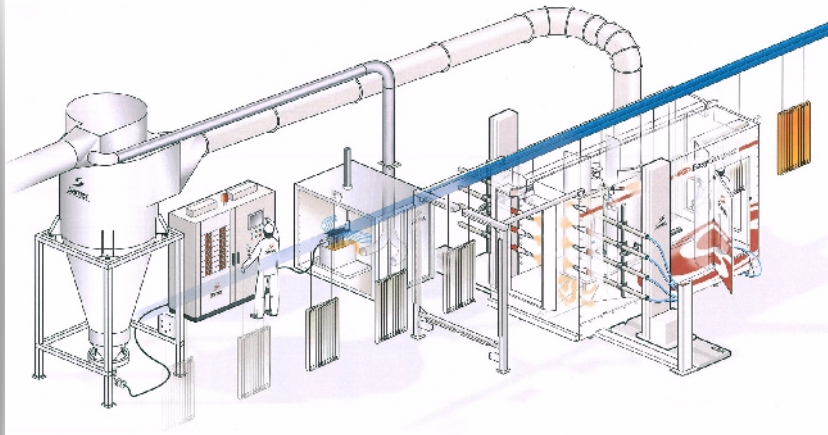




From February 1st, 2017 SAMES Technologies SAS becomes SAMES KREMLIN SAS  
A partir du 1/02/17, SAMES Technologies SAS devient SAMES KREMLIN SAS



# User manual

## EasyCompact PVV Powder-coating Booth



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# EasyCompact PVV Powder-coating Booth

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# 1. Safety

## 1.1. Associated documents

**Note:** This document contains links to the following user manuals:

[see RT Nr 6336](#) For the “Mach-Jet Gun” spray gun

[see RT Nr 6366](#) For the “Auto Mach-Jet” automatic spray gun

See supplier's notice for filter unit

[see RT Nr 7023](#) For EasyCompact PVV recycling system

[see RT Nr 7015](#) For EasyCompact PVV installation.

## 1.2. Safety Regulations



**WARNING :** It is essential for the different operators to be aware of the back-end risks in using the equipment. [see § 1.4 page 7](#)

The rules below apply to installation, maintenance and operation of the equipment.

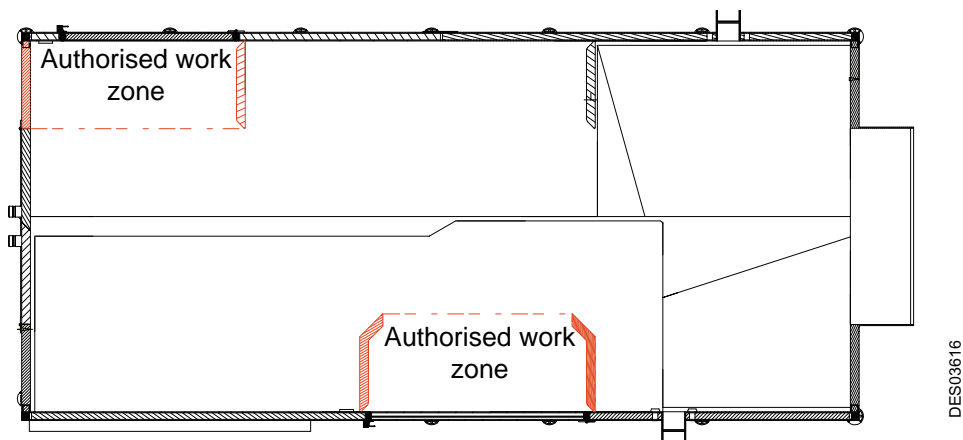


**WARNING :** The electrostatic paint spraying equipment must only be used by qualified personnel fully informed of the following safety rules:

