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

SAMES KREMLIN

User manual

Powder spray gun
SRV 228 QUADRIGUN
Part no: 1520188

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Powder spray gun SRV 228 QUADRIGUN
Part no: 1520188

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1. Safety

This document contains information that every operator needs to know and understand before using the **SRV 228 QUADRIGUN** spray gun. This information is intended to notify users of situations that might involve serious risks and inform them of safety measures to take to minimise these risks.

1.1. Notes

WARNING : In accordance with French standard CENELEC 50053, Part 1:
Before carrying out any work on the spraying position, the HT generator power supply must be disconnected and the HT (spray gun) circuit discharged to earth.

Electrostatic paint-spraying equipment must be regularly maintained in accordance with the guidance and instructions issued by SAMES Technologies.
The equipment must only be used by staff with SAMES Technologies training.

Powder spraying must only take place in the ventilated booth provided, The extractor fan system and the powdering equipment must be interlocked in such a way that powder spraying is only possible when the extractor fan system is running.
Naked flames, incandescent objects or any device likely to generate a spark are forbidden within the spraying booth.
The storage of inflammable material or even containers previously used for inflammable materials is also forbidden in the proximity of the booth.

The surrounding area must be kept clear and clean.
The use of very high voltages increases the risk of sparks. SAMES Technologies HT electrostatic generators and spray guns have electrical and mechanical specifications designed to minimise this risk. However, and in spite of the HT electrode being the only accessible part, a separation distance of 2.5mm per kV must be maintained between the spraying head and any neighbouring earthed parts.

Similarly, any conducting or semi-conducting parts within 2.5 metres of any spray unit must be correctly earthed.
The parts to be painted must have a resistance with respect to earth of at least 1MΩ.
Where this is not the case, they may accumulate an electric charge capable of generating a spark. The same is true for persons, although this risk may be minimised by wearing anti-static footwear and gloves.

For the same reasons, the floor within the spraying area must have an anti-static surface, eg, bare concrete, metallic grill, etc.
Spray booths must always be correctly ventilated to prevent any build up of inflammable vapours.

1.2. Major recommendations

1.2.1. Compressed air standards

Compressed air must always be passed through a filter to extend the equipment's working life and prevent any contamination of the paint being applied.
Filter cartridges must be changed regularly to ensure clean air. The filter unit must be installed as close as possible to the spray unit.

Our guarantee does not cover defects caused by the use of untreated air that has not been filtered in accordance with the specifications above.
The bores of all air lines used to supply the spray unit, and the drillings in the connecting plate must be clean and free of any trace of paint or other foreign matter.

1.2.2. High Voltage (HT) supply

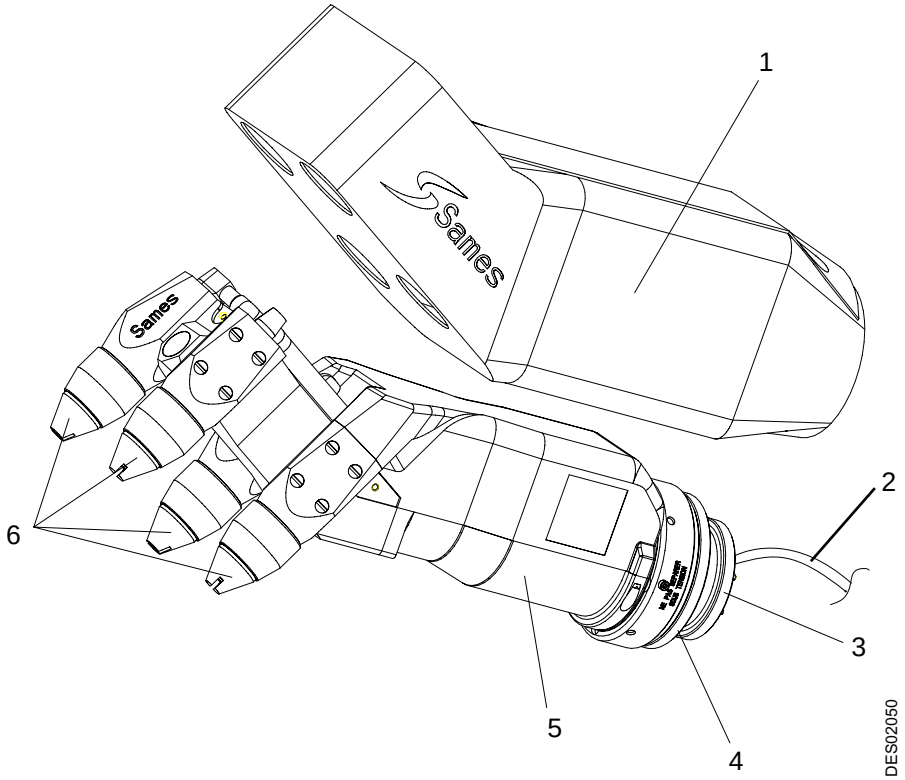
The high voltage supply must be switched off when the SRV 228 QUADRIGUN is not being used for an extended period, eg, conveyor stoppage, bare parts, holes, etc, in order to prevent ionisation of the surrounding air.

