GAS MIXER

MIXOJET 20
MIXOJET DUAL

SAFETY INSTRUCTIONS FOR USE AND MAINTENANCE

DEVICE N° W000138231 - W000270056

EDITION : EN
REVISION : D
DATE : 08-2023

Instructions for use

REF: **8695 4870**

Original instructions

LINCOLN® ELECTRIC

Thank for the trust you have expressed by purchasing this equipment, which will give you full satisfaction if you follow its instructions for use and maintenance.

Its design, component specifications and workmanship comply with applicable European directives.

Please refer to the enclosed CE declaration to identify the directives applicable to it.

The manufacturer will not be held responsible where items not recommended by themselves are associated with this product.

For your safety,there follows a non-restrictive list of recommendations or requirements, many of which appear in the employment code.

Finally we would ask you kindly to inform your supplier of any error which you may find in this instruction manual.

CONTENTS

INFORMATIONS

DISPLAYS AND PRESSURE GAUGES

The measuring devices or displays for voltage, current, speed, pressure, etc., whether analog or digital, should be considered as indicators

REVISIONS

REVISION B **03/06**

DESIGNATION	PAGE
Change logo	-

REVISION C **05/09**

DESIGNATION	PAGE
Complete update + spareparts newoffer	-

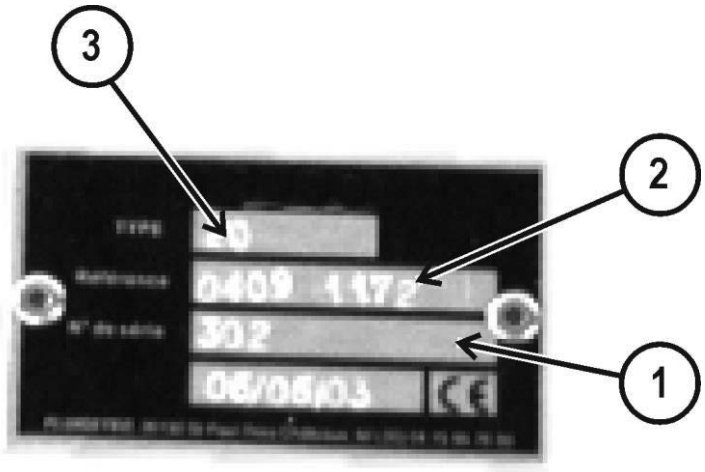
REVISION D **08/23**

DESIGNATION	PAGE
Change logo	-

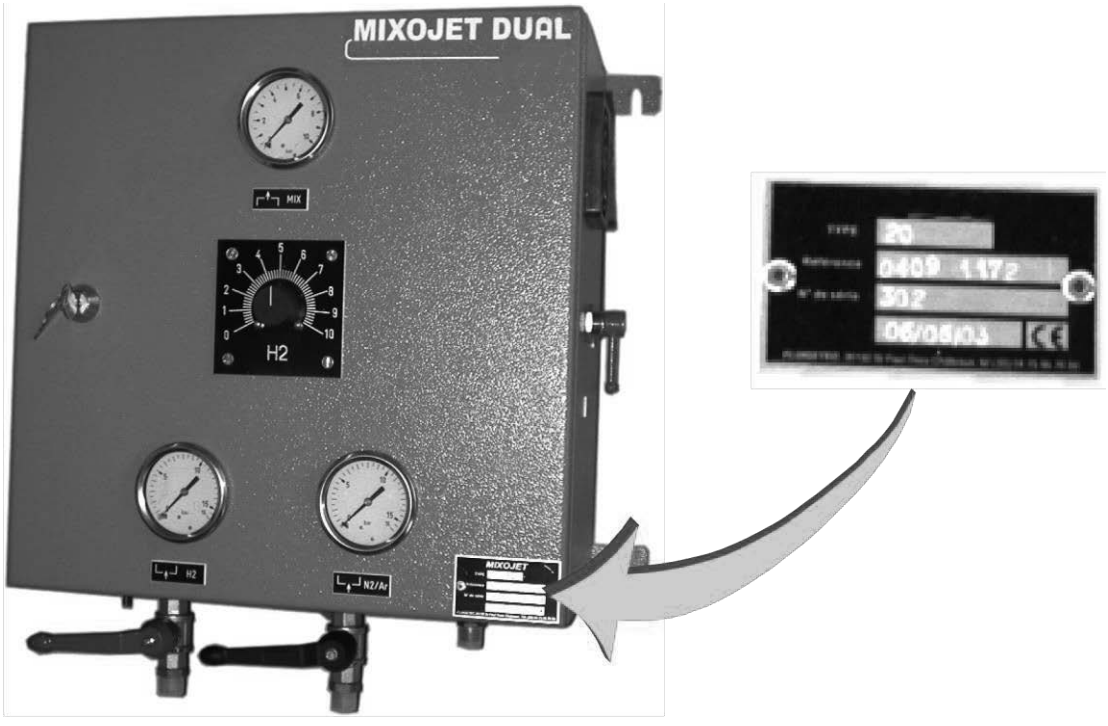
A - IDENTIFICATION

Please enter the number of your equipment in the following box.

Quote this information in all correspondence.



1	Product serial no.
2	Product family code
3	Product type



B - SAFETY INSTRUCTIONS

For general safety instructions, please refer to the specific manual supplied with the equipment.

SPECIFIC SAFETY INSTRUCTIONS

GENERAL REMARKS

These service instructions contain basic remarks that must be followed during starting up, operating and maintenance. That is why it is indispensable to ensure that they are read by the personnel responsible for fitting and by all the affected personnel before starting up. These service instructions must necessarily be kept available in the premises where the installation is to be operated.

The specific safety instructions provided in other paragraphs are to be followed in addition to the general safety instructions stated in this paragraph.

QUALIFICATION AND TRAINING OF PERSONNEL

The personnel responsible for operation, maintenance and assembly shall be appropriately qualified for the work required. The user of the equipment shall be responsible for paying very close attention to issues relating to the liability, competence and monitoring of personnel.

Any failure to comply with the safety instructions could lead to hazards for the personnel as well as for the environment and the installation. The manufacturer shall not be liable in any way and no claim for damages shall be accepted if the safety instructions are not followed.

SAFETY INSTRUCTIONS FOR THE OWNER / OPERATOR

No guard offering protection from moving parts when the installation is operation shall be removed. The hazards due to pneumatic energy (work under pressure) must be eliminated.

SAFETY INSTRUCTIONS RELATING TO ASSEMBLY, INSPECTION AND MAINTENANCE WORK

All cleaning and maintenance work shall only be performed when the installation is halted. As soon as the maintenance work is completed, all the safety and protective systems shall be put back in place and in working order.

MODIFICATION OF THE INSTALLATION WITHOUT THE MANUFACTURER'S CONSENT

Any modification or transformation of the installation shall require the prior consent of the manufacturer. Original spare parts and accessories approved by the manufacturer are aimed at ensuring safety. The manufacturer shall not be liable in the event of the use of other parts.

IMPROPER USE

The safety of the supplied installation is only guaranteed on the condition that it is used for its specific purpose. Any failure to comply with the limit values provided in the technical specifications shall not be permitted.

SPECIFIC INSTRUCTIONS for the different types of gas used
➜ see following pages for safety data sheets.

SAFETY DATA SHEET

Product : HYDROGEN

MSDS Nr: 067A_AL Version : 1.01

1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY

MSDS Nr	067A_AL
Product name	Hydrogen
Chemical formula	H2

2 COMPOSITION/INFORMATION ON INGREDIENTS

Substance/Preparation	Substance
Components/Impurities	Contains no other components or impurities which will influence the classification of the product.
CAS Nr	01333-74-0
EC Nr (from EINECS)	215-605-7

3 HAZARDS IDENTIFICATION

Hazards identification	Compressed gas
	Extremely flammable

4 FIRST AID MEASURES

Inhalation	In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation.
	Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor
	Apply artificial respiration if breathing stopped.
Ingestion	Ingestion is not considered a potential route of exposure.