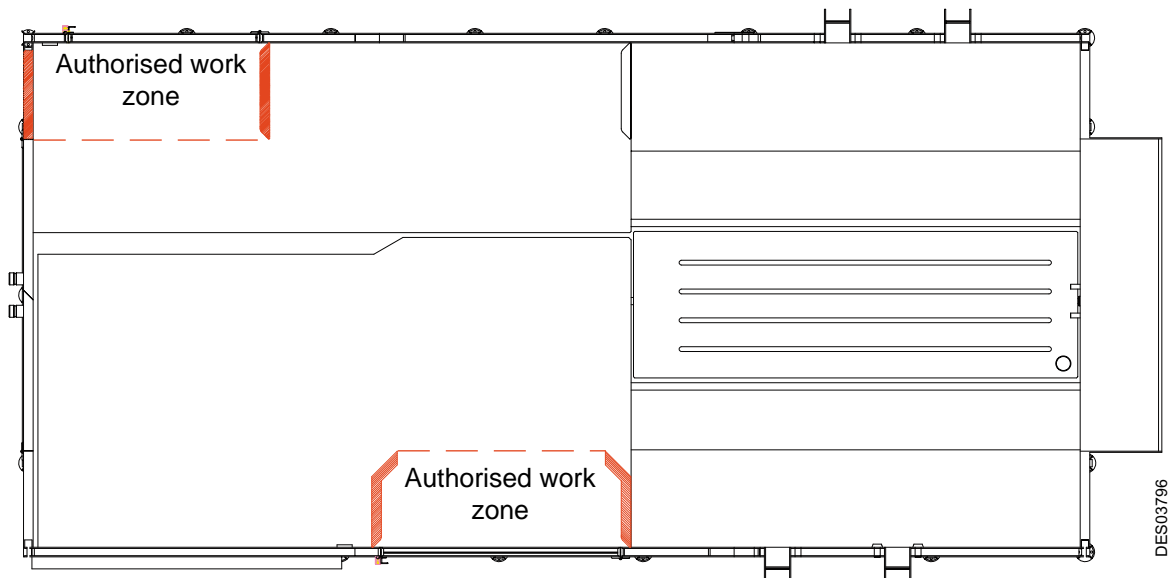
- 1 The ground terminal for the electro-pneumatic control module and all conducting structures (floors, walls of powder-spraying booths, ceilings, barriers, parts to be painted, etc.) that are inside or near the work station must be electrically connected to the ground system protecting the electrical power supply.
- 2 Grinding or welding of metal products carried out less than 5 metres from the booth is forbidden unless the following safety measures are implemented:
  - The booth must be protected by a non-flammable tarpaulin.
  - An employee equipped with a fire extinguisher must patrol the area surrounding the booth during the work.
- 3 The booth must not support any weight other than that of equipment originally intended to be installed on or around it.
- 4 Only use spray guns approved by SAMES Technologies in the booth.
- 5 The surface of the floor on which the booth is installed must be perfectly horizontal.
- 6 The floor on which the booth is installed must have a resistance greater than 400 kN /m<sup>2</sup>.
- 7 The temperature of any heat source in contact with the walls must not exceed 40°C.
- 8 The booth must only be used for electrostatic application of thermoplastic or thermosetting powder paints.
- 9 A warning notice written in a language that the operator understands and summarising the safety rules indicated in this manual must be placed next to the workstation where it can be clearly seen.
- 10 The operator must make sure that the high-voltage power supply has effectively been switched off before working in the spraying area, particularly during the cleaning stage.
- 11 It is recommended to wear slippers or overshoes when entering the booth. If it is necessary to wear gloves, use only antistatic gloves or gloves with the palms removed.
- 12 It is absolutely essential to use solvents with a flash point at least 5°C greater than the ambient temperature for cleaning the booth.
- 13 It is strictly forbidden to smoke or use devices producing a flame at a distance of less than 5 metres from the booth.

- 14 Each part to be painted must have a resistance of less than 1 M $\Omega$ /ground: hooks and supporting devices used to hang parts in the booth must therefore be perfectly scoured and connected to the ground system.
- 15 Powder spraying operations must be executed under optimum ventilation conditions. For this reason, the powder-coating equipment is interlocked with electric fan operation: powder can not be sprayed unless the electric fan is running.
- 16 Booth doors must be assembled and disassembled using appropriate lifting equipment on account of their considerable weight (approximately 30 kg/m<sup>2</sup>).
- 17 It is strictly forbidden to enter the booth via the openings intended for entry and exit of parts to be painted. Only personnel who are fully aware of the risks of electric shock related to the presence of robots are authorised inside the booth (out of the authorised work zone). The booth must only be entered when powder-coating phases are not in progress, after consignment of the energies, and only for the purpose of maintenance of the booth.
- 18 It is strictly forbidden to jump inside the booth. Impacts of this type could break welds.
- 19 The operator must never move beyond the authorised work zone during powder-coating operations (see illustrations below).

