

PANDROL



Preheater HFP 36V

SNCF APPROVAL AGT22382

OPERATION AND MAINTENANCE
MANUAL

S0000473

S0000486 (No SNCF Approval)

S0000498

S0000499 (No SNCF Approval)



Rev14
February 27 2024

Partners in excellence



Instruction video

Foreword

This user's manual is applicable to following products :

S0000473 : Preheater HFP 36V Propane (**commercialized until December 2023**)

S0000486 : Preheater HFP 36V Butane (**commercialized until December 2023**)

S0000498 : Preheater HFP 36V Propane (**commercialized since January 2024**)

S0000499 : Preheater HFP 36V Butane (**commercialized since January 2024**)

SNCF Approval n° AGT22382 only concerns Propane versions of HFP preheater, therefore S0000473 and S0000498.

Revisions historic

Revision	Date	Writer	Comments
V1	20/04/2021	ND	Creation
V2	06/12/2021	ND	Updated translation – remove e+
V4	08/12/2021	ND	Updated weight - added type DIN9 line
V5	15/12/2021	ND	Added the list of all HFP set up. Added instruction when when using the HFP with strong wind.
V6	21/01/2022	ND	Modification of several spare parts code. Added instruction to replace the nozzle and handling the HFP. Added QR code for online training video.
V10	03/11/2022	ND	Updated the list of reference number for HFP. Added Support D. Updated maintenance regime. Picture with user position.
V11	28/03/2023	ND	Added specificities for NWR (Ergonomic during handling) and information about cylinders adaptors.
V12	23/02/2024	RM	Global update
V14	27/02/2024	RM	Std FR

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1. General information

This user's manual is a translation of the French version. The French version will be decisive in case of litigation.

User or maintenance personnel must have read and understood these instructions for use.

The instructions must be always accessible and to all persons concerned.

1.1 About the notice

This user's manual has been drawn up according to the technical data applicable at the time of printing. Minor changes may occur as part of product improvement.

Technical data is given as an information.

The photos are non-contractual (modification of the machine, optional accessory, etc.)

1.2 General requirements

Labor laws applicable in the areas of use and the instructions relating to safety must be respected. In the event of non-compliance, the operator will assume full responsibility.

In the event of a discrepancy between the regulations at the operator those of the machine manufacturer and its supplier, the most stringent regulations will apply.

The purchaser is responsible for providing all equipment, consumables, and resources necessary for commissioning the product and training staff. The manufacturer of the product having non influence of the conditions of use and training of personnel, declines all responsibility for the application of the instructions and training received.

However, our After-Sales Service is at your complete disposal to provide consulting, training, and other advisory services.

1.3 Receiver of the operating instructions

The instructions for use described in this user's manual enable the product to be used properly.

These instructions are written for the exclusive use of qualified personnel who have proven their ability to handle the product as well as product maintenance personnel.

1.4 Exclusion of liability

Any use of the product different from that indicated is non-compliant and endangers the life and health of personnel as well as the surrounding equipment.

PANDROL declines all liability in the event of bodily injury or material damage to the operator or third parties in the following cases:

- When the product is not used in accordance with instructions,



- If these instructions have not been read or understood by the user or the maintenance personnel or if the personnel are not sufficiently qualified.
- If the product has been used for an application other than that intended,
- If the product is used in condition outside the indicated limit values
- If the product is not maintained using original spare parts,
- If components and related element of the product are modified arbitrarily.

1.5 Intellectual property

The technical characteristics and construction features of the product constitute the intellectual property of PANDROL.

The copyright on this user's manual belong to PANDROL. Any reproduction, publication, or any other mode of exploitation for competitive purposes of this user's manual is prohibited. The purchaser and operator of the product is prohibited from communicating its content to persons outside the company.

2. Safety labels explanation



Read the instruction manual carefully before operating or any maintenance.



Warning! The machine can be dangerous. Careless or incorrect use can result in injury to the operator.



Disconnect the HFP preheater before any maintenance.



Risk of contact with parts with electrical current inside the HFP.



Accessible parts that may remain hot after using the HFP, especially the tip of the torch.

3. General safety instructions



The HFP is only intended to be used for the preheating of rail ends in the moulds prior to welding with our Aluminothermic Welding Process. User must be trained to the PANDROL welding process and authorized by the worksite manager to work on the field.

- Never start up the rail saw until you have read and understood the directions for use
- User must always work with clean equipment
- In the event of use other than that recommended, PANDROL declines all responsibility
- Never use the HFP without first reading and understanding its instructions for use
- The user must always work with material in good order
- Never use the machine if you are tired or if you are taking substances, such as drugs, alcohol, which could impair vision, dexterity or the ability to judge
- The HFP user must comply with the regulations, procedures and site safety instructions in force
- The HFP is a dangerous machine which must be operated by a single user; practical training should be given to any new user
- Use and maintenance must be carried out by qualified personnel
- The operator must wear the necessary PPE for preheating operations: goggles, gaiters, overalls, gloves, etc.
- Handling and positioning of the HFP can be done by one person
- The operator must ensure that his working area is clear (People, animals, electric cables, flammable substances, etc.)
- The user should not make any changes to the design or configuration of the machine without consulting PANDROL
- The operator must have a stable position before starting to work
- Ensure correct positioning of the HFP on its support when in use
- Ensure that the propane cylinder is properly supported during use, keep it vertical, never lay the cylinder down during use
- Replace the protective cap of the propane cylinder valve before any handling, never handle the cylinder by its valve directly
- Use of gas cylinders must be in a well-ventilated area at all times
- Transport and store the HFP in its protective case
- Secure the propane cylinder on a support linked to the vehicle during transportation
- Position the flexible hoses straight with no kinks and away from sharp objects
- Always use this HFP under supervision; never let the HFP run alone
- Use lighting or install temporary lighting when carrying out work at night or in dark places
- During maintenance operations, the instructions and instructions given in this instruction manual must be observed
- It is strictly forbidden to intervene on or in the HFP during operation and bring your hands or other parts of the body in contact with the flame
- It is forbidden to operate the device outside of its possibilities and capacities predetermined by the factory settings and stated in this document



In the event of use in a confined space, or of small volume, or enclosed in a low point, such as for example a tunnel, forced ventilation should be implemented in this room. This ventilation will be arranged so as to ensure the permanent evacuation of burnt gases and any unburned gases.

- Wearing Personal Protective Equipment is necessary for the use of this HFP Preheater. This list is a prerequisite; it is liable to be modified with regard to the constraints specific to each particular environment that each site constitutes, which remains the choice and decisions of the user.



Suitable flame retardant work clothing, preferably cotton or similar material, covering the legs and arms.



A pair of high-top safety shoes with good heat resistance.



A pair of handling gloves adapted to the risk of burns category 3.



A pair of safety goggles suitable against projections of hot particles, white glass with side shields or Welding goggles



Approved hearing protection.

- In the event of a fire, shut off the gas supply at the cylinder and use an extinguisher to extinguish the fires. CO2 extinguishers are preferred
- In the event of an accident, refer to the worksite safety instruction

4. Description

This HFP preheater is a device for heating the rails as part of the realization of a weld of rails by the thermitic welding process.

This manual is written in conjunction with the instructions for installing the welds.

These documents should be referred to for the welding and installation procedure.

The unit is composed of :

- The Preheater, which integrate :
 - A variable speed air blower powered by battery
 - A propane gas injection device
 - HFP internal components

The HFP is equipped with a connector for the gas connection. Protections are installed to protect the gas connector against shocks and the batteries against rain.

A carrying handle is installed on the top of the box.

The equipped box weighs 17 kg without battery and 19 kg with batteries.

Its overall dimensions are (L x W x H): 750 x 340 x 295 mm approximately.



- A preheating torch attached to the HFP. (Removable since January 2024 on S0000498 and S0000499)
- 2 batteries 18V Metabo 8Ah (no included with HFP, must be ordered separately)
- A gas supply line comprising:
 - An adjustable gas pressure regulator to be screwed onto a gas cylinder. (Propane or Butane depending on HFP configuration)
 - A flame arrestor valve
 - A gas pipe standard EN 559 10/17 mm length 5 meters
 - A STAUBLI type RBE female coupler
 - A bleeding tube of the HFP preheater and its STAUBLI RBE connection
- A support to be screwed onto the rail allowing the HFP preheater to be placed in the working position.
- A specific storage case for this set. It allows to carry HFP with all accessories listed above.



Black box (Plastic)

HFP commercialized until December 2023
 Total weight with HFP and accessories: 45kg
 Dimensions (L x W x H) : 1000 x 500 x 400 mm
This reference is no longer available for sale

Aluminium box

HFP commercialized since January 2024
 Total weight with HFP and accessories: 38kg
 Dimensions (L x W x H) : 522 x 375 x 420 mm



Inside boxes

5. Use instructions

5.1 Storage

- Do not expose the machine to rain, this could cause a malfunction.
- Pack the HFP in its transport case.

5.2 Handling

To preserve health and wellbeing of the users, the following rules must be followed when handling the HFP.

5.2.1 Handling the HFP box

- The complete HFP box weighs between 38kg and 49kg depending on the version
- The HFP black box is composed of wheels for easy transport on smooth and clean surfaces
- If it's possible operator must avoid to carry the HFP box
 - Use lifting equipment such as hoist whenever it is possible. In that case, web sling must be put around the handles.
 - Use the wheels when it is possible
- If the HFP case must be transported by hand, 2 persons are required.. The HFP case must be put down every 10m to allow the users to have a rest.

5.2.2 Handling the HFP unit

The HFP weight 19kg with batteries. An ergonomic handle has fixed on the top of the unit to facilitate the handling. It is preferable to keep the HFP in its transport box on the railborne trolley at site and to take it out when needed.

If the HFP has to be carried on long distance, the user must put down the HFP every 10m to have a rest or when not possible switch hand to avoid reduce upper limb stresses.

5.3 Safety measures before use

5.3.1 Gas cylinder

Make sure that the propane gas cylinder is sufficiently filled to carry out the preheating correctly.

A 8 minutes preheating under a gas pressure of 1 bar will consume around 650g of gas, around 15 preheating with a 13kg gas cylinder.

