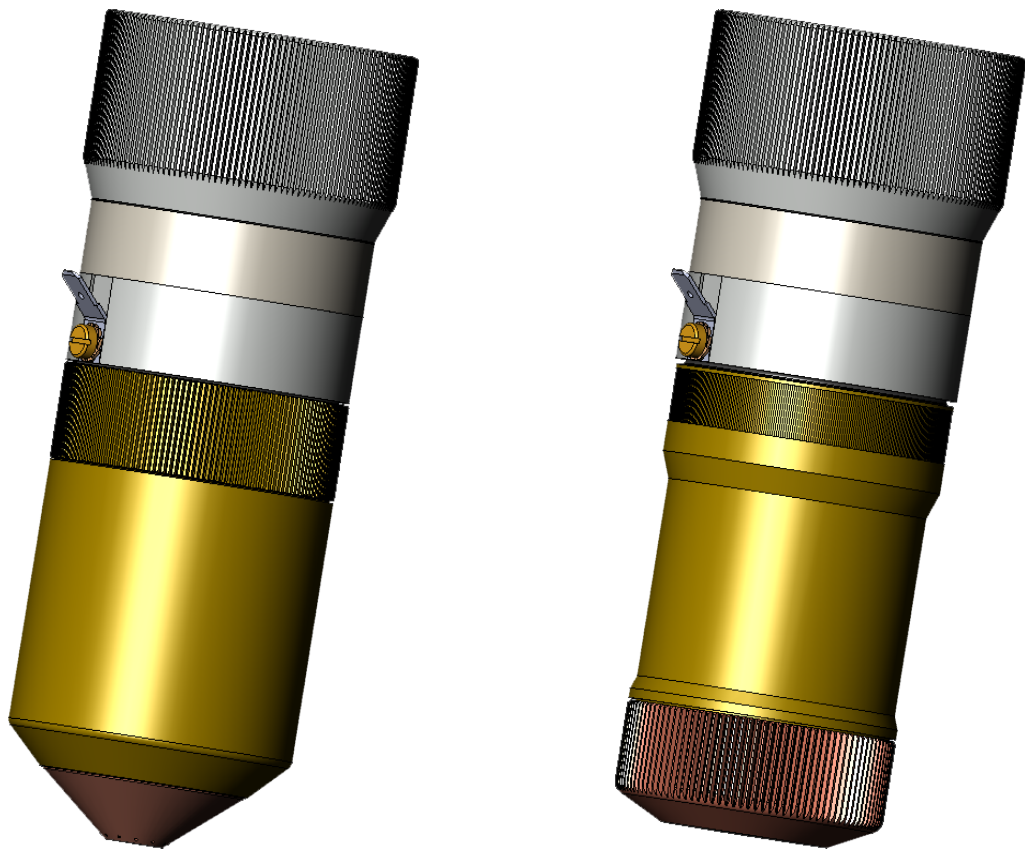


NERTAJET HPI TORCH

# CPM PRO INOX

**SAFETY INSTRUCTIONS FOR USE AND MAINTENANCE**

**No W000401873 - AS-CS-04097674 - W000377822 - W000377823  
AS-CW-CPMPROINOX**



ISSUE : EN  
REVISION : B  
DATE : 10 - 2022

Instructions for use

REF : 8695 4592

Original instructions

**Thank you 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 shall not be liable if the product is used in association with items not recommended by the manufacturer.**

**For your safety, below is a non-limitative list of recommendations or requirements, many of which appear in the labour code.**

**Lastly, please inform your supplier of any error you may find in this instruction manual.**

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# REVISIONS

REVISION : B DATE : 10/22

DESIGNATION	PAGE
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## A - SAFETY INSTRUCTIONS

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



Before starting any work on the torch, make sure that the power source is switched off.



During the cutting process, the torch tip may heat considerably. Before removal, it is imperative to use protective equipment.

### **DISPOSAL OF FREEZCOOL**

- **RED: W000010167 (9.6 L) Coolant 285, pink colour**
- **GREEN: W000404005 (9.6 L)**

**Freezcool may not be discharged in large quantities in the natural environment. Please comply with local disposal regulations regarding COD (\*).**

Before any disposal, contact the water department for the rules applicable in your area.

They will need to know:

- the COD of Freezcool (741000 mg/kg)
- the quantity to be discharged in kg

The water department will let you know what you must do, particularly the following:

- place
- quantity
- time etc.

\*: COD (chemical oxygen demand) is the part of the product that demands oxygen, e.g. oxidisable mineral salts and the majority of organic compounds.



## B - DESCRIPTION

### 1 - General

The **NERTAJET HPI** torch and **CPM PRO INOX** torch tips are plasma cutting tools that are necessarily mechanised and designed to be coupled with a **NERTAJET HPI** system.

The shape and type of electrode inserted in a **CPM PRO INOX** torch tip must be appropriate for the plasma gas chosen depending on the application.

The end of the torch receives a dual injection nozzle which forms the plasma under the combined effect of the electrical arc, the plasma gas and the second injected gas.

### 2 - Characteristics of torch bundles

Bundle and connector item number	W000401873	AS-CS-04097674	W000377822	W000377823
Bundle length	1.1 m	1.6 m	2.2 m	3.4 m
Comments	For <b>NERTAJET HPI</b> system	For <b>NERTAJET HPI</b> system	For <b>NERTAJET HPI</b> system	For <b>NERTAJET BEVEL HPI</b> system
Torch tip item number	AS-CW-CPMPROINOX			
Maximum intensity	600 A			
Duty factor	100 %			
Weight of bundle and connector	4 Kg	4 Kg	5 Kg	7 Kg
Strike type	principle	HF		
	gas	Argon		

### 3 - Characteristics of fluids

Type	Use	Supply pressure	Service pressure	Flow (max. use)			Purity
				150A	300A	450A	
-	-	Bar	Bar	l/min			
Argon	- Plasma pilot gas - Plasma marking	9	1 to 6	30	65	80	99.998%
Nitrogen	- Plasma cutting gas - Plasma shield gas	9	0.5 to 7	75(144**)	135	150	99.99%
ArH2 35%	- Plasma cutting gas - Plasma shield gas	9	0.5 to 7	25(29**)	52	70	99.99%
Argon (MIXOJET)	Supply to MIXOJET 20	12	-	32	44	56	99.99%
Hydrogen (MIXOJET)	Supply to MIXOJET 20	12	-	14	20	25	99.99%
Water	Plasma vortex	6	-	2	2	2	(*)
Freezcool	Cooling 150A-300A- 450A	-	7.5 to 8.5	4.0 l/min minimum T°= 22 - 23 °C			Freezcool
				Friojet 300i	Friojet 300i	Friojet 720	
Water	Cooling 150A-300A- 450A	-	7.5 to 8.5	4.0 l/min minimum T°= 22 - 23 °C			(*)
				Friojet 300i	Friojet 300i	Friojet 720	

\*\* : For bevel cutting

#### (\*) : VORTEX WATER QUALITY

The water used must be demineralised with neutral pH (between 6.5 and 8.3), hardness below 10°F and resistivity above 100 KΩ/cm<sup>2</sup>/cm.

Depending on the characteristics of the water, use either a demineraliser, or a reverse osmosis system or any other deionising system.

## 4 - Torch cooling

For cooling plasma cutting torches in a closed circuit with **Friojet**, the following may be used as the coolant:

- either Freezcool liquid
- or demineralised water.

### **Special Red Freezcool liquid** => W000010167 (9.6L drum)

This product is:

- antifreeze down to -27°C
- anti-algal
- anti-corrosion
- non-toxic
- non-flammable.



It is ready for use.  
**NEVER ADD WATER**

### **Special Green Freezcool liquid** => W000404005 (9.6L drum)

This product is:

- antifreeze down to -5°C
- anti-algal
- anti-corrosion
- non-toxic
- non-flammable.



It is ready for use.  
**NEVER ADD WATER**



**DO NOT MIX RED AND GREEN FREEZCOOL**

### **Demineralised water**

It must have:

- high electrical resistivity
- pH close to 7.



