

Pilot Plant since 1959

PATON®



Data sheet and operating manual

PATON™ wire feed unit
WFU-5 | WFU-15-2 | WFU-15-4





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1. GENERAL PROVISIONS

Digital welding wire feed unit PATON WFU-5/15-2/15-4 it is designed to work with an external welding source in semi-automatic welding mode. Whereby power source supplies power welding current, and wire supply unit provides stable supply of solid or flux-cored wire in the weld pool.

Supply unit has its own inverter power source to power of motor, the valve to supply protective gas and the control circuit. Distinctive feature of the PATON feed units is a very powerful, high-quality and sealed metal wire feed mechanism, as well as the presence of the KZ-2 connector of the "EURO" type, which has become the standard in the world, allowing the user to change the burners at his discretion in the future. The unit has a built-in protective gas supply valve.

During the operation of the supply unit, its internal digital control board itself receives signals from the connector KZ-2 from button on the burner and at the right time switches on the protective gas supply valve, then with a given delay gives a signal to turn on the power supply, then the control board switches on

the wire feed motor and stabilizes its rotation speed. After end of welding process everything is switched off in reverse order with the necessary delays. Everything is set to optimal parameters by default.

The unit is most optimized to work with PATON production sources and will require the user a minimum of time to adapt, as the response space for connectors and installation is already provided in the design.

| CHARACTERISTICS | WFU-5 | WFU-15-2 | WFU-15-4 |
|---|------------------------------|------------------------------|-----------------------------|
| Rated supply voltage 50Hz, V | 220 | 220 | 220 |
| Rated consumed current from power network, A | 0.25 | 0.25 | 0.38 |
| Rated welding current, A | 250 | 250 | 315 |
| Maximum welding current, A | 315 | 315 | 400 |
| Duration of load (DL) | 70% at 315 A 100% at 250A | 70% at 315 A 100% at 250A | 70% at 400A 100% at 315A |
| Change limits of supply voltage, V | 180 – 260 | 180 – 260 | 180 – 260 |
| Quantity of pressure rollers | 2 | 2 | 4 |
| Limits of wire feed speed regulation, m/min | 2.0 – 16.0 | 2.0 – 16.0 | 2.0 – 16.0 |
| Diameter of solid welding wire, mm | 0.6 – 1.2 | 0.6 – 1.2 | 0.6 – 1.6 |
| Maximum weight of the wire spool, not more than | 5 | 15 | 15 |
| Wire threading function | exist | exist | exist |
| Function of presence check of protective gas | exist | exist | exist |
| Rated power consumption, VA | 55 | 55 | 85 |
| Maximum power consumption, VA | 80 | 80 | 115 |
| Operating temperature range | -25 ... +45°C | -25 ... +45°C | -25 ... +45°C |
| Overall dimensions, mm (length, width, height) | 345x260x270 | 430x260x270 | 430x275x290 |
| Weight without coil and accessories, kg | 7.0 | 7.5 | 8.2 |





- 1- button for wire threading, when pressed only turns on wire feed, everything else remains off;
- 2-Digital seven-segment display;
- 3 - Buttons to adjust the feed rate (or selected parameter) to decrease and increase;
- 4- Button to check the presence of protective gas supply; when pressed, only the gas valve is turned on, everything else remains off;
- 5 - Function selection button (locked to protect against unauthorized access see clause 4);
- 6 - Lifting lid;
- 7- Socket KZ-2 type "EURO" for connection of semi-automatic burner;
- 8 - Male plug of giving the power current to the wire feed mechanism;
- 9- Mechanism for installing wire coil with internal brake;
- 10 - Inlet to start the welding wire threading;
- 11 – power cord of the power supply 220V;
- 12 – Button switch on/off of the device (decorative color);
- 13 - Protective gas supply fitting;
- 14 – Connector of flow control signals from the wire feed unit to external source of welding current.

2. COMMISSIONING

Attention! Before commissioning should read the section "safety regulations" C. 13.