### 1800 PVV EasyCompact booth



### 2200 PVV EasyCompact booth

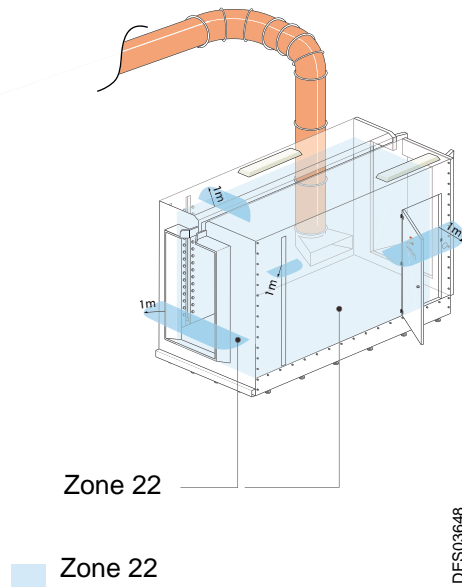


- 20 Travel speed of parts on the conveyor must not exceed 10 m/min.

### 1.3. Compliance with ATEX directive

According to Directive 1999/92 EC, the user is responsible for defining ATEX zones. In accordance with standard EN 12981, Sames Technologies has designed the EasyCompact system taking the following areas into account:

- **Powder-coating booth:**
  - Zone 22 for inside volume and 1 metre around all openings.



#### 1.4. Back-end risks

It is essential for all operators to be fully aware of the back-end risks associated with use of the PVV booth. These are indicated in the table below:

<b>Risks</b>	<b>Severity</b>	<b>Extent of damage</b>	<b>Frequency and length of exposure</b>	<b>Methods implemented to limit damage</b>
Noise during cleaning phases (for sound measurement <a href="#">see RT Nr 7015</a> )	Serious	Several people	0 to 10 times per day for 3 minutes	Personal protection (ear defenders, plugs, etc.)
Crushing, impacts, cuts, falls during booth installation	Serious	SAMES personnel	Once	Installation completed by SAMES personnel trained for these operations
Fall during operations in top part of booth	Serious	One person	Rare	Use appropriate safety equipment when working at height

## **2. Description**

Definition:

- 1 Spray applicator: automatically triggered powder spraying device (Auto Mach-Jet type).
- 2 Spray gun: manually triggered powder spraying device (trigger-operated) ("Mach-Jet Gun" type).

### **2.1. General description**

The powder-coating booth is the chamber inside which powder is sprayed.

Parts are conveyed through the booth. They are coated with powder when they pass in front of the spray guns.

Manual powder-coating stations are provided for pre-coating or retouching parts to be painted.

It is essential to clean the inside of the booth each time the colour is changed. During the cleaning phase, the automatic recycling system sucks in any excess powder deposited in the powder-coating booth, filters it and then re-injects it into the powder container.



### 3. Characteristics

#### 3.1. Dimensions - Weights



**WARNING : Only SAMES Technologies is authorised to move the powder-coating booth.**

- The standard width of a PVV booth is 1,700 mm.
- Approximate booth weight according to dimensions:

	<b>1800 PVV EasyCompact booth</b>	<b>2200 PVV EasyCompact booth</b>
External Length	4,090 mm	4,400 mm
External Width	1,700 mm	2,180 mm
Height	From 2,500 to 3,500 mm	From 2,500 to 3,500 mm
Dimensions of parts to be coated	Max. width. 800 (or width of the opening minus 100 mm) Max. height: 2500 mm (or height of the opening minus 220 mm)	Max. width 1,200 (or width of the opening minus 100 mm) Max. height 2,500 mm (or height of the opening minus 220 mm)
Approximate weight of the booth	From 1,500 to 1,900 kg	From 2,000 to 2,600 kg

- Maximum dimensions of parts to be coated with powder:
  - Max. height: 2,500 mm
  - Max. width: 800 mm to 1,200 mm according to the booth.