The use of scales or equivalent can be used to find out the amount of gas remaining in the cylinder.

Using a gas cylinder heater blanket is recommended in case of :

- Low temperature
- Multiples preheating in a row
- Long preheating process (>15min)

Using a big gas cylinder is recommended for long preheating process (>15min)

5.3.2 Gas line

Check the maintenance has been done on the machine.

Examine the condition of each element of the HFP for :

- The pressure gauge must be in good condition, the windows not broken and the boxes not distorted
- The gas hose must not be split, cracked or cut
- The connections at both ends of the hose must be in good condition and correctly tightened
- The body of the HFP must be clean, not show any signs of damage
- The outlet nozzle of the HFP preheater must not be scaled or damaged by oxidation

If any of these conditions are not met, the HFP must be immediately removed from service.

5.3.3 Batteries

The HFP36v works with two 18v batteries in series. It is necessary to have 2 batteries to make it work.

Before use, check the charge level of the batteries by pressing the test button. **If a battery shows only one light, remove it and use a different one.**

The HFP checks the battery voltage before starting each cycle. If the voltage is too low to complete a cycle, the HFP will not start and illuminate the low battery indicator. (See "Control panel" Chapter)



To preserve the longevity of the batteries, it is advisable to avoid using a full battery with an empty battery.



Always turn off the HFP after using. Leaving it on indefinitely can damage the batteries. (Deep discharge)



In the case of using the HFP on a long preheating process, ensure that the battery level is enough (2 full loaded batteries allow preheating for 1 hour). Exceeding this time may damage the batteries.

Charging a battery takes about an hour. The autonomy of the HFP with 2 full batteries is 8 preheating cycles of 8 minutes.



5.4 Set up of the HFP

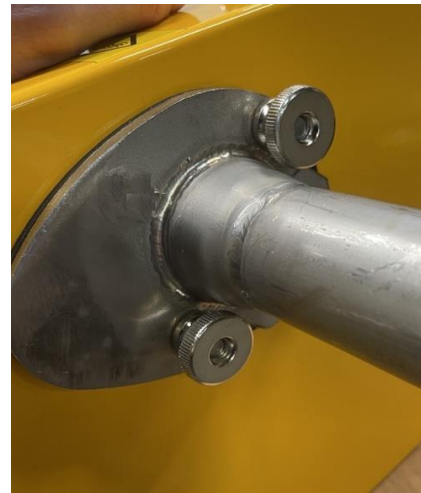
5.4.1 Set up of the torch on the HFP

This chapter only concerns HFP manufactured since January 2024 (S0000498 et S0000499)

HFP manufactured since January 2024 have a removable torch to allow the welder to store it in a compact aluminum box. The torch is secured by 2 hand-tightened nuts.

Assembly :

- Check the seal condition.
- Loosen the nuts slightly without dismantling them completely.
- Slide the HFP torch up and down and from left to right until it stops on the screws.
- Check the correct positioning.
- Tighten the nuts by hand.
- Check the correct tightening of the torch by pressing on it.



For disassembly **when the torch is cold:**

- Loosen the nuts slightly.
- Remove the torch by sliding it from bottom to top and from right to left.
- Tighten the nuts to hold the joints and prevent them from unscrewing during transport.

5.4.2 Positioning the HFP

Position the HFP Preheater support approximately 350mm from the end of the rail and tighten the fixing screw.

For the support choice and its adjustment, refer to chapter "HFP Support".

Place the HFP on its support frame so that the spout of the HFP is positioned in the center of the moulds. When placing the HFP on the railhead, stand face on/perpendicular to the rail, move the unit round in front of your body, and lean forwards to place it on and off the rail. Do not stand side on to the rail and bend sideways and/or twist your torso when doing this task.

If necessary, loosen the support to position the HFP correctly.

Ensure the good stability of the HFP unit and support.

In case of strong wind, set up the HFP back to the wind so the flames are now blown on the HFP when it runs at low speed during the first seconds of preheating.

5.4.3 Set up of the gas line

Position the gas cylinder near the HFP on the side of the track.

Make sure the cylinder is stable before removing the protective cap from the valve.



Do not produce sparks, do not present a flame and do not smoke during this phase!

Take the regulator and gas line hose assembly.

Examine the condition of each item thoroughly for:

- The regulator must not have any trace of shock or damage.
- The pressure gauge must be in good condition, the glass not broken, and the case not distorted (do not touch the setting)
- The hose must not be split, cracked or cut.
- The connections at both ends of the pipe must be properly tightened.

For the butane gas line, it is important that the pressure gauge serial number corresponding to the HFP serial number.



Remove the bleed hose from the retaining spring clip.

Connect the end of the gas line hose to the HFP fitting.

Clip the hose into the retaining spring clip.



Connect the regulator to the propane cylinder. The cylinder must always remain vertical during the welding operation. Tighten the screwed connection of the regulator on the propane cylinder very moderately (not to the left).

The butane gas line allows to connect a second gas cylinder to increase the gas pressure.



Open the cylinder valve a quarter turn and listen and / or feel for any leaks at the connection.

If a gas leak is discovered, immediately close the gas cylinder valve, and remedy the fault before continuing with the work.

The adjustment of the propane gas outlet pressure must be established at the pressure defined in the welding instructions.



The gas pressure is adjusted by slowly turning the HARRIS pressure regulator wheel.



The pressure regulator pressure gauge must indicate the pressure specified in the instructions during the entire preheating cycle. Only adjust this pressure on the regulator if it's necessary to maintain this value.

When the pressure needs to be constantly readjusted, it means the gas cylinder is empty and/or icing up. It must be put aside and use another for the next weld.

Adjustment wheels



Propane gas line



Butane gas line



The gas pressure reading on the manometer when stopped, will be slightly higher than the reading during the preheating operation.



Never search for a gas leak with the help of a flame



If a gas leak is suspected, do not attempt to correct it by tightening the fitting, but dismantle the fitting in search of a foreign particle inserted in the parting hose. In the event of such discovery, change the seal.

5.5 Ignition of the HFP

Make sure that the nozzle of the HFP is correctly centered in the moulds.

Set the main switch to position I.



5.6 Utilisation

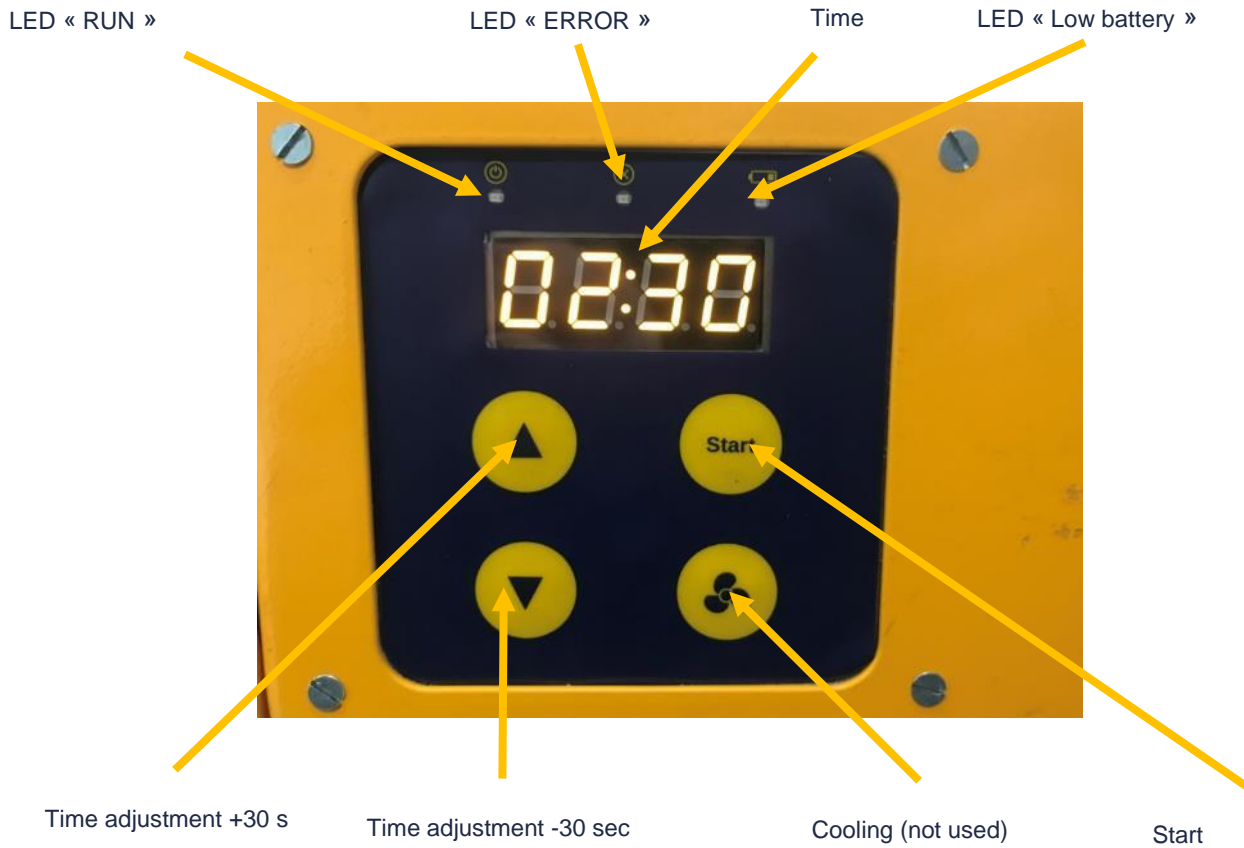
5.6.1 Réglage du temps de chauffage et démarrage

Adjust the preheating time on the timer of the HFP Preheater. The up and down buttons allow you to adjust the time in 30s increments.

Start the HFP preheater by pressing the "START" button.

The green "RUN" indicator lights up for the duration of the junction preheating cycle.

In the event of a fault or malfunction detected by the on-board PLC, the "ERROR" indicator light comes on and the HFP preheater goes off.