2.1 INTENDED USE

The feed unit is designed exclusively for supplying solid or flux-cored welding wire.

Other use of the device is considered to be inappropriate. Manufacturer shall not be liable for damage caused by inappropriate use of the device.

Use for its intended purpose is subject to the instructions in this operating manual.

2.2 REQUIREMENTS FOR PLACEMENT

The feed unit can be located and operated outdoors. Internal electrical parts of the device are protected from direct exposure to humidity, but not from condensation drops.

ATTENTION! After storage in a cold place, when used in a warm room inside closed areas water condensate forms; for this reason, you can't turn on the device before 1... 2 hours!

It is necessary to place the device so that unhindered access to the lifting cover is provided. Make sure that metal dust (such as sandpaper dust) does not access into the machine.

ATTENTION! The feed unit after a strong fall can be life-threatening. It should be installed on stable solid surface.

2.3 CONNECTING TO THE POWER NETWORK

The feed unit in serial version is designed for mains voltage 220V (-15% +20%).

Attention! When connected to mains voltage higher than 270V, all manufacturer's warranty obligations are void! This situation can occur when there is very large phase voltage skew in the standard power network or when using a non-standard connection.

Also the manufacturer's warranty obligations void when the power network phase is mistakenly connected to the ground wire.

Mains plug, cross-sections of the power supply extensions and mains fuses must be selected on the basis of technical data of the device.

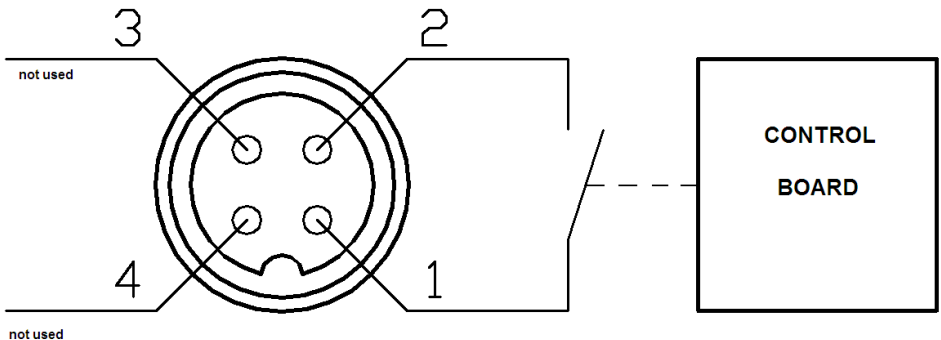
Attention! Mains plug should match the supply voltage. According to safety regulations, use sockets with **guaranteed grounding!!!**

2.4 CONNECTING THE POWER CURRENT CONTACT

It is carried out by means of a power bayonet connector **8** to the corresponding pole of the external welding source. As a rule, for welding with solid wire is connected to the "positive" pole, and when welding with flux wire should be connect to the "negative" pole of the welding source.

2.5 CONNECTING THE CURRENT SOURCE CONTROL MALE PLUG

To control the switching on and off of the external power source of welding current during semi-automatic welding, the plug **14** with the following wiring diagram is used:



Only contacts 1 and 2 are used, which are closed at the right moments with a relay, maximum switching current is not more than 1.5 A, maximum switching voltage is not more than 220V. At the moment when the source should work, the relay contacts are closed, and when the source should be off they are opened.

ATTENTION! Wiring diagram for power source of current for each case is **individual**, therefore it is not described in this wire feed unit manual. Look for it in the operating manual of the power source.

In the power current sources of PATON production of a new generation everything it is already provided, so adaptation will take place with minimal effort. It is enough to check the presence of the control connector on rear panel of the source; if it is installed, the time will only be spent on fixing the plug in this connector, if it is not, then you need to contact service to install it.

2.6 SWITCHING ON THE WIRE FEEDER UNIT

It is carried out by means of the mains switch **12** on rear panel of the unit.