5 FIRE FIGHTING MEASURES

Specific hazards	Exposure to fire may cause containers to rupture/explode.
Hazardous combustion products	None
Suitable extinguishing media	All known extinguishants can be used.
Specific methods	If possible, stop flow of product.
	Move away from the container and cool with water from a protected position.
	Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire.
Special protective equipment for fire fighters	In confined space use self-contained breathing apparatus.

Product : HYDROGEN

MSDS Nr: 067A_AL Version : 1.01

6 ACCIDENTAL RELEASE MEASURES

Personal precautions	Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.
	Evacuate area.
	Ensure adequate air ventilation.
	Eliminate ignition sources.
Environmental precautions	Try to stop release.
Clean up methods	Ventilate area.

7 HANDLING AND STORAGE

Handling and storage	Ensure equipment is adequately earthed.
	Suck back of water into the container must be prevented.
	Purge air from system before introducing gas.
	Do not allow backfeed into the container.
	Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.
	Keep away from ignition sources (including static discharges).
	Segregate from oxidant gases and other oxidants in store.
	Refer to supplier's container handling instructions.
	Keep container below 50°C in a well ventilated place.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Personal protection	Ensure adequate ventilation.
	Do not smoke while handling product.

9 PHYSICAL AND CHEMICAL PROPERTIES

Molecular weight	2
Melting point	-259 °C
Boiling point	-253 °C
Critical temperature	-240°C
Relative density, gas	0.07 (air=1)
Relative density liquid	0.07 (water=1)
Vapour Pressure 20°C	Not applicable
Solubility mg/l water	1.6 mg/l
Appearance/Colour	Colourless gas
Odour	None
Autoignition temperature	560 °C
Flammability range	560 °C
Other data	Burns with a colourless invisible flame.

Product : HYDROGEN

MSDS Nr: 067A_AL Version : 1.01

10 STABILITY AND REACTIVITY

Stability and reactivity	Can form explosive mixture with air.
	May react violently with oxidants.

11 TOXICOLOGICAL INFORMATION

General	No toxicological effects from this product.

12 ECOLOGICAL INFORMATION

General	No known ecological damage caused by this product.

13 DISPOSAL CONSIDERATIONS

General	Do not discharge into areas where there is a risk of forming an explosive mixture with air.
	Waste gas should be flared through a suitable burner with flash back arrestor.
	Do not discharge into any place where its accumulation could be dangerous.
	Contact supplier if guidance is required.

14 TRANSPORT INFORMATION

Proper shipping name	Hydrogen, compressed
UN Nr	1049
Class/Div	2.1
ADR/RID Classification code	2, 1°F
ADR/RID Hazard Nr	23
Labelling ADR	Label 3: flammable gas
Other transport information	Avoid transport on vehicles where the load space is not separated from the driver's compartment
	Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency.
	Before transporting product containers ensure that they are firmly secured and :
	- cylinder valve is closed and not leaking
	- valve outlet cap nut or plug (where provided) is correctly fitted
	- valve protection device (where provided) is correctly fitted
	- there is adequate ventilation.
	- compliance with applicable regulations.

Product :	HYDROGEN
MSDS Nr: 067A_AL	Version : 1.01

15 REGULATORY INFORMATION

Number in Annex I of Dir 67/548	001-001-00-9.
EC Classification	F+;R12
- Symbols	F+: Extremely flammable
-Risk phrases	R12 Extremely flammable.
-Safety phrases	S9 Keep container in well ventilated place.
	S16 Keep away from ignition sources - No smoking.
	S33 Take precautionary measures against static discharges.

16 OTHER INFORMATION

Ensure all national/local regulations are observed.

Ensure operators understand the flammability hazard.

The hazard of asphyxiation is often overlooked and must be stressed during operator training.

Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.

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This Safety Data Sheet has been established in accordance with the applicable European Directives and applies to all countries that have translated the Directives in their national laws.

Product :	ARGON
MSDS Nr: 003A_AL	Version : 1.01

1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY

MSDS Nr	003A_AL
Product name	Argon
Chemical formula	Ar

2 COMPOSITION/INFORMATION ON INGREDIENTS

Substance/Preparation	Substance
Components/Impurities	Contains no other components or impurities which will influence the classification of the product.
CAS Nr	07440-37-1
EC Nr (from EINECS)	231-147-0

3 HAZARDS IDENTIFICATION

Hazards identification	Compressed gas
	In high concentrations may cause asphyxiation.

4 FIRST AID MEASURES

Inhalation	In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation.
	Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.
Ingestion	Ingestion is not considered a potential route of exposure.

5 FIRE FIGHTING MEASURES

Specific hazards	Exposure to fire may cause containers to rupture/explode.
	Non flammable
Hazardous combustion products	None
Suitable extinguishing media	All known extinguishants can be used.
Specific methods	If possible, stop flow of product.
	Move away from the container and cool with water from a protected position.
Special protective equipment for fire fighters	In confined space use self-contained breathing apparatus.

Product :	ARGON
MSDS Nr: 003A_AL	Version : 1.01

6 ACCIDENTAL RELEASE MEASURES

Personal precautions	Evacuate area.
	Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.
	Ensure adequate air ventilation.
Environmental precautions	Try to stop release.
	Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.
Clean up methods	Ventilate area.

7 HANDLING AND STORAGE

Handling and storage	Suck back of water into the container must be prevented.
	Do not allow backfeed into the container.
	Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.
	Refer to supplier's container handling instructions.
	Keep container below 50°C in a well ventilated place.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Personal protection	Ensure adequate ventilation.

9 PHYSICAL AND CHEMICAL PROPERTIES

Molecular weight	40
Melting point	-189°C
Boiling point	-186 °C
Critical temperature	-122°C
Relative density, gas	1.38 (air=1)
Relative density liquid	Not applicable
Vapour Pressure 20°C	Not applicable
Solubility mg/l water	61 mg/
Appearance/Colour	Colourless gas
Odour	No odour warning properties.
Flammability range	Non flammable.
Other data	Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

Product : ARGON

MSDS Nr: 003A_AL Version : 1.01

10 STABILITY AND REACTIVITY

Stability and reactivity	Stable under normal conditions.

11 TOXICOLOGICAL INFORMATION

General	No known toxicological effects from this product.

12 ECOLOGICAL INFORMATION

General	No known ecological damage caused by this product.

13 DISPOSAL CONSIDERATIONS

General	Do not discharge into any place where its accumulation could be dangerous. To atmosphere in a well ventilated place. Contact supplier if guidance is required.

14 TRANSPORT INFORMATION

Proper shipping name	Argon, compressed
UN Nr	1006
Class/Div	2.2
ADR/RID Classification code	2, 1°A
ADR/RID Hazard Nr	2,1°O
ADR/RID Hazard Nr	20
Labelling ADR	Label 2: non flammable non toxic gas
Other transport information	Avoid transport on vehicles where the load space is not separated from the driver's compartment Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers ensure that they are firmly secured and: - cylinder valve is closed and not leaking - valve outlet cap nut or plug (where provided) is correctly fitted. - valve protection device (where provided) is correctly fitted - there is adequate ventilation. - compliance with applicable regulations.

Product : ARGON

MSDS Nr: 003A_AL Version : 1.01

15 REGULATORY INFORMATION

Number in Annex I of Dir 67/548	Not included in Annex I.
EC Classification	Not classified as dangerous preparation.
EC Labelling (Symbols, R&S phrases)	No EC labelling required.

16 OTHER INFORMATION

Asphyxiant in high concentrations.

Keep container in well ventilated place.

Do not breathe the gas.

Ensure all national/local regulations are observed.

The hazard of asphyxiation is often overlooked and must be stressed during operator training.

Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.

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Product : **Nitrogen**

MSDS Nr : 089A_AL Version : 1

1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY

MSDS Nr	089A_AL
Product name	Nitrogen
Chemical formula	N2

2 COMPOSITION/INFORMATION ON INGREDIENTS

Substance/Preparation	Substance.
Components/Impurities	Contains no other components or impurities which will influence the classification of the product.
CAS Nr	07727-37-9
EEC Nr (from EINECS)	231-783-9

3 HAZARDS IDENTIFICATION

Hazards identification	Compressed gas
	In high concentrations may cause asphyxiation.