2. Introduction to the SRV 228 QUADRIGUN spray gun

The **SRV 228 QUADRIGUN** spray gun is used in the automatic mode for electrostatic spraying of paints in powder form.

The **SRV 228 QUADRIGUN** is a fully equipped spray gun with 4 spray heads to maximise the spraying area.

Main components:



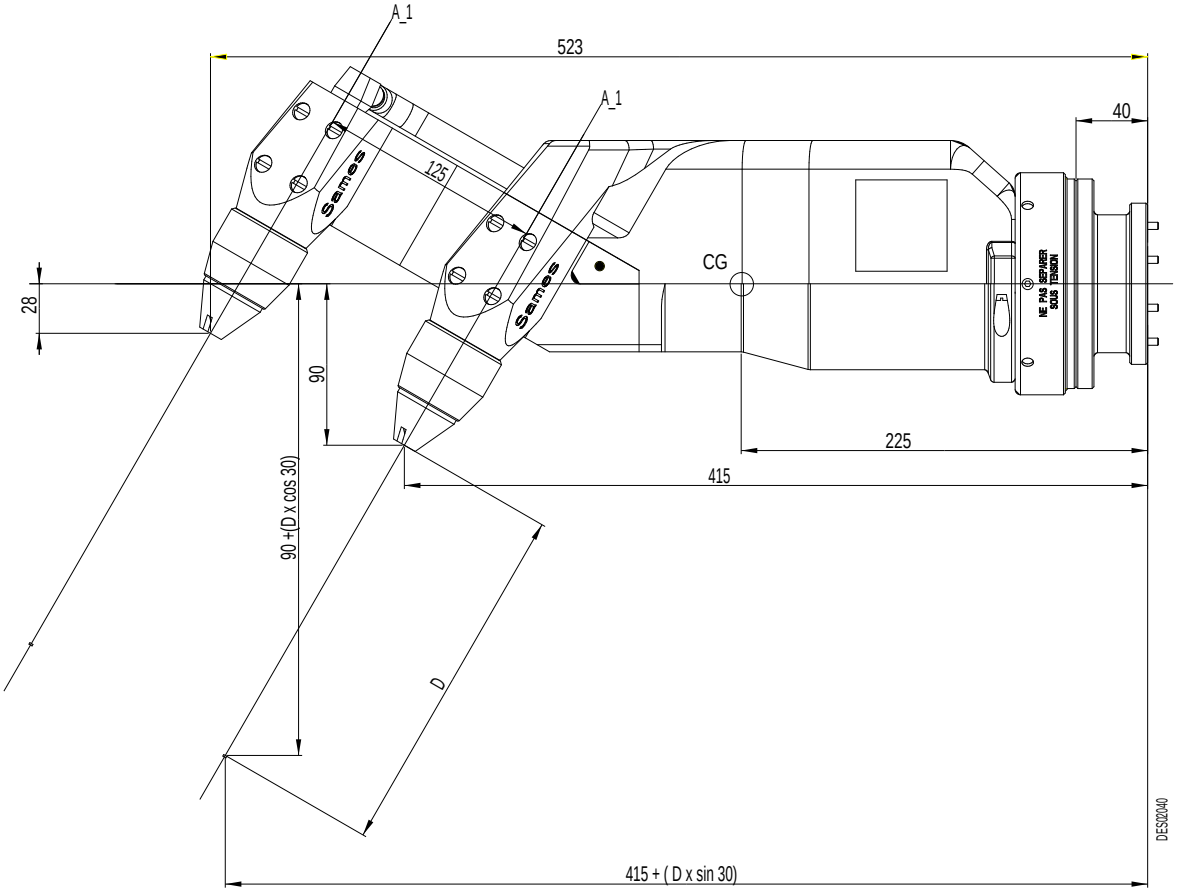
1	Protective housing
2	Electrical connecting cable
3	Adapter flange
4	Fixed flange
5	SRV 228 - Detachable part
6	SRV 028 Pistol - BSR 163P nozzle