2.7 SUPPLYING THE SHIELDING GAS

Hose from protective gas cylinder is connected to connector **13** on rear panel of the feed gas unit.

ATTENTION! Pressure reducer should already be pre-installed on the cylinder, optimum outlet pressure is set individually for each specific case. If you are a beginner and have no experience in setting the optimal pressure for welding a particular product, then at the first moment gas pressure can be set more than the optimal value of ~0.2 MPa, this will have little effect on the process, only will increase consumption of shielding gas. But in the future, to save money, follow the general guidelines for welding with semiautomatic devices.

Press button **4** on front panel of the feed unit to check whether the protective gas supply is available.

2.8 INSTALLING THE WIRE SPOOL

For fastening the spool, quality mechanism **9** with internal brake is used to prevent spontaneous rotation of the coil. To increase or decrease the degree of slowdown, use screw under the plastic "nut"

ATTENTION! Do not clamp spool tightly, the degree of clamping should be the minimum necessary to keep the coil from spontaneous rotation. If more than is needed, it will create an extra force on the motor and ultimately lead to uneven wire feed.

Having opened the lifting cover **6** for wire filling, elevate the clamping rocker arms upwards, plastic cams are used to unlock them.

End of the wire moves into the hole **10** in rear wall of the block, then wire should be passed through the entire metal wire feeder: from the back of the flexible helix, between the rollers, to exit from the connector KZ-2 type EURO. Fix with clamping rocker arms. Clamping force is regulated by cam.

ATTENTION! Do not clamp tightly the rocker, similarly as in the coil braking mechanism; here the degree of clamping should be minimally necessary for pushing the wire when the wire is not much clamped with a hand.

2.9 INSTALLATION THE WELDING TORCH

Torch is fixed with screw connection in connector **7** on front panel of the feed unit. Screw as much as possible until it stops!

Quality of the contact must be ensured, since entire working welding current passes through this connector.

2.10 WIRE THREADING

After securing the wire with the rocker arm, press button **1** on front panel and wait for wire to come out of the torch nozzle. At the same time, for convenience, wire feed rate increases smoothly to the maximum, this can be seen from the indication on the front panel.

3. FEED UNIT OPERATION

After successfully passing the previous points of preparation for operation, the feed unit shows its full functional readiness. After that, the wire feed unit is ready for operation.

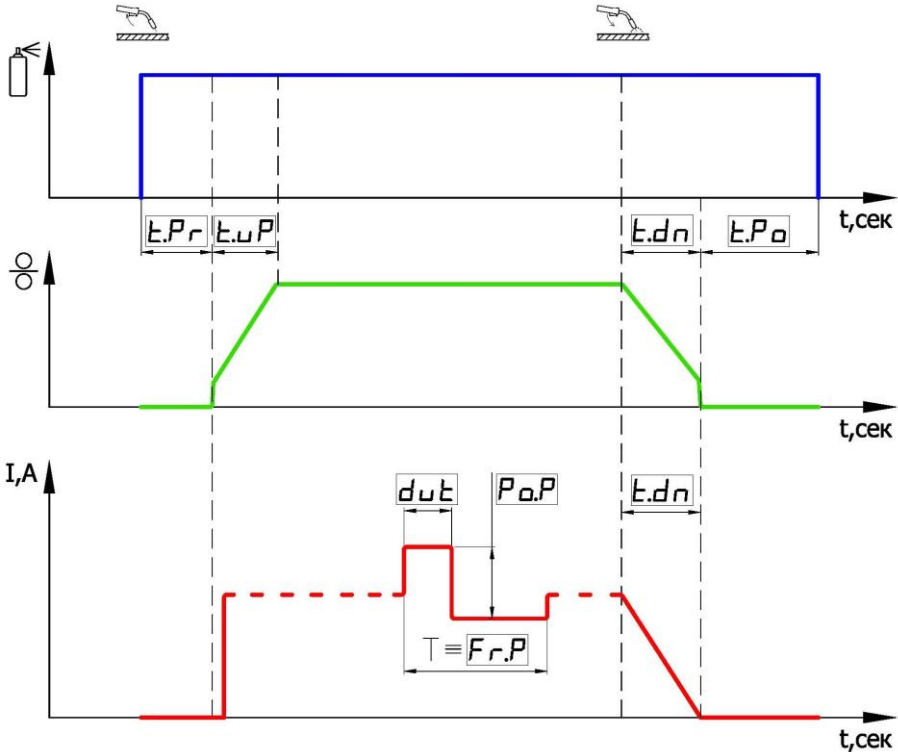
ATTENTION! Do not forget to connect opposite pole of the power supply unit to the product to be welded using the "mass" terminal.