4 FIRST AID MEASURES

Inhalation	In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation.
	Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

5 FIRE FIGHTING MEASURES

Specific hazards	Exposure to fire may cause containers to rupture/explode.
	Non flammable
Hazardous combustion products	None
Suitable extinguishing media	All known extinguishants can be used.
Specific methods	If possible, stop flow of product.
	Move container away or cool with water from a protected position.
Special protective equipment for fire fighters	In confined space use self-contained breathing apparatus.

Product : **Nitrogen**

MSDS Nr : 089A_AL Version : 1

6 ACCIDENTAL RELEASE MEASURES

Personal precautions	Evacuate area. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Ensure adequate air ventilation.
Environmental precautions	Try to stop release.
Clean up methods	Ventilate area.

7 HANDLING AND STORAGE

Handling and storage	Suck back of water into the container must be prevented. Do not allow backfeed into the container. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt. Refer to supplier's container handling instructions. Keep container below 50°C in a well ventilated place.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Personal protection	Ensure adequate ventilation.

9 PHYSICAL AND CHEMICAL PROPERTIES

Molecular weight	28
Melting point	-210 °C
Boiling point	-196 °C
Critical temperature	-147 °C
Relative density, gas	0.97
Relative density, liquid	Not applicable.
Vapour Pressure 20°C	Not applicable.
Solubility mg/l water	20 mg/l
Appearance/Colour	Colourless gas
Odour	No odour warning properties.

Product : **Nitrogen**

MSDS Nr : 089A_AL Version : 1

10 STABILITY AND REACTIVITY

Stability and reactivity	Stable under normal conditions.

11 TOXICOLOGICAL INFORMATION

General	No known toxicological effects from this product.

12 ECOLOGICAL INFORMATION

General	No ecological damage caused by this product.

13 DISPOSAL CONSIDERATIONS

General	Do not discharge into any place where its accumulation could be dangerous. To atmosphere in a well ventilated place. Contact supplier if guidance is required.

14 TRANSPORT INFORMATION

Proper shipping name	Nitrogen, compressed
UN Nr	1066
UN Nr	2.2
ADR/RID Item Nr	2, 1°A
ADR/RID Hazard Nr	20
Labelling ADR	Label 2: non flammable non toxic gas
Other transport information	Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers ensure that they are firmly secured and: - cylinder valve is closed and not leaking - valve outlet cap nut or plug (where provided) is correctly fitted - valve protection device (where provided) is correctly fitted - there is adequate ventilation. - compliance with applicable regulations.

Product : **Nitrogen**

MSDS Nr : 089A_AL Version : 1

15 REGULATORY INFORMATION

Number in Annex I of Dir 67/548	Not included in Annex I.
EC Classification	Not classified as dangerous substance.
EC Labelling (Symbols, R&S phrases)	No EC labelling required.

16 OTHER INFORMATION

Asphyxiant in high concentrations.

Keep container in well ventilated place.

Do not breathe the gas.

Ensure all national/local regulations are observed.

The hazard of asphyxiation is often overlooked and must be stressed during operator training.

Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.

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C - DESCRIPTION

1 - GENERAL

The **MIXOJET** device is a dynamic (binary) gas mixer designed to supply gas to **NERTAJET H.P.** automatic plasma cutting installations.

The **MIXOJET** gas mixer is designed to be installed at the utilisation station (cutting machine etc.).

It can deliver the following mixtures from 2 gas supplies (cylinders, cylinder racks, evaporators, bulk, etc.):

⇒ The Argon + Hydrogen percentage is variable (Ar - H_2),

⇒ The Nitrogen + Hydrogen percentage is variable (N_2 - H_2)

The gases are mixed pneumatically, at a constant proportion by volume and variable flow rates.

MIXOJET DUAL additionally offers manual selection on its nitrogen (N2) outlet only.

BENEFITS

The ability to vary the hydrogen content (H_2) on request means that the mixture most suitable for the application can be used.

Thanks to the dynamic preparation of the gas mixture, there is no need for a buffer capacity.

The argon control system makes it possible to eliminate all the electrical energy.

2 - PRESENTATION

The **MIXOJET** mixer is an independent device. It is compact, small and easy to install :

⇒ It takes the form of a steel cabinet painted blue (RAL 5015).

⇒ It is supplied with brackets for wall mounting

⇒ It has threaded rods to protect the inlet valves during device transport and handling. The rods are to be removed after the cabinet is fixed to the wall.

⇒ It is supplied with connectors (olive + nut) for the supply of gas (pilot and secondary). The connectors are foolproof.

⇒ It is supplied with an outlet connector (olive and nut) for a soft pipe with a 6-mm interior diameter.