2.1. Component Functions

Component	Function
Protective housing	Protects the sprayer from excess powder fouling.
SRV 028 Pistol - BSR 163P Nozzle	Sprays the paint powder onto the surface to be painted.
SRV 228 Detachable part	This component, in the form of two clamshell halves, houses the powder supply and the UHT 151RM HT unit.
UHT 151 RM	This component converts a low voltage supply to the high voltage necessary for applying a charge to the particles of spray powder that will be attracted to the earthed paint surface. The low voltage cable passes under the robot's arm and through the fixed flange and the insulating sleeve.
Cable	This is used to connect the HMI (control module) to the high voltage unit.
Fixed flange	This provides a leak proof joint with the powder inlets. It may be attached and detached from the spray gun.
Adaptor flange	This is used to attach the spray gun to the robot arm.

3. SRV 228 QUADRIGUN spray gun - Specifications

3.1. Dimensions (mm)



Note:
D: Spraying distance
CG: centre of gravity

3.2. Operating specifications

3.2.1. Overview

Weight without pipes or cables	4.5 kg
Maximum operating voltage	100 kV

Paint:

Paint powder flow	30kg/hr max per head.

3.2.2. Pneumatic specifications

Maximum solid impurity content	5 mg/m_0^3
Maximum size of solid impurities	5 micrometres
Maximum oil content	0.01 mg/ m_0^3
Dew point (air at 6 bar.)	3° C

3.3. Operation

The **SRV 228 QUADRIGUN** spray gun uses a standard "corona"-type charge.
An electrode fitted to the end of the gun is brought to a high negative potential. The air around the electrode is ionised by it.
The ions emitted follow the electric field lines and thus arrive, all together, at the part to be painted. Passing powder across the ionised electrical field allows it to take a charge.
If the charged powdered paint is to be made to stick to the part to be painted, then this part must be a conductor (or semi-conductor) and correctly earthed. The resistance between the part to be painted and earth must be no more than 1MΩ.
The HT unit is incorporated into the spray gun.

4. Installation

4.1. Assembling the powder spray gun

- Attach the adapter flange onto its bracket in front of the powder gun's receiver
- Attach the electrical power supply cable's socket onto the fixed flange, ensuring it is correctly aligned.
- Connect the powder transport pipes to the fixed flange and attach it to the adapter flange.

4.2. Switching the equipment ON and OFF

4.2.1. Switching ON

- **Step 1**: Turn ON the HT supply.
- **Step 2**: Spray

4.2.2. Switching OFF

- **Step 1**: Stop spraying,
- **Step 2**: Switch OFF the HT supply,

4.3. Operation and settings

The powder spray gun must be set up at a distance of between 150 and 300mm from the part to be painted.

WARNING : Never let the current being consumed by the SRV 228 QUADRIGUN, flat-jet spray gun exceed 30µA per pistol (ie, 120µA for all four) when spraying. Should the current exceed this figure, it will lead to premature fouling of the electrode with a resulting fall-off in the powder spray's effectiveness.

4.4. Recommended tools

- Pipe cutter
- C-spanner (Facom part no. 126.120)
- Set of Allen keys
- Open-ended spanners
- Screwdrivers

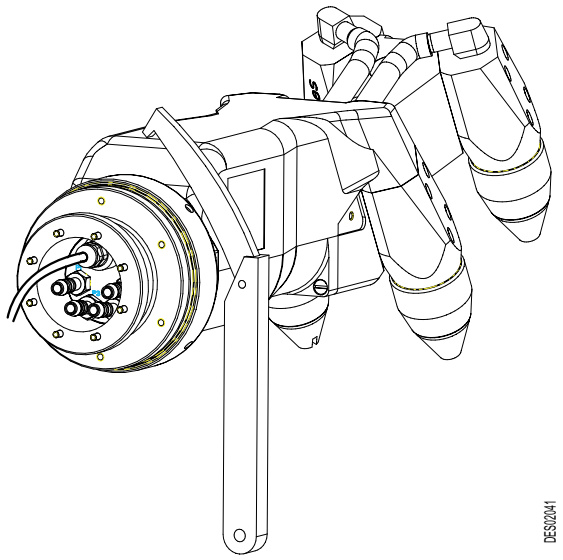
5. Spray gun maintenance

5.1. SRV 228 QUADRIGUN spray gun

WARNING : Disconnect the high voltage power supply before carrying out any work on the spray gun.