Welding should be carried out according to the general recommendations for welding with semiautomatic devices.

If you are beginner and have no experience in setting the optimal wire feed speed for welding a particular product, then start from middle position of wire feed speed (~6..8 m/min) and average voltage at source (~19V) at any diameter of installed wire (Fo,6...1,2 mm); it may not be optimal, but with proper operation of the source and smooth wire feed (without jerks, checked ONLY AT IDLE "on weight"), as well as correct connection, this bunch "source + supply unit" should carry out welding.

By default pre-blowdown with shielding gas is set to 0.5 sec, after blowdown – 1.5 sec.

3.1 MIG/MAG-2T WELDING PROCESS CYCLE



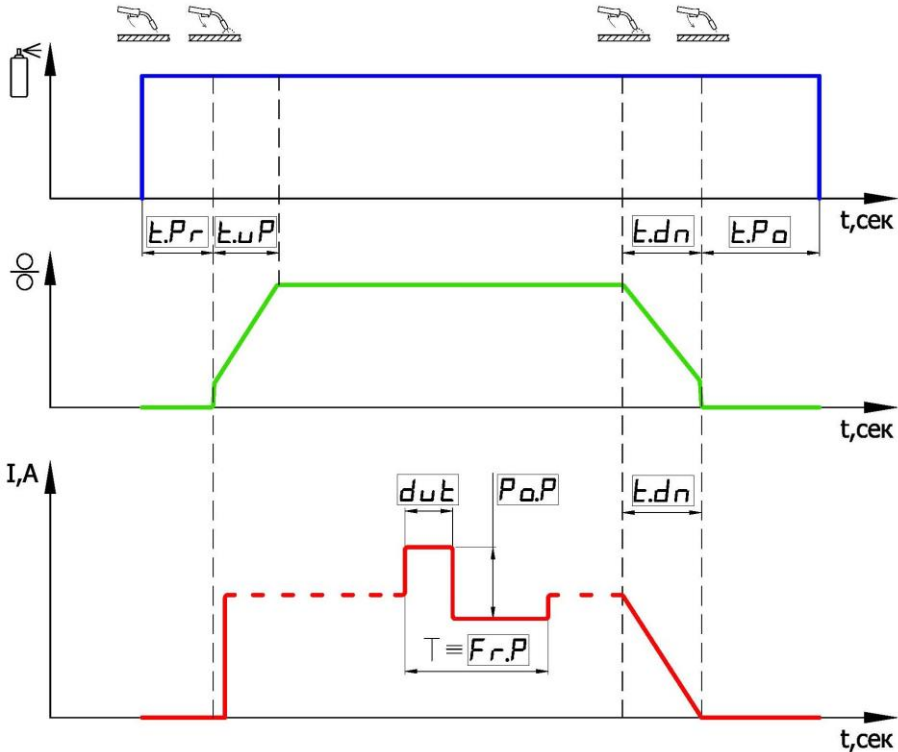
Order of changing the value of any function, see clause 4