5.6.2 HFP preheater operating cycle

Two operating phases are carried out by the HFP preheater :

- The start-up for a duration fixed at about 35 seconds, phase in which the blower turns, gradually accelerates to reach the final speed. This phase is used to preheat the torch and the mold. In this phase, the flames reach about 60 cm high at the start and 20cm at the end. The countdown is not started yet.
- Full power for a period set by the previously set time delay. In this phase, the flames reach 20 to 25 cm in height (The height increases during preheating). On the timer, the countdown of the remaining time is displayed.

Let the HFP preheater operate for the entire time delay preselected on the timer.



In the event of a malfunction, first close the gas cylinder valve, then position the handle of the general on O.



If HFP does not start or does not create flame, refer to the malfunction table.



Bell igniter HFP ignition.

In the event that the problem arises from a fault in the high voltage generator generating the spark, the HFP can be ignited with a bell igniter.

Start the cycle, position yourself with your back to the wind, reach out and activate the igniter over a pipe. Do not position yourself above the moulds, this will avoid any risk of burns when the flame emerges. This operation must be carried out during the first 20 seconds of the cycle, before the maximum speed is reached. After 20 seconds, switch off the HFP and start again.

5.6.3 HFP Operation

Monitor the HFP for the time required during preheating, you can also use this time to prepare the crucible and the portion. The noise of the turbine and the HFP provides information on its operating state; monitoring this operating parameter requires staying in the immediate vicinity.

5.7 Stopping the machine

When the required operating time has elapsed, the HFP will shut down on its own.

Close the gas supply valve on the cylinder.

Return the main switch to position O. **The HFP must be turned off and on between each cycle. It will not be able to restart if the power has not been cut off after the previous cycle.**



The following operations are carried out on very hot parts and objects, sources of risk of serious burns. Wearing personal protection against the risk of burns and the use of handling tools are required.

Carefully remove the HFP, along with the gas hose from its support, taking care not to damage the internal walls of the moulds.

Carefully place the HFP in a safe area away from the casting operation, taking care not to touch the torch nose, or to place it near or against anything flammable. Take care not to bang the nozzle as this can result in damage to it.

Loosen the thumbscrew on the rail of the HFP support and remove it.

Resume the aluminothermic welding procedure, by the casting operation, which must very quickly follow the preheating phase.

5.8 Storing the HFP

Once the weld has been made, store the HFP in its case. Wait 15 minutes after the end of the last preheating to ensure that the torch nose has cooled sufficiently. This time can be reduced by starting HFP with no gas for a few minutes.

- Disconnect the hose from the gas line on the HFP side.
- Check that the HFP is turned off (general switch on O).
- Place the HFP in its location in the case
- Store the HFP support in the case
- Bleed the gas by connecting the purge hose, then remove it

- Disconnect the pressure regulator from the cylinder, replace the bottle cap
- Put it in the suitcase, in the housing provided for this purpose
- Coil the hose over the pressure regulator
- Close the case

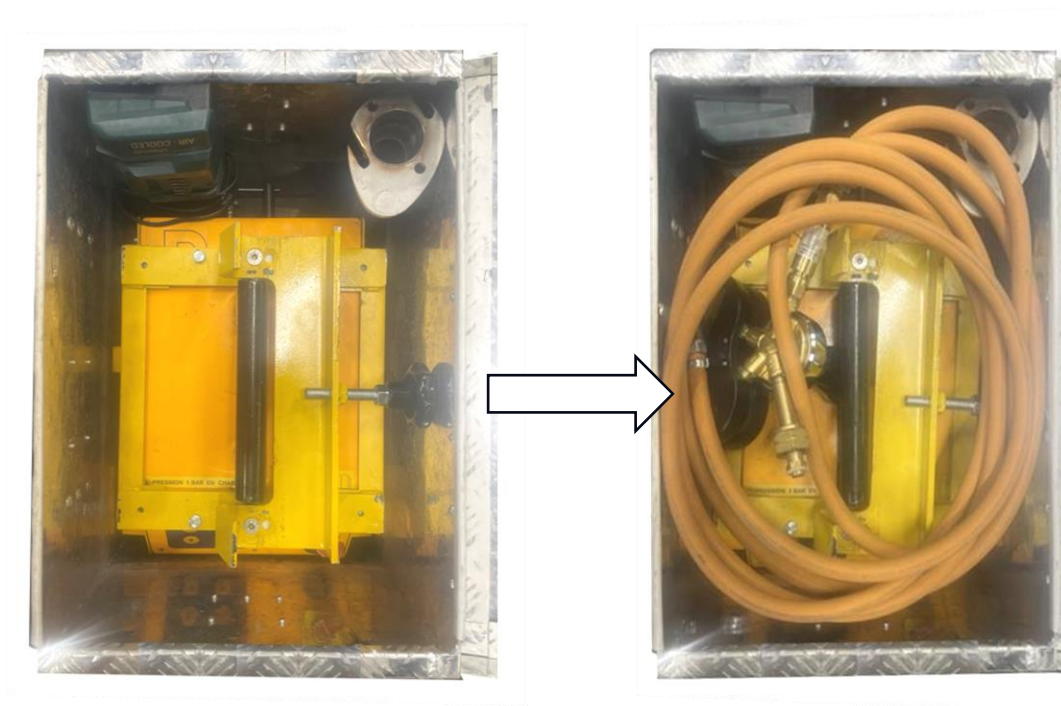
Take the gas cylinder to the transport vehicle and secure it from movement (or to the next work location).



The securing of the gas cylinder must be achieved by a reliable means, such as a strap and secure housing for clamping the gas cylinder, or any other means of equivalent effectiveness. The use of bungee cords or elastic bands is prohibited.

Storing in the compact aluminium box.

- Store the HFP
- Put the charger and the torche along the front side.
- Put the universal support upside down around the handle.
- Put the gas line with the pressure regulator along the handle.



5.9 Workstation

The user's workstation area is represented by a yellow perimeter.



6. HFP support

HFP support must be selected according to the rail and the preheating process. Refer to Chapter 10 for more information on configuring and choosing the right support. There are 2 types of supports :

6.1 Fixed support

They are suitable for users who mainly weld on the same type of rails. They are not configurable.



A Support :

Vignol rail – 90mm



B Support :

Grooved rail – 90mm



C Support :

PLA EVO – 70mm

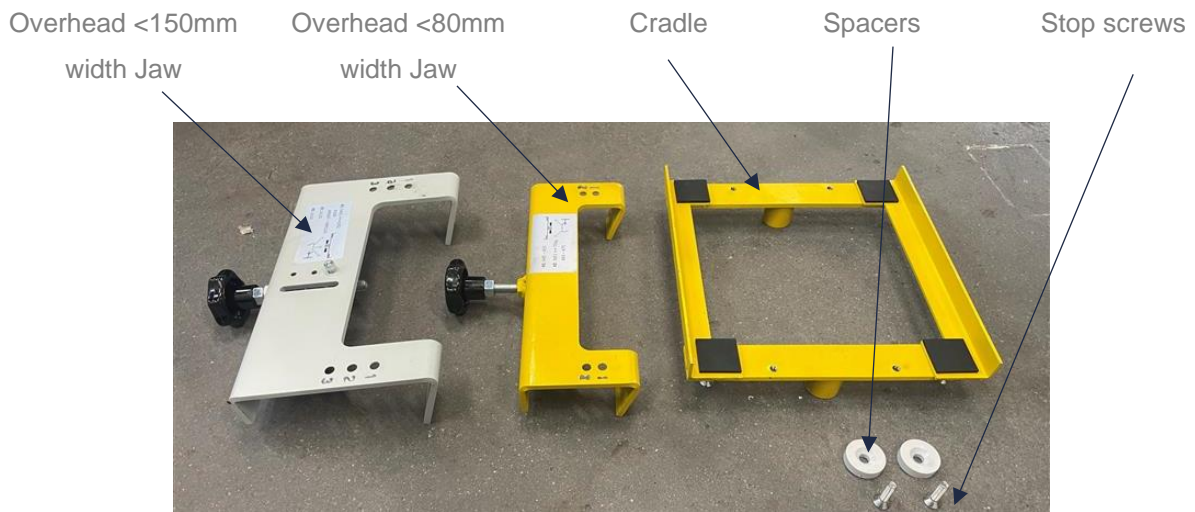


HEM Support :

HEB : HEM – 90mm

6.2 Universal support

It is modular and can be adapted to all rail profiles, including crane rails. It is composed of a removable cradle and mounting supports. The height is adjusted with spacers.

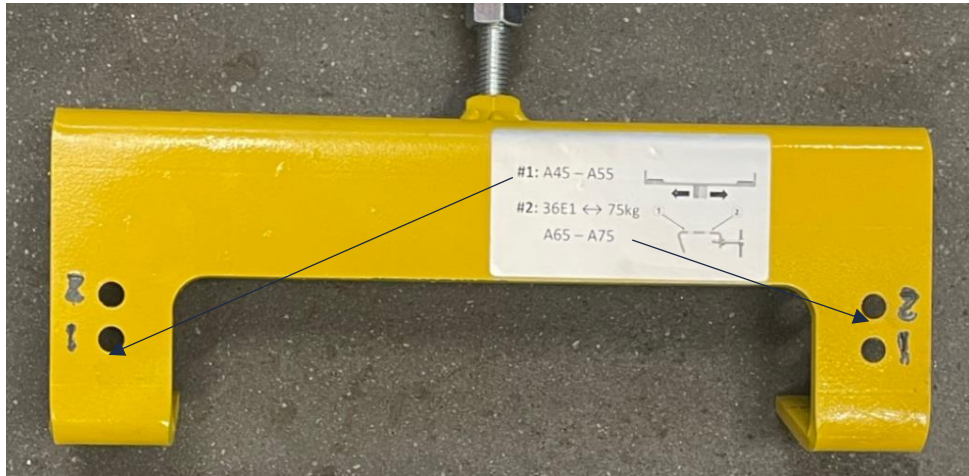


6.2.1 Jaw selection

Refer to the label on the support :

Support	Rails compatibility
Overhead <80mm width Jaw :	Vignol rails, A45, A55, A65, A75
Overhead <150mm width Jaw :	Grooved rails, A100, A120, 150, MRS87
HEM support :	Guiding bars, HEB, Hem, Track rails

The support can be dismantled from below with a flat screwdriver. Refer to the label to choose the position of the mounting holes. They are defined to ensure the centering of the HFP in relation to the rail.