5.1.1. Disassembly

- Remove the protective housing
- Unscrew the M4x 8 Allen screw on the fixed flange lock ring.
- Position the C-spanner (Facom part no 126.120) in one of the holes in the lock-ring (see illustration below).
- Unscrew the lock ring to release the spray gun



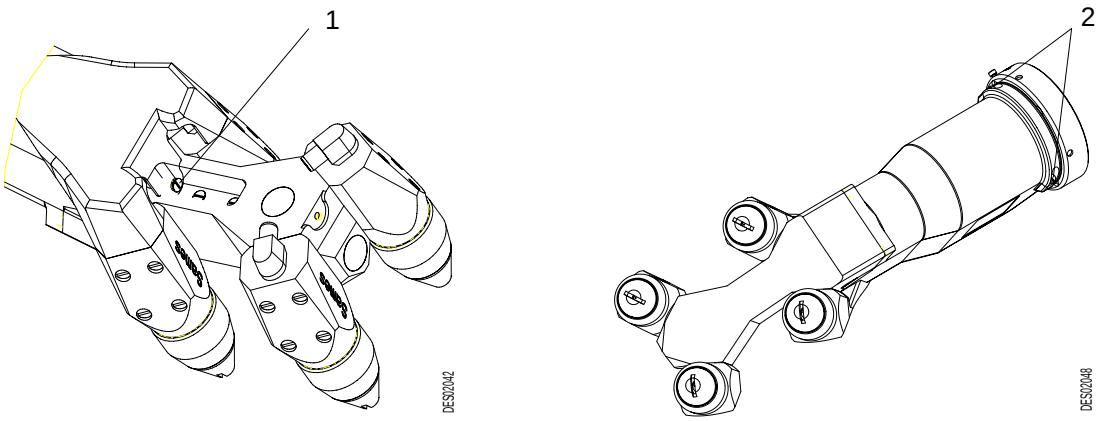
NB: The adapter flange and the fixed flange both stay attached to the robot.

5.1.2. Reassembly

- Fit the protective housing
- Position the SRV 228 QUADRIGUN spray gun on the centre of the fixed flange.
- Tighten the lock ring by hand.
- Refit the M4x 8 Allen screw to secure the locking ring to the fixed flange.

5.2. Cover

5.2.1. Disassembly



- Unscrew the retaining (pos.1) on the front of the cover
- Unscrew the other two retaining screws (pos.2) on the back of the cover
- Remove the cover carefully to avoid snagging the pipes.

5.3. High unit voltage UHT 151RM

5.3.1. Removing

- With the cover removed, unscrew the four M4 x 10 screws and their 4 washers from the cover, behind the HT unit.
- Disconnect the terminals, taking care not to damage the connector pins.
- Remove the two M6 x 16 mounting screws located on the back.
- Disconnect the powder supply pipes.
- Unscrew the two M5 x 10 screws on the flange in front of the HT unit.
- One by one, feed the seven wires through the HT unit (taking care not to snag the terminals).
- Remove the HT unit.

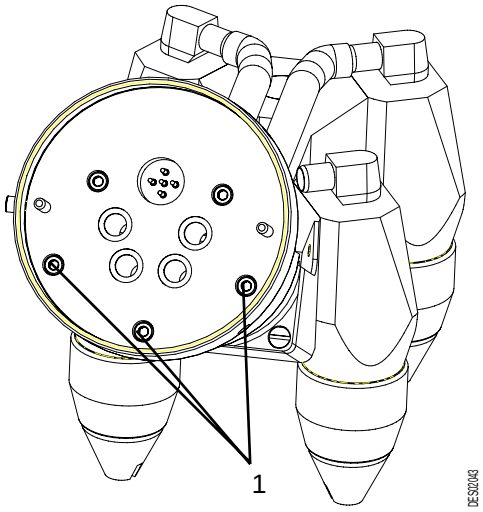
5.3.2. Refitting

- Fit the two screws on the flange in front of the HT unit.
- Feed the seven wires, one by one, through the HT unit (taking care not to snag the terminals).
- Tighten the two M6 x 16 screws.
- Reconnect the wires in accordance with the wiring diagram.
- Position the cover, the four washers and screws and then tighten up the screws.