**Caution:** with water => **RISK OF FREEZING**

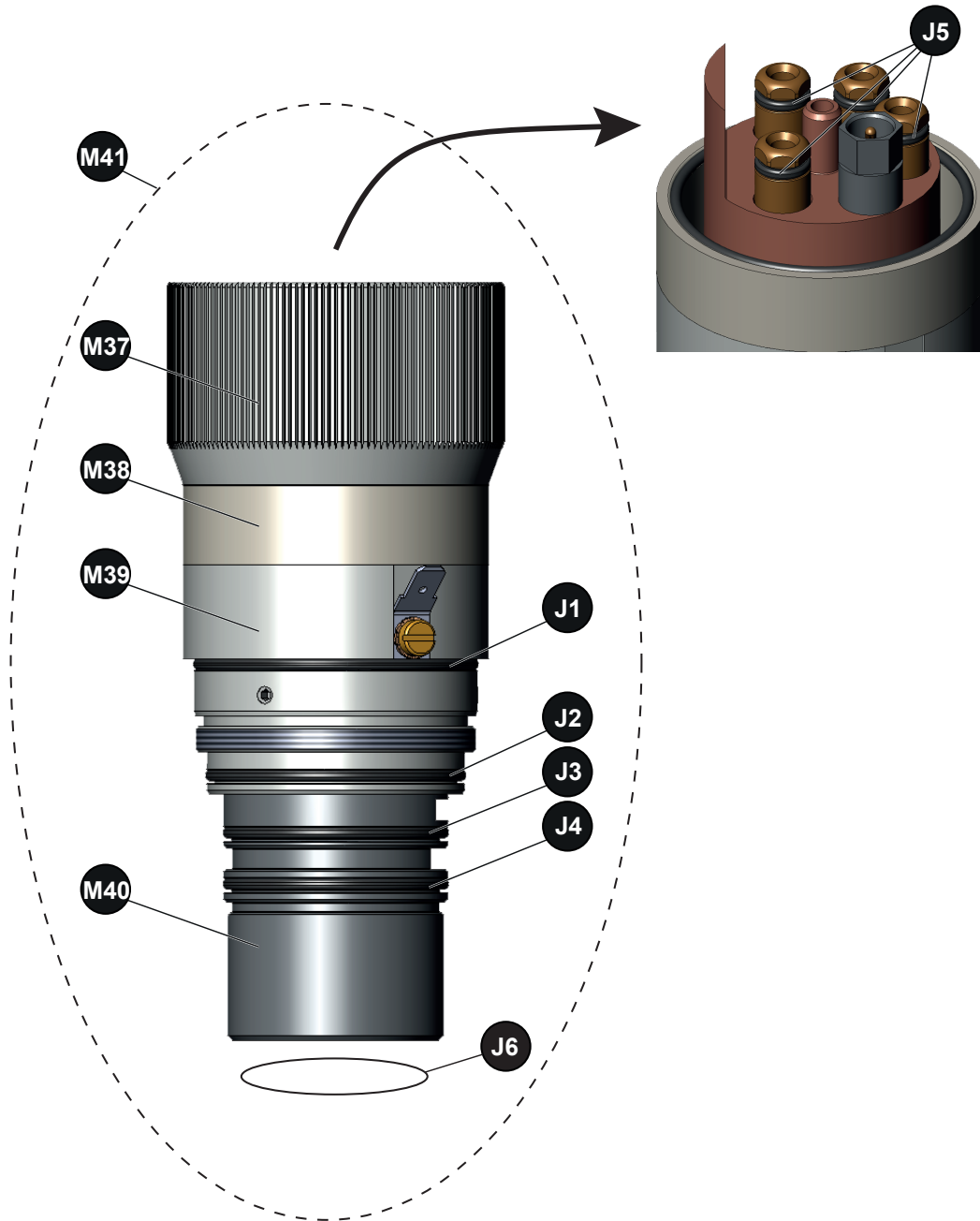


**Caution:** **NEVER ADD ANTIFREEZE**

## 5 - CPM PRO INOX process cases

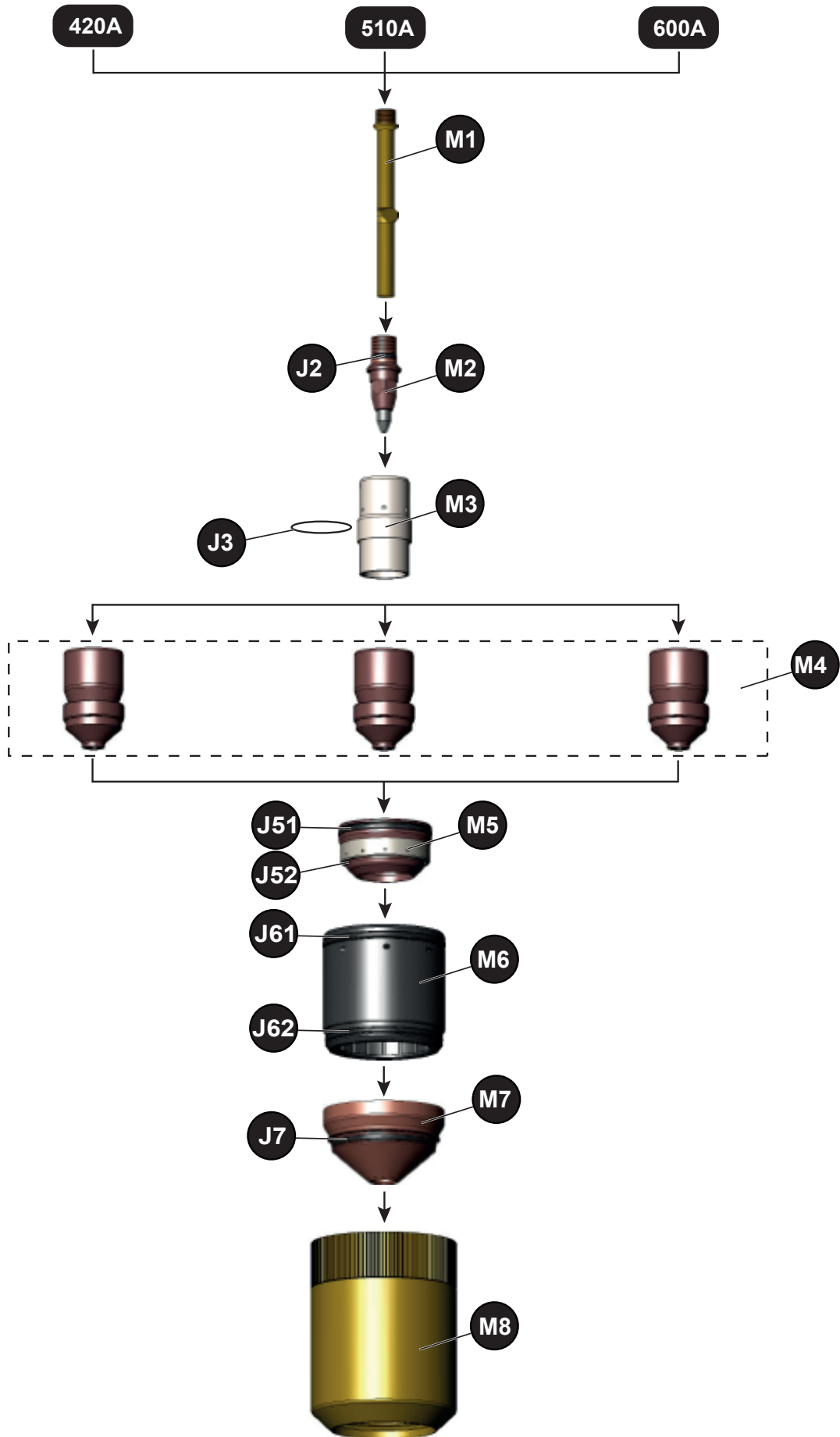
AS-CW-04150505	<b>CPM PRO INOX</b> argon/hydrogen 600A case	420 - 510 - 600
AS-CW-04150500	<b>CPM PRO INOX</b> water vortex case	60 - 90 - 120
W000374323	<b>NERTAJET HP300</b> (180 to 300 A) drawer complement	180 - 240 - 300
W000384203	<b>NERTAJET HP600</b> (510 to 600 A) drawer complement	510 - 600