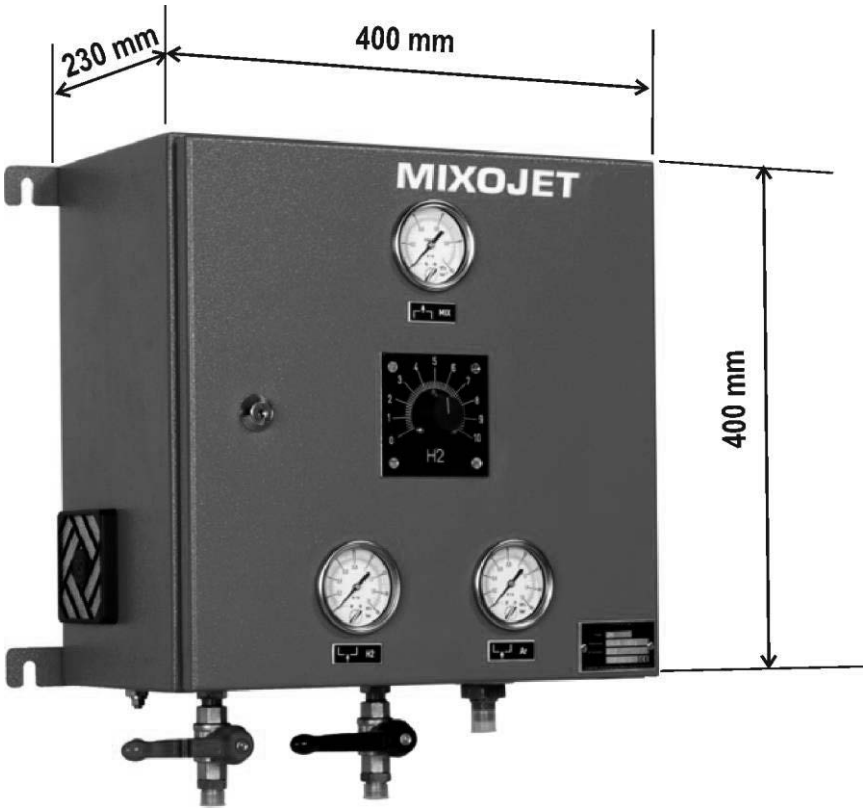
3 - SPECIFICATIONS

<table>
<tr><th></th><th></th><th></th><th colspan="3">MIXOJET 20</th><th colspan="3">MIXOJET DUAL</th></tr>
<tr><td rowspan="9">INPUTS</td><td rowspan="3">Nature of supply gases</td><td>Pilot gas</td><td colspan="3">Argon (Ar) (inert gas) or Nitrogen N_2</td><td colspan="3">Argon (Ar) (inert gas) or Nitrogen (N_2)</td></tr>
<tr><td>Secondary gas</td><td colspan="3">Hydrogen (H_2) (oxidant gas)</td><td colspan="3">Hydrogen (H_2) (oxidant gas)</td></tr>
<tr><td>Complementary gas</td><td colspan="3">-</td><td colspan="3">Nitrogen (N_2)</td></tr>
<tr><td rowspan="4">* Supply pressures</td><td rowspan="3">Pilot gas and Secondary gas</td><td></td><td>Min.</td><td>Max.</td><td></td><td>Min.</td><td>Max.</td></tr>
<tr><td>Static</td><td>10 bar</td><td>15 bar</td><td>Static</td><td>10 bar</td><td>15 bar</td></tr>
<tr><td>Dynamic</td><td>9 bar</td><td>12 bar</td><td>Dynamic</td><td>9 bar</td><td>12 bar</td></tr>
<tr><td>Complementary gas</td><td colspan="3">-</td><td colspan="2">Min.</td><td>Max.</td></tr>
<tr><td rowspan="2">Max. difference between gases</td><td>Pressure</td><td colspan="3">Static: 0,5 bar
Dynamic: 0,5 bar</td><td colspan="3">Static: 0,5 bar
Dynamic: 0,5 bar</td></tr>
<tr><td>Temperature</td><td colspan="3">25° C</td><td colspan="3">25° C</td></tr>
<tr><td rowspan="2"></td><td colspan="2">* Service pressure</td><td colspan="3">8 to 10 bar</td><td colspan="3">8 to 10 bar</td></tr>
<tr><td colspan="2">Utilisation temperature</td><td colspan="3">- 10° C à + 50° C</td><td colspan="3">- 10° C à + 50° C</td></tr>
<tr><td rowspan="6">OUTPUTS</td><td rowspan="2">Nature of the mixture</td><td>Ar + H_2
N_2 + H_2</td><td colspan="3">Variable adjustment from 0 % to 40 % of hydrogen in the argon or in the nitrogen</td><td colspan="3">Variable adjustment from 0 % to 40 % of hydrogen in the argon or in the nitrogen</td></tr>
<tr><td colspan="2">Precision of the mixture obtained</td><td colspan="3">±1 % in absolute value over the entire flow range</td><td colspan="3">±1 % in absolute value over the entire flow range</td></tr>
<tr><td colspan="2">Output pressure</td><td colspan="3">à 20 l/mn – 7,9 bar
à 200 l/mn – 6 bar</td><td colspan="3">à 8 l/mn – 7,9 bar
à 80 l/mn – 6,5 bar</td></tr>
<tr><td colspan="2">Capacity between the mixer and the regulation system after the mixer (utilisation)</td><td colspan="3">Rubber pipe ∅ 6,3 x 10
Important: if the length is greater than 20 metres, please use a Ø10 pipe in order to prevent pressure loss problems</td><td colspan="3">Rubber pipe ∅ 6,3 x 10
Important: if the length is greater than 20 metres, please use a Ø10 pipe in order to prevent pressure loss problems</td></tr>
<tr><td rowspan="2">Usage rate</td><td>Min.</td><td colspan="3">20 NL/min</td><td colspan="3">8 NL/min</td></tr>
<tr><td>Max.</td><td colspan="3">200 NL/min</td><td colspan="3">80 NL/min</td></tr>
</table>

*** For the power supplies of LINCONL ELECTRIC machines, please see section D5.**

Do not exceed a supply pressure of 15 bar.
No leaks tolerated.

4 - DIMENSIONS



WEIGHT: 25 daN

5 - LIMIT OF SUPPLY

NOT INCLUDED IN THE SUPPLY

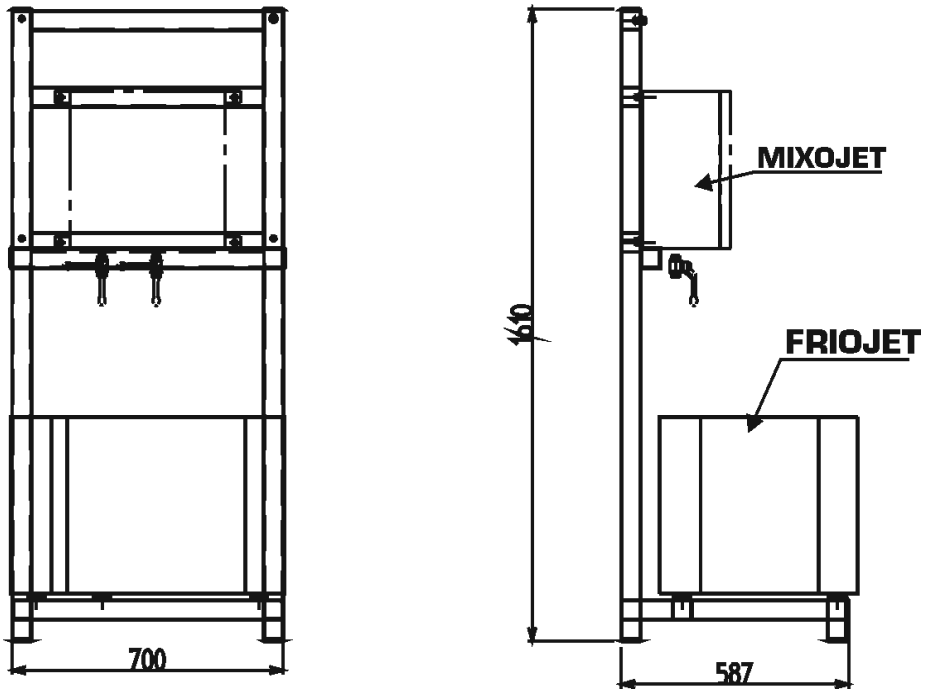
Pressure relief valves depending on the type of supply used and the country :

Gas supply	Argon Ar Nitrogen N_2	Hydrogen H_2
Cylinder relief valve	W000291310	W000269572
Frame connection	W000291528	-

6 - OPTIONS

- Support N°0409 1170

This support is used to accommodate **MIXOJET** and **FRIOJET 10** or **30**.



D - ASSEMBLY - INSTALLATION

1 - PRELIMINARY CONDITIONS BEFORE ASSEMBLY

The following conditions relating to the gas supply are required :

➔ Provide the following gas sources (cylinders, cylinder racks, evaporators etc.) with regulators that can supply the flow rates and pressure values required, and also a stop valve if the supply is through a pipe.

		MIXOJET	MIXOJET DUAL
GAS	**PURITY TYPE**	**Max. flow at 10 bar dynamic**	**Max. flow at 10 bar dynamic**
Argon (Ar)	**99,99 %.**	**200 Nl/mn**	**80 Nl/mn**
Hydrogen (H_2)	**99,99 %.**	**80 Nl/mn**	**32 Nl/mn**
Nitrogen (N_2)	**99,99 %.**	**200 Nl/mn**	**80 Nl/mn**

2 - INSTALLATION

➔ With the fasteners provided, fix the **MIXOJET** cabinet close to the installation to be supplied :

- in a sheltered well-ventilated place

- leave clearance of at least one metre around the cabinet

- leave minimum clearance of one metre between the bottom of the cabinet and the floor

The nuts and olives are supplied with **MIXOJET**. Use supply pipes with the following characteristics:

For pilot gas – Ø 10 (inner), black colour, with 20-bar service pressure. Ref. W000010073 (40 m coil)

For supplementary gas with **MIXOJET DUAL** – Ø 10 (inner), black colour, pressure 20 bar. Part no. W000010073

For hydrogen – Ø 10 (inner), red colour, with 20-bar service pressure. Ref. W000010068 (40 m coil)

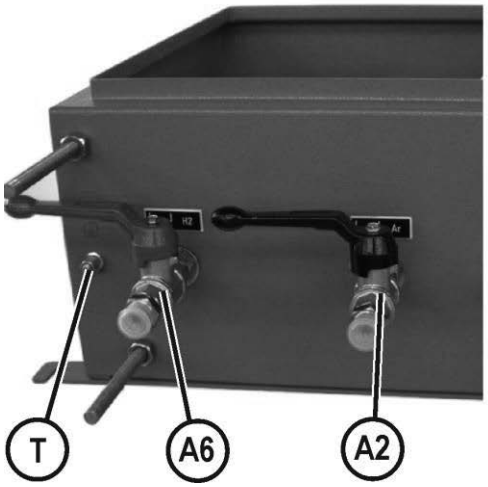
- Do not join two pipes

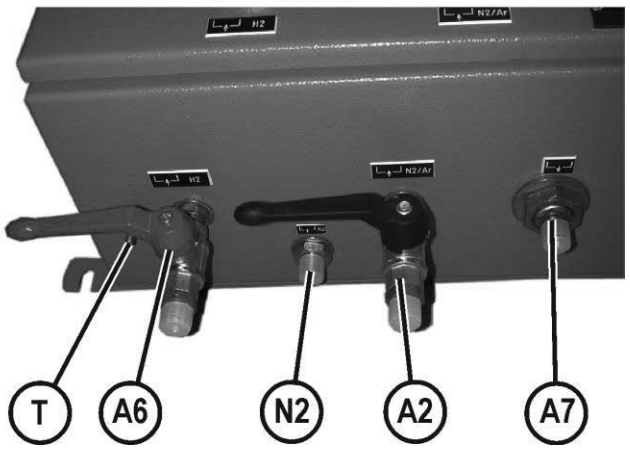
- Mark the pipes.