5.4. SRV 228 QUADRIGUN - Detachable part

5.4.1. Disassembly

- Unscrew the QD flange nut by hand
- Unscrew the five Allen screws (M5 x 16).
- Disconnect the pipes.
- Withdraw the unit, keeping it aligned centrally.

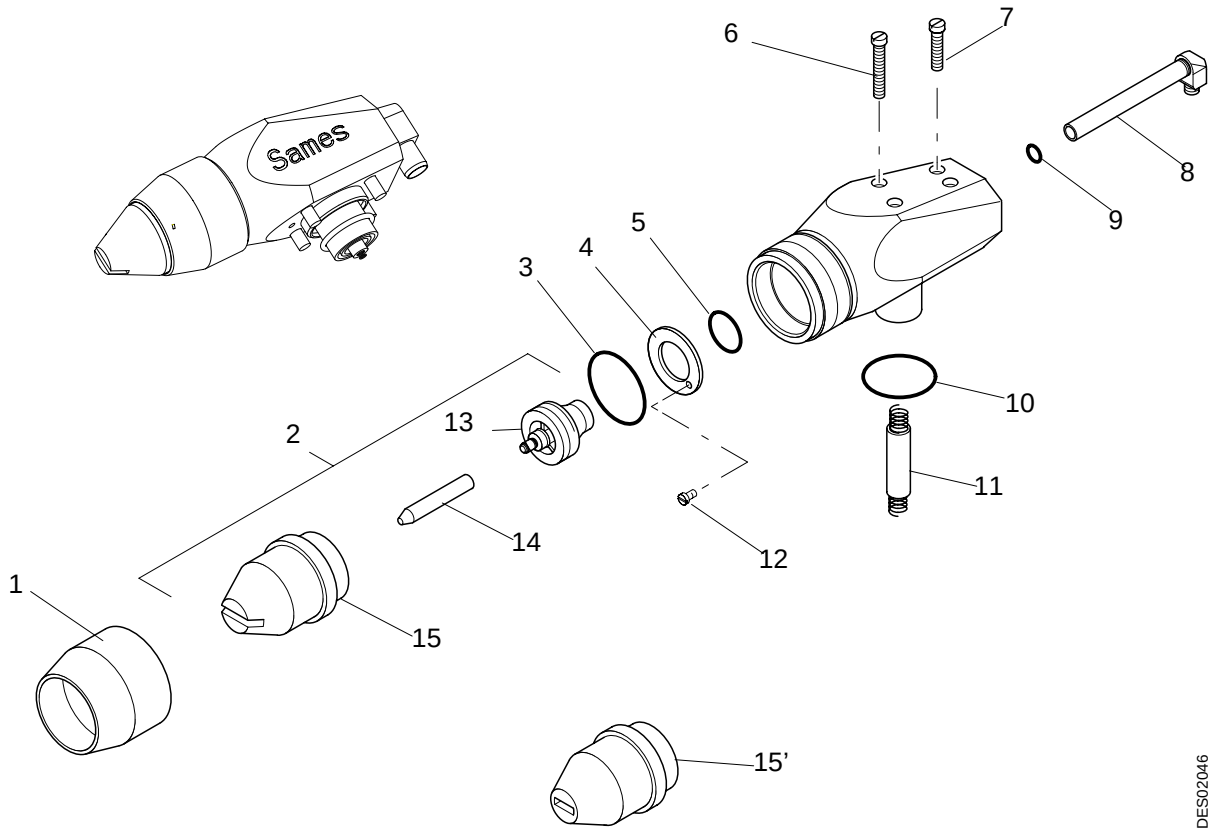


5.4.2. Reassembly

Reassembly is the reverse of disassembly but check the amount of wear on the various components (powder coupling, seal and pipes). Change any parts as required.

5.5. SRV 028 Pistol - BSR 163P Nozzle

5.5.1. Disassembly



- Unscrew the four glass-reinforced Nylon M6 x 50 and M6 x 40 screws (6 and 7) to split the SRV 028 pistol from its manifold.
- Unscrew the nozzle's retaining ring (1)
- Remove the nozzle (2) by withdrawing it horizontally.
- Remove the O-ring (3)
- Unscrew the brass M3 x 6 screw (12) and remove the contact washer (4)
- Remove the O-ring (5)
- Remove the powder inlet (8) and its O-ring (9).