1 - CPM PRO INOX torch tip

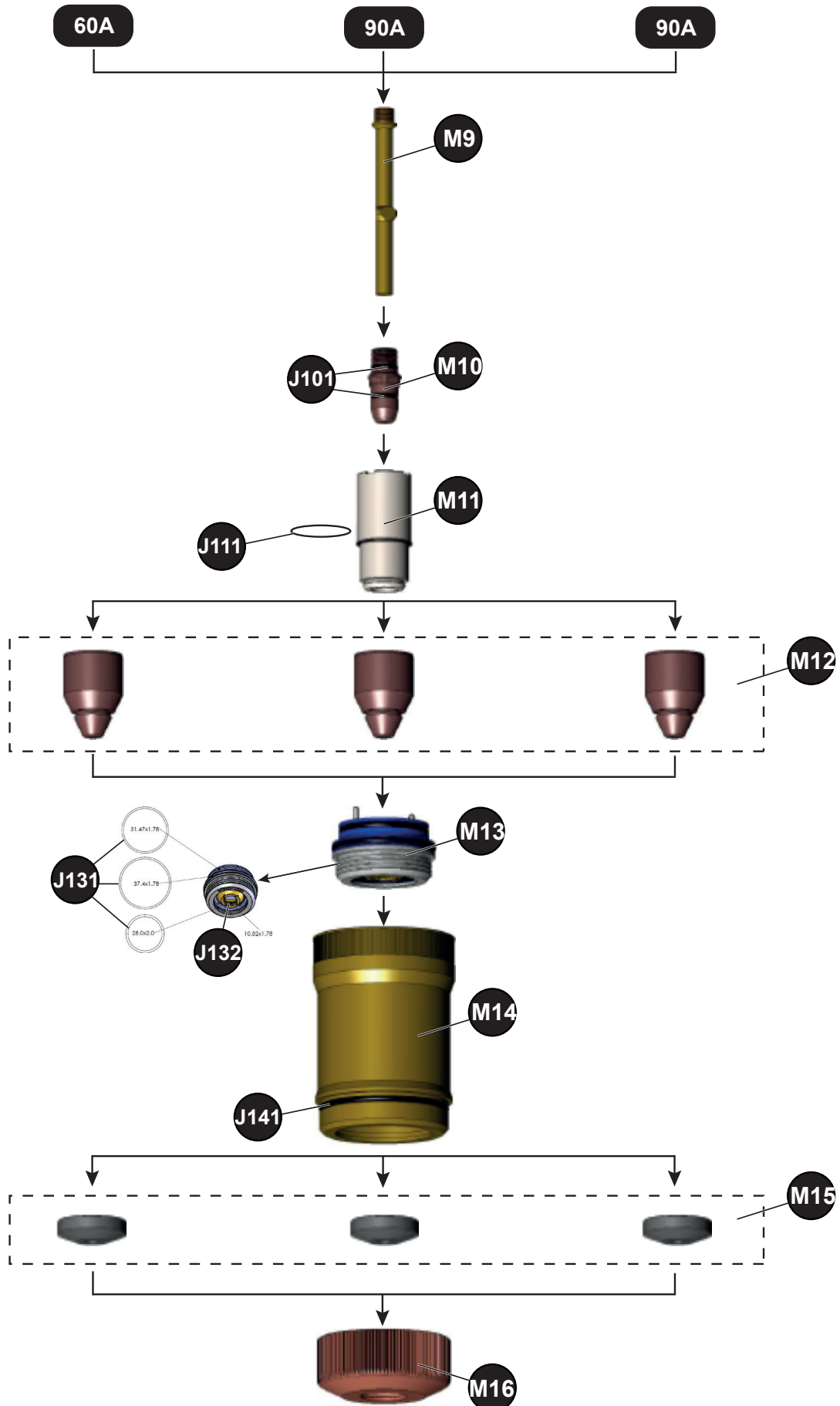




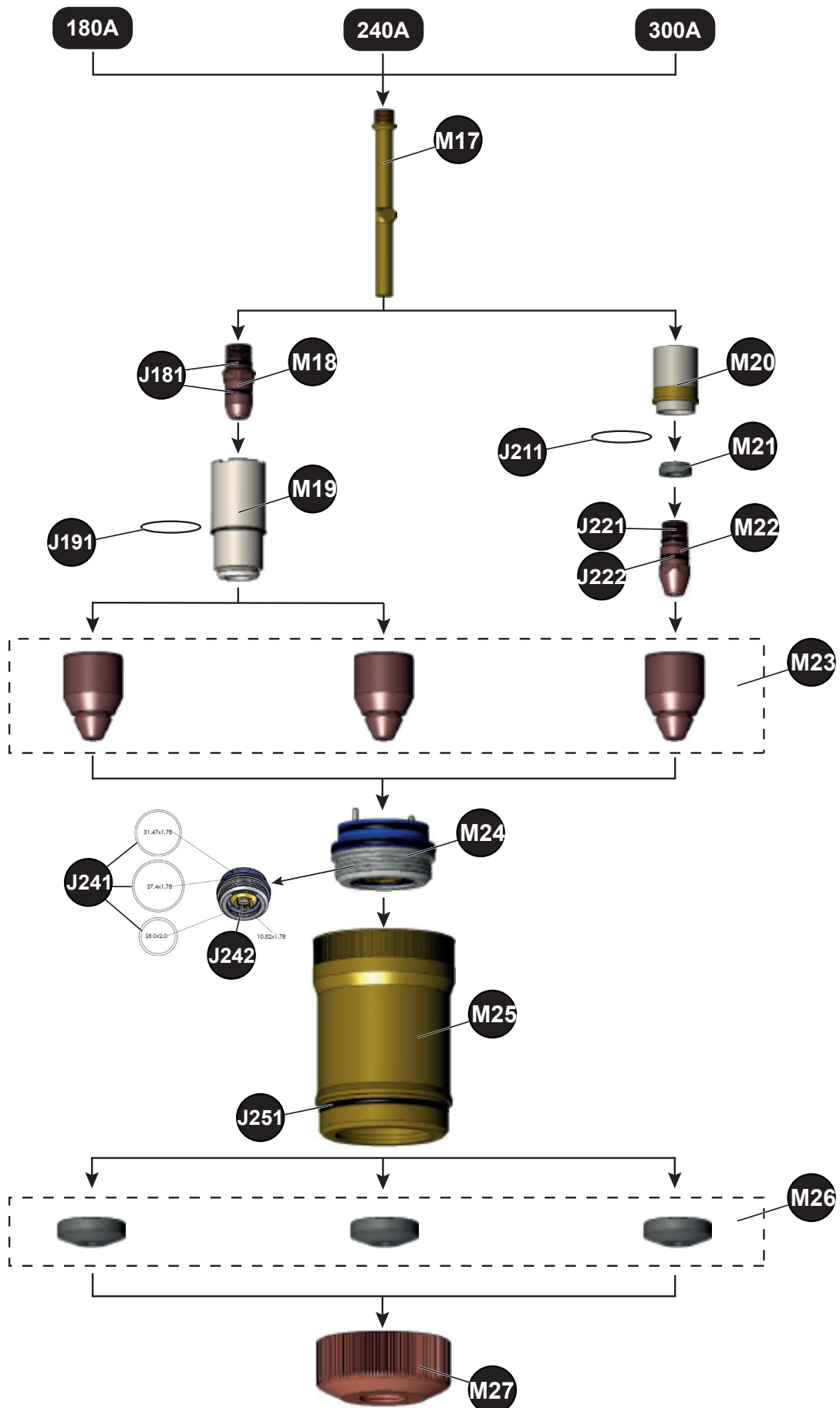
<b>ASSEMBLY OF CPM PRO INOX TORCH TIP</b>			
<b>Reference</b>	<b>Item no</b>	<b>Description</b>	<b>Symbol</b>
<b>M37</b>	P04180308	<b>CPM PRO INOX</b> torch body nut	
<b>M38</b>	P04180309	Insulating spacer	
<b>M39</b>	P04180305	<b>CPM PRO INOX</b> torch body shaft	
<b>M40</b>	P04180304	Intermediate insulation	
<b>M41</b>	AS-CW-CPMPROINOX	<b>CPM PRO INOX</b> torch tip	
	<b>J1</b>	AS-CW-04180318	Ø50x2 O-ring seal (set of 5)
	<b>J2</b>	AS-CW-04180325	Ø46x2 O-ring seal (set of 5)
	<b>J3</b>	AS-CW-04180324	Ø 38.7x2 O-ring seal (set of 5)
	<b>J4</b>	AS-CW-04180324	Ø 38.7x2 O-ring seal (set of 5)
	<b>J5</b>	AS-CW-04180316	Ø 6.75x1.78 O-ring seal (set of 5)
	<b>J6</b>	P04180322	Ø24x2 FKM80 O-ring seal