The cabinet is ventilated by louvers at the bottom and top of the cabinet.

Do not block the ventilation louvers and vents

➔ Connect the earth to the terminal provided on the cabinet with an earth cable having a minimum section of 4 mm^2.





➔ Flush the pipes with neutral gas and make all the gas connections when the pipes are free from pressure.

➔ A stop valve is placed on each pipe supplying gas to the mixer.

All the inlet connections are indicated by their name and designed to avoid mix-ups.

Reminder of connectors and valve colour

A2	Black	**N_2 ou Ar**	Argon → G 3/8 connector, right hand.
A6	Red	**H_2**	Hydrogen→ G 3/8 connector, left hand.
N2	-	**N_2**	Nitrogen → 16/150 connector, right hand.

Provide a means for supporting and protecting the soft pipes from the source of gas up to the **MIXOJET** mixer**.**

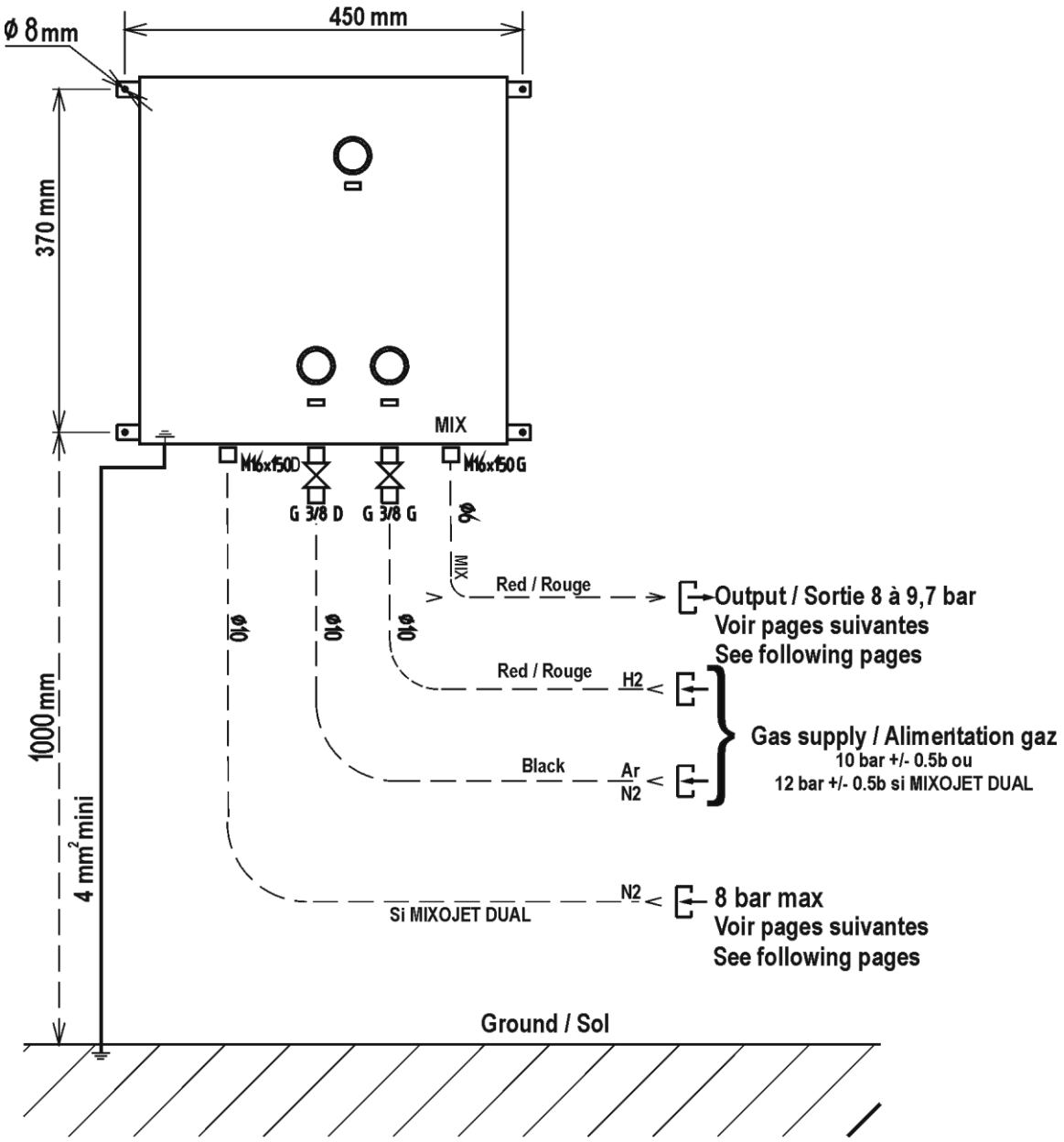
➔ Connect the pipe to the installation to be supplied with mixed gas to the MIX outlet connector (M16 x 150G connector)

➔ The outer connectors shall be kept protected from impacts and the soft pipes shall be kept protected from incandescent particles.

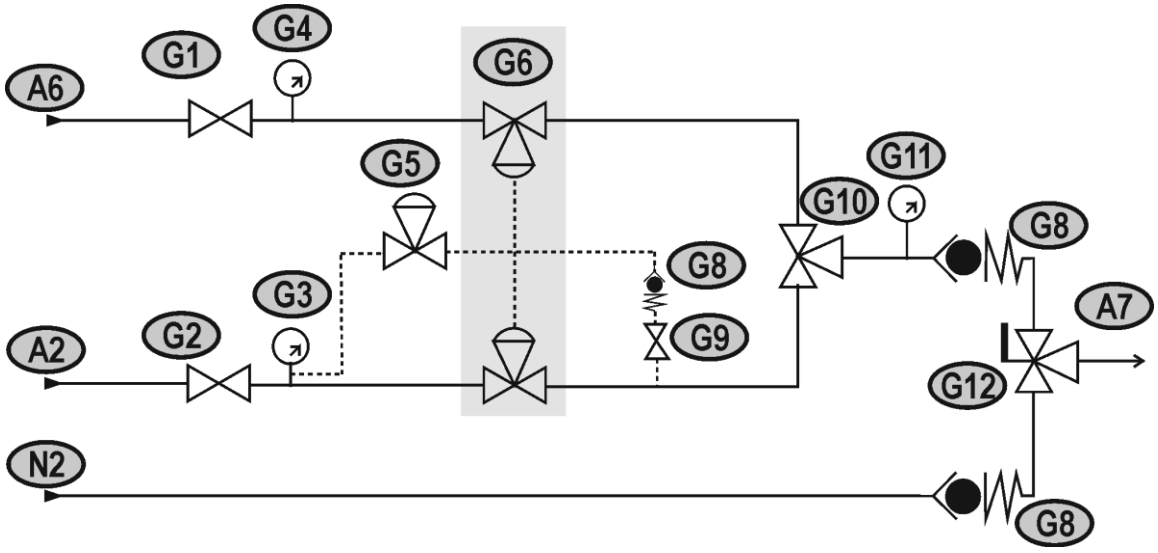
➔ Pressurise the entire installation (see “Starting up”). With a bubble leak tester, make sure that there is no leak from **any** connection of the installation.

