on the power source.

If it is needed, the welding voltage can be adjusted ± 10V by the Right Control [24]. When the Right Control is rotated, the display will show an upper or lower bar indicates if the voltage is above or below the ideal 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
- Spot Time
- 2-Step/4-Step
- Polarity
- Crater [27]
- Wave Control [27]:
  - Pinch

Pinch controls the arc characteristics when short-arc welding. increasing Pinch Control greater than 0.0 results in a crisper arc (more spatter) while decreasing the Pinch Control to less than 0.0 provides a softer arc (less spatter).

- Adjust range: from -10 to +10.
- Factory default, Pinch is OFF.

Welding GMAW-P Process in synergic mode

Table 15. Exemplify GMAW-P programs

Wire material	Gas	Wire diameter					
		0.8	0.9	1.0	1.2	1.4	1.6
Steel	ArMIX	95	140	12	22	26	108
Steel (RapidArc®)	ArMIX	-	141	13	18	27	106
Steel (Precision Puls™)	ArMIX	410	411	412	413	-	-
Stainless	ArMIX	66	30	36	46	-	-
Stainless	Ar/He/CO_2	64	-	34	44	-	-
Metal Core	ArMIX	-	-	-	82	84	-
Ni Alloy	70%Ar/30%He	-	-	170	175	-	-
Si Bronze	Ar	-	-	192	-	-	-
Copper	ArHe	-	-	198	196	-	-
Aluminum AlSi	Ar	-	-	-	72	-	74
Aluminum AlMg	Ar	-	-	152	76	-	78

Note: Before using the synergic program, the program had to be assigned to the user memory.
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 [32] 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 [24] is used as a secondary control – the Right Display [21]. The Trim setting adjusts the arc length. Trim is adjustable from 0.50 to 1.50. 1.00 is the nominal setting.

Figure 10.

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

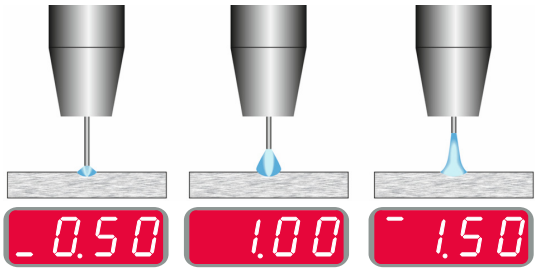


Figure 11.

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
- Polarity
- Crater [27]
- Wave Control [27]:
  - UltimArc™

UltimArc™ – 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

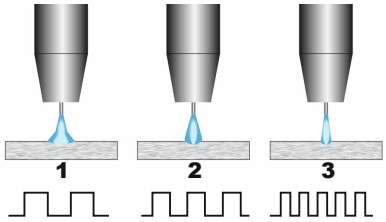


Figure 12.

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

Aluminum Welding GMAW- PP Process in synergic mode

Table 16. Exemplify GMAW-PP synergic programs

Wire material	Gas	Wire diameter					
		0.8	0.9	1.0	1.2	1.4	1.6
Aluminum AlSi	Ar	-	-	98	99	-	100
Aluminum AlMg	Ar	-	-	101	102	-	103

Note: Before using the synergic program, the program had to be assigned to the user memory.
Note: The list of available programs depends on the power source.

GMAW-PP (Pulse-On-Pulse®) process is used for aluminum welding. Use it to make welds with a "stacked dime" appearance, similar to GTAW welds (see Figure 13).

Figure 13.

Wire Feed Speed [32] is the main control parameter. As the Wire Feed Speed is adjusted, the power source adjusts the waveform parameters to maintain good welding characteristics. Each pulse sends a small droplet of molten metal from the wire to the weld puddle.

Trim [24] is used as a secondary control – the Right Display [21]. The Trim setting adjusts the arc length. Trim is adjustable from 0,50 to 1,50. 1,00 is the nominal setting.

Figure 14.

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

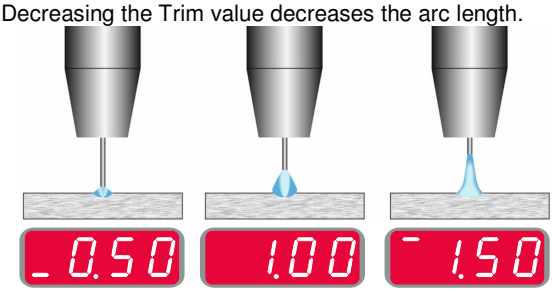


Figure 15.

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 Time
- Run-in WFS
- Preflow Time/ Postflow Time
- Spot Time
- 2-Step/4-Step
- Polarity
- Crater [27]
- Wave Control [27]:
  - Frequency

Frequency influences the width of the arc and the amount of heat input to the weld. If the frequency is higher:

- 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: from -10 to +10.

The frequency controls the spacing of the ripples in the weld:

- Frequency less than 0,0 – Wide weld and ripple spacing, slow travel speed. Figure 16 shows the spacing weld when the frequency is "-10".

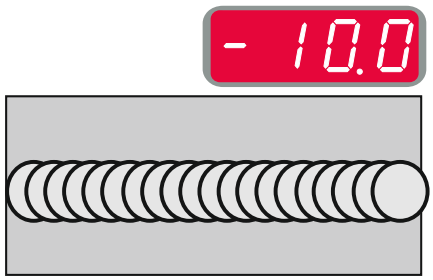


Figure 16.

- Frequency greater then 0,0 – Narrow weld and ripple spacing, fast travel speed. Figure 17 shows the spacing weld when the frequency is "+10"".

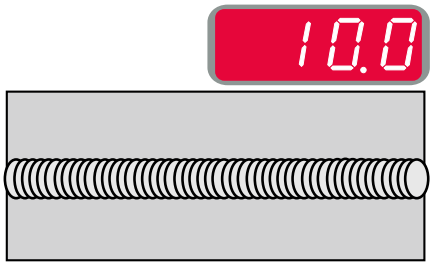


Figure 17.

Welding STT® Process

Table 17. Exemplify STT® non-synergic programs

Wire material	Gas	Wire diameter					
		0.8	0.9	1.0	1.2	1.4	1.6
Steel	CO_2	-	304	306	308	-	-
Steel	ArMIX	-	305	307	309	-	-
Stainless	$HeArCO_2$	-	345	347	349	-	-
Stainless	ArMIX	-	344	346	348	-	-

Table 18. Exemplify STT® synergic programs

Wire material	Gas	Wire diameter					
		0.8	0.9	1.0	1.2	1.4	1.6
Steel	CO_2	-	324	326	328	-	-
Steel	ArMIX	-	325	327	329	-	-
Stainless	$HeArCO_2$	-	365	367	369	-	-
Stainless	ArMIX	-	364	366	368	-	-

Note: Note that STT® is available only with specially equipped Power Wave power sources, like the Power Wave 455M/STT or the Power Wave S350 + STT Module.
Note: Before using the STT® program, the program had to be assigned to the user memory.

STT® (Surface Tension Transfer®) is a controlled GMAW short circuit transfer process that uses current controls to adjust the heat independent of the wire feed speed, resulting in superior arc performance, good penetration, low heat input control, reduced spatter and fumes.
The STT® process makes welds that require low heat input much easier without overheating or burning through, and distortion is minimized.

STT® is also ideal for:
- Open root welding
- Welding on thin materials
- Welding on parts with poor fit-up.

During STT® welding, sense lead has to be connected to the workpiece.

Welding STT® in non-synergic mode
Manually can set:
- Wire Feed Speed, WFS [32]
- Burnback Time
- Run-in WFS
- Preflow Time/ Postflow Time
- Spot Time
- 2-Step/4-Step
- Polarity
- Crater [27]
- Wave Controls [27]:
  - Peak Current
  - Background Current
  - TailOut
  - HOT START

During the STT® welding in non-synergic mode, voltage control is disabled.

Figure 18.

Welding STT® in synergic mode
In synergic mode, the welding parameters are optimally set to the Wire Feed Speed [32].
Wire Feed Speed controls the deposition rate.

Trim [24] is used as a secondary control – the Right Display [21]. The Trim setting adjusts the arc length. Trim is adjustable from 0,50 to 1,50. 1,00 is the nominal setting.
Arc length change ball size and arc energy.

Figure 19.

Additionally can manually set:
- Burnback Time
- Run-in WFS
- Preflow Time/ Postflow Time
- Spot Time
- 2-Step/4-Step
- Polarity
- Crater [27]
- Wave Controls [27]:
  - UltimArc™
  - HOT START.

HOT START – value in percentage of nominal value welding current during arc start current. The control is used to set the level of the increased current and arc start current is made easy.
- Adjust range: from 0 to +10.

TailOut provides additional heat into the weld without increasing the arc length or the droplet size. Higher tailout values improve wetting and may give faster travel speeds.
- Adjust Range: from 0 to +10.

Background Current adjusts the overall heat input into the weld. Changing the background current changes the shape of the back bead. 100% CO_2 requires less background current than when welding with blended shielding gases.

- **Note:** Range depends on the power source.

Peak Current controls the arc length, which also affects the shape of the root. When using 100% CO_2, the peak current will be higher than when welding with blended shielded gases. A longer arc length is required with CO_2 to reduce spatter.

- **Note:** Range depends on the power source.

UltimArc™ – 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

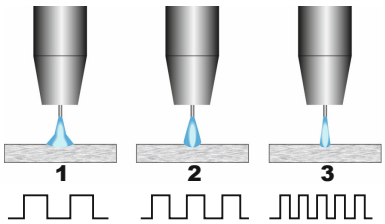


Figure 20.

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

Wire Spool Loading

Wire spool type S300 and BS300 can be installed on the wire spool support without adapter.
Wire spool type S200, B300 or Readi-Reel® can be installed, but the applicable adapter must be purchased. The applicable adapter can be purchased separately(see "Accessories" chapter).

Wire Spool Type S300 & BS300 Loading

WARNING

Turn the input power OFF at the welding power source before installation or changing a wire spool.

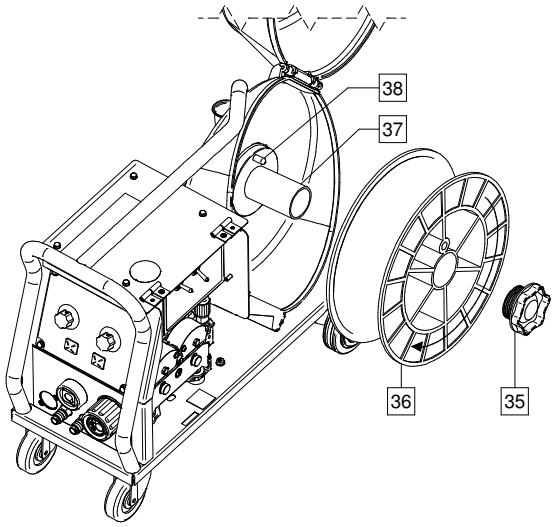


Figure 21.

- Turn the input power OFF.
- Open the spool wire case.
- Unscrew the Locking Nut [35] and remove it from the Spindle [37].
- Place the spool type S300 or BS300 [36] on the Spindle [37] making certain the Spindle Brake Pin [38] is put in the hole in back side of spool type S300 or SB300.

WARNING

Position the spool type S300 or SB300 so that it will rotate in a direction when feeding so as to be de-reeled from bottom of the spool.

- Re-install the locking nut [35]. Make sure that the locking nut is tightened.

Wire Spool Type S200 Loading

⚠ WARNING

Turn the input power OFF at the welding power source before installation or changing a wire spool.

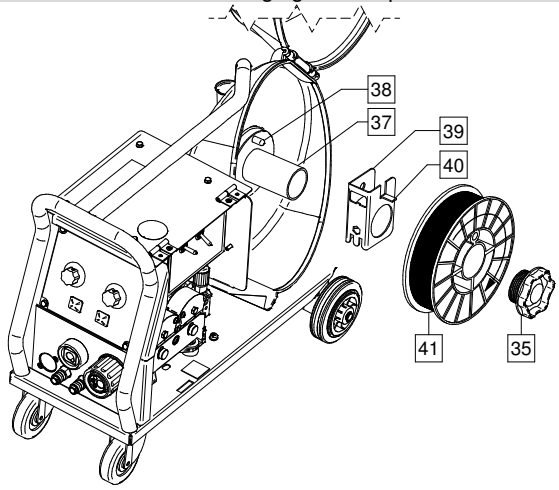


Figure 22.

- Turn the input power OFF.
- Open the spool wire case.
- Unscrew the Locking Nut [35] and remove it from the Spindle [37].
- Place the adapter of spool type S200 [39] on the spindle [37] making certain the spindle brake pin [38] is put in the hole in back side of the adapter [39]. The adapter of spool type S200 can be purchased separately (see "Accessories" chapter).
- Place the spool type S200 [41] on the spindle [37] making certain that the adapter brake pin [40] is put in the hole in the back side of the spool.

⚠ WARNING

Position the spool type S200 so that it will rotate in a direction when feeding so as to be de-reeled from bottom of the spool.

- Re-install the locking nut [35]. Make sure that the locking nut is tightened.

Wire Spool Type B300 Loading

⚠ WARNING

Turn the input power OFF at the welding power source before installation or changing a wire spool.