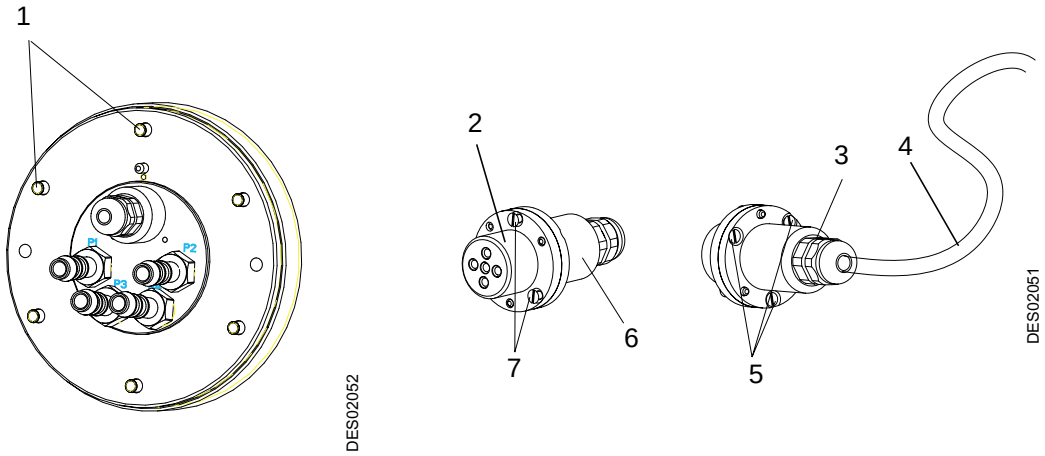
5.5.2. Reassembly

- Check the state of the O-rings (3, 5, 9 and 10), the brass screw (12) and the powder inlet (8). Replace any parts as necessary.
- refit the O-ring (9) and the powder inlet (8).
- Refit the O-ring (5).
- Refit the contact washer (4) inside the pistol body and secure it with the M3 x 6 brass screw.
- Position the nozzle (2) inside the body and secure it with the retaining ring (1).
- Refit the assembled pistol onto its manifold, ensuring the O-ring (10) and the resistor (11) are correctly positioned.
- Secure the pistol using the M6 x 50 and M6 x 40 glass reinforced nylon screws (6 and 7).

5.6. Fixed flange - changing the low voltage cable.

5.6.1. Disassembly

NB: When disassembling the spray gun, the fixed flange remains attached to the robot's arm.



- Unscrew the six M5 x 20 screws(1) and remove the fixed flange.
- Disconnect the pipes one by one.
- Disconnect the other end of the low voltage cable (4).
- Unscrew the 3 M 2.5 x 12 screws (5) in order to remove the assembled cable socket unit (2).
- Unscrew the compression joint (3).
- Unscrew the 3 M2.5 x 6 screws (7) to detach the cover (6) from the socket (2).
- Make a note of the wiring of the low voltage wires (4) within the socket (2).
- Unsolder the resistors and withdraw the cable, salvaging the compression joint.

5.6.2. Reassembly

- Fit the compression joint (3) and the socket (2) onto the cable (4).
- Solder the wires onto the socket's resistors, taking care to refit them as noted during disassembly.
- Assemble the socket cover (6) and the socket (2) using 3 M2.5 x 6 screws (7).
- Offer up the compression joint (3) and tighten it up.
- Attach the socket (2) to the fixed clamp using M2.5 x 12 screws (5)
- Check the various components for wear (connectors, pipes, etc), and change them where necessary.
- Fit the 6 M5 x 20 screws (1) to secure the fixed flange.
- Connect up the pipes.

6. Cleaning procedures

6.1. Cleaning

WARNING : Cleaning operations must only be done with compressed air, rag and, where necessary, a brush.
Never use water to clean this equipment.

Any fouling or wear on the SRV 228 QUADRIGUN spray gun caused by the use of powdered paint must depend on the nature of that powder and the conditions of use. The servicing periods shown below are therefore for guidance only. Users must draw up their own servicing schedule as dictated by their use of the spray gun.

WARNING : Before working on the spray gun, disconnect the high voltage power supply.

WARNING : To prevent any powder clogging at the solenoid valve, always disconnect the injection and dilution air lines (plunger functions) before attempting to clean the suction needle.