6.2.2 Height adjustment

Height adjustment must be checked in the welding process instructions. 2 spacers allow you to adjust the support height. When they are not used, they are fixed to the cradle.



With spacers : Height ≈90mm



Without spacers : Height ≈70mm

In the case of A45 rail welding, the spacer must be fixed under the support.



6.2.3 Inclined rails welding

When welding rails on a slope, the HFP should be positioned at the top. The 2 retaining screws must be unscrewed from their storage places and screwed onto the crosspiece in the central position.



Support with retaining screws in operating position



Support with retaining screws in storage position

6.2.4 Grooved rails Welding

When the HFP is used on grooved rails where the rail flap is set back from the head, the adjustment screw keeps the support vertical.



7. Maintenance

7.1 Maintenance periodicity

The responsibility for maintenance is the responsibility of the owner of the equipment. Maintenance should be performed at least once a year by a competent and qualified person.

ITEM	OPERATION	PERIODICITY					
		Level 1 Operation achievable on track		Level 2 Operation to achieve on workshop		Level 3 Operation to achieve by PANDROL or by qualified person	
		Before use	After use	12 month	24 month or 350 welds (45h)	1000 welds (130h)	2000 welds or 260h of use
Complete machine	- Visual inspection - Torch checking - Gas line checking - Exterior gas sealing checking - No-load test						
Complete machine	Machine cleaning (Cloth, air gun)						
Gas line	Pressure gauge checking						
Complete machine	No-load operating cycle						
Complete machine	Air flow checking						
Complete machine	Machine interior cleaning						
Complete machine	Interior gas sealing						
Complete machine	Preheating test						
Engine	Carbons replacement						
Electronic	Reset cycle counter						

The error indicator flashes at start-up when the HFP has made more than 350 welds in order to be able to schedule the maintenance. On request, a mobile application in beta version allows you to connect to HFP to see the total number of cycles achieved with HFP.

It is recommended to stick a label on the HFP after all maintenance operation in order to keep traceability of achieved maintenance operations.



The standard cycle is 8 minutes long and the cycle is only counted when it ends. In case of regular use on long preheating process (crane rails etc.), it is necessary to adjust the maintenance frequency.

7.2 Machine visual inspection

HFP check :

- Presence of torch nuts
- Safety labels
- No missing parts

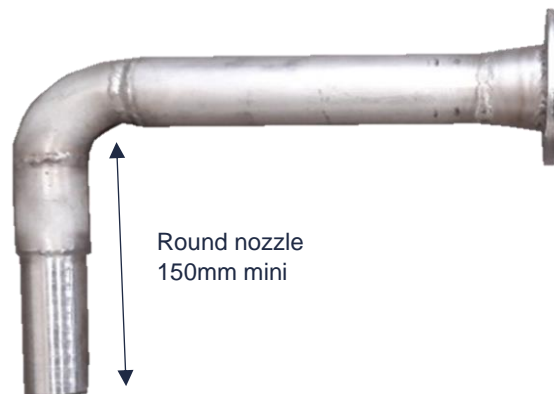
Condition of the box contents :

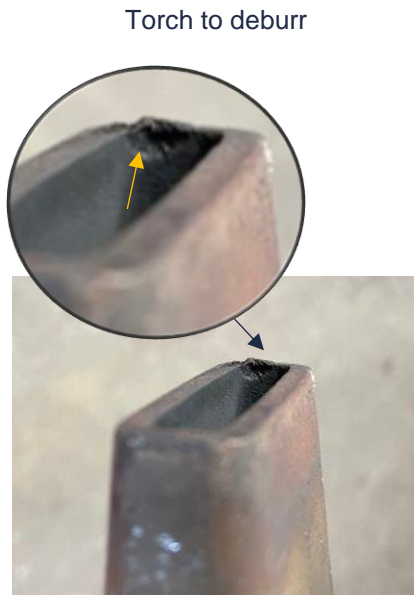
- Chargers
- Gas line
- Purge hose
- Supports
- Presence and status of batteries
- Torches

7.3 Torches wear checking

Torch must be in good condition

- If it is melted less than 3mm, remove the burrs.
- If it is melted more than 3mm, torch must be replaced.





7.4 Gas line checking

- Gas line condition checking
- Every 12 months, check of pressure gauge date of calibration according to local regulation
- Hose expiration date checking
- Flame arrestor expiration date checking

7.5 Exterior gas sealing checking

- Connect HFP to gas cylinder
- Open gas cylinder
- Check absence of leaks with a suitable product

7.6 Pressure gauge calibration

Contact PANDROL or an authorized company.

7.7 No- load test

The purpose of this operation is to ensure before starting work that the preheating system is functional.

- Turn on the HFP
- Time adjustment
- Start cycle
- Check proper operation until the countdown starts
- Turn off HFP

7.8 Interior gas sealing checking

This involves checking the gas circuit sealing inside the HFP. For this, it is necessary to :

- Remove the elbow from the gas connection
- Remove the HFP left side and the torch
- Replace the elbow on the gas connection
- Replace the torch
- Start a preheating cycle
- Check absence of leaks with a suitable product



7.9 No-load operating cycle checking

- Turn on the HFP
- Test the keyboard buttons (Up and Down)
- Start a 2 minutes cycle
 - Check the solenoid valve by blowing into it.
 - Check that the cycle is running correctly (Start, stop)



To remove the left side panel, it is necessary to remove the exterior elbow. It must be replaced with sealing thread lock (Loctite 577 or 5400)



When replacing the left side panel, it is necessary to reposition the screws starting with the elbow protection then the battery protection. Once all screws are engaged, they should be hand tightened.

7.10 Air Flow checking

- Contact the PANDROL sales department to obtain a control kit.
- Check the correct detection of the round nozzle. During the cycle, loosen the torch slightly until you lose contact with the torch detector. The flow rate of the HFP must decrease when the torch pin no longer presses on the detector.

7.11 Preheating test

This operation is necessary when you recommission an HFP which has not operated for a few time and whose last user can not attest to the correct operation of ignition.

- Mounting molds on rail
- Start a cycle
- Check the ignition quality (Spark)
- Check the flame height (15-20cm)

7.12 Interior and exterior cleaning

Clean the inside of the HFP with a air gun. Left and right panels must be removed before.

7.13 Engine carbons replacement

This operation must be achieved after 2000 cycles or 260h of use. It requires to disassembly carefully the HFP.

Please contact Pandrol for technical support.

7.14 Reset cycle counter

- Update cycle counter
 - Option 1 : With the application
 - Option 2 : With the keyboard

Please contact Pandrol for technical support.

- Save the maintenance operation in the tracking file.

7.15 Troubleshooting guide

Faults	Possible causes	Solutions
The HFP does not turn on.	Batteries are empty	Check the batteries level. If the problem persists, contact the after-sales service
	Batteries not fully pushed into the sockets	Push the batteries to the end
	Internal problem	Contact after-sales service

The HFP displays a red light on startup or the HFP does not start.	Batteries are empty	Check the batteries level. If the problem persists, contact the after-sales service
	Engine carbons worn	Refer to Maintenance chapter Contact after-sales service
	Engine is damaged	Contact after-sales service
HFP starts, but does not create a flame	The gas supply is not connected or the gas cylinder is not opened.	Check the gas supply
	The solenoid valve is damaged	Listen if the solenoid valve is functioning or if gas is coming out.
	Damaged high voltage generator	Check that a cracking noise can be heard within the first 5 seconds after pressing START. If no noise, contact the after-sales service.
The HFP can be ignited with a bell igniter. (See procedure)		
The HFP starts up, but the flame is blown out.	Wrong gas pressure	Check the gas pressure
	Wind	Restart the cycle. Ignition is more stable when the nozzle is hot. If the problem persists, contact the after-sales service.
The nozzle is damaged	The nozzle has overheated	Contact the after-sales service
Start button has not effect	HFP has not been turned off after previous preheating	Restart the HFP
	Display is damaged	Contact after-sales service
The time cannot be set or the display stops responding	Display is damaged	Contact after-sales service

7.16 After-sales service

For all requests for repairs or spare parts, please contact our After-Sales Service at the following email address:

contact.sav@pandrol.com

When making your request, please specify the machine reference, as well as its serial number and year of manufacture.

7.17 Environmental protection

For all works carried out with or on the machine, comply with legal obligations to limit and avoid waste. The management of this waste must be done in comply with the environmental protection regulations in force in the country of use.

During repair and maintenance work, materials that may contaminate water such as lubricants and oils, should not contaminate the ground or be poured into pipes.

7.18 Elimination

7.18.1 Machine elimination

Elimination of the machine and its components or fluids must comply with local disposal regulations.

Due to risk of pollution for the environment, call on a specialized company to dismantle the machine.

7.18.2 Battery elimination

Worn-out battery packs contain large amounts of valuable raw materials and plastics, which can also be recycled.



Battery packs must not be disposed of with regular waste.

Return faulty or used battery packs to Pandrol.

Before disposal, discharge the battery pack in the power tool. Prevent the contacts from short-circuiting (e. g. by protecting them with adhesive tape).

Do not allow battery packs to encounter water.

8. Batteries instructions

8.1 Safety instructions



Before using the battery pack, read the entire Operating Instructions carefully and thoroughly. Keep safe all documents accompanying the battery pack.

- Protect battery from water and moisture.
- Do not use faulty or deformed battery.
- Do not open battery.
- Do not short-circuit the contacts of the battery.



- Do not expose battery to naked flame.
- Slightly acidic, flammable fluid may leak from defective li-ion battery.
- If battery fluid leaks out and comes into contact with your skin, rinse immediately with plenty of water. If battery fluid leaks out and comes into contact with your eyes, wash them with clean water and seek medical attention immediately.
- Transporting li-ion battery packs: The shipping of li-ion battery packs is subject to laws relating to the carriage of hazardous goods (UN 3480 and UN 3481). Inform yourself of the currently valid specifications when shipping li-ion battery packs. If necessary, consult your freight forwarder. Certified packaging is available from Metabo.