No leak may be tolerated.

3 - FASTENING DRAWING



4 - PRINCIPLE DIAGRAM

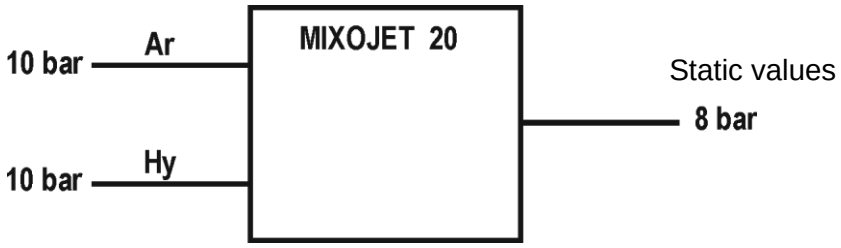


REFERENCE	DESIGNATION
A2	3/8” right-hand inlet connector
A6	3/8" left-hand inlet connector
N2	16/150 right-hand inlet connector
A7	16 x 150 left-hand outlet connector
G1 G2	Gas inlet isolation valve.
G3 G4	Inlet pressure gauge.
G5	Pilot relief valve.
G6	Dome relief valve.
G8	Non-return valve.
G9	Flow limiter.
G10	Mixing valve.
G11	Service pressure gauge.
G12	Selection valve

5 - POWER SUPPLIES RECOMMENDED FOR LINCOLN ELECTRIC MACHINES

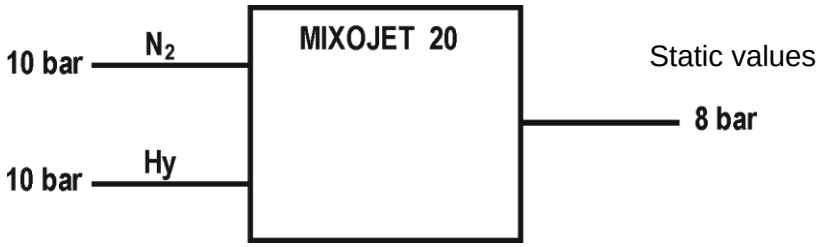
CPM 250, CPM 300, CPM 720, CPM 900, and CPM 15

Method Ar Hy or Ar Hy + N_2 (CPM 15)



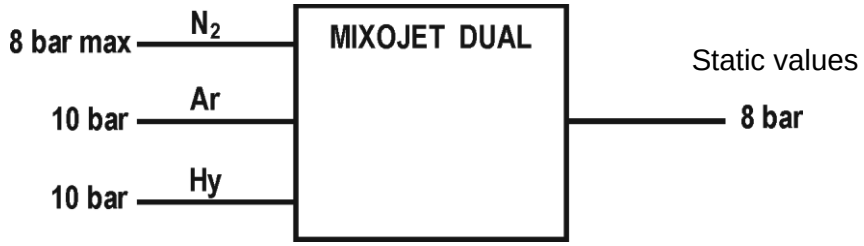
CPM 720 and CPM 900

Method N_2 Hy + water vortex



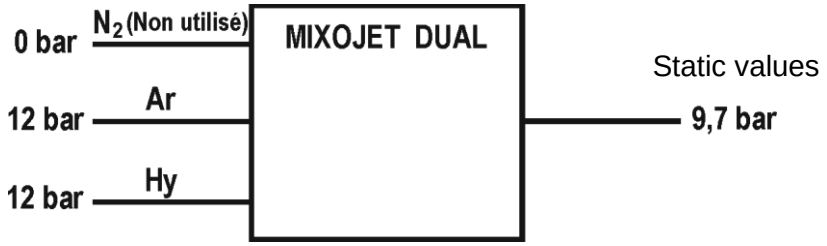
CPM 360 - OCP 150 DUAL GAS

Method N_2 + N_2 or N_2 + Ar Hy



OCP 150 DUAL GAS

Method Ar Hy + N_2



NOTE With **OCP 150**, if the customer uses the three methods **DUAL GAS** N_2 + N_2, N_2 + Ar Hy and Ar Hy + N_2 → two **MIXOJET DUAL** are required

If a DUAL GAS **OCP 150** assembly and a **CPM 360** are used with the same machine, two **MIXOJET DUAL** may be used

- the first one is supplied with 12 bars, and is to be connected to **OCP 150** cutting,

- the second one is supplied with 10 bars and is to be connected to the second gas inlets of **OCP 150** and **CPM 360** with a T at the mixer outlet.

E - OPERATOR MANUAL

1 - OPERATION

The mixed gas is connected to the inlet connectors of the mixer. The inlet pressure values must be identical :

10 bar ±0,5 bar

In the specific case of the **OCP150 DUAL GAZ** ARHy+N2 plasma assembly, the supplies must be set to **12 bar +/- 0.5 bar**

The pressure is read by means of pressure gauges **G3 G4**.

Each gas goes through a filter and enters a dome type pressure relief valve **G6 G7** piloted by the argon or the nitrogen (pilot gas), so that the pressure is the same in all the gas lines in operation.

The gas lines then come together at the inlet of a mixing valve with markings from 0 to 10 in order to mix the argon and hydrogen or the nitrogen and hydrogen.

The proportion of hydrogen undergoes a linear increase or decrease depending on the desired setting (0 to 40% of hydrogen).

In that way, the openings are subject to the same pressure difference and the gas flow rates through the mixing valve are proportional to each other.

In addition to the preparation of the mixture, **MIXOJET DUAL** offers a manual nitrogen selection facility on its outlet. That feature is particularly practical if you are using **CPM360** or **OCP150** with the **DUAL GAZ** method on stainless steel or aluminium. It enables the user to select the mixture or nitrogen without having to disconnect any pipe.

The mixer is designed to prevent the following:

- injection of secondary gas if the pilot gas is absent.

The outlet pressure is variable depending on the output for the application – it ranges from 8 to 6 bar for a total output of 20 l/min to 200 l/min with **MIXOJET 20** or 8 to 6.5 bar for a total output of 8 to 80 l/min with **MIXOJET DUAL**.

In the particular case of the **OCP150 DUAL GAZ** ARHy+N2 plasma assembly, the static (no output) outlet pressure will be 10 bar. It may be as low as 8.5 bar if the output is 80 l/min.