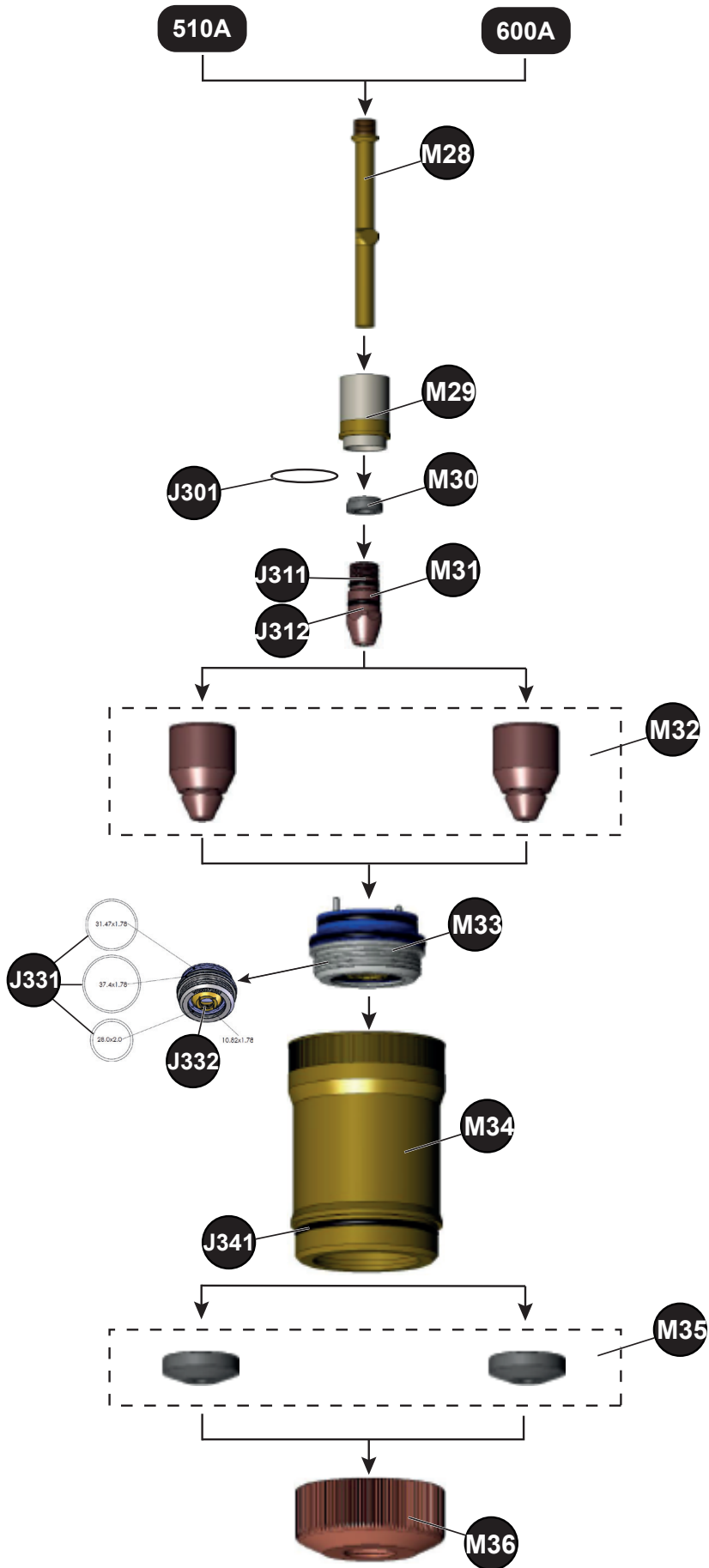
<b>ASSEMBLY OF «420A - 510A - 600A argon/hydrogen</b>			
<b>Reference</b>	<b>Item no</b>	<b>Description</b>	<b>Symbol</b>
<b>M1</b>	AS-CW-001820	<b>CPM PRO INOX</b> 600A pointed electrode immersion tube	
<b>M2</b>	AS-CW-001823	<b>CPM PRO INOX</b> ARH2 600A pointed electrode	
<b>M3</b>	AS-CW-002048	<b>CPM PRO INOX</b> ARH2 600A gas diffuser	
<b>M4</b>	AS-CW-001849	<b>CPM PRO INOX</b> ARH2 420A nozzle	
	AS-CW-001850	<b>CPM PRO INOX</b> ARH2 510A nozzle	
	AS-CW-001851	<b>CPM PRO INOX</b> ARH2 600A nozzle	
<b>M5</b>	AS-CW-001854	<b>CPM PRO INOX</b> ARH2 600A internal cover	
<b>M6</b>	AS-CW-001856	<b>CPM PRO INOX</b> ARH2 600A cooled cover diffuser	
<b>M7</b>	AS-CW-001855	<b>CPM PRO INOX</b> ARH2 600A downstream nozzle	
<b>M8</b>	AS-CW-001822	<b>CPM PRO INOX</b> ARH2 600A cooled external cover	
<b>J2</b>	AS-CW-04180333	Ø8x1.25 O-ring seal - FKM80	
<b>J3</b>	AS-CW-04180332	Ø14x1.78 O-ring seal - FKM80	
<b>J51</b>	AS-CW-04180327	Ø33x2 O-ring seal - FKM80	
<b>J52</b>	AS-CW-04180328	Ø24.6x2.40 O-ring seal - FKM80	
<b>J61</b>	AS-CW-04180331	Ø45x2 O-ring seal - FKM80	
<b>J62</b>	AS-CW-04180335	Ø 41x1.78 O-ring seal - FKM80	
<b>J7</b>	AS-CW-04180329	Ø 37.82x1.78 O-ring seal - FKM80	



<b>ASSEMBLY OF 60A - 90A - 120A water vortex</b>			
<b>Reference</b>	<b>Item no</b>	<b>Description</b>	<b>Symbol</b>
<b>M9</b>	AS-CW-001821	<b>CPM PRO INOX</b> 600A flat electrode immersion tube	
<b>M10</b>	W000325107	W2 electrode	W2
<b>M11</b>	W000325077	20 - 240A straight gas diffuser	
<b>M12</b>	W000325106	Plasma nozzle for use with 60A	90-Ø1.3
	W000325108	Plasma nozzle for use with 90A	120-Ø1.6
	W000325574	Plasma nozzle for use with 120A	150-Ø1.8
<b>M13</b>	W000372583	<b>CPM PRO INOX</b> internal water vortex kit	
<b>M14</b>	W000403502	Water vortex external cover	
<b>M15</b>	W000325110	Water vortex ceramic nozzle, 60A	Ø2.2
	W000325111	Water vortex ceramic nozzle, 90A	Ø2.8
	W000325112	Water vortex ceramic nozzle, 120A	Ø3.2
<b>M16</b>	W000372582	Nut for <b>CPM PRO INOX</b> vortex ceramic nozzle	
<b>J101</b>	Z04081283	8x1.125 nitrile seal (set of 5)	
<b>J111</b>	S04080916	18.5x12 nitrile seal (set of 5)	
<b>J131</b>	W000372628	Water vortex kit seal kit: - 2x31.47x1.78 - 2x37.4x1.78 - 2x28x2	
<b>J132</b>	W000325028	10.82x1.78 nitrile seal (set of 5)	
<b>J141</b>	Z04092198	46x2 nitrile seal	