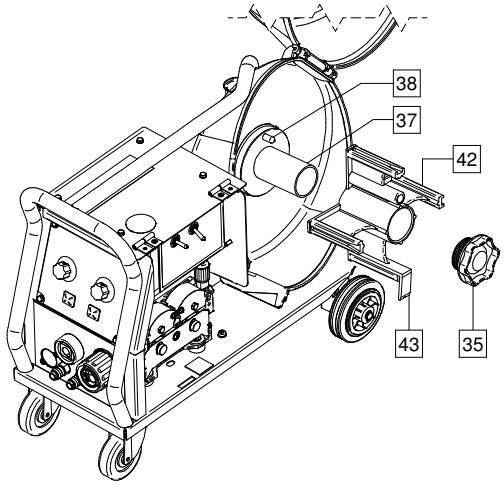


Figure 23.

- Turn the input power OFF.
- Open the spool wire case.
- Unscrew the Locking Nut [35] and remove it from the Spindle [37].
- Place the adapter of spool type B300 [42] on the spindle [37]. Make certain that the spindle brake pin [38] is put in the hole in the back side of the adapter. The adapter of spool type B300 can be purchased separately (see "Accessories" chapter).
- Re-install the locking nut [35]. Make sure that the locking nut is tightened.

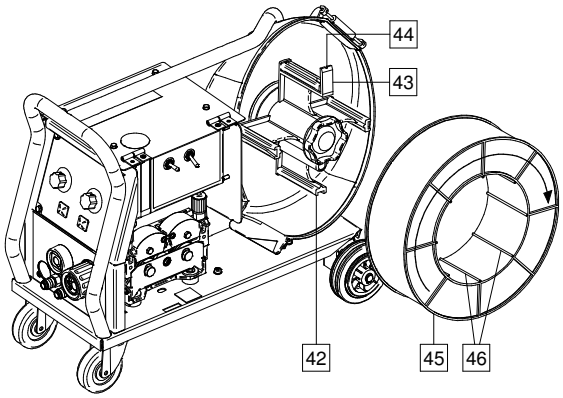


Figure 24.

- Rotate the spindle and adapter so the retaining spring [43] is at the 12 o'clock position.
- Place the spool type B300 [45] on the adapter [42]. Set one of the B300 inside cage wires [46] on the slot [44] in the retaining spring tab [43] and slide the spool onto the adapter.

⚠ WARNING

Position the spool type B300 so that it will rotate in a direction when feeding so as to be de-reeled from bottom of the spool.

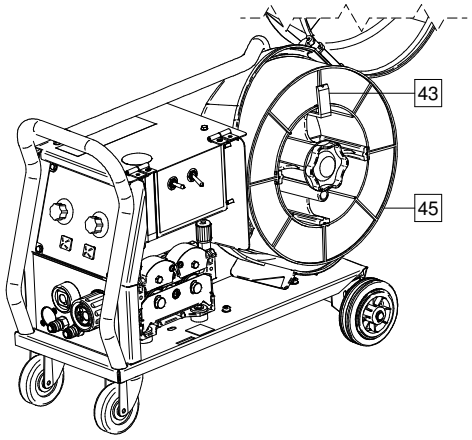


Figure 25.

Wire Spool Type Readi-Reel® Loading

⚠ WARNING

Turn the input power OFF at the welding power source before installation or changing a wire spool.

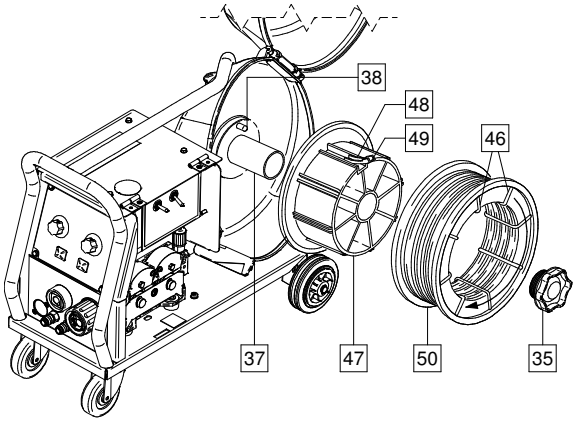


Figure 26.

- Turn the input power OFF.
- Open the spool wire case.
- Unscrew the Locking Nut [35] and remove it from the Spindle [37].
- Place the adapter of spool type Readi-Reel® [47] on the spindle [37]. Make certain that the spindle brake pin [38] is put in the hole in the back side of the adapter [47]. The adapter of spool type Readi-Reel® can be purchased separately (see "Accessories" chapter).
- Re-install the locking nut [35]. Make sure that the locking nut is tightened.
- Rotate the spindle and adapter so the retaining spring [48] is at the 12 o'clock position.
- Place the spool type Readi-Reel® [50] on the adapter [47]. Set one of the Readi-Reel® inside cage wires [46] on the slot [49] in the retaining spring tab [48].

⚠ WARNING

Position the spool type Readi-Reel® so that it will rotate in a direction when feeding so as to be de-reeled from bottom of the spool.

Loading the Electrode Wire

- Turn the input power OFF.
- Open the spool wire case.
- Unscrew the locking nut of the sleeve.
- Load the spooled wire on the sleeve such that the spool turns clockwise when the wire is fed into the wire feeder.
- Make sure that the spindle brake pin [38] 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 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 locking nut of the sleeve.

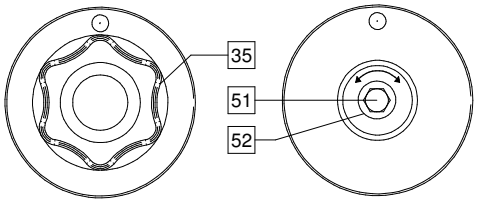


Figure 27.

35. Locking Nut.
51. Adjusting Screw M10.
52. Pressing Spring.

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

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

After finishing of adjustment, you should screw in the 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 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 Gun

- Turn the input power OFF.
- Depending on welding process, connect the proper gun to the Euro Socket, the rated parameters of the gun and of the welding machine should be matched.
- Remote the nozzle from the gun and contact tip or protection cap and contact tip. Next, straighten the gun out flat.
- 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 centimetres, and should feed easily and without any force.

⚠ WARNING

If force is required it is likely that the wire has missed the liner of gun.

- Turn the input power ON.
- Depress the gun trigger to feed the wire through the gun liner until the wire comes out of the threaded end. Or the Cold Inch / Gas Purge Switch [13] can be used – keep in "Cold Inch" position until the wire comes out of the threaded end.
- When trigger or the Cold Inch / Gas Purge Switch [13] is released 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, FCAW-GS process) or protection cap (FCAW-SS 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 threated end.

Changing Driving Rolls

⚠ WARNING

Turn the input power OFF at the welding power source before installation or changing drive rolls and/or guides.

PF42 is equipped with drive roll V1.0/V1.2 for steel wire.

For others wire sizes, is available the proper drive rolls kit (see "Accessories" chapter) and follow instructions:

- Turn the input power OFF.
- Release the pressure roll levers [53].
- Unscrew the fastening caps [54].
- Open the protection cover [55].
- Change the drive rolls [56] with the compatible ones 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 [57] and [58].
- The guide tube of the Euro Socket [59].

- Replace and tighten the protection cover [55] to the drive rolls.
- Screw fastening caps [54].
- Manually feed the wire from the wire reel, the wire through the guide tubes, over the roller and guide tube of Euro Socket into liner of gun.
- Lock the pressure roll levers [53].

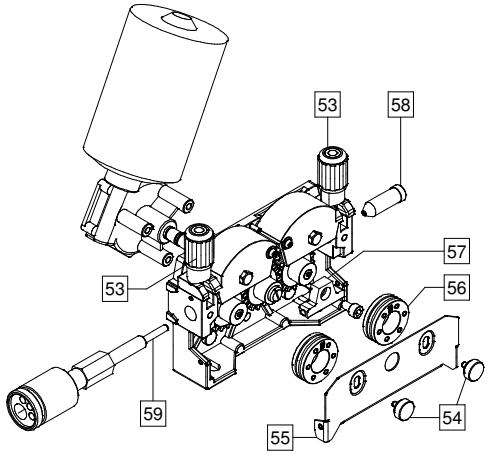


Figure 28.

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 if 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 may be potential difficulties in ensuring electromagnetic compatibility in those locations, due to conducted as well as radiated disturbances.

MAINTENANCE

⚠ WARNING

For any repair operations, modifications or maintenance, 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 manufacturer's warranty to become null and void.

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.

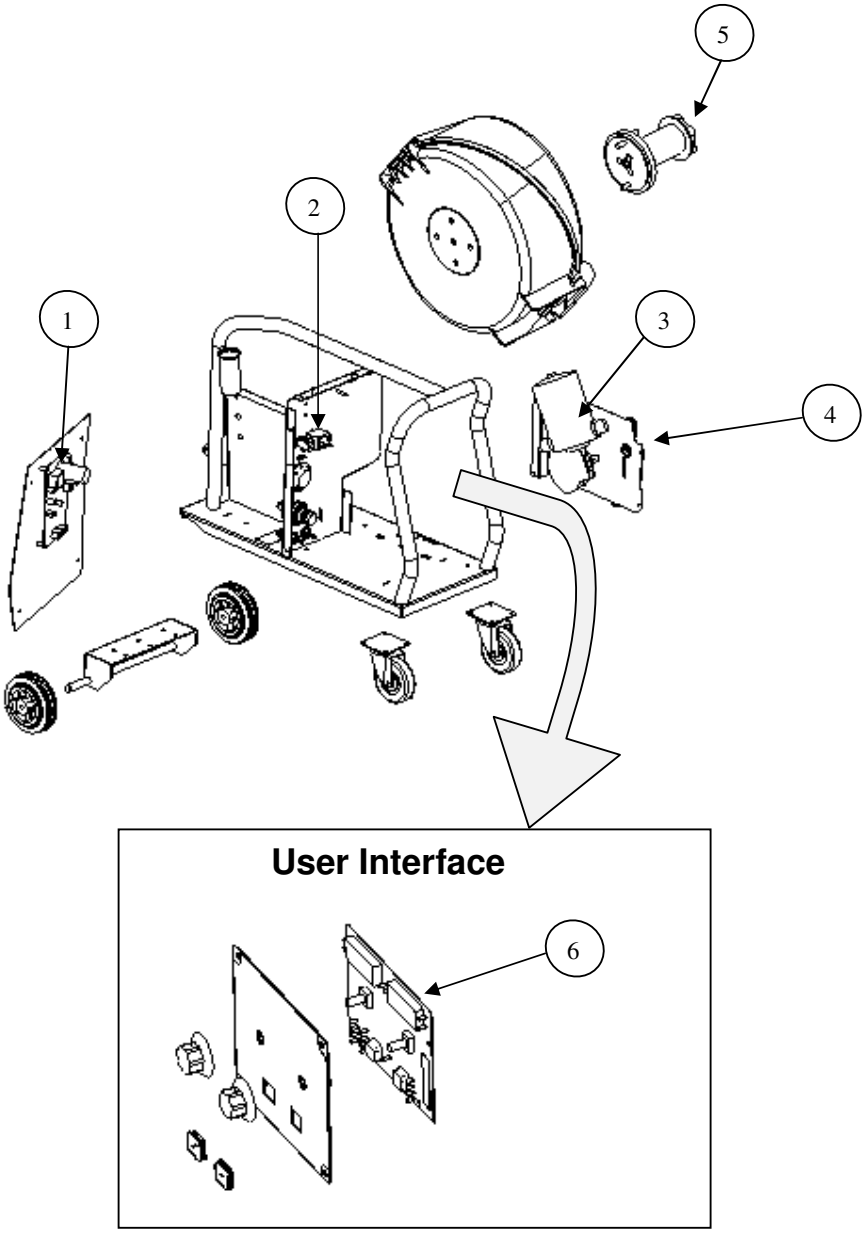
⚠ WARNING

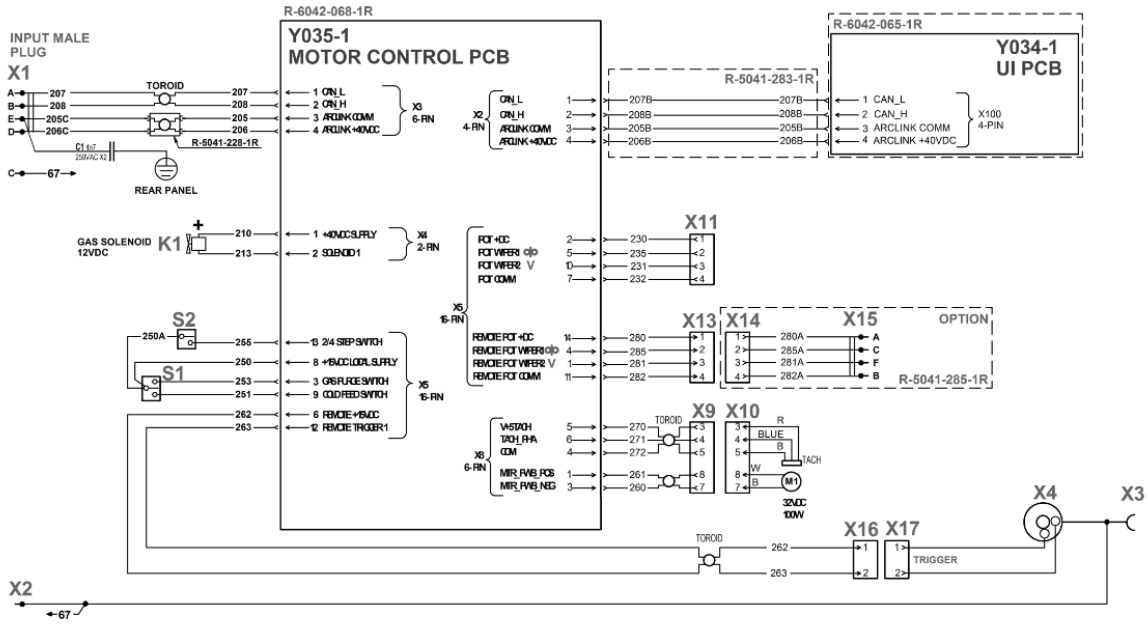
Mains supply network must be disconnected from the machine before each maintenance and service. After each repair, perform proper tests to ensure safety.