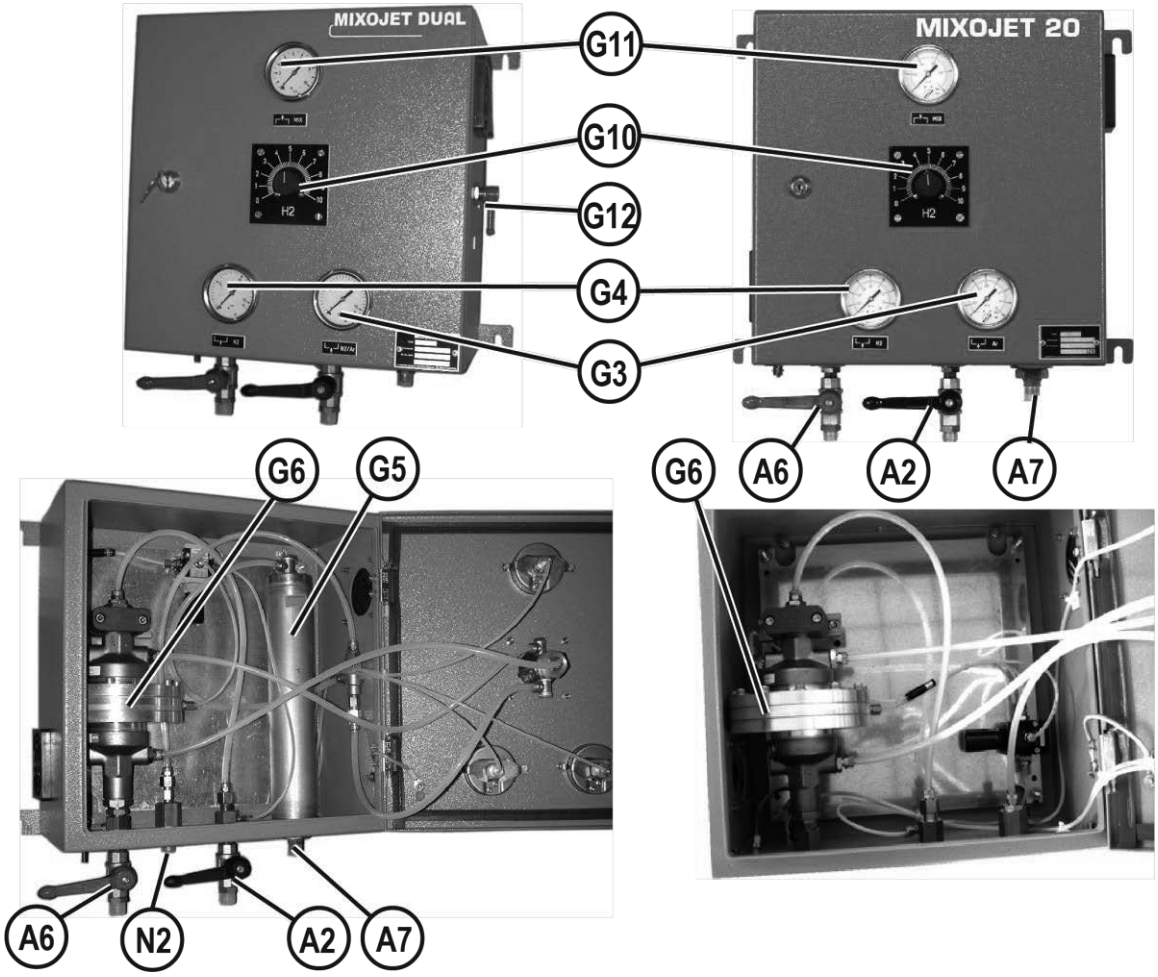
With both devices, the service pressure (outlet) may if required be readjusted via the pilot pressure relief valve **G5** to 8 bar static (no output) if the supplies are set to 10 bar or 10 bar static (no output) if the supplies are set to 12 bar.

The output pressure is read by means of pressure gauge **G11**.

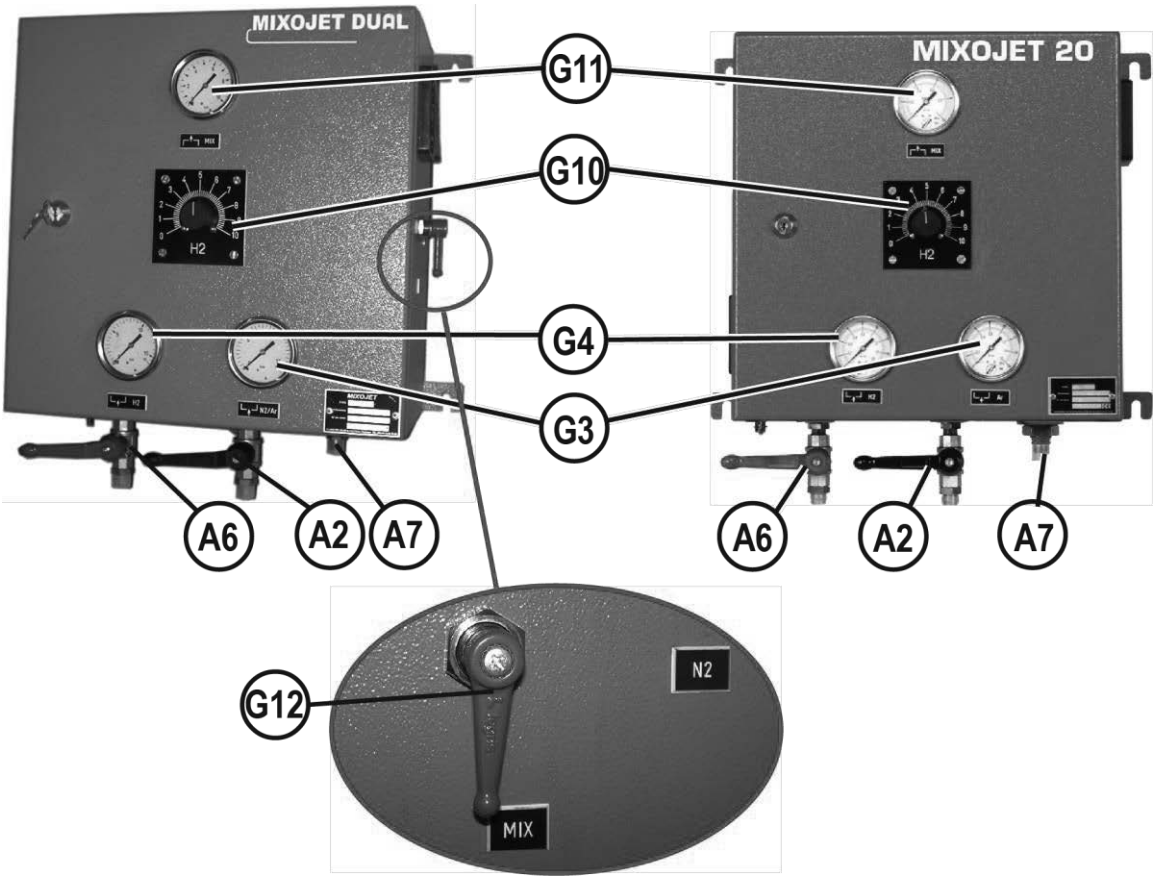
The mixture is delivered continuously to the pipe of the installation to be supplied and is adapted automatically to the flow rate required by the application.

For an optimised mixture with no loss of flow, the maximum length of the machine supply outlet pipe (MIX) must never be exceeded.

The additional nitrogen circuit of **MIXOJET DUAL** that may be selected from the lever **G12** does not have a pressure indicator. The pressure is adjusted and displayed on the supply pressure relief valve connected to the cylinder or the system.



2 - STARTING UP AND UTILISATION



MIXOJET 20

⇒ Set mixing valve **G10** to 0

⇒ Open the valves for supplying hydrogen **G1**

⇒ On pressure gauge **G4** check the supply pressure.
→ it must be equal to 10 bar static pressure.

⇒ Open the valve supplying Argon or Nitrogen **G2.**

⇒ On the pressure gauge of gas **G3**, check the supply pressure.
→ it must be equal to 10 bar static pressure.

⇒ Make the device deliver gas (gas test on the installation to be supplied) in order to flush the piping of the application with argon or nitrogen.

⇒ On the output pressure gauge MIX (**G11**), check the output pressure
→ between 6 and 8 bar.

MIXOJET DUAL

If nitrogen alone is used at the mixer outlet:

⇒ Set valve **G12** to the Nitrogen position

⇒ Set the nitrogen pressure on the supply pressure relief valve connected to the cylinder or the system to between 8 bar max.

⇒ Make the device deliver gas (gas test on the installation to be supplied) in order to flush all the piping used with nitrogen

If an ArHy or N2Hy mixture is used:

⇒ Set valve **G12** to the Mix position.

⇒ Set mixing valve **G10** to 0

⇒ Open the valves for supplying hydrogen **G1**

⇒ On pressure gauge G4 check the supply pressure : 10 bar static (12 if DUAL **OCP150** ArHy+N2)

⇒ Open the valve supplying Argon or Nitrogen **G2.**

⇒ On the pressure gauge of gas G3, check the supply pressure : 10 bar static (12 if DUAL **OCP150** ArHy+N2)

⇒ Make the device deliver gas (gas test on the installation to be supplied) in order to flush the piping of the application with argon.

⇒ On the output pressure gauge MIX (G11), check the output pressure : between 8 to 6,5 bar (10 to 8,5 if DUAL **OCP150** ArHy+N2)

MIXOJET DUAL - MIXOJET 20

Setting valve G10 is graduated from 0 to 10 for linear setting of the percentage of hydrogen from 0 to 40%.