8.2 Specified use

The battery is designed for use in corresponding Metabo battery-operated power tools. They must only be charged using Metabo chargers. To select the appropriate device, please contact us. Read the relevant instructions for the devices used. For example, the charging process is displayed on the charger. For details, see the charger instructions.

The user bears sole responsibility for any damage caused by improper use. Generally accepted accident prevention regulations and the safety information must be observed.

8.3 Charging

Charge the battery before use (see 4.4.2 Battery) . Do not recharge a fully charged battery pack. If performance diminishes, recharge the battery pack.

The ideal storage temperature is between 10°C and 30°C. The permissible storage temperature is between 0°C and 50°C.

Li-Power li-ion battery has a capacity and a signal indicator (depending on the model):

- Press the button and the charge level is displayed by the LEDs.
- If one LED is flashing, the battery pack is almost flat and must be recharged.

9. Signalisation

HFP is manufactured under a traceability process and identified by a unique serial number.

The ID plate is identical for all HFPs except the product reference.

Serial number:		HFP 36V
Manufacture date:		High Flow Preheater
Reference n°:	S0000498	
SNCF Agreement :	AGT 22 382	
Power:	58 kW	
Weight:	17 kg (without batteries)	
Nominal voltage:	36V DC	
Nominal current:	8 A	
Manufacturer:	PANDROL	
Adress:	ZI du Bas Pré - 59590 Raismes - FRANCE	
		Made in France

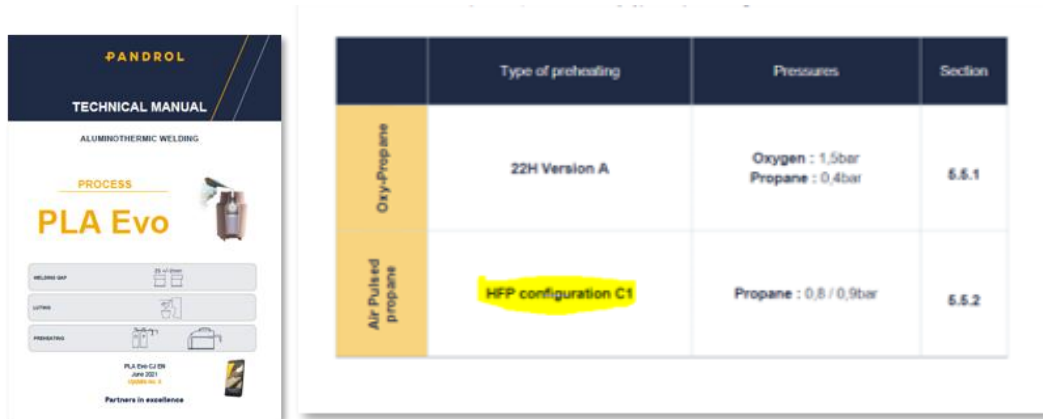
10. Technical characteristics

- Nature : Forced air propane or butane burner
- Weight :
 - Weight without batteries : 17 kg
 - Weight with batteries : 19 kg
- Dimensions :
 - Length : 750 mm
 - Width : 305 mm
 - Height : 335 mm
- Power supply :
 - Rated voltage : 36V
 - Rated current : 8A
- Heating
 - Fuel : Propane ou Butane gas (depending on version)
 - Nominal fuel flow : 4,5 kg/h
 - Heating power : 58 kWh
 - Special nozzle in refractory steel
- Operating temperature : -20 à +40°C
- Protection index : IP42
- Noise emissions in operation : 90 dB(A) at workstation (1m from torch).
- Vibration : Néant
- Acoustic power : 103 dB (Lwa)
- Acoustic pressure : 92 dB (Lpa)

• Storing box	Plastic (until December 2023)	Aluminium (since January 2024)
– Dimensions (L x W x H) :	1000 x 500 x 400 mm	522 x 375 x 420 mm
– Weight (kg)	45 kg	38kg

11.HFP configurations

To know which configuration should be used, report to the welding manual. Configurations are the combination of a support and a torch.



The number in the configuration code indicates the torch type.

- 0 → Square torch
- 1 → Round torch

Letters indicate the support.

- A → A Support or universal support with 80mm jaw
- B → B Support or universal support with 150mm jaw
- C → C Support or universal support with 80mm jaw and 70mm height

11.1 Complete HFP configuration

The table below allows you to define the HFP code according to the desired configuration. Details of the accessories are described in the following chapter.



Batteries and charger to be purchased separately.

11.1.1 HFP propane coding

HFP (base)	Torch	Universal support with jaw	Line	Reference
HFP + Alu box + Purge	Square (0)	80mm (A)	E (0)	S0A00498
			DIN477 n° 2 (1)	S0A01498
			CGA 510 (2)	S0A02498
			BS 341 N°4 (3)	S0A03498
			UNI 4405 (4)	S0A04498
			Without pressure regulator (5)	S0A05498
		150mm (B)	E (0)	S0B00498
			DIN477 n° 2 (1)	S0B01498
			CGA 510 (2)	S0B02498
			BS 341 N°4 (3)	S0B03498
			UNI 4405 (4)	S0B04498
			Without pressure regulator (5)	S0B05498
	Round (1)	80mm(A)	E (0)	S1A00498
			DIN477 n° 2 (1)	S1A01498
			CGA 510 (2)	S1A02498
			BS 341 N°4 (3)	S1A03498
			UNI 4405 (4)	S1A04498
			Without pressure regulator (5)	S1A05498
		150mm (B)	E (0)	S1B00498
			DIN477 n° 2 (1)	S1B01498
			CGA 510 (2)	S1B02498
			BS 341 N°4 (3)	S1B03498
			UNI 4405 (4)	S1B04498
			Without pressure regulator (5)	S1B05498

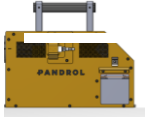
11.1.2 Butane version

HFP (base)	Torch	Support	Line	Reference
HFP 36V + Box + Purge	Round (1)	C Support (H=70mm)	Butane Line AFNOR E (0)	S01C0474

11.2 Accessories available

11.2.1 HFP alone

Delivered with its box and purge hose (No torch, no gas line, no charger, no batteries)



Item	Ref	Quantity
HFP 36V Propane (No torch)	S0000498	
HFP 36V Butane (No torch)	S0000499	

11.2.2 Propane gas line



The gas line should be chosen depending on the type of cylinder used.



Gas line		Ref
With AFNOR E connection (IS 21,7x1,814 LH) <i>France, Spain, Canada, CZech Republique...</i>		S0000425
With DIN477 n° 2 connection (W21,8 x 1/14" LH) <i>Germany, Poland, Austria, Ukraine</i>		S0000477
With CGA 510 connection (0,825" – 14 NGO LH Int) <i>Sweden, Norway, Belgium, USA, Brazil</i>		S0000482
With English BS 341 N°4 connection (G 5/8" LH int) <i>United Kingdom</i>		S0000501
Only gas line, No pressure regulator, No flame arrestor valve <i>Regulator to be supplied on site</i>		S0000483
With UNI 4405 Italian cylinder (W20 X 1,814 LH femelle) <i>Italy</i>		S0000503




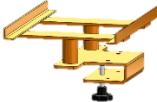
11.2.3 Butane gas line

The butane gas line is only compatible with butane version.




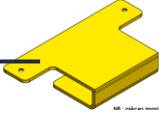
Item		Ref
Butane gas line AFNOR E connection (IS 21,7x1,814 LH)		S0000492
Second cylinder gas line		S0000493

11.2.4 Support





Refer to the preheating process instructions to choose the support. Several supports can be purchased to increase the range of weldable rails.

Item		Ref
A Support <i>Support for vignol rails and A45, A55, A65, A75</i>		21245008
B Support <i>Support for grooved rails and A100, A120, A150, MRS87</i>		21245016
C Support <i>Support for PLA-EVO process</i>		21245017
HEM Support <i>Support for Guiding bars, HEB, HEM, Track rails</i>		21245018

Universal support is recommended when several types of rails are going to be welded (Vignol, grooved, crane rails, etc.).

Universal support – Top part (Spacers included)		21245026
80mm jaw for universal support : <i>Vignol rails and A45, A55, A65, A75</i>		21245027
150mm jaw for universal support : <i>Grooved rails and A100, A120, A150, MRS87</i>		21245028
Guiding bars jaw for universal support : <i>Guiding bars, HEB, HEM, Track rails</i>		21245029
2 spacers (Included in top part). <i>To be purchased in case of after-sales</i>		31210516
2 TC/90 hc M8X30 Stainless Steel Screw <i>Assembly of the 2 parts</i>		41008060