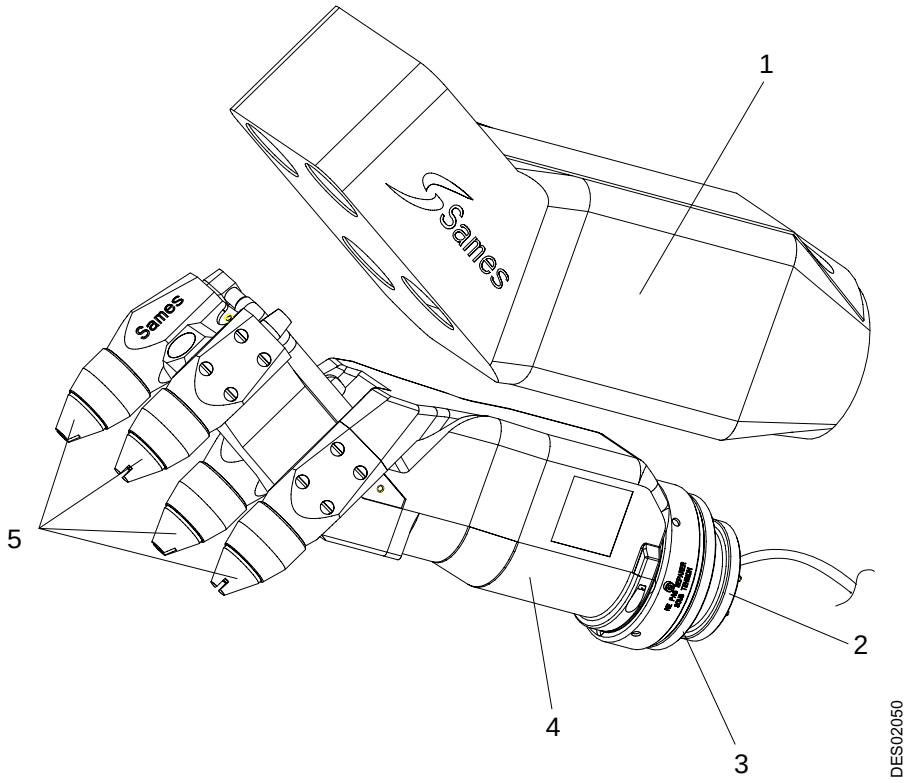
Frequency	Task
Every 8 hrs	Remove the spray nozzles and clean the electrodes with using a brush. Clean the nozzles with compressed air.
Between 150 and 300 hours (or more)	Change the nozzles if the bores are starting to show traces of grooving.

7. Troubleshooting

Symptoms	Likely causes	Remedies
No powder comes out of the spray gun	Equipment installed incorrectly	Check that the installation and the spray gun's connections comply with the instructions see § 1 page 5 and see § 4 page 11
	Spray gun incorrectly set up	Refer to the instructions: see § 4.3 page 11
	The powder transport pipe is blocked	Clean out the powder transport pipe using compressed air
No powder comes out and no current is being drawn although the trigger contacts are properly closed.	Overcurrent coming from the generator	Disconnect the mains power supply and then reconnect it
The powder doesn't stick to the parts to be painted	The parts are not correctly earthed	Check that the resistance between the parts to be sprayed and earth is less than 1MΩ.
	The ionising electrode is fouled with powder.	Disconnect the HT power supply. Clean the electrode and check that the current being drawn is less than 30µA for flat jet nozzles.
	The voltage is too low	Raise the voltage whilst ensuring that the current does not exceed 30µA per head (ie, 120µA for all four heads).
The current consumption is unusually high	The earth conductor is too close to the spray gun electrode.	Move the earth conductor further away.