3.1.1 FUNCTION OF BUTTON ON A TORCH - 2T

It is used for welding short and medium length joints. Function is the following: when the button is pressed on burner, control signal enters the control unit, function of pre-blowdown the welding zone with gas during the time $[t.P_r]$ (the gas valve opens) is processed, then signal is given to turn on the source and wire feed motor. From this moment the welding process begins, at the same time function of smooth output to the welding mode for the time $[t.uP]$ is carried out, as well as can be carried out additional functions (for example, pulse current mode is provided in digital sources of the PATON brand of the latest generation), all this according to the cycle of the welding process described in the cyclogram of clause 3.1. After releasing the button, function of smooth fall of current and wire feed rate during the time $[t.d_n]$ is tested, then source turns off. Then, function of after gas

blowdown the welding zone during the time [t.Po] is carried out (gas valve closes with a delay).

3.2 MIG/MAG-4T WELDING PROCESS CYCLE



Order of changing the value of any function, see clause 4

3.2.1 Function of button on the torch - 4T and _4T

- world standard of button mode - 4T
- an alternative mode of button - _4T

It is used for welding long seams. Function is the following: when button is pressed on torch, control signal enters to control unit, function of gas pre-blowdown of welding zone is carried out (gas valve opens), after button is first released the signal is given to switching on the source and motor of the wire feeder. From this moment, welding process begins, at the same time, function of a smooth exit to welding mode during the [t.U.P] time is worked out, and additional functions can also be worked, (for example, in digital sources of the latest generation PATON

brand, pulse mode is provided), all this according to the cycle of welding process described in cyclogram section 3.2.

4. SWITCH TO THE REQUIRED FUNCTION

If the system of protection against unauthorized access to the function menu is installed, when you press the button **5**, no changes occur on the indicator, that is, this button is locked. To unlock you need to keep it pressed for more than 3.5 seconds. When unlocked, indicator displays horizontal bars indicating that the function menu is unlocked. After successful unlocking by pressing the **5** button, digital indicator displays graphical name of current function and while held down, it can be viewed. When the button is released, current value of this function is displayed, which can be changed to a smaller or larger side using the **3** buttons. By quickly pressing and releasing the **5** button, you can switch to the next function in a circle.

4.1 GENERAL LIST AND SEQUENCE FUNCTIONS

- o) [-1-] main displayed parameter is v_{feed} SPEED = 7.0 m/min (default)
 - (a) 2.0 ... 16.0 m/min (step change of 0.1 m/min.)
- 1) [But] button mode on burner = [2T] (default)
 - a) [2t] - 2T button mode on burner
 - b) [4t] - 4T standard mode button on the burner
 - c) [_4t] - alternative 4T mode button on the burner
- (2) [t.Pr] protective gas pre-blowdown time = 0.5 sec (default)
 - (a) 0.1 ... 25.0 sec (change step 0.1 sec)
- 3) [t.Po] after blowdown time with shielding gas = 1.5 sec (default)
 - (a) 0.1 ... 25.0 sec (change step 0.1 sec)
- 4) [t.uP] rise time of wire feed speed = 0.1s (default)
 - (a) 0.1 ... 5.0 sec (change step 0.1 sec)
- 5) [t.dn] wire feed speed decay time = 0.1s (default)
 - (a) 0.1 ... 5.0 sec (change step 0.1 sec)

5. CARE AND MAINTENANCE

Attention! Before you open the unit, you must turn it off, remove the mains plug. Given the opportunity discharge internal circuits of the device (about 1 min) and only after that you can perform rest of the action. When you maintain the device install a sign prohibiting its switching on.

In order to keep the feed unit operational for many years, you should comply with several rules:

- perform inspections of accident prevention at specified intervals (see section " Safety Regulations");
- in case of intensive use, we recommend once a year to blow the unit with dry compressed air. **Attention!** Gas blowdown from too short a distance may damage the electronic components;

6. OPERATION MODE FROM THE GENERATOR

Feed unit consumes very little, usually no more than 100W, so the main condition is that output voltage of generator should not go beyond the allowable limits of 180-260V.

7. STORAGE RULES

Preserved and packaged wire feeder should be stored in storage conditions 4 according to GOST 15150-69 for a period of 5 years.