#### 3.2. Pneumatic characteristics

Compressed-air flow rates used by cleaning devices:	
Blower rod (inside booth cleaning)	110 m <sup>3</sup> / h (*)
Blower nozzles (automatic cleaning of external spray gun surfaces)	12 m <sup>3</sup> / h per nozzle, i.e. 24 m <sup>3</sup> / h per spray gun.
Required compressed-air characteristics for booth cleaning according to standard NF ISO 8573-1:	
Maximum dew point at 6 bar (90 psi)	class 4, i.e. + 3 °C (37 °F)
Maximum particle-size of solid pollutants	class 3, i.e. 5 microns
Maximum oil concentration	class 1, i.e. 0.01 mg/m <sup>3</sup> (*)
Maximum concentration of solid pollutants	class 3, i.e. 5 mg/m <sup>3</sup> (*)

\* m<sup>3</sup>: values given for a temperature of 0 °C, at atmospheric pressure (1,013 mb).

Noise generated by booth components refer to sound measurement sheets (for system manual).

### 4. Diagrams

Not applicable.

## 5. Operation

The booth is installed on supporting legs with the possibility to adjust the height of each one to ensure that the booth is horizontal.

### 5.1. Passage of parts

Passage of parts through the booth is authorised by its exit doors and the slot in the ceiling.

The cell gantry serves to detect and calibrate parts entering the booth:

- Detection triggers automatic powder spraying, robot movements and the required number of spray guns according to the characteristics of the part to be painted.
- In and out measurement of parts serves to optimise application distances.

### 5.2. Powder spraying

The powder spray guns enter the booth via vertical slots in the side walls. They are supplied with powder by the powder feed centre and driven by the double-axis robots.

Manual powder-coating stations are provided (doors in the side panels of the booth) as an option. When not in use, spray guns must be housed in the circular opening provided for the purpose.

Powder deposited in the booth during spraying is extracted by the suction tube. The "V" profile of the booth floor in the automatic zone limits powder accumulation.

### 5.3. Cleaning phase

Powder deposited on the inside panels of the booth is cleaned by the operator, using a compressed-air lance.

Powder spray guns are cleaned automatically by blower units.

All excess powder is extracted via the suction tube and recycled.

## 6. Tools

Not applicable.

## 7. Installation

The powder-coating booth is installed by SAMES Technologies.

It is essential to contact SAMES Technologies before proceeding with any modifications to the powder-coating booth or its installation.



**WARNING** : Assembly and installation procedures are described in document STR02G.

## 8. Maintenance

### 8.1. Cleaning



**WARNING :** The equipment may only be operated by personnel trained in compliance with SAMES Technologies recommendations.

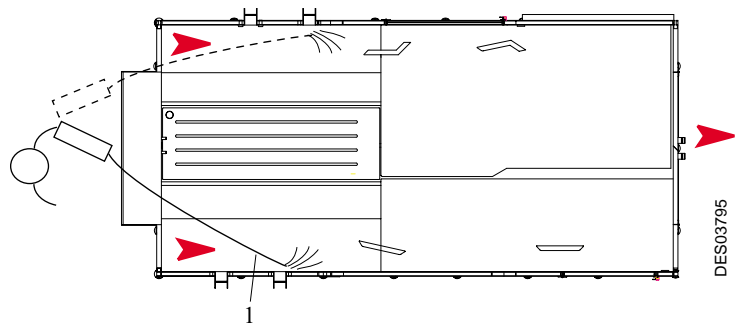
#### 8.1.1. Cleaning booth walls



**WARNING :** Comply with safety instructions [see § 1 page 4](#).

Only clean when the extraction system is running.

1	Cleaning rod
---	--------------



- Cleaning must be carried out from outside the booth from the sas (closed doors) using the compressed-air cleaning rods provided for the purpose.
- Blow on the walls from top to bottom using the compressed-air cleaning rod (1). The compressed-air cleaning rod must be moved tangentially with respect to the walls of the booth, particularly around the spray gun entry slots. The end piece on the compressed-air cleaning rod may be used as a guide when placed in contact with the walls. It is manufactured using materials that do not damage the walls.
- Excess powder left on the floor is extracted into the suction tube and sent to the cyclone for recycling.