ASSEMBLY OF 180A - 240A - 300A Water vortex			
Reference	Item no	Description	Symbol
M17	AC-CW-001821	<b>CPM PRO INOX</b> 600A flat electrode immersion tube	
M18	W000325107	W2 electrode	W2
M19	W000325077	20 - 240A straight gas diffuser	
M20	W000262880	300A and above vortex support	
M21	S04092098	300A and above straight gas vortex	
M22	W000372626	W4 electrode	W4
M23	W000325575	Plasma nozzle for use with 180A	200 - Ø2.0
	W000325084	Plasma nozzle for use with 240A	240 - Ø2.2
	Z04091350	Plasma nozzle for use with 300A	320 - Ø3.0
M24	W000372583	<b>CPM PRO INOX</b> internal water vortex kit	
M25	W000403502	Water vortex external cover	
M26	W000325093	Water vortex ceramic nozzle, 180A	Ø3.8
	W000325092	Water vortex ceramic nozzle, 240A	Ø4.2
	W000325094	Water vortex ceramic nozzle, 300A	Ø4.6
M27	W000372582	Nut for <b>CPM PRO INOX</b> vortex ceramic nozzle	
J181	Z04081283	8x1.125 nitrile seal (set of 5)	
J191	S04080916	18.5x12 nitrile seal (set of 5)	
J211	S04092099	16x1 nitrile seal (set of 5)	
J221	Z04081283	8x1.125 nitrile seal (set of 5)	
J222	S04092081	8.1x1.6 nitrile seal (set of 5)	
J241	W000372628	Water vortex kit seal kit: - 2x31.47x1.78 - 2x37.4x1.78 - 2x28x2	
J242	W000325028	10.82x1.78 nitrile seal (set of 5)	
J251	Z04092198	46x2 nitrile seal	





<b>ASSEMBLY OF 510A - 600A Water vortex</b>			
<b>Reference</b>	<b>Item no</b>	<b>Description</b>	<b>Symbol</b>
<b>M28</b>	AS-CW-001821	<b>CPM PRO INOX</b> 600A flat electrode immersion tube	
<b>M29</b>	W000262880	300A and above vortex support	
<b>M30</b>	S04092098	300A and above straight gas vortex	
<b>M31</b>	W000372626	W4 electrode	W4
<b>M32</b>	Z04091351	Plasma nozzle for use with 510A	500 - Ø3.5
	Z04091352	Plasma nozzle for use with 600A	640 - Ø4.0
<b>M33</b>	W000372583	<b>CPM PRO INOX</b> internal water vortex kit	
<b>M34</b>	W000403502	Water vortex external cover	
<b>M35</b>	Z04091369	Water vortex ceramic nozzle, 510A	Ø4.8
	Z04091370	Water vortex ceramic nozzle, 600A	Ø5.9
<b>M36</b>	W000372582	Nut for <b>CPM PRO INOX</b> vortex ceramic nozzle	
<b>J301</b>	S04092099	16x1 nitrile seal (set of 5)	
<b>J311</b>	Z04081283	8x1.125 nitrile seal (set of 5)	
<b>J312</b>	S04092081	8.1x1.6 nitrile seal (set of 5)	
<b>J331</b>	W000372628	Water vortex kit seal kit: - 2x31.47x1.78 - 2x37.4x1.78 - 2x28x2	
<b>J332</b>	W000325028	10.82x1.78 nitrile seal (set of 5)	
<b>J341</b>	Z04092198	46x2 nitrile seal	

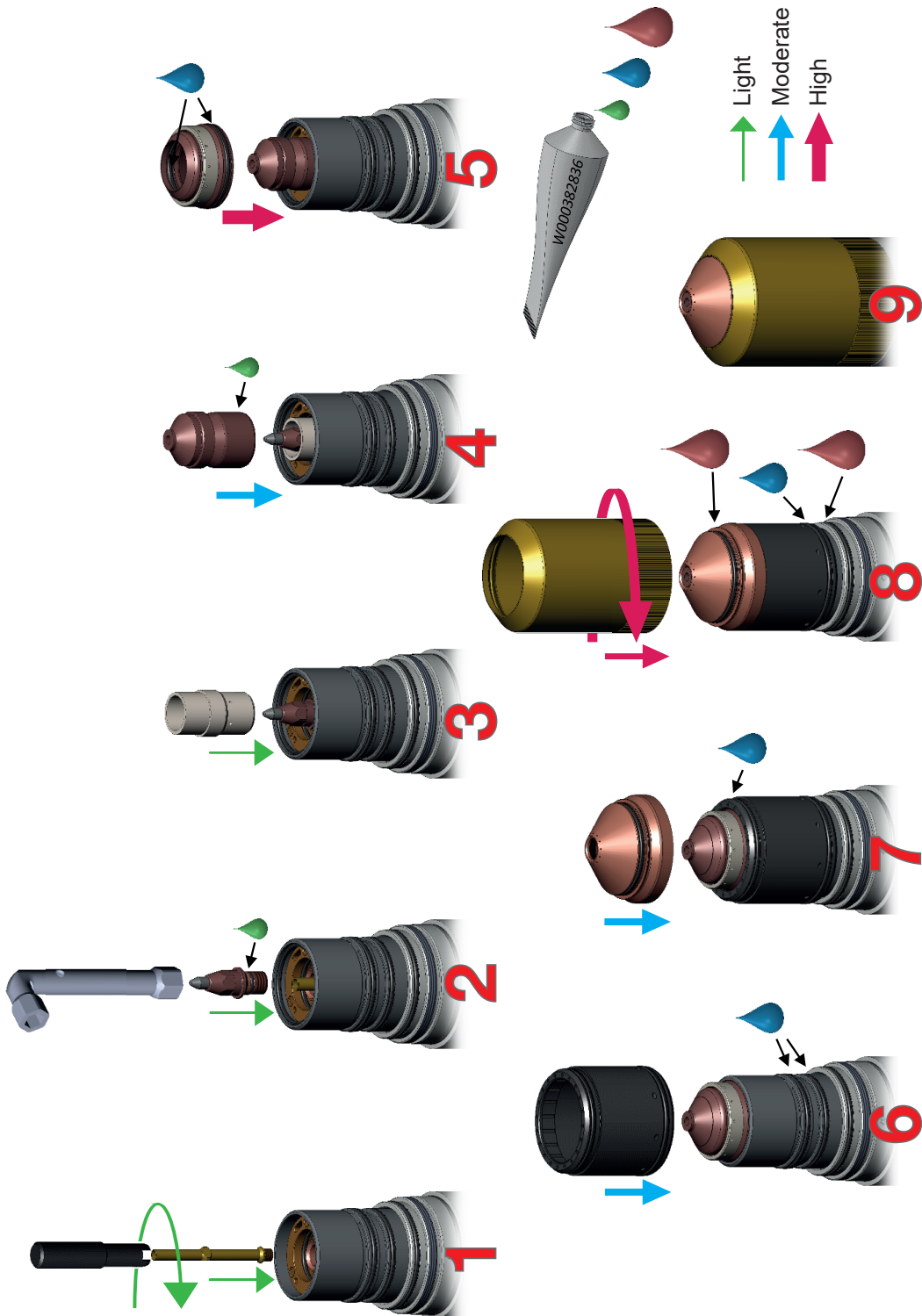
## 6 - Assembly procedure for CPM PRO INOX 420A - 600A Argon/hydrogen



High-quality cutting starts with taking very good care of the torch tip and consumables



Clean before and after each use (see section E - MAINTENANCE)