MAJOR COMPONENTS LOCATION

PF42

1. Motor Board
2. Gas Solenoid
3. Motor
4. Wire Drive
5. Reel Hub
6. User Interface Board





GENERAL DESCRIPTION

The PF42 is a four rolls, digitally controlled, wire feeder that operates on 40 VDC input power. PF42 supports all welding modes installed on power sources. Network communications, PC board input power, and arc voltage feedback is received and transmitted through the input male plug X1.

MOTOR CONTROL BOARD

The motor control board processes the information received from the various user operated switches, (2-step/4-step, cold inch, gas purge), the data reveived from the User Interface and sends the signals to energize the active components such as the solenoid and wire drive motor.
The tach feedback signal is also processed by this board which regulates the motor supply voltage to maintain the required wire feed speed.

USER INTERFACE BOARD

From the User Interface is possible to recall welding programs from the power source, pre-set welding parameters, read actual values during welding and define other parameters like crater and wave controls. Informations and data are exchanged between the User Interface and the motor control board via digital Arclink protocol.

TROUBLESHOOTING AND REPAIR SECTION

- How to use troubleshooting Guide
- Troubleshooting Guide
- Motor Control Board test
- User Interface Board test
- Gas Solenoid test
- Wire Drive Motor test
- Wire Drive Motor Tachimeter test

HOW TO USE TROUBLESHOOTING GUIDE

Service and repair should be performed by only Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

This Troubleshooting Guide is provided to help you locate and repair possible machine malfunctions. Simply follow the three-step procedure listed below.

Step 1. LOCATE PROBLEM (SYMPTOM). Look under the column labeled “PROBLEMS”. This column describes possible symptoms that the machine may exhibit. Find the listing that best describes the symptom that the machine is exhibiting. Symptoms are grouped into three main categories: Output Problems, Function Problems, and LED Function Problems.

Step 2. PERFORM EXTERNAL TESTS. The second column, labeled “CHECKS”, lists the obvious external possibilities that may contribute to the machine symptom. Perform these tests/checks in the order listed. In general, these tests can be conducted without removing the case wrap-around cover.

Step 3. PERFORM COMPONENT TESTS. The last column, labeled “RECOMMENDED COURSE OF ACTION ” lists the most likely components that may have failed in your machine. It also specifies the appropriate test procedure to verify that the subject component is either good or bad. If there are a number of possible components, check the components in the order listed to eliminate one possibility at a time until you locate the cause of your problem.

All of the referenced test procedures referred to in the Troubleshooting Guide are described in detail at the end of this chapter. Refer to the Troubleshooting and Repair Table of Contents to locate each specific Test Procedure. All of the referred to test points, components, terminal strips, etc., can be found on the referenced electrical wiring diagrams and schematics. Refer to the Wiring Diagrams Section Table of Contents to locate the appropriate diagram.

WARNING

ELECTRIC SHOCK can kill

- Have an electrician install and service this equipment
- Turn the input power off at the fuse box before working on equipment
- Do not touch electrically hot parts
- Prior to performing preventive maintenance, perform the following capacitor discharge procedure to avoid electric shock

---

Sometimes machine failures appear to be due to PC board failures. These problems can sometimes be traced to poor electrical connections. To avoid problems when troubleshooting and replacing PC boards, please use the following procedure:

1. Determine to the best of your technical ability that the PC board is the most likely component causing the failure symptom.
2. Check for loose connections at the PC board toassure that the PC board is properly connected.
3. If the problem persists, replace the suspect PC board using standard practices to avoid static electrical damage and electrical shock.
4. Test the machine to determine if the failure symptom has been corrected by the replacement PC board.

NOTE: Allow the machine to heat up so that all electrical components can reach their operating temperature.

5. Remove the replacement PC board and substitute it with the original PC board to recreate the original problem.
   - If the original problem does not reappear by substituting the original board, then the PC board was not the problem. Continue to look for bad connections in the control wiring harness, junction blocks, and terminal strips.
   - If the original problem is recreated by the substitution of the original board, then the PC board was the problem. Reinstall the replacement PC board and test the machine.
6. Always indicate that this procedure was followed when warranty reports are to be submitted.

NOTE: Following this procedure and writing on the warranty report, “INSTALLED AND SWITCHED PC BOARDS TO VERIFY PROBLEM,” will help avoid denial of legitimate PC board warranty claims.

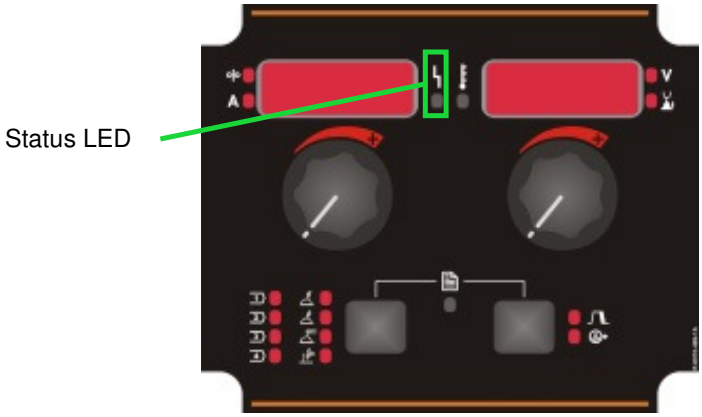
TROUBLESHOOTING

!! WARNING !! **BEFORE CONNECT POWER SUPPLY, MAKE A CAREFUL VISUAL INSPECTION INSIDE THE MACHINE, CHECK ALL THE BOARDS AND HARNESS.**

PROBLEMS / SYMPTOMS	CHECKS / ERROR DESCRIPTION	RECOMMENDED COURSE OF ACTION
A VISUAL DAMAGE IS EVIDENT WHEN YOU OPEN THE COVER	----------	• REPLACE THE BROKEN PART AND PERFORM THE TESTS FOR THE OTHER MACHINE COMPONENTS
NO WIRE FEED AND SOLENOID	• MAKE SURE THAT THE PF42 RECEIVES THE 40VDC POWER SUPPLY • THE GUN TRIGGER MAY BE DEFECT	• PERFORME THE MOTOR BOARD TEST • CHECK AND REPLACE THE GUN TRIGGER IF NECESSARY
NO CONTROL OF WIRE FEED SPEED	• THE TACHIMETER MAY BE FAULTY • THE USER INTERFACE BOARD MAY BE MAULTY • THE MOTOR BOARD MAY BE FAULTY	• PERFORM THE TACHIMETER TEST • REPLACE THE USER ITERFACE • PERFORM THE MOTOR BOARD TEST AND REPLACE IF DEFECT
THERE IS NO WELDING OUTPUT WHEN THE GUN TRIGGER IS PRESSED. THE WIRE FEEDS NORMALLY AND THE GAS SOLENOID IS ACTIVATED PROPERLY	• THE ARC LINK CABLES BETWEEN POWER FEED AND POWER SOURCE MAY BE DEFECT. • THE MOTOR BOARD MAY BE FAULTY • THE POWER SOURCE MAY BE DEFECT	• CHECK STATUS LED ON POWER SOURCE FOR COMMUNICATION ERROR • CHECK THE ARCLINK CABLES FOR GOOD CONTINUITY • REPLACE THE MOTOR BOARD • PERFORM THE POWER SOURCE TESTS
THE WELDING VOLTAGE IS NOT CHANGING WHILE TURNING THE USER INTERFACE VOLTAGE ENCODER	• THE USER INTERFACE MAY BE FAULTY • THE MOTOR BOARD MAY BE FAULTY • THE POWER SOURCE MAY BE DEFECT	• REPLACE THE USER INTERFACE • REPLACE THE MOTOR BOARD • PERFORM THE POWER SOURCE TEST
WELDING PROCESS DOES NOT CHANGE WHEN THE LEFT PUSH BUTTON ON THE UI IS PRESSED	• MAY BE A SOFTWARE PROBLEM ON UI IS PRESENT • THE BUTTON IS DEFECT	• RE-FLASH THE FEEDER • REPLACE THE UI BOARD
THE FEEDER RESET ITSELF WHEN THE WELD STARTS	• NOISE CAN BE THE CAUSE OF THIS PROBLEM	• CHECK CAPACITOR C1 FOR GOOD CONNECTIONS TO CONNECTOR X1 PIN E AND TO FEEDER FRAME (SEE FEEDER WIRIND DIAGRAM)
WITH TRIGGER PRESSED THE ROLLS DO NOT TURN BUT GAS SOLENOID IS WORKING PROPERLY	• LOOSE OR FAULTY MOTOR CONNECTION MAY BE PRESENT • THE MOTOR BOARD MAY BE FAULTY (NO POWER TO THE MOTOR)	• CHECK LEADS 261 AND 260 CONNECTIONS FROM MOTOR BOARD CONNECTOR X8 PIN 1 AND 3 TO MOTOR X10 CONNECTOR PIN 7 AND 8 • PERFORM THE MOTOR BOARD X8 CONNECTOR TEST
NO WIRE FEEDING BUT THE DRIVE ROLLS ARE TURNING	• THE DRIVE ROLLS PRESSURE MAY BE NOT CORRECT • THE DRIVE ROLLS OR WIRE GUIDE MAY BE NOT CORRECTLY INSTALLED • A MECHANICAL RESCTRICTION MAY BE PRESENT INSIDE THE TORCH • THE SPOOL BRAKE TORQUE MAY BE TOO MUCH	• CHECK THE DRIVE ROLLS FOR CORRECT PRESSURE • CHECK THE DRIVE ROLLS AND WIRE GUIDE FOR CORRECT INSTALLATION • CHECK THE TORCH LINER, REPLACE IF NECESSARY • CHECK THE SPOOL BRAKE TORQUE
THE GAS SOLENOID IS NOT ACTIVATED WHEN TRIGGER IS PRESSED, BUT ROLLS ARE TURNING	• THE GAS SOLENOID MAY BE FAULTY • THE MOTOR BOARD MAY BE FAULTY (NO POWER TO THE GAS SOLENOID)	• PERFORM THE GAS SOLENOID TEST • PERFORM THE MOTOR BOARD X4 CONNECTOR TEST
THE COLD INCH/GAS PURGE SWITCH DOES NOT ENABLE THE WIRE DRIVE MOTOR BUT WIRE DRIVE MOTOR IS ACTIVATED WHEN GUN TRIGGER IS PRESSED	• A MECHANICAL DAMAGE ON THE COLD INCH/PURGE SWITCH MAY BE PRESENT • CHECK FOR LOOSE OR FAULTY LEAD CONNECTIONS BETWEEN THE COLD INCH/PURGE SWITCH AND MOTOR BOARD X5 CONNECTOR	• REPLACE THE COLD INCH/PURGE SWITCH IF NECESSARY • IF THERE IN MECHANICAL PROBLEMS AND ALL CONNECTIONS ARE OK, THE MOTOR BOARD IS DEFECT; REPLACE IT.

These tests and repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

ERROR CODES



A two color status light that indicates system errors. Normal operation is steady green light. Error conditions are indicated, per table below:

LED Light Condition	Meaning Only machines which using ArcLink® protocol for communication
Steady Green	System OK. 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 in the system. Normal for first 1-10 seconds after power is turned on, or if the system configuration is changed during operation.
Alternating Green and Red	If the status lights are flashing any combination of red and green, errors are present in the power source. 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. If occurs, to clear the error try to turn Off the machine, wait for a few seconds, then turn ON again. If the error remains, a maintenance is required. Please contact the nearest authorized technical service center or Lincoln Electric and report the error code read.
Steady Red	Indicate no communication between the power source and device which has been connected to this power source.

Refer to the Power Source Service Manual for the Error Codes table and descriptions.

CASE COVER REMOVAL PROCEDURE

WARNING

Service and repair should be performed only by Lincoln Electric factory trained personnel.Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual.