**Note:** Two types of cleaning rod must be used:

- Cleaning rod with a length of 1 metre for the area immediately surrounding the opening.
- Cleaning rod with a length of 3 or 4 metres (according to booth height) for cleaning the rest of the booth.

#### 8.1.2. Cleaning external surfaces of spray guns



**WARNING :** Comply with safety instructions [see § 1 page 4](#).

When booth operation is controlled by the PLC, the external surfaces of the spray guns are cleaned automatically.

The spray guns are located inside the booth. Cleaning air is blown through the nozzles automatically. The robot moves slowly backwards until the spray guns are free of the booth and moves the spray gun support arms up and down to ensure complete cleaning of the external surfaces of the spray guns.

## 8.2. Preventive maintenance



**WARNING :** Cleaning operations must be carried out using compressed air only or cleaning products specifically recommended by SAMES Technologies.

It is strictly forbidden to use flammable products with a flash point less than the ambient temperature + 5°C for cleaning the booth (the booth has a PVC coating, which increases the risk of a build-up of electrostatic charges that may lead to production of sparks and possible explosion of the solvent).

### 8.2.1. Cleaning the booth

We advise to clean the inside of the booth once a month and the outside every three months using the product PS 1098 (P/N: 100000037) recommended by SAMES Technologies. Follow the procedures described below.

#### Required equipment:

- Clean non-fluffy cloths
- Cleaning product
- Stepladder equipped with rubber feet to avoid damaging the plastic floor
- Butyl rubber gloves
- Safety goggles
- Protective mask



**WARNING :** Refer to safety regulations [see § 1 page 4](#) before carrying out any work.

#### Procedure for inside maintenance operations:

- Clean the inside of the booth in the same way as for a change of colour, using the cleaning rod provided for the purpose. [see § 8.1.1 page 11](#)
- Rub down the whole inside surface of the booth with a clean, dry cloth.
- Progressively clean the inside surface of the booth with a cloth soaked in the cleaning product describing circles of approximately 1 square metre in diameter. Wipe with a clean, dry cloth and repeat the operation until the entire surface has been covered. Clean from the top down, paying particular attention to stubborn stains.
- Switch on booth ventilation system.
- Leave to dry during 24 hours without powder spraying.



**WARNING :** Do not spray cleaning product in the booth with the ventilation ON.

**Procedure for outside maintenance operations:**

- Wipe down the entire outside surface of the booth with a clean, dry cloth to remove dust.
- Progressively clean the outside surface of the booth with a cloth soaked in the cleaning product describing circles of approximately 1 square metre in diameter. Wipe with a clean, dry cloth and repeat the operation until the entire surface has been covered. Clean from the top down, paying particular attention to stubborn stains.
- Leave to dry during 24 hours without powder spraying.