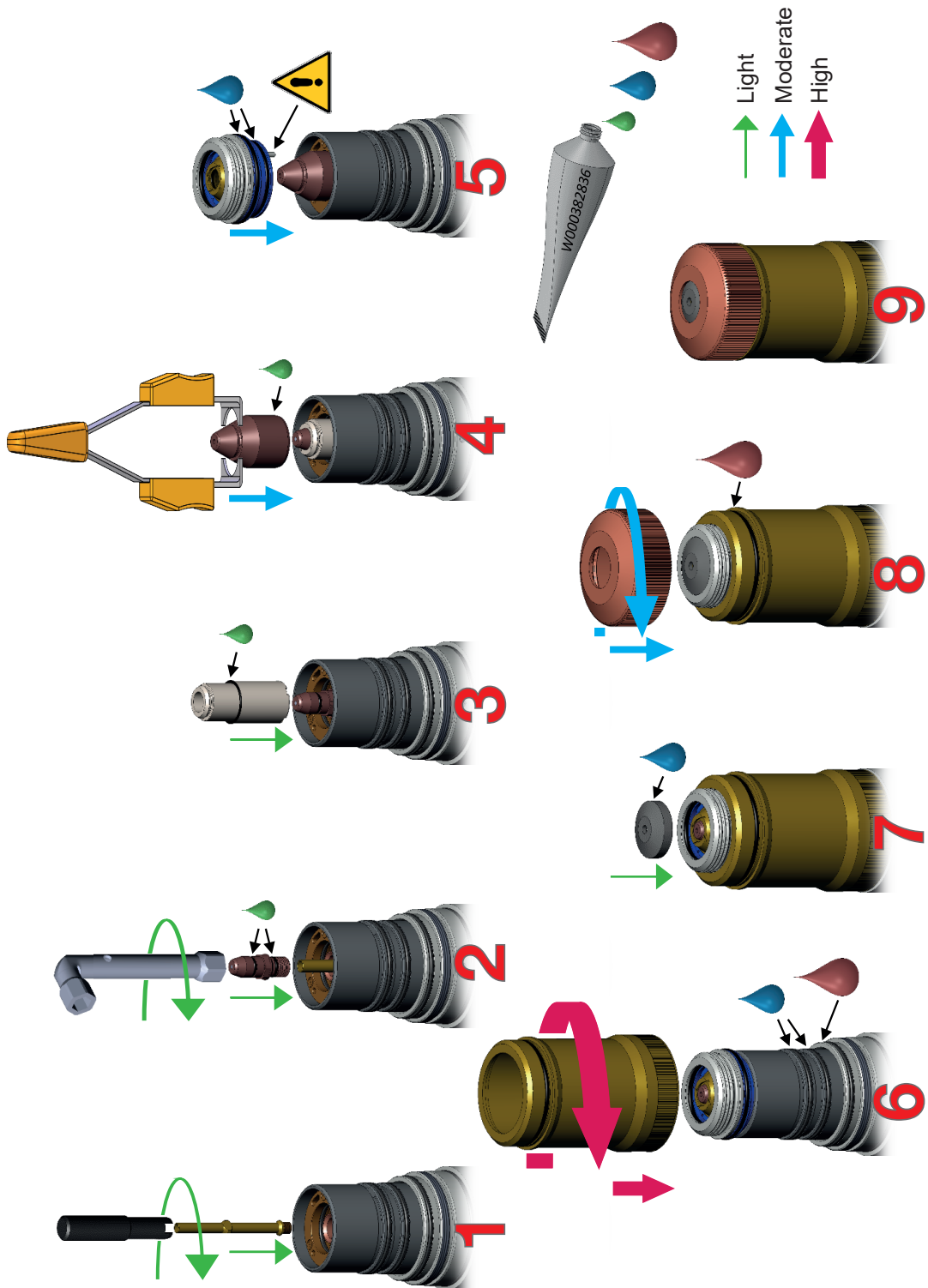




High-quality cutting starts with taking very good care of the torch tip and consumables



Clean before and after each use (see section E - MAINTENANCE)