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact your Local Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed.
……

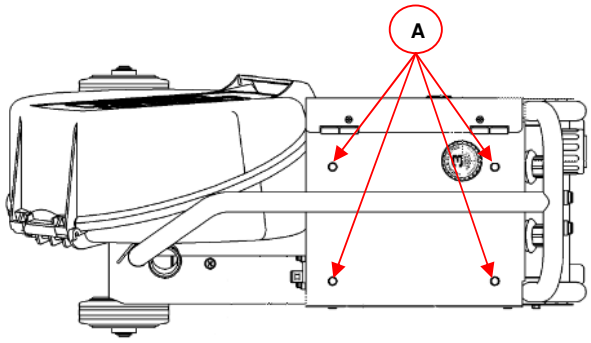
DESCRIPTION

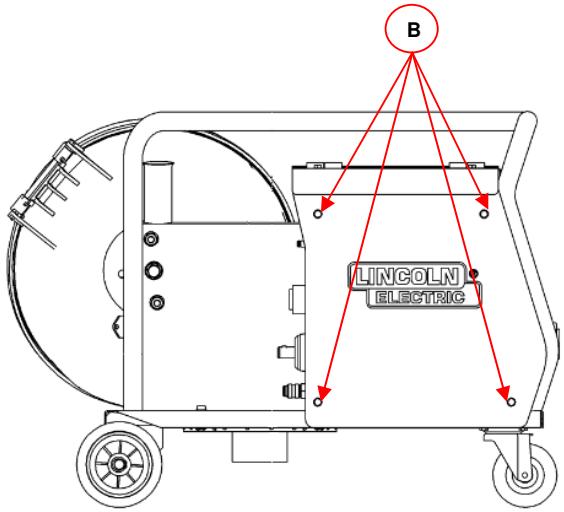
This procedure will aid the technician in the removal and replacement of the case sheet metal cover .

MATERIALS NEEDED

8 mm nut driver

PF42 - CASE COVER REMOVAL





Procedure:

1. Turn the power source ON/OFF switch to OFF position.
2. **Disconnect Input Power from the power source !**
3. Using the 8mm nut driver, remove the 4 screws (**A**) from the top of the Feeder cover.
4. Remove carefully the top cover together with the right feeder door.
5. Using the 8 mm nut driver remove the 4 screw (**B**) from the left side Feeder panel.
6. Be careful, do not pull too much the left side panel; the motor control boars is installed on the internal side of this panel.

MOTOR CONTROL BOARD TEST

WARNING

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TEST DESCRIPTION

This test will determine if the motor control board is receiving the correct voltage and if it is working properly

MATERIALS NEEDED

Multimeter
Power Feed Wiring diagram

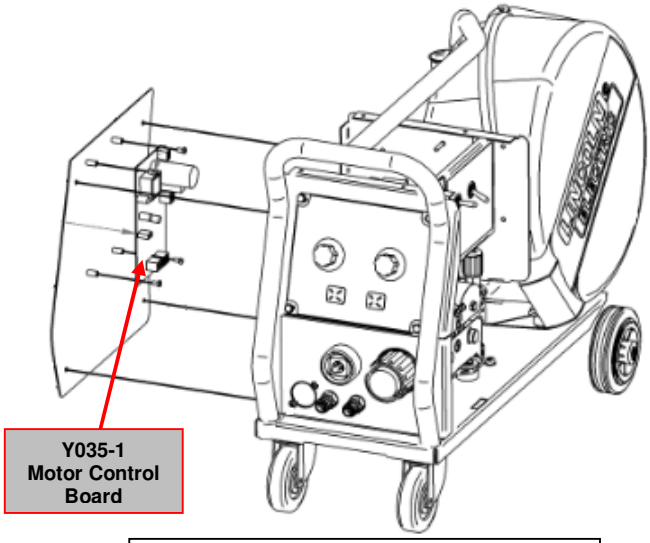


Figure 1 - Motor control board location

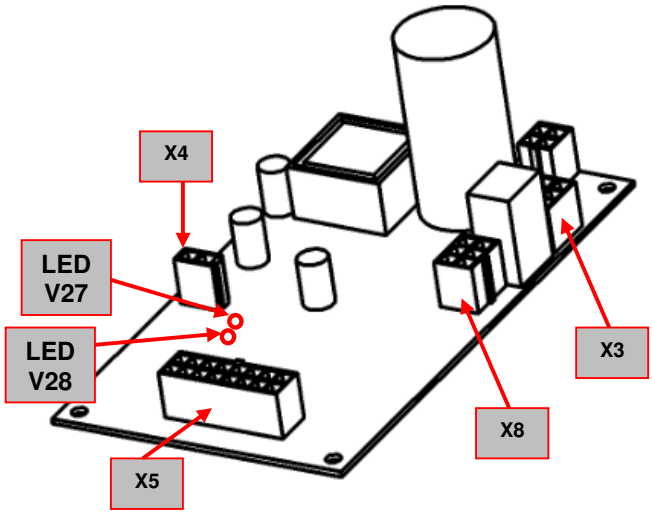
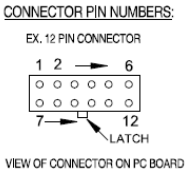


Figure 1a – Y035-1 Test point locations



TEST PROCEDURE

⚠ **Use always electrically insulate gloves during this test procedure**

1. Remove input power from the wire feed unit.
2. Perform the wire feeder case removal procedure.
3. Located the Motor Control Board. See **Figure 1**. Do not remove the plugs from the Motor Control Board.
4. Visually check for burned or damaged components. If any components are physically damaged the motor control board has to be replaced.
5. Apply the correct input power to the wire feeder connecting it through control cable to the power source.
6. Using the multimeter perform the tests as indicated in **Test Table 1**. See **Figure 1a** for correct test points location.

Test table 1 – Motor Control Board test

Test Points	*Expected reading*	*PCB LEDs status and color*	*Note*
X3 pin 4(+) to pin 3(-)	40VDC	-	+40VDC power supply from power source
X4 pin 2(+) to pin 1(-)	0VDC = Gas solenoid OFF 7,5VDC = Gas solenoid ON	-	Press the gun trigger or purge switch to test the gas solenoid power supply. Note: solenoid is supplied with a PWM signal
X8 pin1(+) to pin 3(-)	From 2VDC to 30VDC	-	Press the gun trigger for this test. Expected reading dependent upon WFS potentiometer setting
X8 pin 5(+) to pin 4(-)	+5VDC	-	Tachimeter voltage supply
X8 pin 6(+) to pin 4(-)	Approx. 2,5VDC when motor is running	-	Press the gun trigger to do this test
X8 pin 6(+) to pin 4(-)	0VDC or 5VDC Depend upon where the motor is stopped	-	With motor not running.
X2 pin 4(+) to pin 3(-)	40VDC	-	User Interface +40VDC power supply
-	-	LED - **V27** Red	Lights on when wire drive motor is supplied
-	-	LED – **V28** Green	Arclink connection state. Normal status is steady green. If blinking all the time it means, no communication or connection with the power source. (Blinking during start-up is normal)

USER INTERFACE BOARD TEST

WARNING

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact your Local Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed.

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TEST DESCRIPTION

This test will determine if the User Interface board is receiving the correct power supply voltage and if it is working properly. This test will not indicate if the entire board is fuctional.

MATERIALS NEEDED

7mm nut driver
Multimeter
Power Feed Wiring diagram

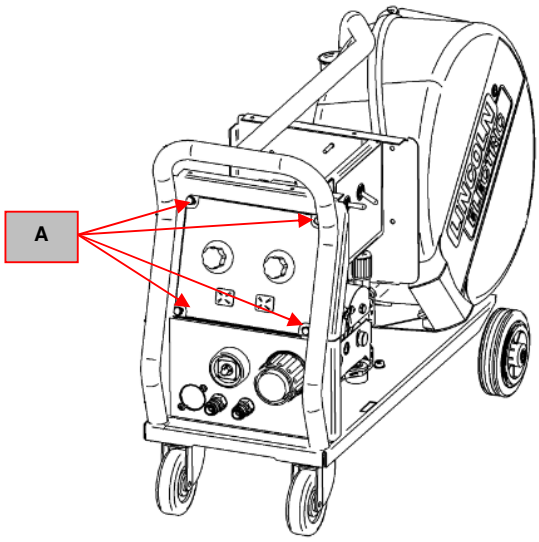

Figure 1b – User Interface removal

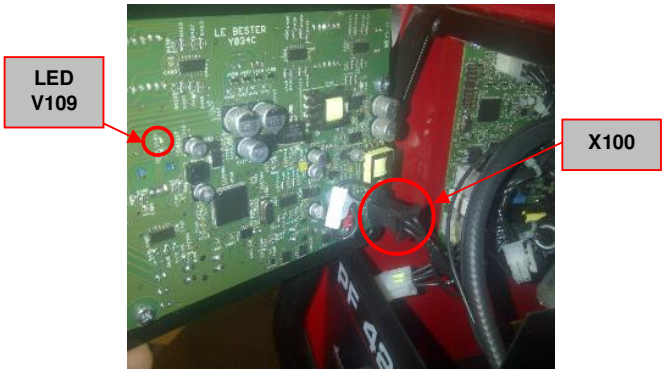

Figure 1c – User Interface component side

TEST PROCEDURE

⚠ **Use always electrically insulate gloves during this test procedure**

1. Remove input power from the wire feed unit.
2. Using the 7mm nut drive remove the four screws (**A**) that are fixing the User Interface panel to the Power Feed front panel. See **Figure 1b.**
3. Do not unplug the User Interface board from the Power Feeder. Keep it connected as indicated in **Figure 1c**.
4. Visually check for burned or damaged components. If any components are physically damaged the motor control board has to be replaced.
5. Apply the correct input power to the wire feeder connecting it through control cable to the power source.
6. Locate the User Interface board connector **X100** and using the multimeter perform the tests as indicated in **Test Table 1**. See **Figure 1c**.

Test table 1 – User Interface Board test

Test Points	*Expected reading*	*PCB LEDs status and color*	*Note*
X100 pin 4(+) to pin 3(-)	40VDC	-	+40VDC power supply from Motor Control Board
-	-	V109 red	3,3 Vdc generated by the User Interface board is present

GAS SOLENOID TEST

WARNING

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact your Local Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed.

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TEST DESCRIPTION

This test will help determine if the gas solenoid is working properly.

MATERIALS NEEDED

Multimeter
Power Feed Wiring diagram

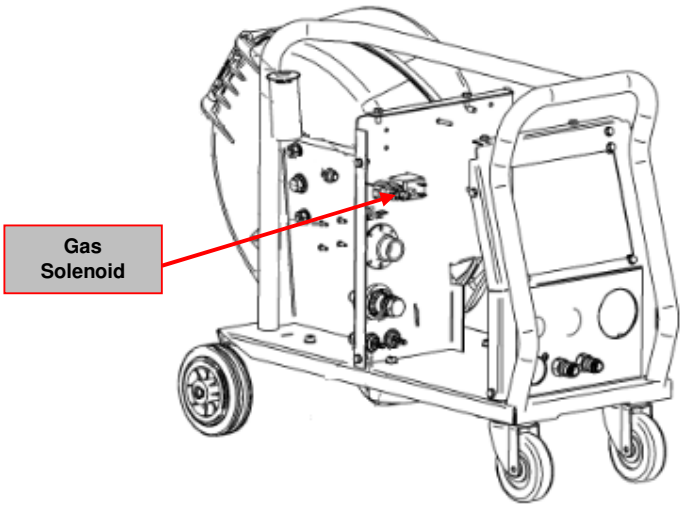

Figure 2 – Gas solenoid location

TEST PROCEDURE

⚠ **Use always electrically insulate gloves during this test procedure**

1. Remove input power from the wire feed unit.
2. Perform the wire feeder case removal procedure.
3. Located the Gas Solenoid. See **Figure 2**.
4. Apply the correct input power to the wire feeder connecting it through control cable to the power source.
5. Whit the gun trigger pressed check the supply voltage at gas solenoid terminals (wire 210 and 213). Normal voltage is 7,5VDC. Gas solenoid is supplied with a PWM signal. If the voltage is present but the gas solenoid is not activated, the gas solenoid may be faulty. Correct coil resistance with wire 210 and 213 disconnected is 14ohms +/- 10%
6. If Voltage is not presend check first for loose or faulty wires connections between gas solenoid and plug **X4**. See wire feeder wiring diagram. If connections are good, the Motor Control board may be faulty.

WIRE DRIVE MOTOR TEST

WARNING

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact your Local Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed.

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TEST DESCRIPTION

This test will help determine if the wire drive motor receives the correct voltage and if it is capable of working properly.