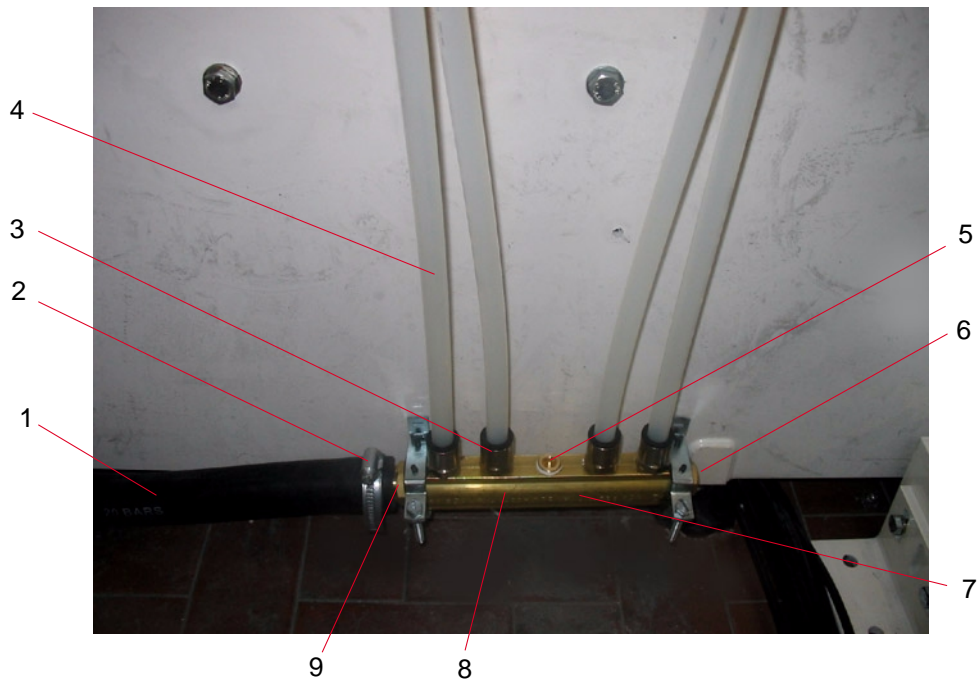


**WARNING** : It is essential to ensure that the cleaning product does not enter in the ventilation duct (product traces in the duct may generate powder deposits) like on the applicators.

**9. Corrective maintenance**

Symptoms	Probable causes	Remedies
Spray gun not cleaned.	No air supply.	Restore compressed-air supply.
	Air valve malfunction.	Replace air valve.
Walls incorrectly cleaned.	Unsuitable cleaning product.	Use cleaning products recommended by SAMES.

## 10. Spare Parts



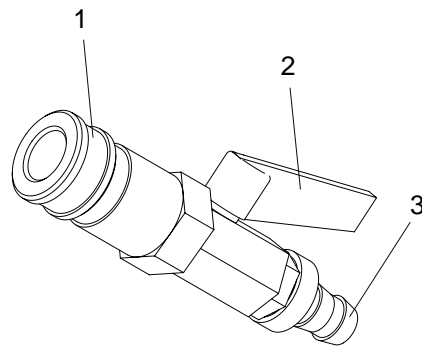
Item	Reference	Description	Qty	Unit of sale	First Emergency	Consumable
-	E5FBME143AT	Emergency stop button	2	1	-	-
-	Q1RCAM081	Screw-on hinge	10	1	-	-
-	Q1FFER338	Door latch	2	1	-	-
1	J2CTTL265	Blowing air supply hose		m	-	-
2	X2BCCF004	Collar, width: 4, dia.: 3	1	1	-	-
3	F6RLUS201	Male simple union	4	1	-	-
4	U1CBBS006	Rilsan hose, dia.: 11/14, clear	1	m	-	-
5	F6RLBH233	Plug, 3/8	1	1	-	-
6	F6RLSZ412	Plug	1	1	-	-
7	F6RLSZ411	Collector	1	1	-	-
8	F6RLSZ413	Collector support	1	1	-	-
9	F6RLQF474	Ringed socket	1	1	-	-
-	100000037	Cleaning product PS 1098 (bottle of 1liter)	1	1	-	-



Item	Reference	Description	Qty	Unit of sale	First Emergency	Consumable
1	R3VELM342AT	Solenoid valve	1	1	X	-
2	R3PVPR167	Valve 2/2	1	1	-	X

## 10.1. Cleaning rods

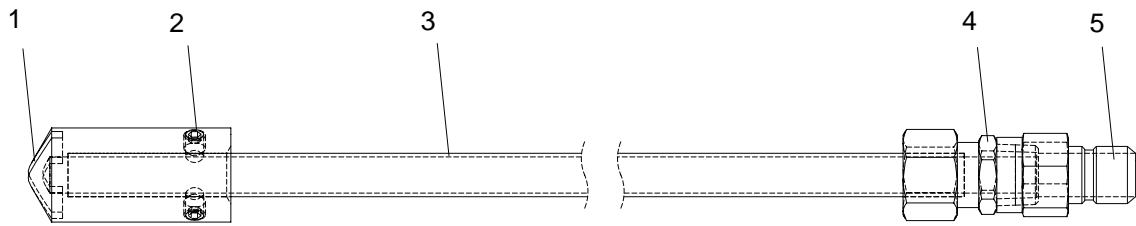
### 10.1.1. Cleaning rod handle



DES03615

Item	Reference	Description	Qty	Unit of sale	First Emergency	Consumable
	<b>910003039</b>	<b>Cleaning rod handle</b>	<b>1</b>	<b>1</b>	<b>-</b>	<b>-</b>
1	F6RLJR197	Coupler	1	1	-	-
2	F1RBTU179	Ball valve 3/8"	1	1	-	-
3	F6RLQF189	Ringed socket	1	1	-	-