Reconditioned feed unit should be stored in dry closed rooms at air temperature not below plus 5 °C. In the premises should not be acid vapors and other active substances.

8. TRANSPORTATION

Packed feed unit can be transported by all types of transport, ensuring its safety in compliance with the rules of transportation established for this type of transport.

9. SCOPE OF DELIVERY

- | | |
|--|----------|
| 1. Wire feed unit | – 1 pc; |
| 2. Wire roller 0.6-0.8 (installed) | – 1 set; |
| 3. Roller for wire 1.0-1.2 or 1.2-1.6 (for WFU-15-4) | – 1 set; |
| 4. Branded corrugated box "PATON" | – 1 pc; |
| 5. Burner semi-automatic, BINZEL 3M | – 1 pc; |
| 6. User's manual | – 1 pc. |

10. WARRANTY

Experimental Plant of Welding Equipment named after Paton E.O. guarantees correct operation of the wire feed unit in compliance with consumer operating conditions, storage and transportation.

Free warranty service is not available at:

- mechanical damage!

Warranty period is ___ years from the date of sale, signed in the certificate.

Warranty service does not include the replacement of consumable items worn out during operation, which have to be mandatory replace during repair, for example: power connectors and power sockets of the device.

11. SAFETY REGULATIONS

GENERAL PROVISIONS

The wire feed unit is manufactured in accordance with technical standards and established safety regulations. However, if handled incorrectly, there is a danger:

- injury of service personnel or a third party;
- causing damage to the apparatus itself or material values of the enterprise;
- disruption of an effective workflow.

All persons involved in the commissioning, management, care and maintenance of the device must:

- pass the appropriate certification;
- have knowledge of welding;
- strictly follow these instructions.

Malfunctions that may impair safety should be urgently cleared.

OBLIGATIONS OF THE USER

User undertakes to allow to work on the device only persons who:

- familiarized with basic safety regulations, were trained on the use of welding equipment;
- read the section "Safety Regulations" and instructions on the necessary precautions given in this manual and confirm this with your signature.

PERSONAL PROTECTIVE EQUIPMENT

For personal protection follow these rules:

- wear durable footwear that maintains electrical insulating properties, including in wet conditions;
- protect hands with insulating gloves;
- protect your eyes with protective mask with anti-UV filter that meets safety standards;
- use only suitable, not flammable clothing.

HAZARD OF HARMFUL GASES AND EVAPORATIONS

- remove smoke and harmful gases from the working area by special means;
- to ensure sufficient flow of fresh air;
- solvent vapors should not fall into radiation zone of welding arc.



DANGER OF MAINS AND WELDING CURRENT

Electrical shock can be fatal;

- welding cable must be strong, undamaged and insulated. Loose connections and damaged cable should be replaced immediately. Mains cables and cables of the welding machine should be systematically checked by electrician for proper insulation;

- during use it is forbidden to remove external casing of the device.

INFORMAL PRECAUTIONS

- in addition to the instructions it is necessary comply with applicable General and local safety and environmental regulations;

- if possible, do not install the device directly on conductive floor or desktop, use insulating pads.

PRECAUTIONS UNDER NORMAL CONDITIONS

At least once a week to check the device for external damage.

12. ACCEPTANCE CERTIFICATE

Inverter feed unit "PATON WFU-5/15-2/15-4»

Serial number _____BP is approved to operation

Sale date " ____ " _____ 20____

Place seal

(seller's signature)

=====



Date of acceptance for repair " ____ " _____ 20 ____

(signature)

Signs of malfunction:

Reason: _____

=====

Date of acceptance for repair " ____ " _____ 20 ____

(signature)

Signs of malfunction:

Reason: _____



Date of acceptance for repair " ____ " _____ 20 ____

(signature)

Signs of malfunction:

Reason: _____

=====

Date of acceptance for repair " ____ " _____ 20 ____

(signature)

Signs of malfunction:

Reason: _____