MATERIALS NEEDED

Multimeter
Power Feed Wiring diagram

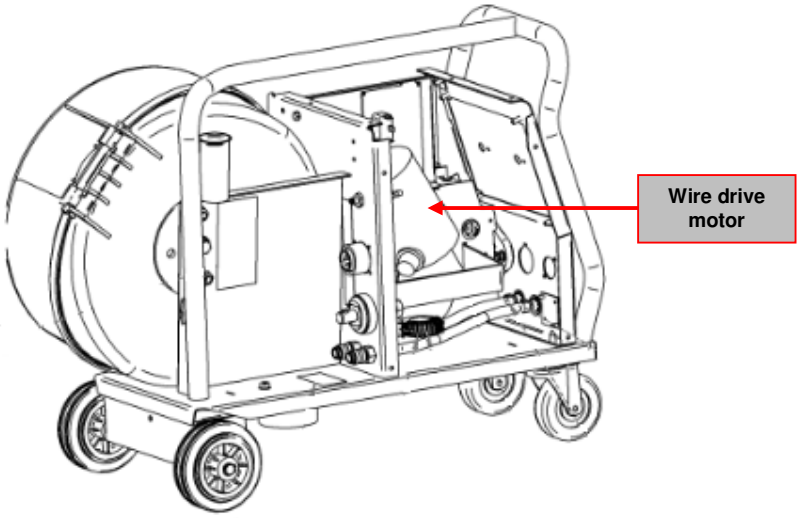

Figure 3 – Wire drive motor location

TEST PROCEDURE

Use always electrically insulate gloves during this test procedure

1. Remove input power from the wire feed unit.
2. Perform the wire feeder case removal procedure.
3. Located the wire drive motor. See **Figure 3**.
4. Apply the correct input power to the wire feeder connecting it through control cable to the power source.
5. Press the gun trigger and with the motor running check at connector **X10** between pin 7 and pin 8, see wiring diagram, for approximately 2VDC to 30VDC. Reading depends upon WFS potentiometer position on user interface panel.
6. If Voltage is not presend check first for loose or faulty wires connections between motor control board plug **X8** and connector **X10**. See wire feeder wiring diagram. If connections are good, the Motor Control board may be faulty.
7. If voltage is present but the wire drive motor does not run, the motor may be faulty.
8. If changing the WFS potentiometer setting on user interface the motor does not change the speed, perform the motor control board test and tachimeter test.

WIRE DRIVE MOTOR TACHIMETER TEST

WARNING

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual. If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact your Local Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed.

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TEST DESCRIPTION

This test will help determine if the tachimeter is correctly supplied by the motor control board and if the tachimeter is sending the correct feedback to the motor control board.

MATERIALS NEEDED

Multimeter
Power Feed Wiring diagram

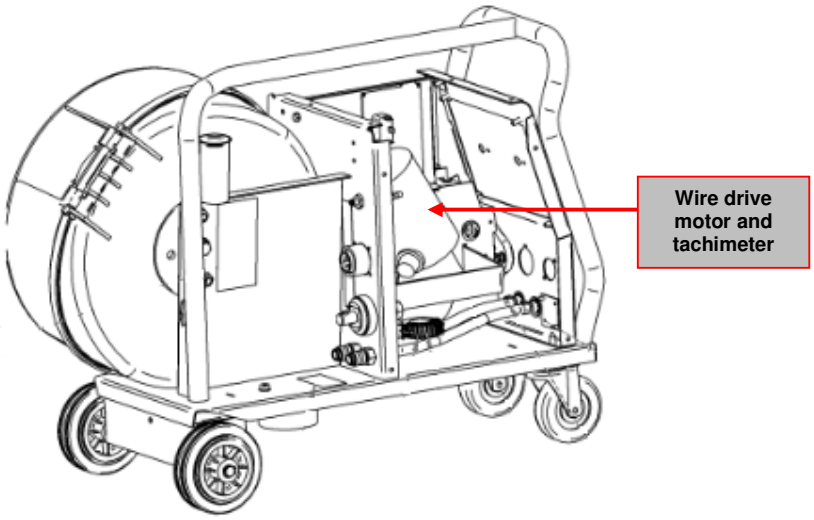


Figure 4 – Wire drive motor and tachimeter location

TEST PROCEDURE

⚠ **Use always electrically insulate gloves during this test procedure**

1. Remove input power from the wire feed unit.
2. Perform the wire feeder case removal procedure.
3. Located the wire drive motor. See **Figure 4**.
4. Apply the correct input power to the wire feeder connecting it through control cable to the power source.
5. Check at connector **X10** between pin 3 and pin 5, see wirng diagram, for approximately 5 VDC. If the 5VDC are missing check for loose or faulty connection between connector **X10** and plug **X8** on Motor Control board. If connection are good, may be the Motor Control board is faulty.
6. With the trigger pressed and the motor running check at connector **X10** the tachimeter feedback voltage between pin 4 and pin 5. Normal feedback value should be about 2,5VDC. If the correct 5 VDC supply are present but the voltage feedback is missing, the tachimeter is faulty.
7. Take note that with the motor not running the tachimeter voltage feedback may be 0VDC or 5VDC depending the position where the tachimeter magnet, mounted on the motor axle, has stopped.

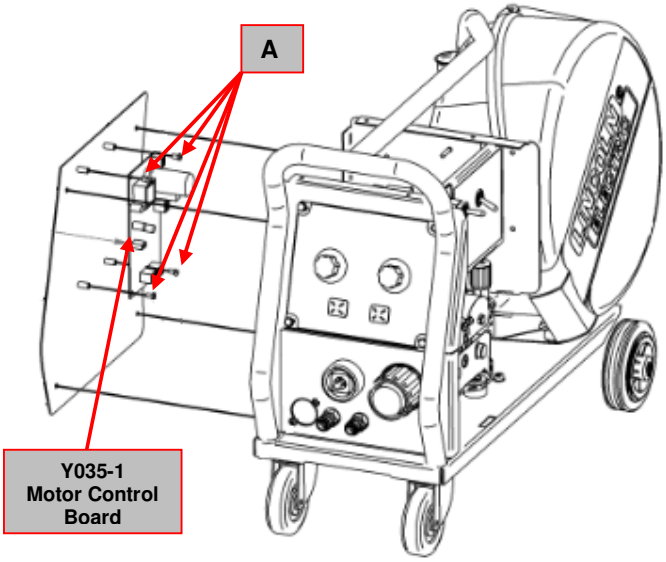


Figure 5

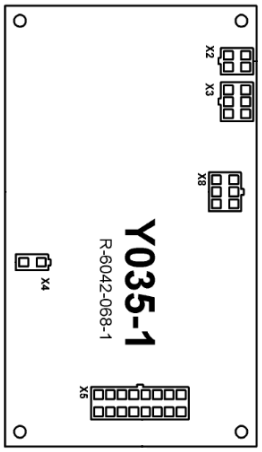


Figure 6 – Motor Control board plugs locations

REMOVAL PROCEDURE

Necessary tools:

- Phillips screwdriver PH02

1. Remove main input power from the Wire Feeder.
2. Perform the wire feeder case removal procedure.
3. Locate the Motor Control board. See **Figure 5**
4. Unplug the connectors **X2, X3, X4, X5** and **X8** from the motor control board. See **Figure 6** for plugs locations.
5. Using Phillips screwdriver PH02 remove the 4 screws (**A**) from the motor board corners.
6. Carefully remove the Motor Control board from wire feeder left side panel.
7. **For the new Motor Control board re-assembly operations,** make the previous steps in the reverse order

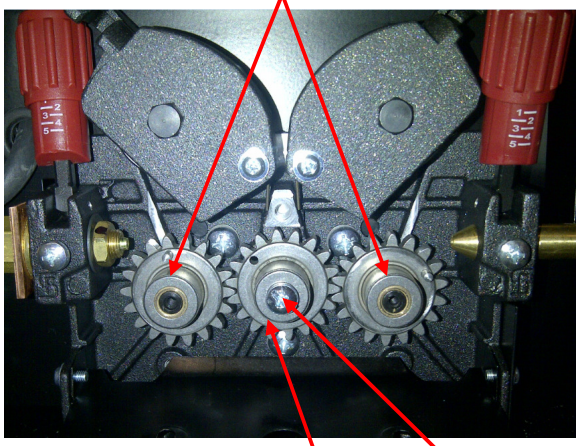


Figure 7

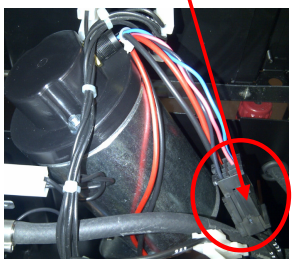


Figure 8

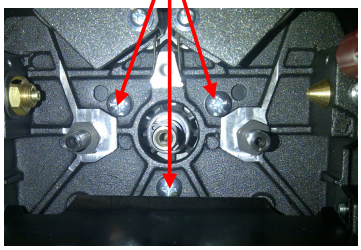


Figure 9

REMOVAL PROCEDURE

Necessary tools:

- Phillips screwdriver PH02

1. Remove main input power from the Wire Feeder.
2. Perform the wire feeder case removal procedure.
3. Remove the drive rolls from the wire drive
4. Remove the rolls gear wheels (**A**). See **Figure 7**.
5. Using the Phillips PH02 screwdriver remove the screw (**B**). See **Figure 7**.
6. Remove the motor gear wheel (**C**). See **Figure 7**.
7. Unplug motor connectors **X9**/**X10**. See **Figure 8**.
8. Using the Phillips PH02 screwdriver remove the 3 screws (**D**), that are fixing the motor to the wire drive. See **Figure 9**.
9. Remove carefully the motor from the Wire Feeder, paying attention to the metal panel that is installed between the motor and the wire drive plate.
10. **For the new Motor re-assembly operations,** make the previous steps in the reverse order

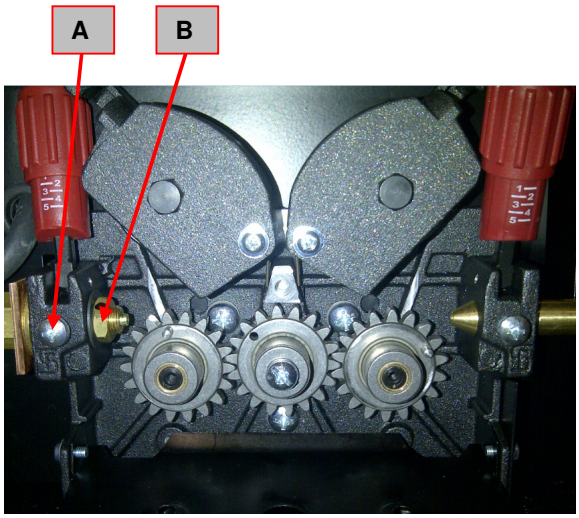


Figure 10

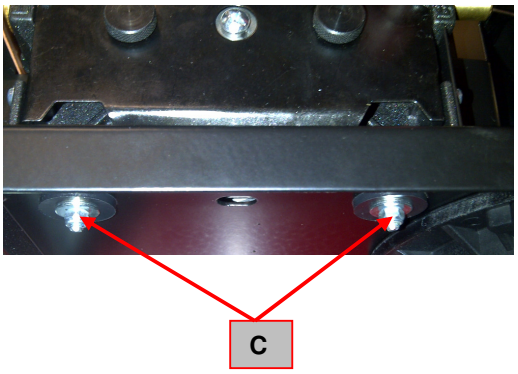


Figure 11

REMOVAL PROCEDURE

Necessary tools:

- Phillips screwdriver PH02
- 8mm nut driver/wrench
- 14mm wrench

1. Remove main input power from the Wire Feeder.
2. Perform the wire feeder case removal procedure.
3. Perform the wire drive motor removal procedure following the instructions provided in the previous page.
4. Using the phillips screwdriver remove the screw (**A**).See **Figure 10**.
5. Using the 14mm wrench remove the nut (**B**) and washer. See **Figure 10**.
6. Using the 8 mm nut driver remove the 2 nuts (**C**), the related 2 screws and washers.
7. Remove the wire drive plate taking care of the plastic insulators that insulate the wire drive plate from the feeder bottom panel.
8. Carefully remove the wire drive plate from the wire feeder, paying attention to the metal panel that is installed between the motor and the wire drive plate.
9. **For the new wire drive plate re-assembly operations,** make the previous steps in the reverse order

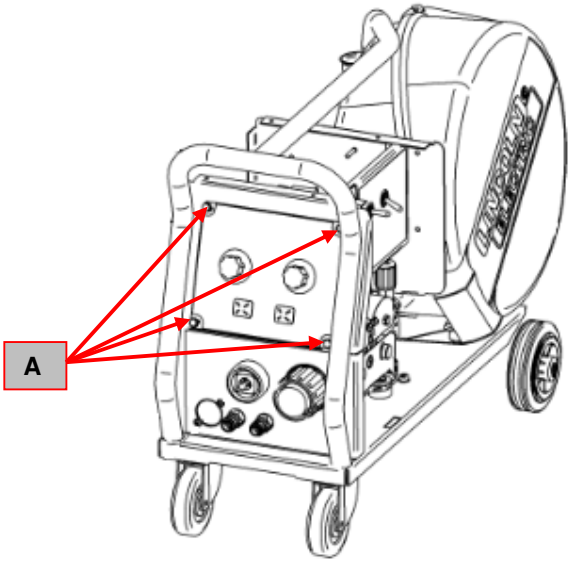


Figure 12

Figure 13

REMOVAL PROCEDURE

Necessary tools:

- 8mm nut driver
- 2mm allen wrench
- 10mm wrench

1. Remove main input power from the Wire Feeder.
2. Using the 8 mm nut driver remove the 4 screw (**A**).See **Figure 12**.
3. Carefully pull the User Interface panel few centimeters away from the feeder front panel
4. Unplug the connector **X100** from the User Interface board. See **Figure 13**.
5. Remove the User Interface board from the feeder.