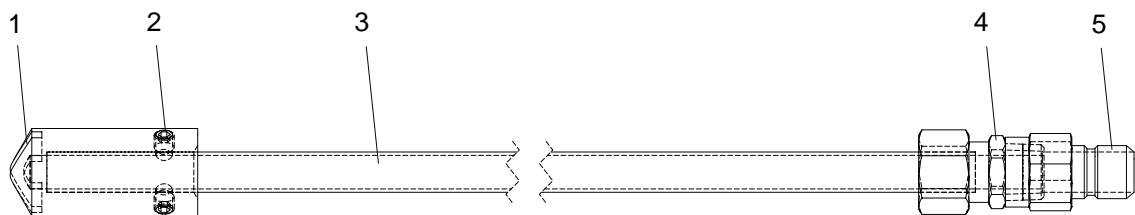
10.1.2. Cleaning rod, length 1 m



DES03595

Item	Reference	Description	Qty	Unit of sale	First Emergency	Consumable
	<b>910003024</b>	<b>Cleaning rod, length: 1 m</b>	<b>1</b>	<b>1</b>	-	-
1	900002261	Cleaning nozzle	1	1	-	-
2	X3ASSC686	Set screw HC M6 x 6, galvanised steel	2	1	-	-
3	13000360	Carbon fibre tube, 10x12, Length: 1 m	1	1	-	-
4	F6RLUQ318	Straight male union	1	1	-	-
5	F6RLJR201	Female end piece	1	1	-	-

10.1.3. Cleaning rod, length 3 m

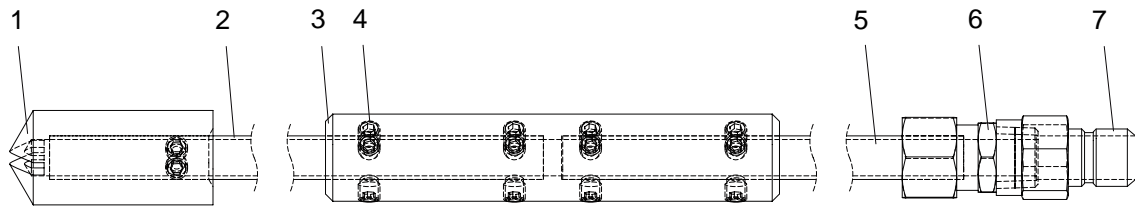


DES03596

Item	Reference	Description	Qty	Unit of sale	First Emergency	Consumable
	<b>910003025</b>	<b>Cleaning rod, length: 3 m</b>	<b>1</b>	<b>1</b>	-	-
1	900002261	Cleaning nozzle	1	1	-	-
2	X3ASSC686	Set screw HC M6 x 6, galvanised steel	2	1	-	-
3	13000359	Carbon fibre tube, 10x12, Length: 3 m	1	1	-	-
4	F6RLUQ318	Straight male union	1	1	-	-
5	F6RLJR201	Female end piece	1	1	-	-



10.1.4. Cleaning rod, length 4 m



DES03597

Item	Reference	Description	Qty	Unit of sale	First Emergency	Consumable
	<b>910003026</b>	<b>Cleaning rod, length: 4m</b>	<b>1</b>	<b>1</b>	-	-
1	900002261	Cleaning nozzle	1	1	-	-
2	13000359	Carbon fibre tube, 10x12, Length: 3 m	1	1	-	-
3	900002357	Connecting sleeve	1	1	-	-
4	X3ASSC686	Set screw HC M6 x 6, galvanised steel	14	1	-	-
5	13000360	Carbon fibre tube, 10x12, Length: 1 m	1	1	-	-
6	F6RLUQ318	Straight male union	1	1	-	-
7	F6RLJR201	Female end piece	1	1	-	-