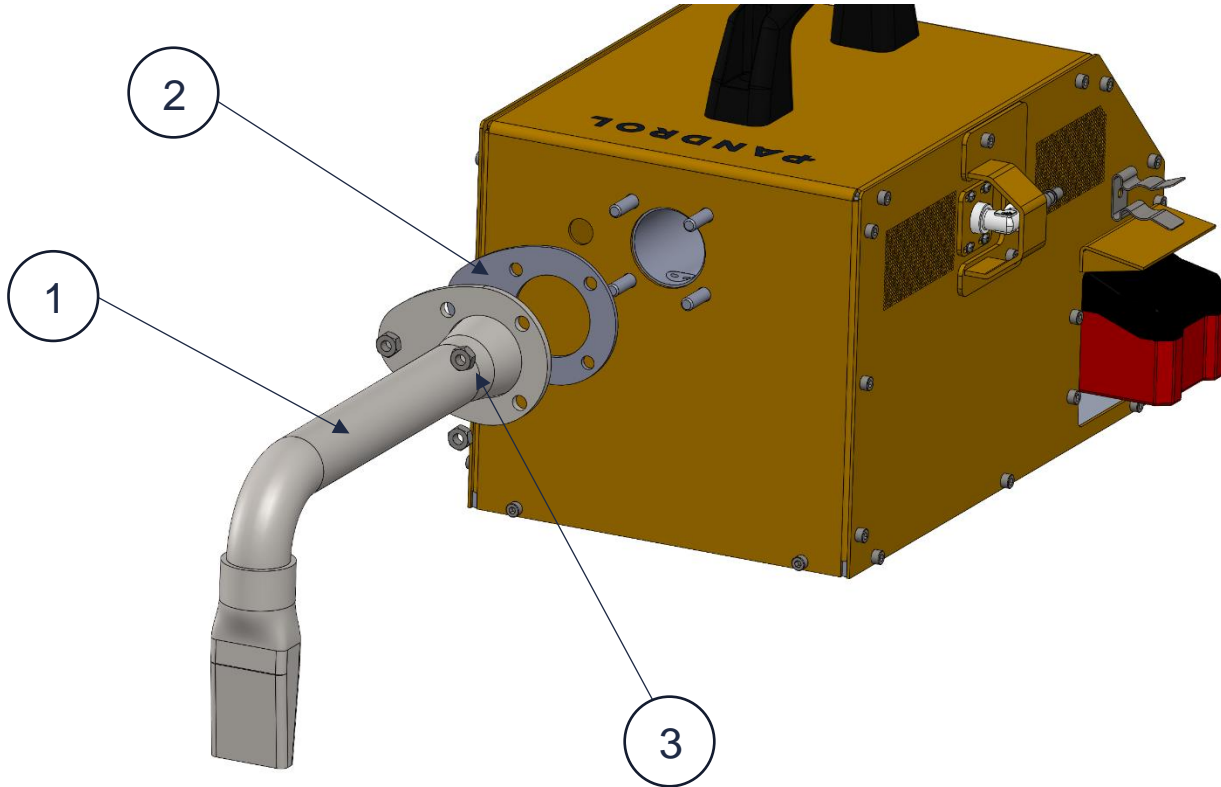
11.2.5 Accessories

Item		Ref
Batteries 18V 8Ah <i>HFP requires 2 batteries.. 2 batteries allow you to preheat for approximately 1 hour.</i>		48402027
Fast dual charger 230 VAC 50Hz		48402043
Square Torch <i>The torch to use is indicated in the process instructions, refer to the user manual to define it. (Non-exhaustive list of processes requiring the square nozzle: PLR, PLA, PLAVG2, SRG, SRG-N, SRG-R, PLK, etc.)</i>		35210008
Round Torch <i>The torch to use is indicated in the process instructions, refer to the user manual to define it. (Non-exhaustive list of processes requiring the round nozzle: PLA-EVO, QP, etc.)</i>		35210009

12. Spare parts & consummables

12.1 HFP Preheater with not removable torch

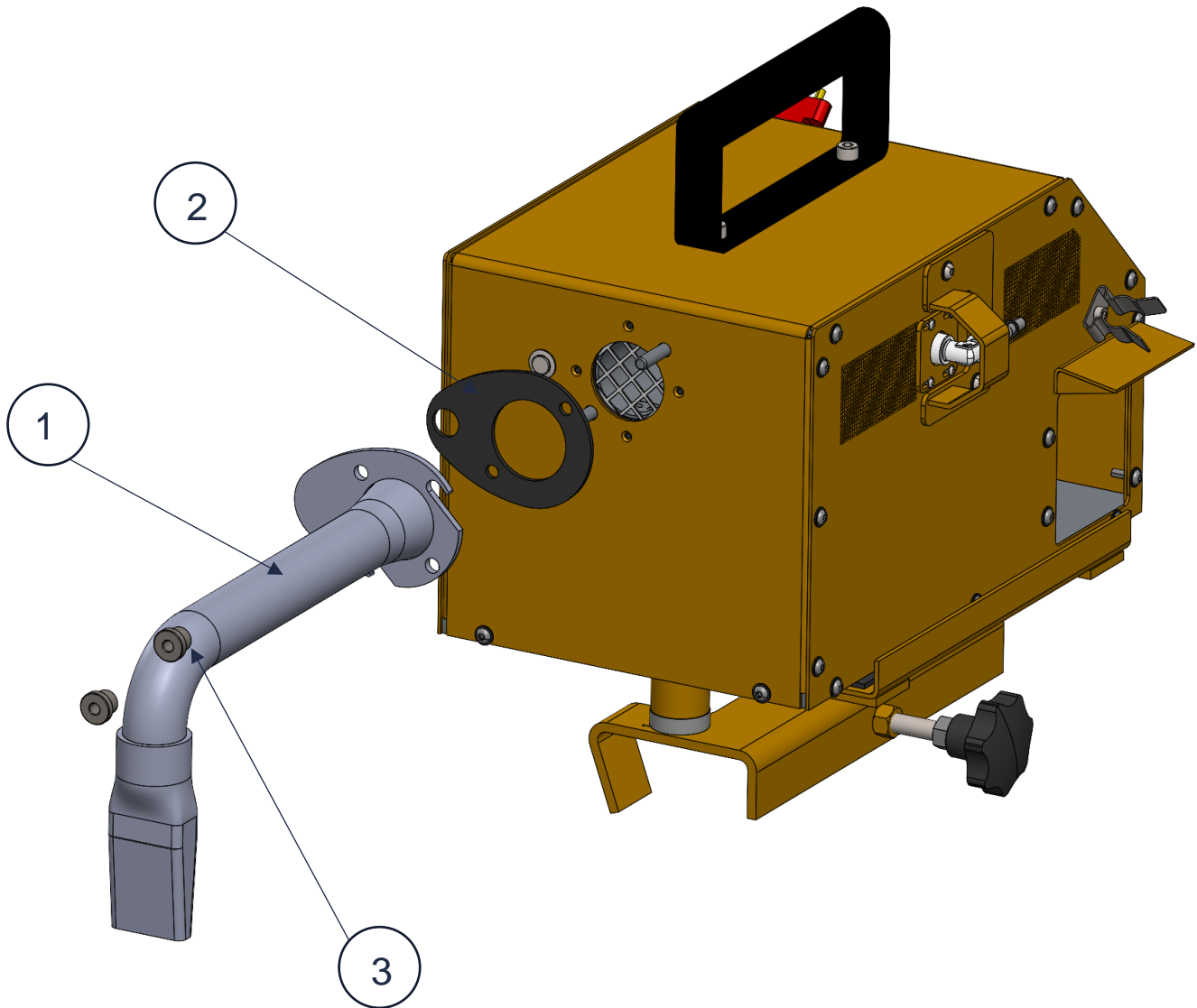
The list below applies for references S0000473 et S0000486 (until December 2023)



Rep.	Qty	Ref	Désignation	Description
1	1	35210008	Buse rectangulaire	Rectangular nozzle
		35210009	Buse ronde	Round nozzle
2	1	31260006	Joint tube d'alimentation	Gasket for supply tube
3	4	40908001	Écrou nylstop M8	Nylstop nut M8

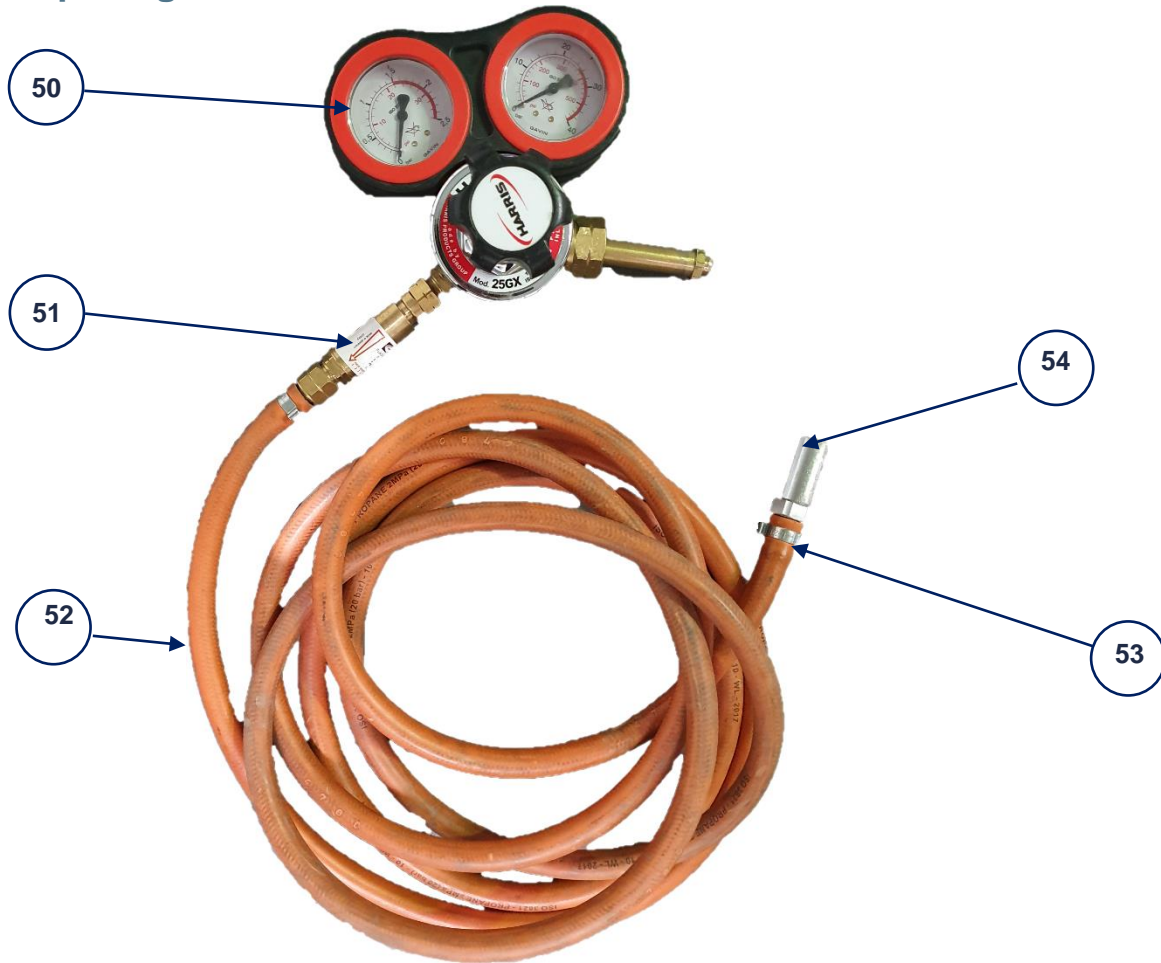
12.2 HFP Preheater with removable torch

The list below applies for references S0000498 et S0000499 (since January 2024)