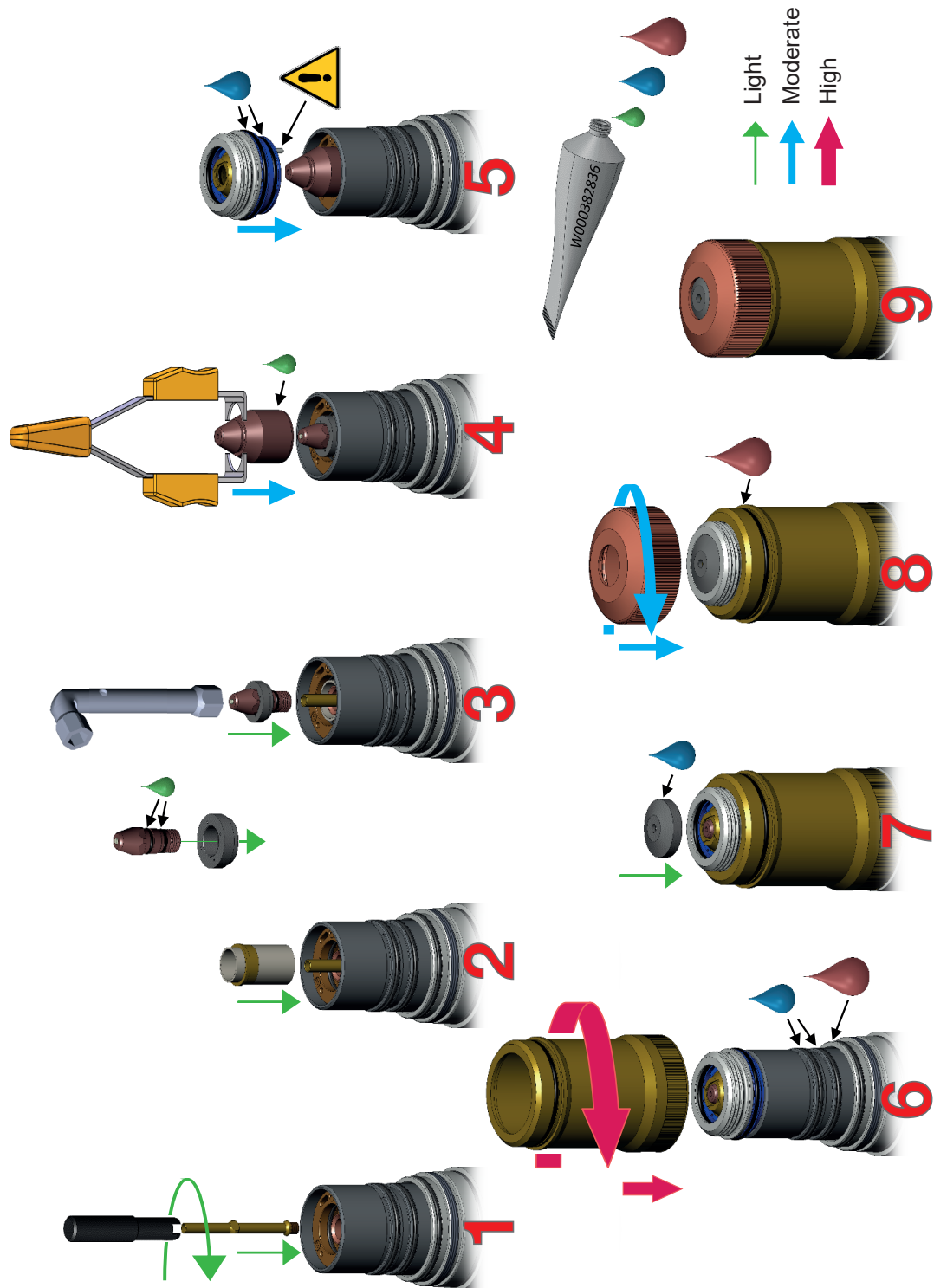


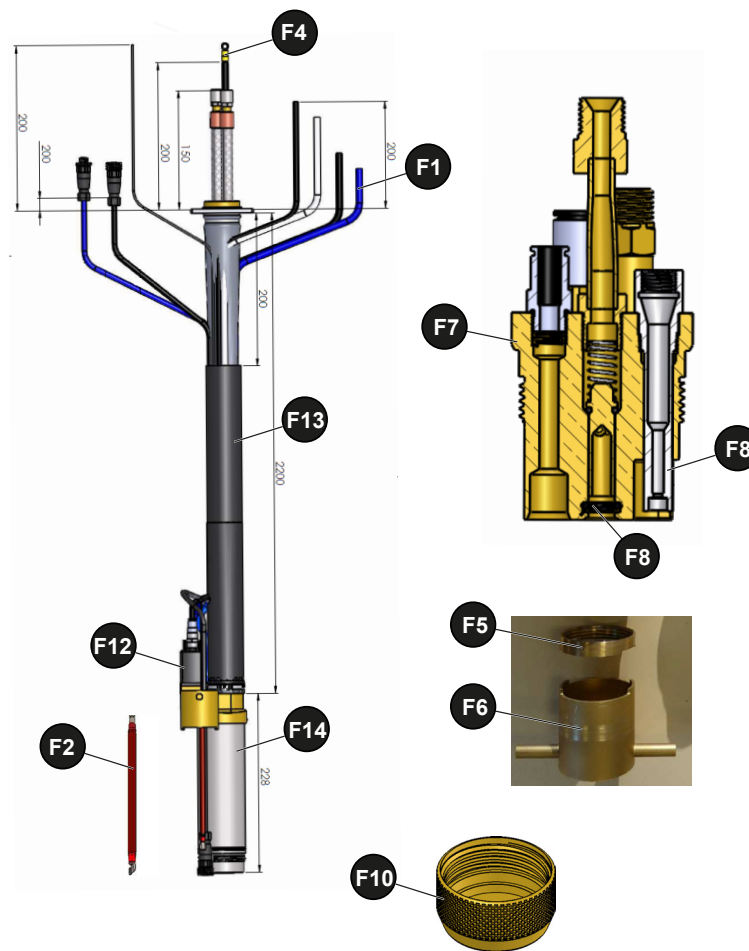


High-quality cutting starts with taking very good care of the torch tip and consumables



Clean before and after each use (see section E - MAINTENANCE) Clean before and after each use