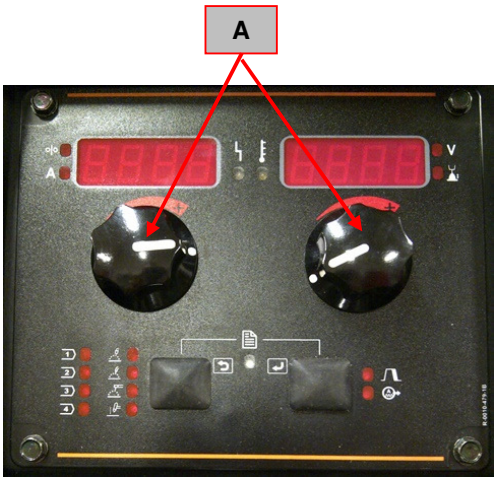


Figure 14

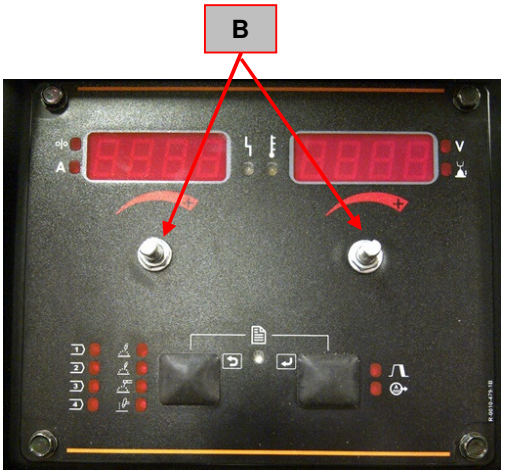


Figure 15

6. Using the 2mm allen wrench remove the two knobs (**A**). See **Figure 14**.
7. Using the 10 mm wrench remove the two nuts (**B**) that are fixing the two encoders to the UI panel. See **Figure 15**.

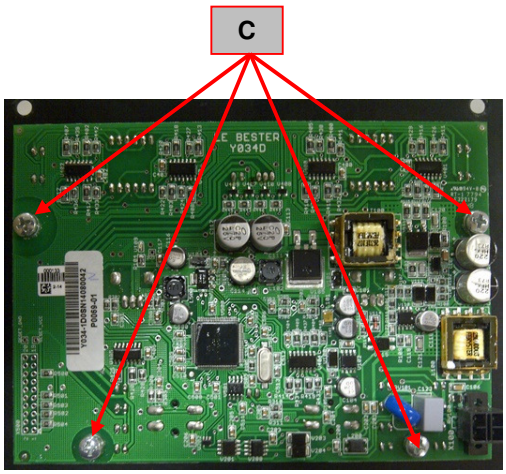


Figure 16

8. Using the phillips PH02 screwdriver remove the four screws (**C**) that are fixing the UI board to the front UI metal panel. See **Figure 16**.
9. Remove the UI board from the metal metal panel.
10. Collect the two washers that are present on the two encoders and install them to the new UI board.
11. **For the new PF42 UI board re-assembly operations,** make the previous steps in the reverse order

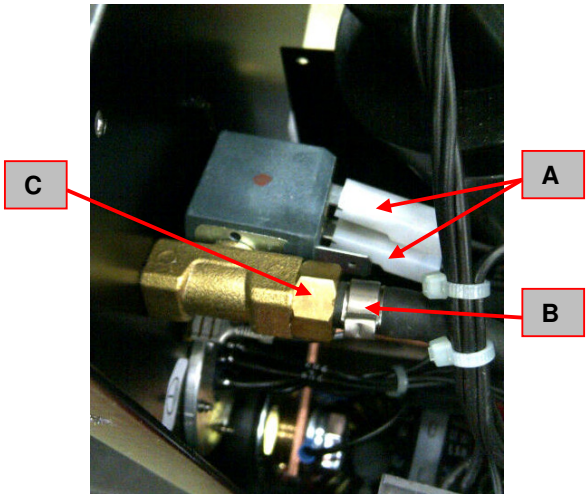


Figure 12

Figure 13

REMOVAL PROCEDURE

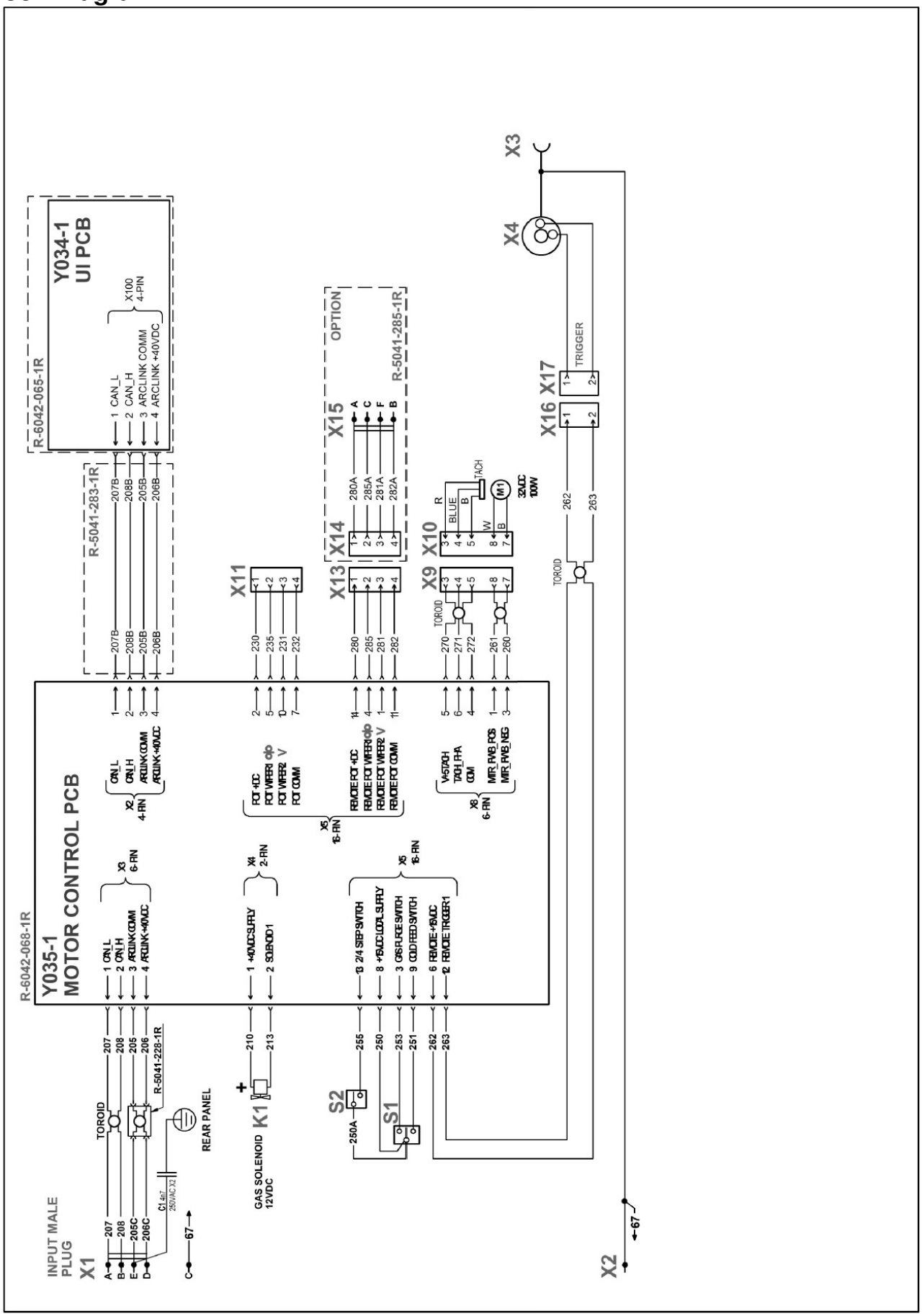
Necessary tools:

- 14mm wrench
- Pincers
- Metal clip 10,5 GER (part number 0656-790-105R)
- Threadlocker liquid

1. Remove main input power from the Wire Feeder.
2. Perform the wire feeder case removal procedure.
3. Disconnect the two gas valve supply leads n° 210 and 213 (**A**).
4. Using the pincers remove the metal clip (**B**) and using the 14mm wrench unscrew the couple (**C**). See **Figure 12.**
5. Using the 14 mm wrench remove the quick connect coupling (**D**), see **Figure 13,** and remove the gas valve from the wire feeder.
6. **For the new gas valve re-assembly operations,** make the previous steps in the reverse order, using treadlocker liquid on couple thread (**C**) and quick connect coupling thread (**D**).