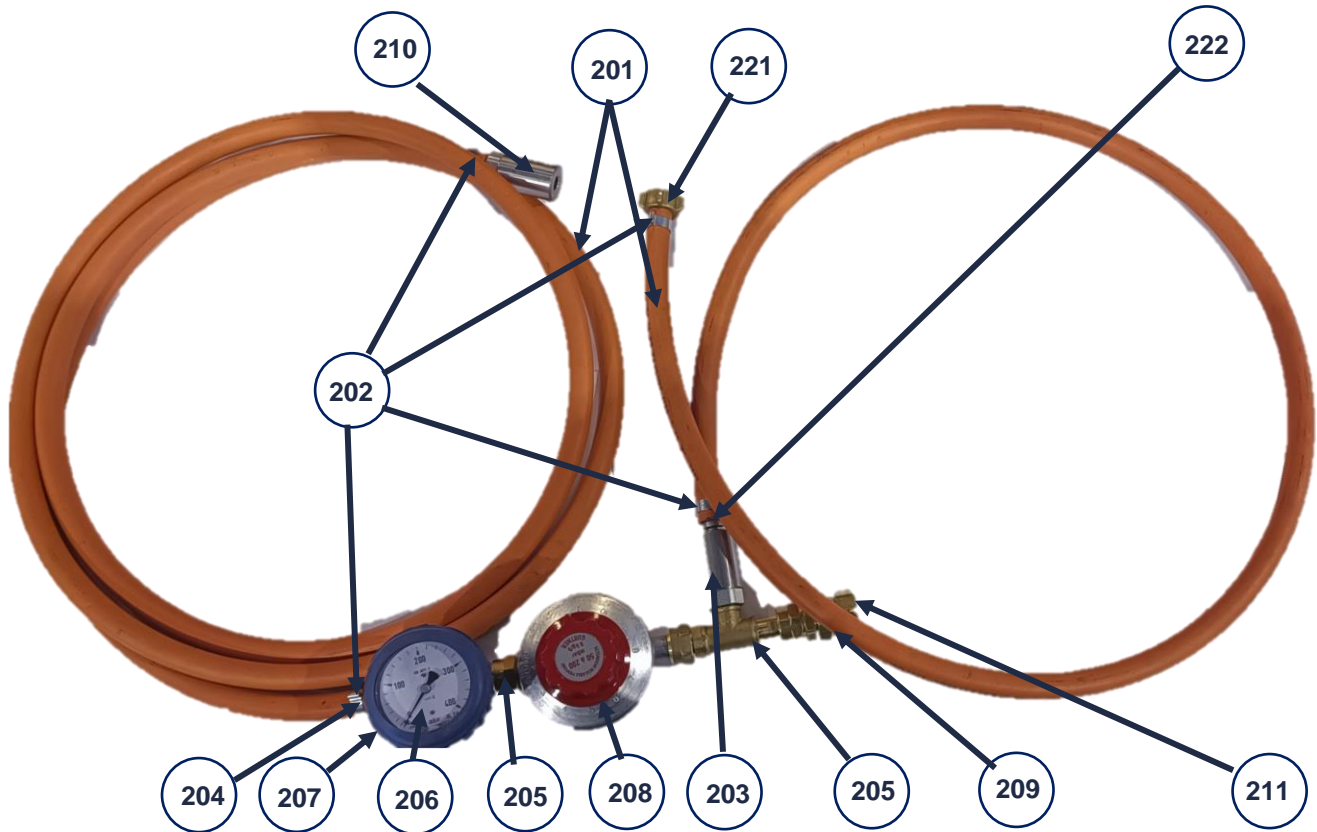
Rep.	Qty	Ref	Désignation	Description
1	1	35210008	Buse rectangulaire	Rectangular nozzle
		35210009	Buse ronde	Round nozzle
2	1	31260006	Joint tube d'alimentation	Gasket for supply tube
3	2	31210517	Écrou moleté M8	knurled nut M8

12.3 Propane gas line



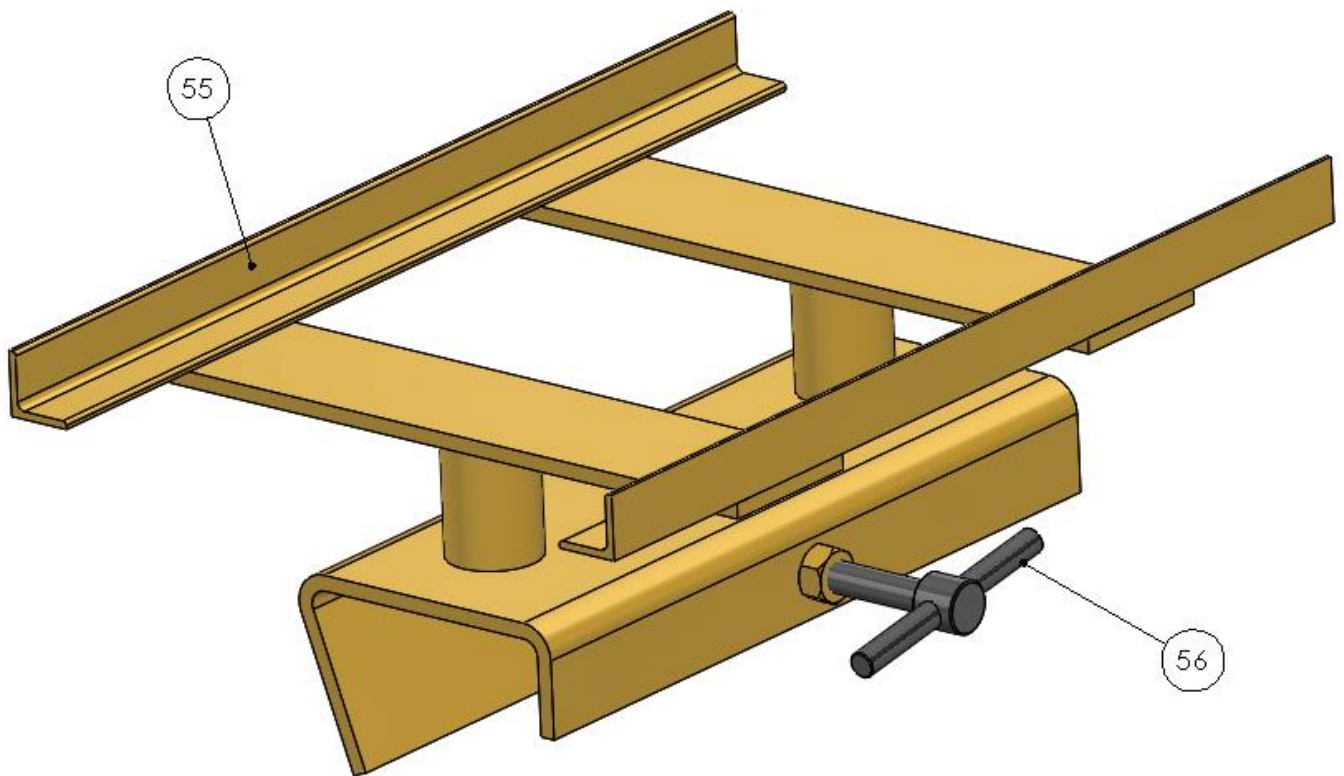
Rep.	Qty	Ref	Désignation	Description
50	1	48102016	Manodétendeur Propane raccord NF E 650 type E	Propane pressure regulator connection type NF E 650 type E
		48102023	Manodétendeur Propane raccord CGA510	Propane pressure regulator connection type CGA510
		S0000213	Manodétendeur Propane raccord DIN477 n°1	Propane pressure regulator connection type DIN477 n°1
		S0000500	Manodétendeur Propane raccord BS341 n°4	Propane pressure regulator connection type BS341 n°4
		S0000502	Manodétendeur Propane raccord UNI4405	Propane pressure regulator connection type UNI4405
51	1	48302028	Clapet pare-flamme	Flame protection valve
52	5m	S0000176	Tuyau Propane 10/17 NF-EN559	Propane hose 10/17 NF-EN559
53	2	48301073	Collier de serrage CL1020	Hose clamp CL1020
54	1	48301008	Coupleur à douille cannelée RBE.06	Spline socket coupler