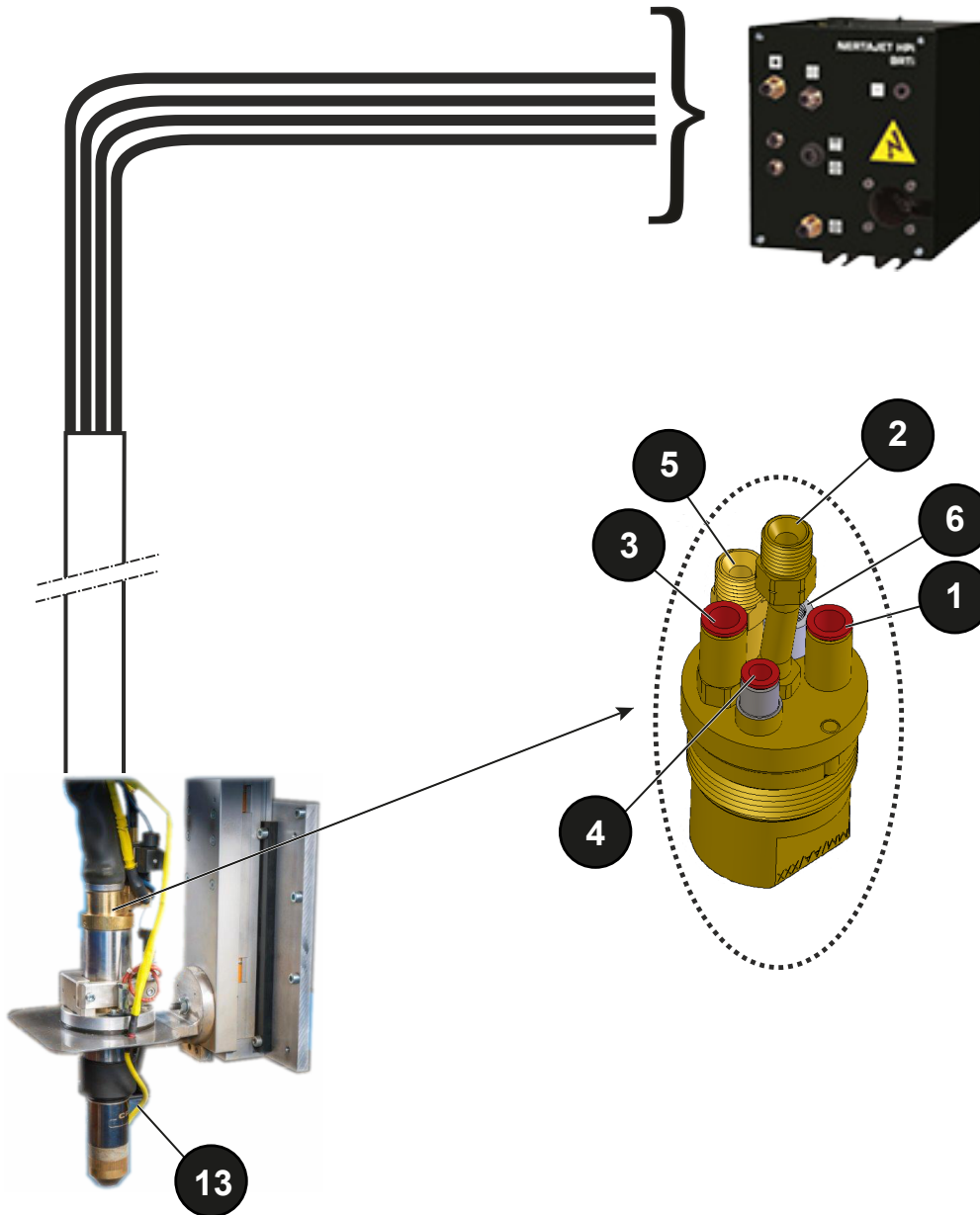




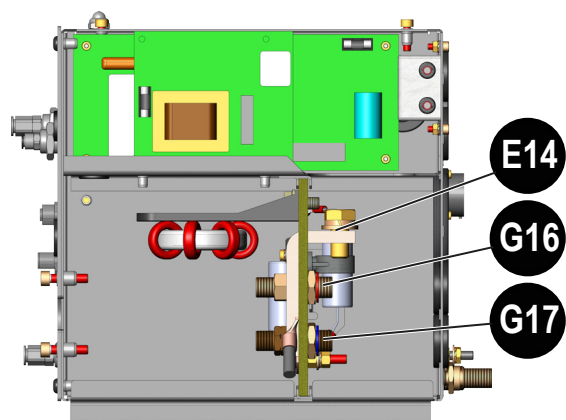
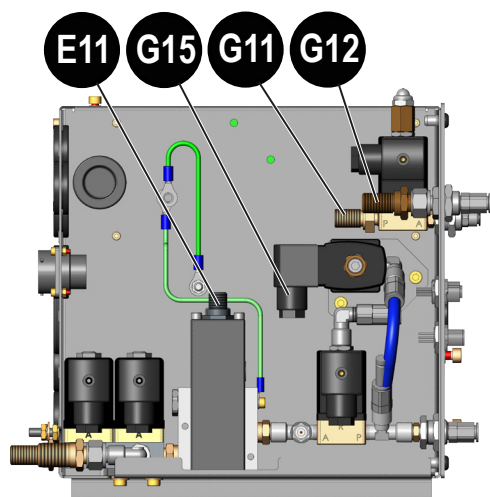
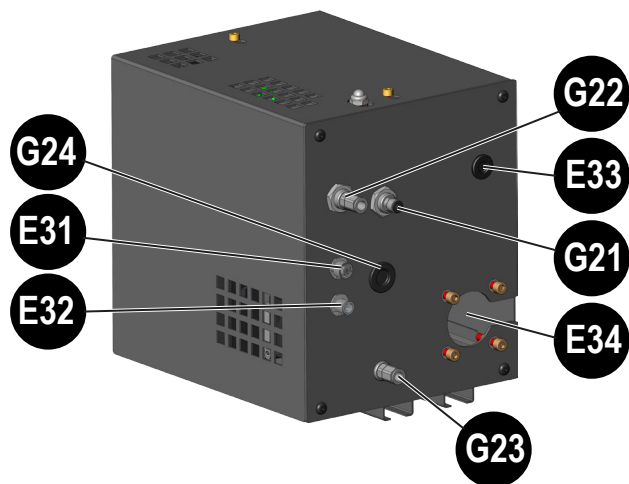
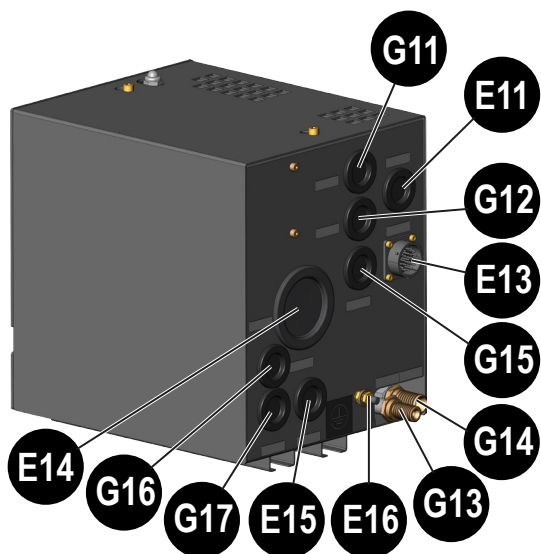
HPI bundle and connector			
Reference	Item no	Description	Keep in stock
F1	W000401873	HPI torch bundle and connector (1.1 m long) BRTi compatible connectors	✓
	AS-CS-04097674	HPI torch bundle and connector (1.6 m long) BRTi compatible connectors	✓
	W000377822	HPI torch bundle and connector (2.2 m long) BRTi compatible connectors	✓
	W000377823	HPI torch bundle and connector (3.4 m long) BRTi compatible connectors	✓
F2	W000372173	Touch & Go spare cable kit	✓
F4	W000372171	Complete HF cable for torch bundle	✓
F5	W000372172	Connector fastening nut	✓
F6	W000372170	Fastening tool for connector	✓
F7	W000381062	Complete <b>CPM PRO INOX</b> HPI connector	✓
F8	W000372169	HF feed-through for <b>CPM PRO INOX</b> connector	✓
F9	W000372968	6.8x2 seal for <b>CPM PRO INOX</b> connector	✓
F10	W000375181	<b>CPM PRO INOX</b> connector guard nut	✓
F12	AS-CS-5908126	HPI connector SV	✓
F13	W000383305	Complete 2.2m HPI torch bundle	✓
F14	W000383304	Connector tube for HPI	✓

1 - connecting the bundles near the CPM PRO INOX torch

**BRTi**



Reference	Description
1	Annular gas
2	Cooling circuit inlet + current supply
3	Vortex
4	Cutting gas
5	Cooling circuit return + current supply
6	Nozzle cable
13	Plate detection (for connection on the torch body)



Reference	Inputs
G11	Pilot gas/marketing input
G12	Cutting gas input
G13	Annular gas 1 input
G14	Annular gas 2 input
G15	Option (Water for vortex)
G16	Cooling (return)
G17	Cooling (inlet)
E11	Annular gas proportional valve control
E13	<b>BRGi / BRTi</b> cable
E14	Electrode cable
E15	Nozzle cable
E16	<b>BRTi</b> cabinet earth connection

Reference	Outputs
G21	Pilot gas/marketing line
G22	Cutting gas line
G23	<b>CPM400 BLACK</b> torch annular gas line
G24	<b>CPM PRO INOX</b> torch annular gas line
E31	Torch SV control cable - Y9
E32	Torch impact safety system cable
E33	Plate detection cable
E34	Torch connector bundle



Before starting any work on the torch, make sure that the power source is switched off.



During the cutting process, the torch tip may heat considerably. Before removal, it is imperative to use protective equipment.

### 1 - Servicing and maintenance

**CPM PRO INOX** plasma cutting torches are the location of different phenomena that create plasma arcs. For that, they are supplied with:

- electrical energy,
- plasma gas,
- cooling water,

through a bundle of pipes and cables.

#### **Note:**



Normal wear and tear of the nozzle and the electrode limit the life of these parts, making it necessary to replace them.

Assembly errors or the omission of parts would harm the life of the torch.

While removing or assembling the parts making up the torch, handle them with care to avoid breaking, scratching or marking them.

Always use original manufacturers' parts.

#### **Bundle:**



The bundle must be installed so that it is safe from mechanical, chemical and thermal damage. Monitor the condition of the ducting that covers the bundle.

If there is any defect, explore the condition of the various conduits that make up the bundle.

Also check the cable to the piece (ground cable).

Work for maintaining and repairing insulating ducts, pipes and enclosures may not be carried out in a haphazard manner.

Regularly check all the connections and make sure that the electrical connections are not heating.

#### **Observations:**



- when the electrode is removed, mind you do not damage the end of the immersion tube located in the body of the torch,
- make sure that the immersion tube is properly fastened before putting back the electrode.

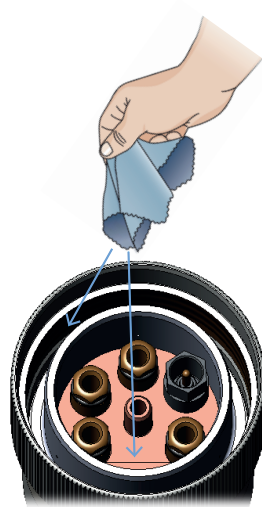




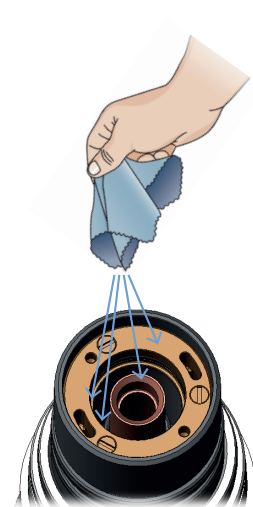
Clean before and after each use



1



2



3

## 2 - Rules to follow while assembling CPM PRO INOX



The consumables and torch are to be stored in a clean dry place.



Never use soiled or over-used consumables.

- The nozzle holes must not be deformed or obstructed.
- All consumables and the torch must be clean and dry (clean with a dry cloth if necessary)
- Never use a dusty, moist or greasy cloth



Visually check the concentricity of the holes of the upstream and downstream nozzles.

### 3 - Troubleshooting

Problem	Remedy
<b>Difficult ignition of pilot arc</b>	- check the nature and pressure of the pilot gas (argon) using the tables.
	- make sure that there is an HF burst between the electrode and the nozzle.
	- check the gas pipe over the entire circuit: to do so, put a blocked nozzle in place on the torch and run a gas test. Make sure that the pressure displayed on the regulator does not change after the gas cylinder is shut; if the pressure drops => leak.
<b>The arc blows at the time of the transfer.</b>	- reduce the ramping up delay.
	- check the pressure values of the cutting gas.
	NB: Mind the regulator pressure build-up; take care not to move the torch away excessively at the time of transfer: risk of arc break.
<b>Transfer difficult</b>	- check the connection of the electrical cable to the piece (ground cable).
	- check the electrode circuit, particularly the connections of the bundles.
	- check the condition of the cone nozzle: it must be changed if the cutting channel widens at the bottom.
<b>Nozzle destroyed</b>	- Nozzle destruction may be due to:
	- an excessively fast rise to power: increase the power rise time,
	- contact with the piece due to metal splatter during mid-plate striking: raise the torch at the time of the transfer,
	- direct contact with the piece.
	- lack of cutting gas: check the flow rate or the circuit of the cutting gas,
	- intensity too high for the nozzle diameter used: see table,
	- deficient cooling: check the flow rate of the return circuit and the temperature of the cooling circuit,
<b>Flat electrodes are rapidly worn or destroyed.</b>	- check the condition of the gas gun.
	- increase the cutting gas pressure.
	- check the cooling circuit.
	- immersion tube in poor condition (affects flow rate).

### 4 - Spare parts



**Spare parts relating to the consumables of the CPM PRO INOX torch can be found in section:**

**“C- Description of different assemblies for plasma cutting”**

**“D - Torch bundles”**