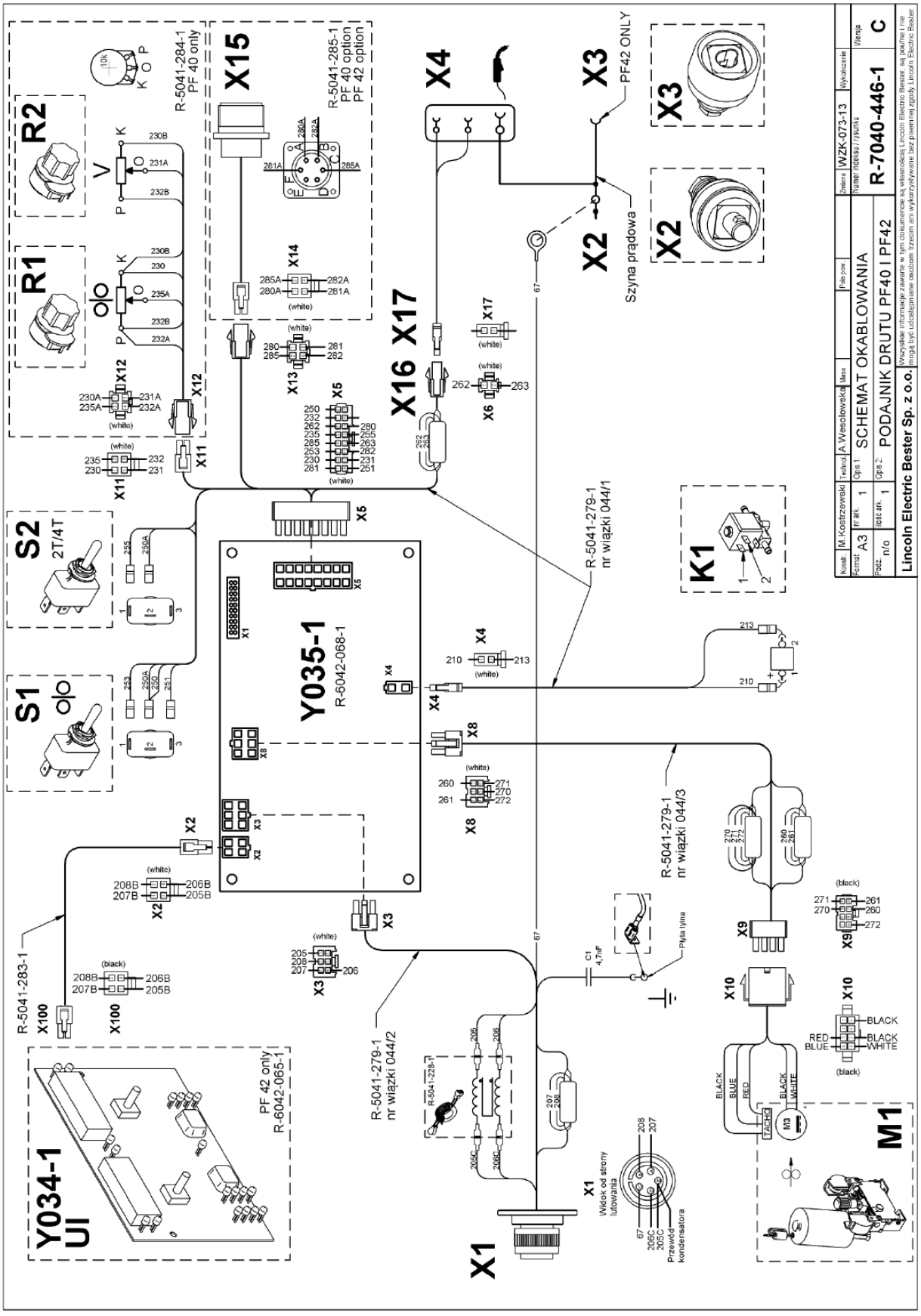
ELECTRICAL SCHEMATICS

Block Diagram : PF42



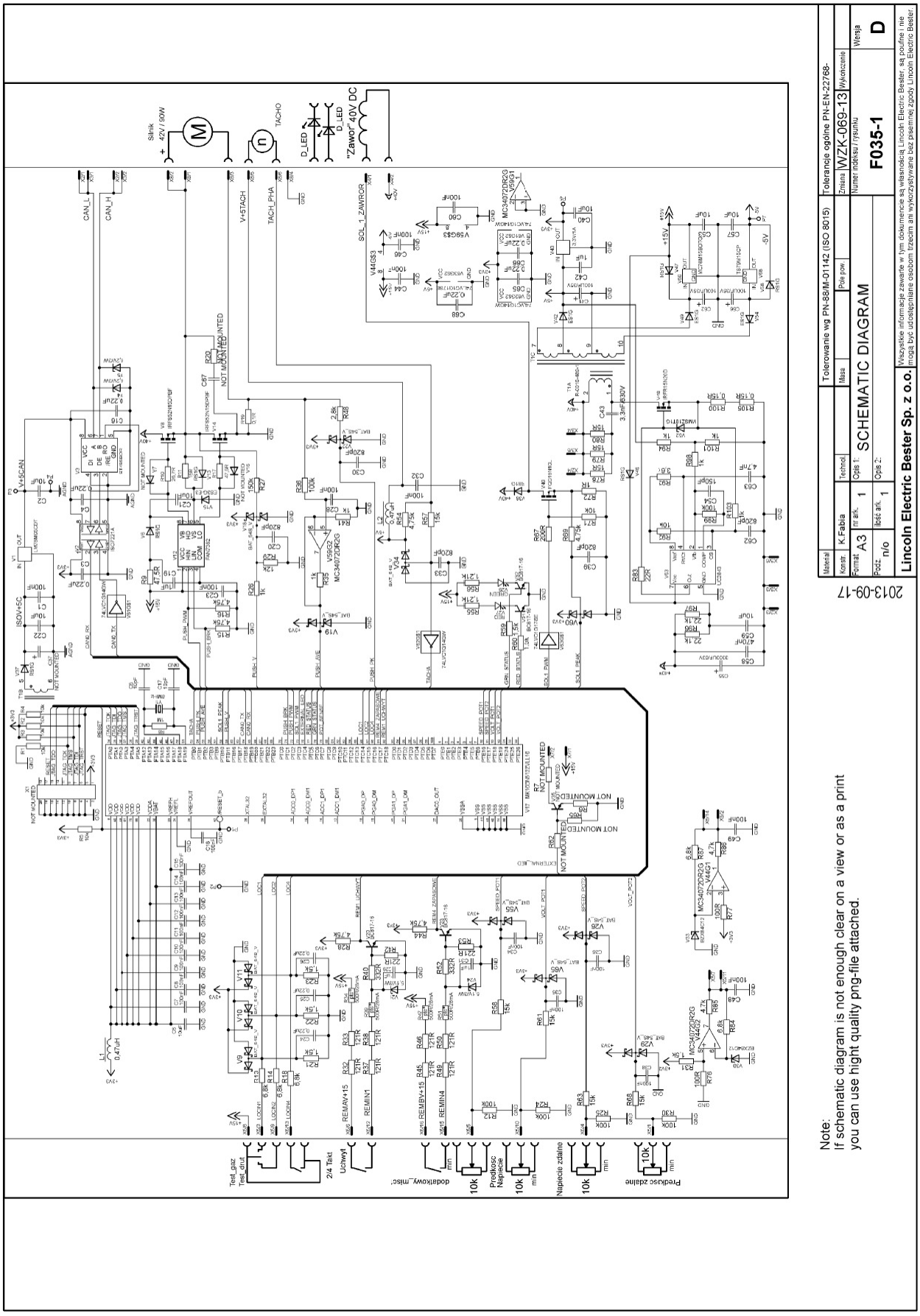
ELECTRICAL DIAGRAMS

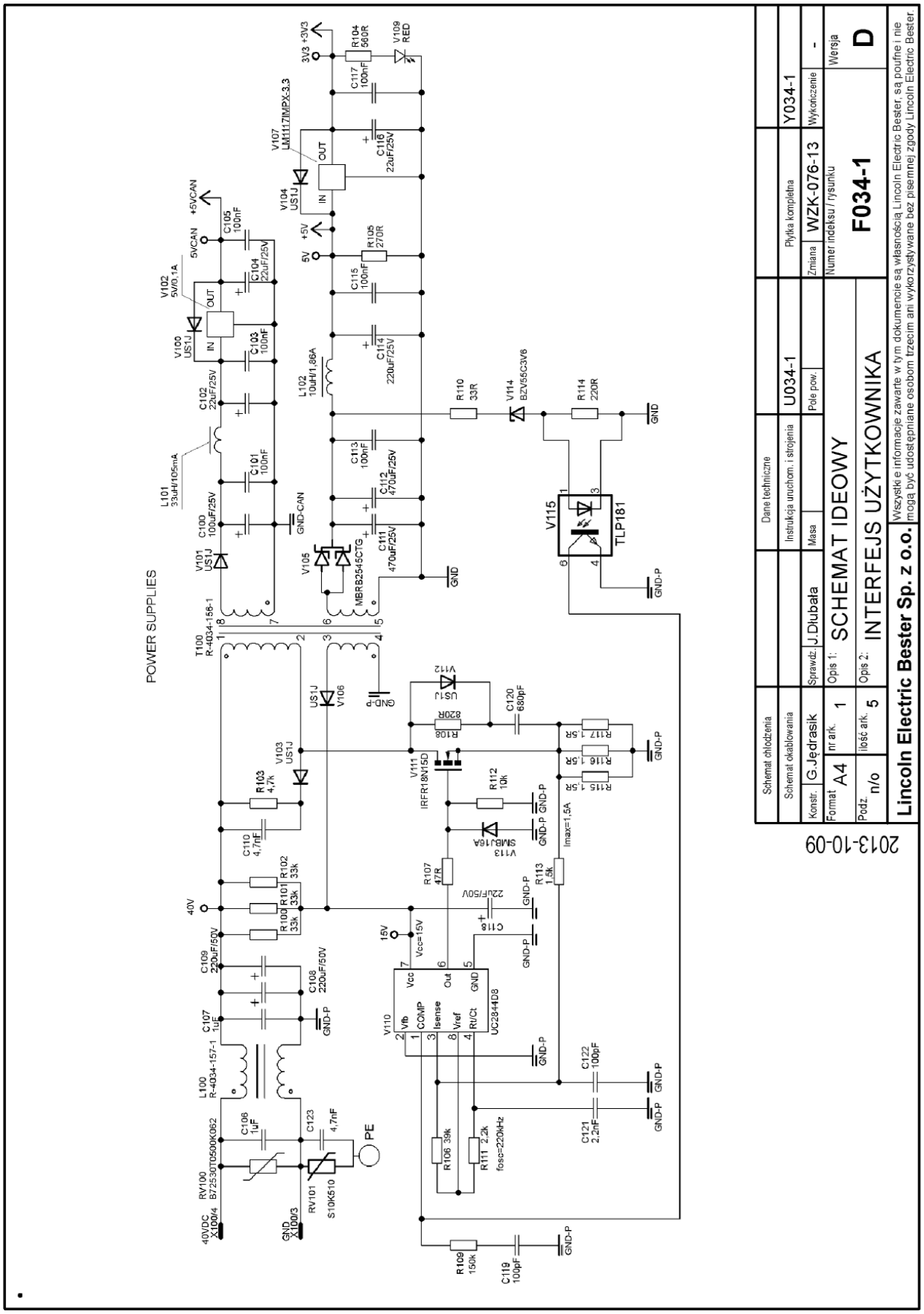
Wiring Diagram : PF42

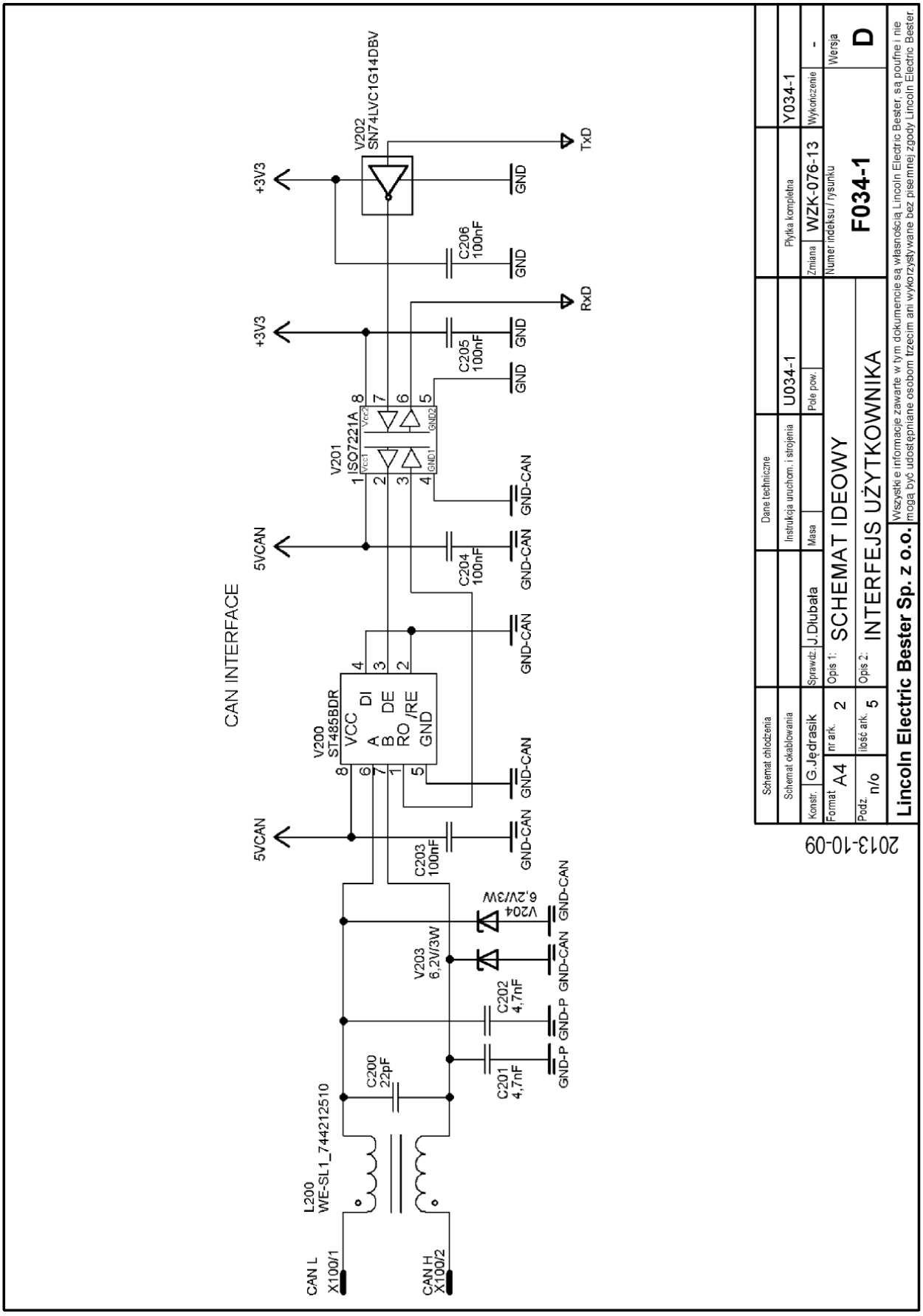


ELECTRICAL DIAGRAMS

MOTOR CONTROL BOARD Y035-1 SCHEMATIC




POWER SUPPLIES
Schemat chłodzenia
Schemat okablowania
Konstr. G.Jędrasik
Sprawdz. J.Dłubała
Format A4 nr ark. 1
Podz. n/o ilość ark. 5
Opis 1: SCHEMAT IDEOWY
Opis 2: INTERFEJS UŻYTKOWNIKA
Dane techniczne
Instrukcja uruchom. i strojenia
Masa
U034-1
Pole pow.
Płytka kompletna
Y034-1
Zmiana WZK-076-13
Wykończenie -
Numer indeksu / rysunku
F034-1
Wersja D
2013-10-09
Lincoln Electric Bester Sp. z o.o.
Wszystkie informacje zawarte w tym dokumencie są własnością Lincoln Electric Bester, są poufne i nie mogą być udostępniane osobom trzecim ani wykorzystywane bez pisemnej zgody Lincoln Electric Bester.