12.4 Butane gas line



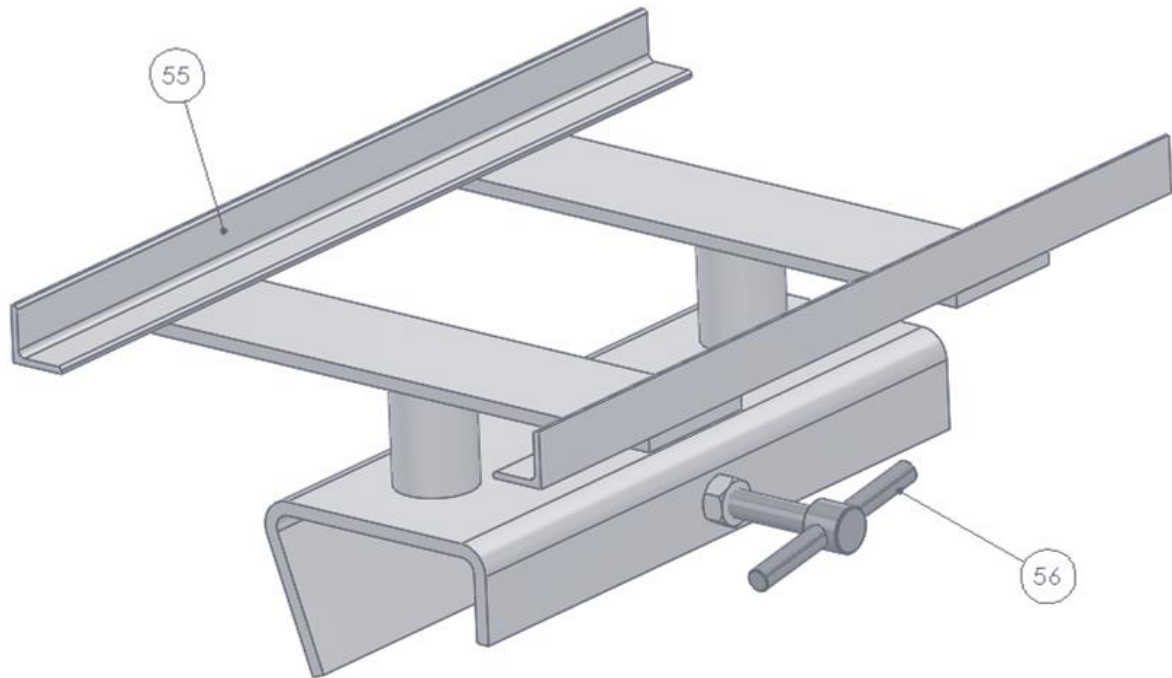
Rep.	Qty	Ref	Désignation	Description
	1	S0000493	Système d'alimentation Butane	Butane fuel system
Comprenant les articles / include following articles				
201	3m	S0000176	Tuyau Propane 10/17 NF-EN559	Propane hose 10/17 NF-EN559
202	2	48301073	Collier de serrage CL1020	Hose clamp CL1020
203	1	18301166	Coupleur à douille cannelé M G1/4	Splined socket coupler M G1/4
204	1	48301092	Raccord gaz écrou M20x150 – tétine	Gas connection nut M20x150 – hose connection
205	2	48301093	Té F G1/4 – M M20x150 – écrou M20x150	Te F G1/4 – M M20x150 – nut M20x150
206	1	48101011	Manomètre M G1/4 0-400mbar	Manometer M G1/4 0-400 mbar
207	1	48101012	Protection pour manomètre	Manometer protection
208	1	48201005	Détendeur réglable 50-200mbar M20x150	Adjustable regulator 50-200mbar M20x150
209	1	48301094	Raccord gaz NF Male M20x150	Gas connection NF Male M20x150
210	1	48301008	Coupleur à douille cannelée tétine Ø10	Ø10 hose connection splined socket coupler
211	1	48301095	Raccord femelle M20x150 – écrou bouteille	Connection F M20x150 – bottle nut
	1	S0000494	Système d'alimentation Butane 2 nd bouteille	Butane fuel system for 2 nd bottle
Comprenant les articles / include following articles				
201	1.5m	S0000176	Tuyau Propane 10/17 NF-EN559	Propane hose 10/17 NF-EN559
221	1	48301091	Raccord écrou bouteille – tétine	Connection bottle nut – hose connection
222	1	48301007	About raccord male	Splined male coupler
202	2	48301073	Collier de serrage CL1020	Hose clamp CL1020

12.5 A Support H90 (Yellow)



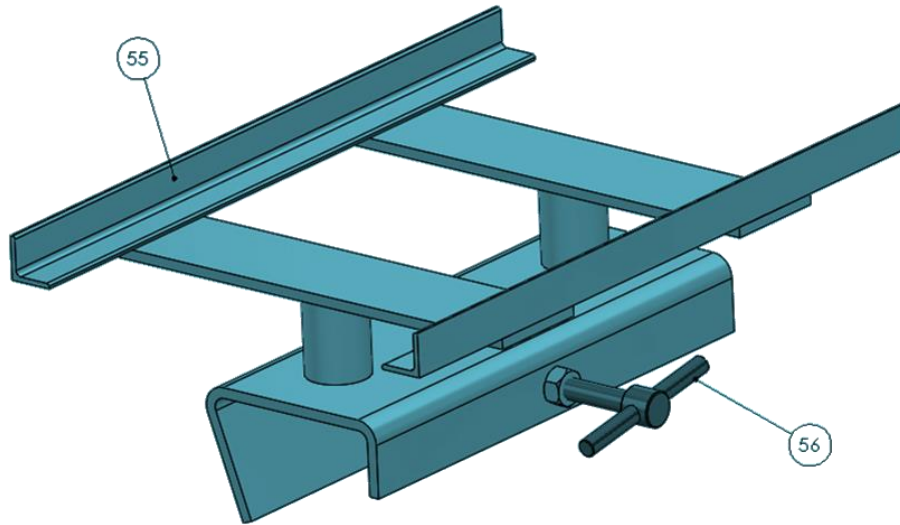
Rep.	Qty	Ref	Désignation	Description
55	1	35910533	Structure soudée pied support h90mm HFP Vignole	Welded structure vignol support H90
56	1	47403007	Vis à patin M12x60	Pad screw M12x60

12.6 B Support H90 (grey)



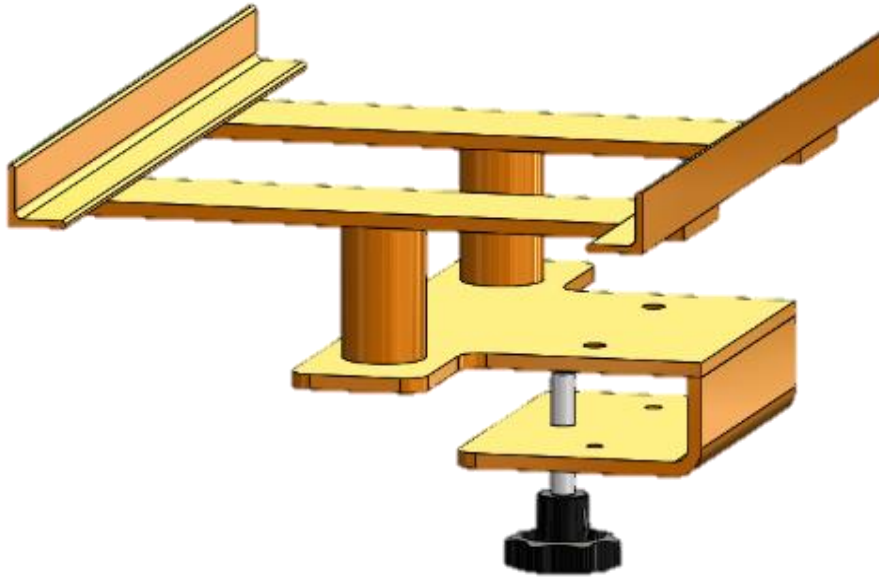
Rep.	Qté	Réf	Désignation	Description
55	1	35910535	Structure soudée pied support h90mm HFP RAG	Welded structure grooved support H90
56	1	47403009	Patin Ø25 DIN 6311	DIN 6311 Ø25 Pad
	1	47403012	Broche poignée étoile	Screw with fixed bar

12.7 C Support H70 (blue)



Rep.	Qty	Ref	Désignation	Description
55	1	3591053	Structure soudée pied support h70mm HFP Vignole	Welded structure vignol support H70
56	1	47403007	Vis à patin M12x60	Pad screw M12x60

12.8 HEM Support H90 (Yellow)

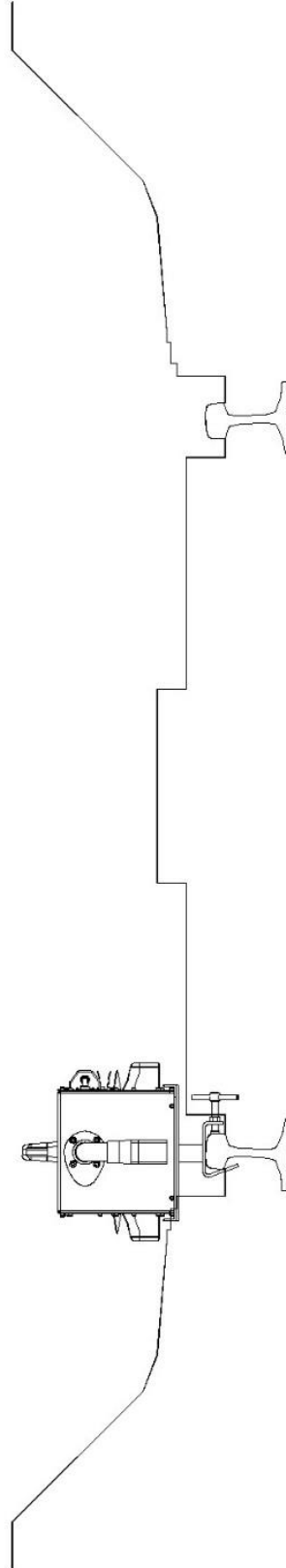


Rep.	Qty	Ref	Désignation	Description
55	1	35910580	Structure soudée pied support h90mm HFP HEM	Welded structure HEM support H90
56	1	41010035	Vis de serrage	Clamping screw

12.9 Universal support

Refer to the second table of chapter “11.2.4 Support”

13. Plan of control following EN13977





14. Declaration of conformity

CERTIFICATE OF CONFORMITY

Le constructeur soussigné (*The undersigned manufacturer*) :

PANDROL SAS
Z.I. DU BAS PRE
59590 RAISMES

Certifie que le matériel neuf désigné ci-après (*Certify that the under described products*) :

Préchauffeur haut débit HFP36V
Propane : Réf. S0000473 / S0000498
Butane: Réf. S0000486 / S0000499

High flow preheater HFP36V
Propane : Ref. S0000473 / S0000498
Butane: Ref. S0000486 / S0000499

N° de machine (*machine number*) :

Est conforme à (*comply with*) :

- Norme Européenne (*European Norm*) : NF EN 13977
- Directive machine (*Machine directive*) : 2006/42/CE
- Procédure d'auto-certification (*self-certification procedure*) : Article R4313-20

La société **PANDROL SAS** est le détenteur du dossier technique.
PANDROL SAS company is holder of the technical file.

Petite-Forêt, Février 2024, *February 2024*

Thibaut Descamps

Directeur Ligne produit ATW
ATW Product Line Director

PANDROL

More on

pandrol.com

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