For a homogenous mixture, make **MIXOJET** run with the controls of the plasma installation for a time (less than half a minute) that depends on the pipe length. That precaution will enable you to start working with the correct mixture of gas..

Note that the hydrogen content differs slightly between nitrogen and argon with the same setting

In order to check the sealing of the plasma machine, the Hy and Ar valves of the mixer should be shut (after the pressure is applied) and check that the pressure at the mixer outlet does not drop.

3 - STOPPING

MIXOJET DUAL - MIXOJET 20

⇒ Set valve G10 to 0.

⇒ Make the device deliver gas to flush all the piping of the application with pilot gas.

⇒ Shut the mixer supply inlet valves.

⇒ Shut the cylinders, racks, etc., before each long stop (e.g. every evening).

F - MAINTENANCE

1 - SERVICING

- So that the machine continues to provide good service for as long as possible, a certain minimum of care and maintenance is necessary
- The frequency of this maintenance work is given on the basis of the production of one work station per day. Maintenance should be more frequent if production is greater.

Your maintenance department may photocopy these pages so that it can follow up maintenance dates and operations (tick as appropriate)

Static pressure : Pressure of a fluid with a zero flow rate. When the **MIXOJET** mixer is stopped, the static pressure values can be read on the pressure gauges.

Dynamic pressure : Pressure of a fluid when the flow rate is not zero. When the **MIXOJET** mixer is operating, the dynamic pressure values can be read on the pressure gauges.

Daily		
		Check the inlet pressure values (10 bar or 12 bar depending on use) Check the delivery static pressure values (8 bar or 10 bar depending on use)

Weekly		
Date of maintenance: / /		
		Check any leak before or after the mixer (risk of incorrect mixture)

Annually		
Date of maintenance: / /		
		Clean the filters of the ventilation grills.

2 Years		
Date of maintenance: / /		
		For optimised operation, we strongly recommend complete maintenance, including the replacement of filters and wearing parts and a review and correction of all the settings.

This equipment is to be serviced by the manufacturer.

2 - TROUBLESHOOTING

Possible symptoms	Probable causes	Possible remedies
Drop in the pressure delivered from the mixer	Lack of argon or nitrogen pressure at the mixer inlet	Restore the argon or the nitrogen supply pressure (10 bar or 12 bar depending on use)
Poor cut surface quality each time cutting starts	Leak between the mixer and the installation (incorrect mixture when the mixer is stopped)	Check the tightness of the connections and pipes after the mixer
When the mixer is stopped, the output pressure gauge shows a value that is greater than 8 bar (and equal to one of the input pressure values)	The input pressure balancing system is faulty	Return the mixer to the factory
The cutting is dark and of poor quality.	The hydrogen supply is absent or insufficient	Set the inlet hydrogen pressure
The cutting speed needs to be reduced to obtain satisfactory cutting quality	The inlet pressure balancing system is faulty	Send the mixer back to the factory

3 - SPARE PARTS

How to order

The photos or sketches identify nearly every part in a machine or an installation

The descriptive tables include 3 kinds of items:

- **those normally held in stock:** ✔
- **articles not held in stock:** ✘
- **those available on request: no marks**

(For these, we recommend that you send us a copy of the page with the list of parts duly completed. Please specify in the Order column the number of parts desired and indicate the type and the serial number of your equipment.)

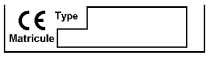
For items noted on the photos or sketches but not in the tables, send a copy of the page concerned, highlighting the particular mark.

For example:

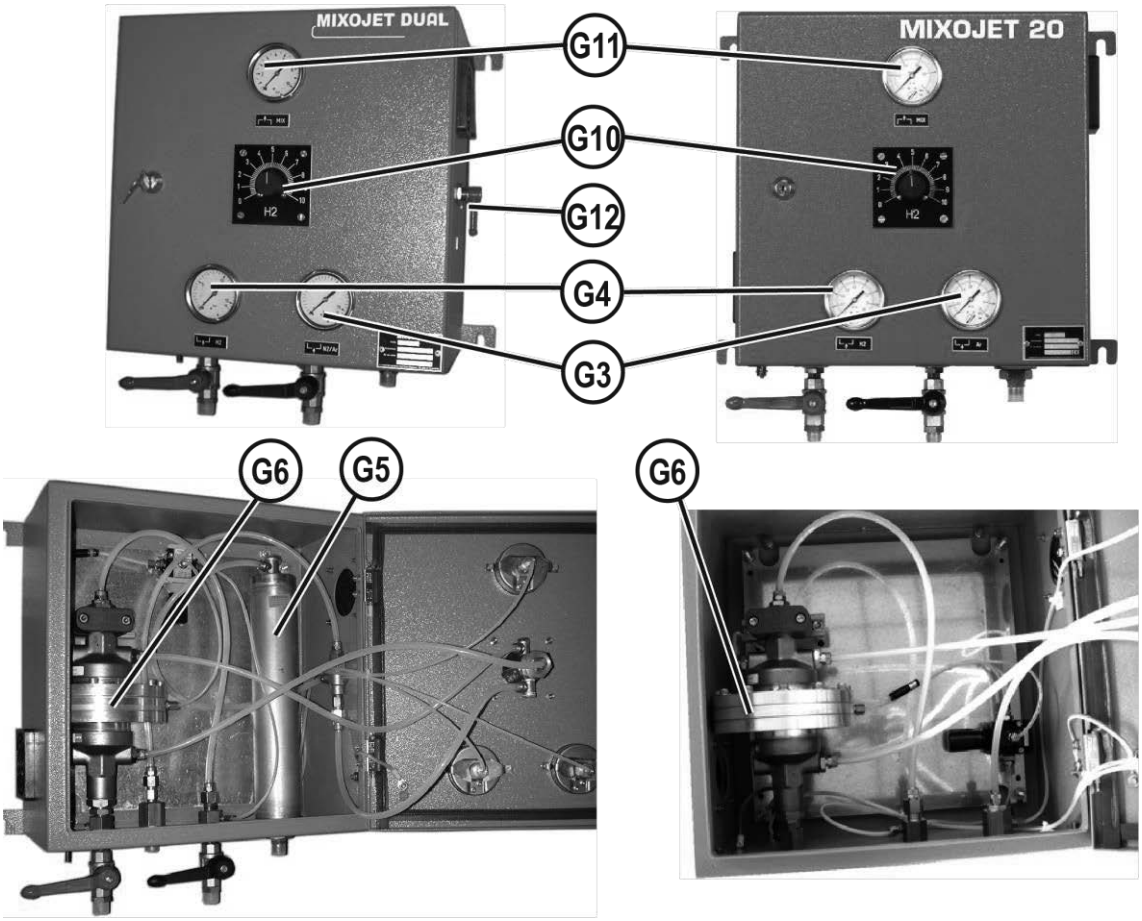
✔	normally in stock
✘	not in stock
	on request

Item	Ref.	Stock	Order	Designation
1	W000XXXXXX	✔		Machine interface board
2	W000XXXXXX	✘		Flowmeter
3	9357 XXXX			Silk-screen printed front panel

- For parts order, give the quantity required and put the number of your machine in the box below.



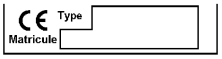
TYPE :
Number :


MIXOJET DUAL
MIXOJET 20
G11
G10
G12
G4
G3
G6
G5
G6

✔	normally in stock
✘	not in stock
	on request

Rep	Ref.	Stock	Cde	Désignation
G3	W000138238	✔		Input pressure gauge 0-16 bar.
G4	W000138238	✔		Input pressure gauge 0-16 bar.
G5	0409 5862			Pilot relief valve.
G6	0409 5860			Dome relief valve.
G10	0409 5861			Mixing valve.
G11	W000138239	✔		Output pressure gauge, 0-10 bar.
G12	-			Selection valve

➢ For parts order, give the quantity required and put the number of your machine in the box below.



TYPE :

Number :

PERSONAL NOTES

Lincoln Electric France S.A.S.
Avenue Franklin Roosevelt 76120 Le Grand Quevilly
76121 Le Grand Quevilly cedex
www.lincolnelectriceurope.com