CAN INTERFACE
V200 ST485BDR
V201 ISO7221A
V202 SN74LVC1G14DBV
V203 6,2V/3W
V204 6,2V/3W
L200 WE-SL1_744212510
C200 22pF
C201 4,7nF
C202 4,7nF
C203 100nF
C204 100nF
C205 100nF
C206 100nF
+3V3
5VCAN
GND
GND-CAN
GND-P
TxD
RxD
CAN L X100/1
CAN H X100/2
Schemat chłodzenia
Schemat okablowania
Konstr. G.Jędrasik
Sprawdz. J.Dłubała
Format A4
nr ark. 2
Podz. n/o
ilość ark. 5
Opis 1: SCHEMAT IDEOWY
Opis 2: INTERFEJS UŻYTKOWNIKA
Dane techniczne
Instrukcja uruchom. i strojenia
Masa
U034-1
Pole pow.
Płytka kompletna
Y034-1
Zmiana WZK-076-13
Wykończenie -
Numer indeksu / rysunku
F034-1
Wersja D
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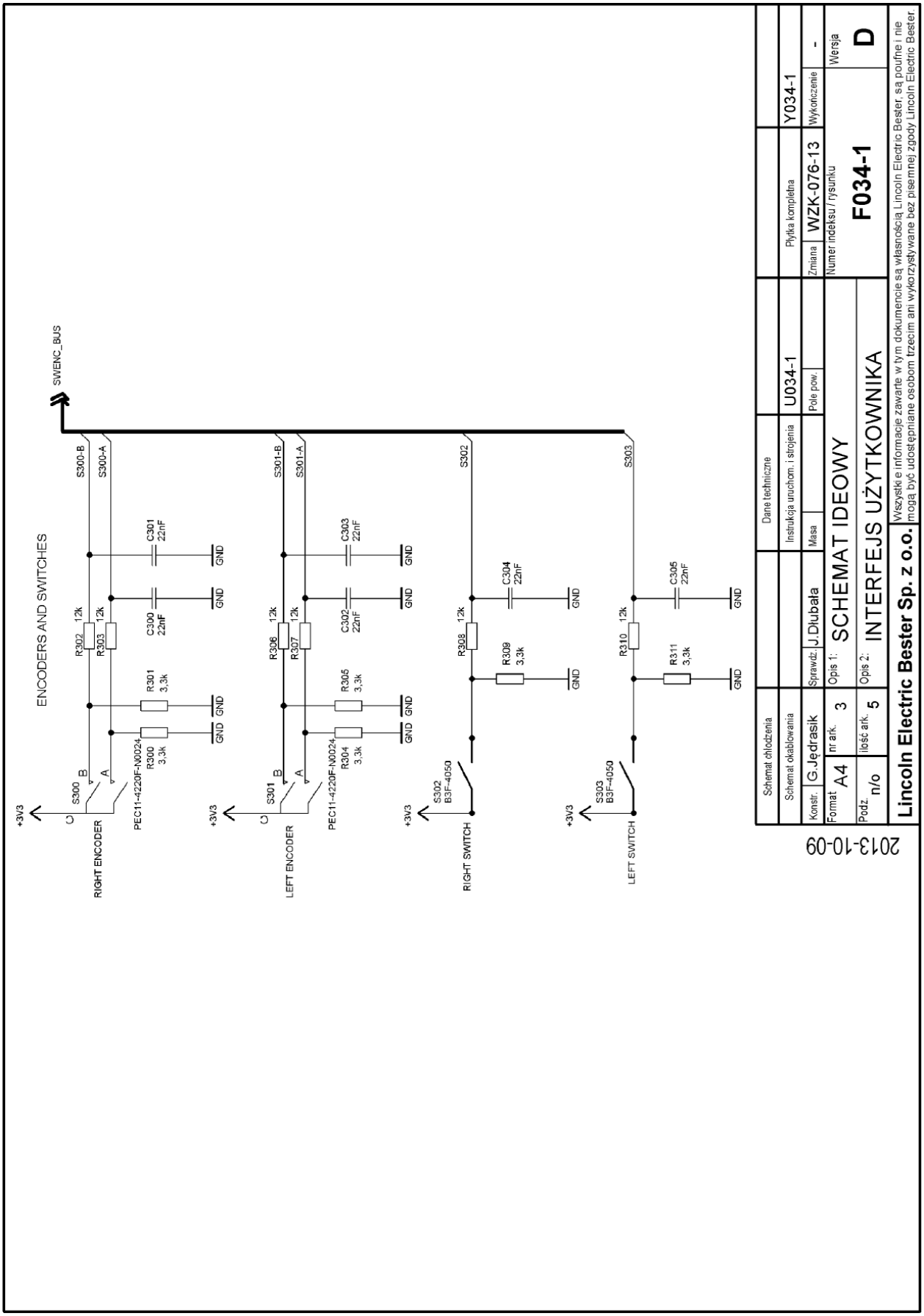
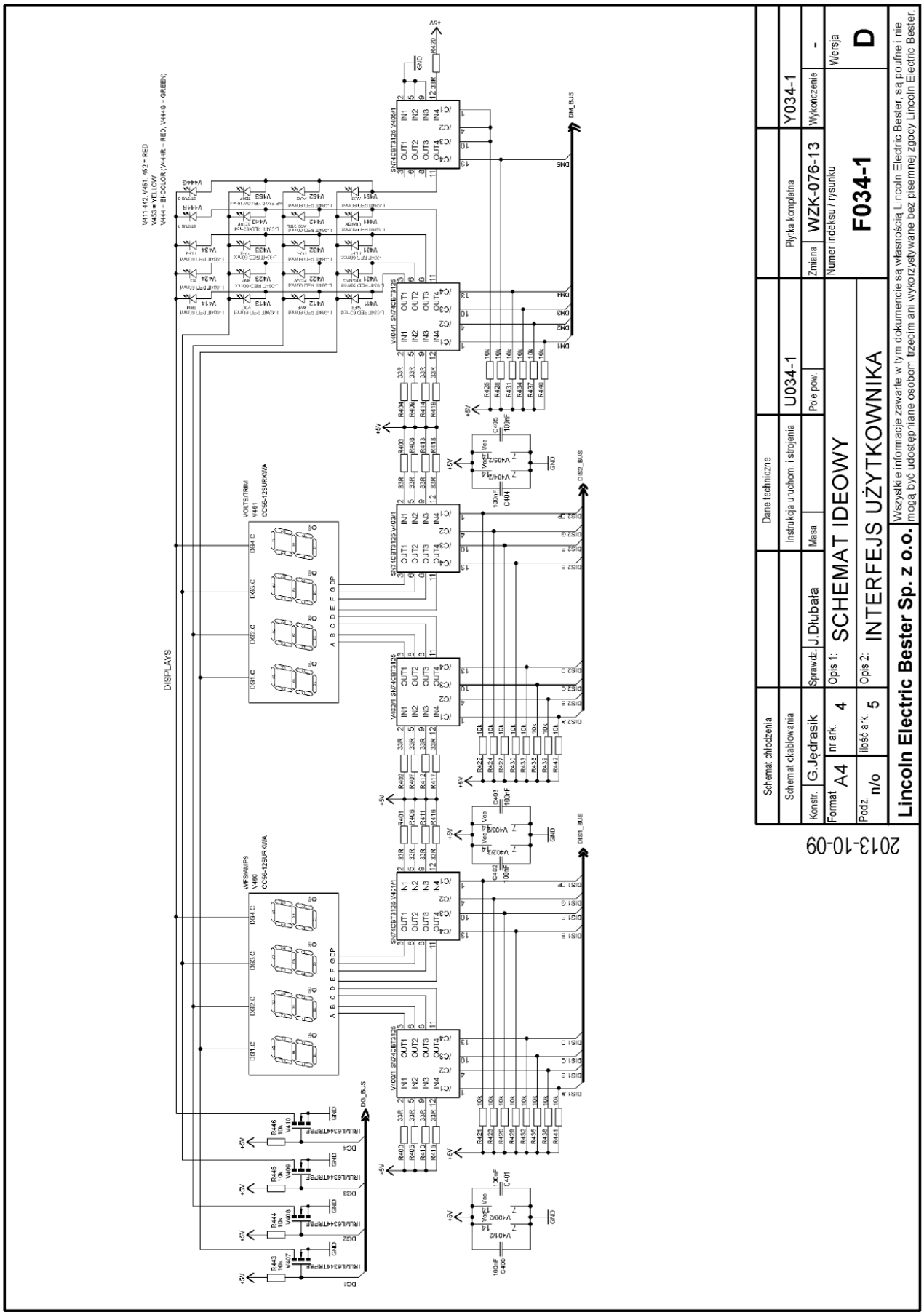
2013-10-09


ENCODERS AND SWITCHES
SWENC_BUS
+3V3
S300
S300-B
S300-A
PEC11-4220F-N0024
R300 3,3k
R301 3,3k
R302 12k
R303 12k
C300 22nF
C301 22nF
GND
RIGHT ENCODER
S301
S301-B
S301-A
R304 3,3k
R305 3,3k
R306 12k
R307 12k
C302 22nF
C303 22nF
LEFT ENCODER
S302
B3F-4050
R308 12k
R309 3,3k
C304 22nF
RIGHT SWITCH
S303
R310 12k
R311 3,3k
C305 22nF
LEFT SWITCH
Schemat chłodzenia
Schemat okablowania
Konstr. G.Jędrasik
Sprawdz. J.Dłubała
Format A4
nr ark. 3
Opis 1: SCHEMAT IDEOWY
Podz. n/o
ilość ark. 5
Opis 2: INTERFEJS UŻYTKOWNIKA
Dane techniczne
Instrukcja uruchom. i strojenia
Masa
U034-1
Pole pow.
Płytka kompletna
Y034-1
Zmiana WZK-076-13
Wykończenie -
Numer indeksu / rysunku
F034-1
Wersja D
Lincoln Electric Bester Sp. z o.o.
Wszystkie informacje zawarte w tym dokumencie są własnością Lincoln Electric Bester, są poufne i nie mogą być udostępniane osobom trzecim ani wykorzystywane bez pisemnej zgody Lincoln Electric Bester.
2013-10-09


Schemat chłodzenia
Schemat okablowania
Konstr. G.Jędrasik
Sprawdz. J.Dlubala
Format A4
nr ark. 4
Podz. n/o
ilość ark. 5
Opis 1: SCHEMAT IDEOWY
Opis 2: INTERFEJS UŻYTKOWNIKA
Dane techniczne
Instrukcja uruchom. i strojenia
Masa
Pole pow.
U034-1
Płytka kompletna
Y034-1
Zmiana
WZK-076-13
Wykończenie
-
Numer indeksu / rysunku
F034-1
Wersja
D
2013-10-09
Lincoln Electric Bester Sp. z o.o.
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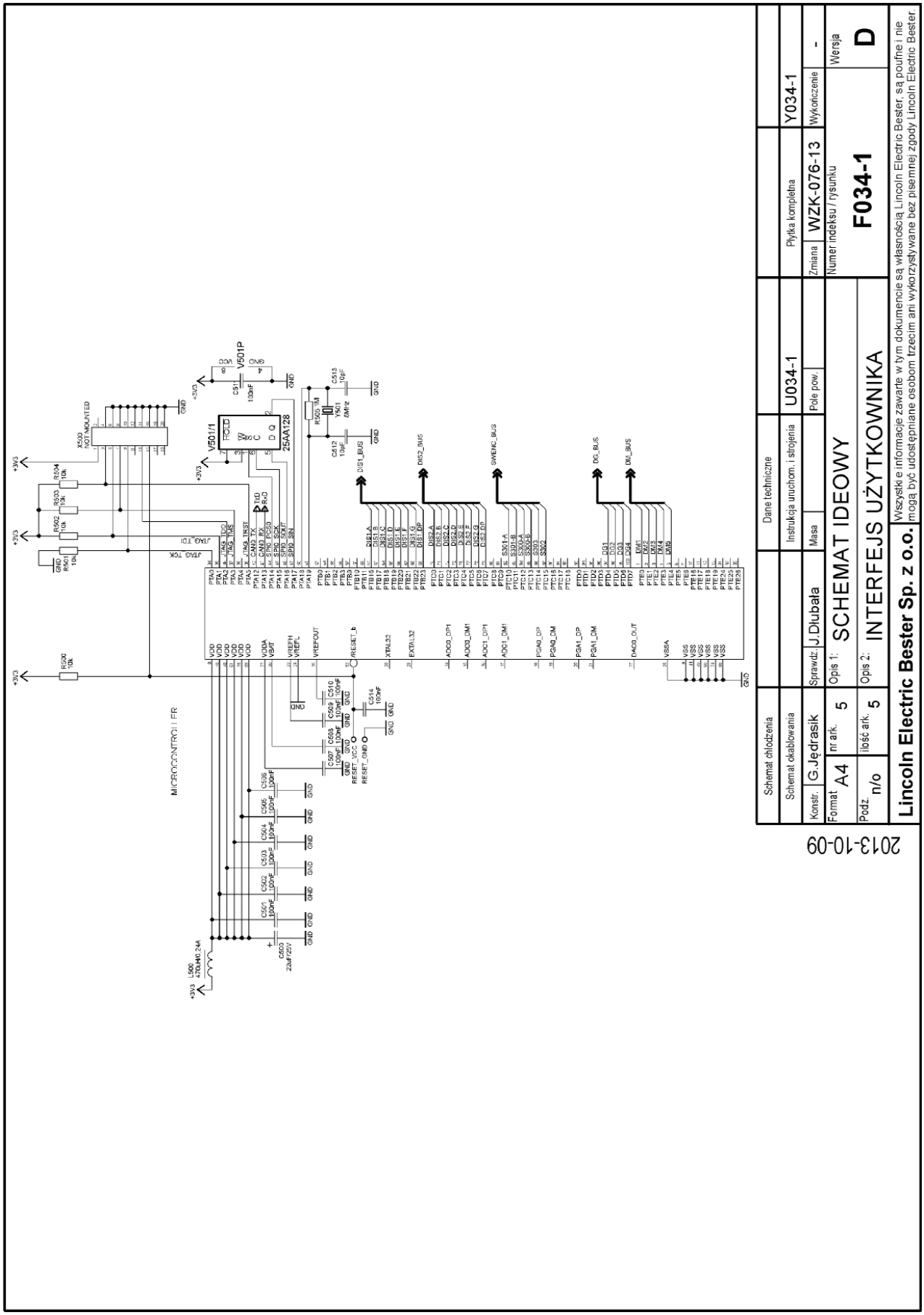
DISPLAYS
V491
V490
DIS1_BUS
DIS2_BUS
DIG_BUS
DNS_BUS


Schemat chłodzenia
Schemat okablowania
Konstr. G.Jędrasik
Format A4 nr ark. 5
Podz. n/o ilość ark. 5
Sprawdz. J.Dłubała
Masa
Opis 1: SCHEMAT IDEOWY
Opis 2: INTERFEJS UŻYTKOWNIKA
Dane techniczne
Instrukcja uruchom. i strojenia
U034-1
Pole pow.
Płytka kompletna
Y034-1
Zmiana WZK-076-13
Wykończenie -
Numer indeksu / rysunku
F034-1
Wersja D
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2013-10-09

NOTE