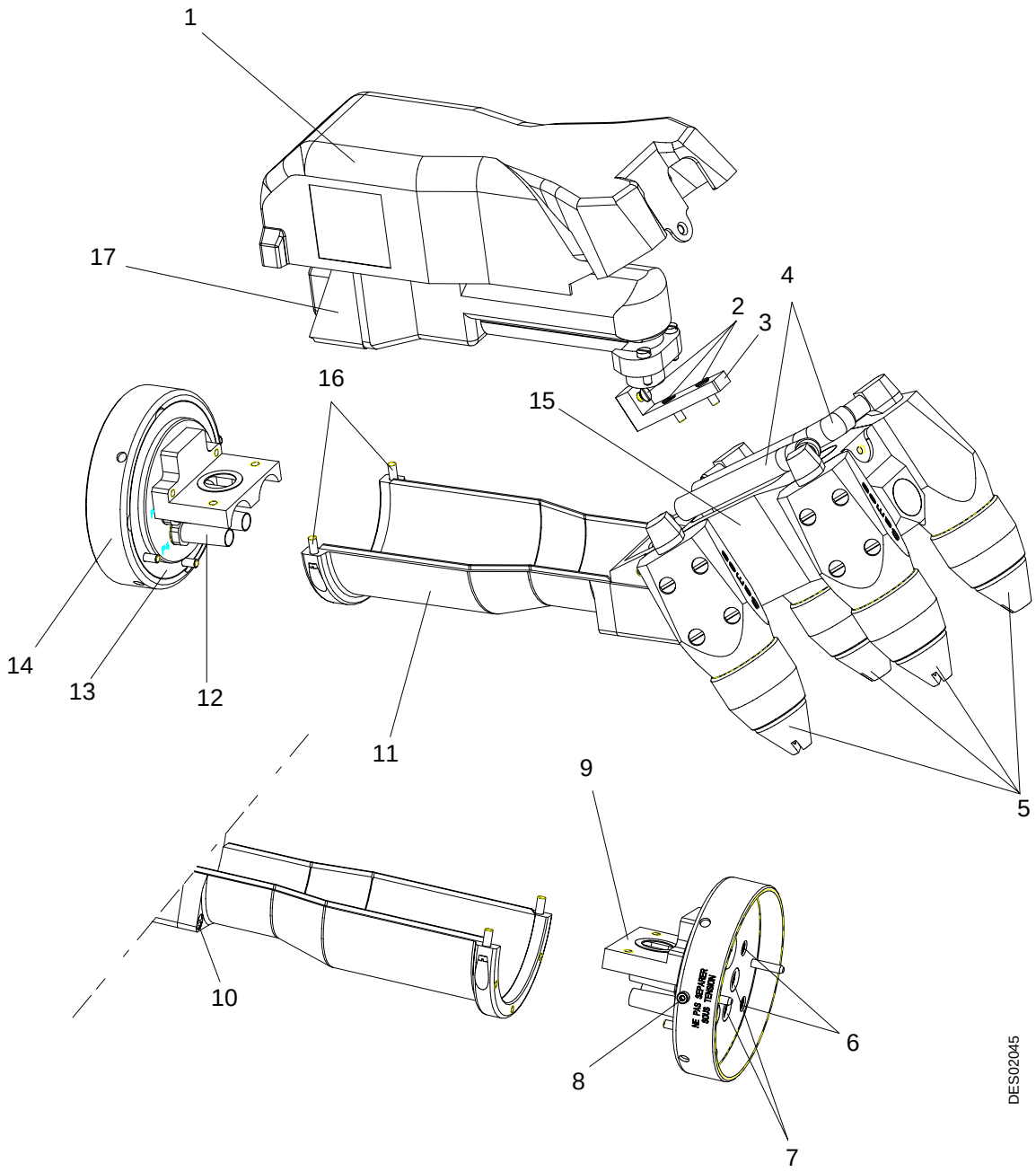
8. Spare parts

8.1. SRV 228 QUADRIGUN spray gun - Part No: 1520188



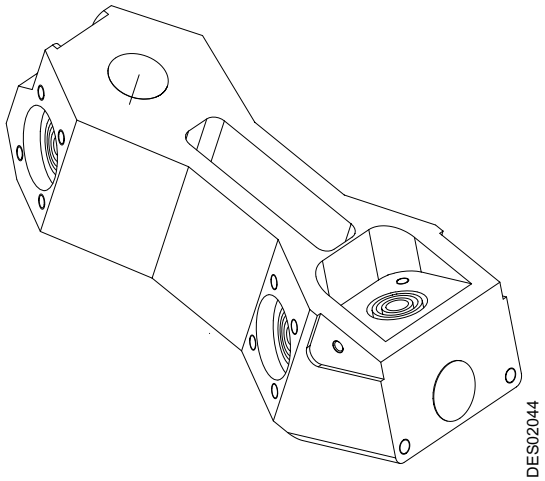
Item	Part Number	Description	Qty	Unit of sale
	1520188	**SRV 228 - QUADRIGUN spray gun**	**1**	**1**
1	1312387	Protective housing	1	1
2	428914	Adapter flange (see § 8.4 page 26)	1	1
3	**1520189**	**SRV 228 - Fixed flange** (see § 8.3 page 25)	**1**	**1**
4	**1520190**	**SRV 228 - Detachable part** (see § 8.2 page 20)	**1**	**1**
5	**855474**	**SRV 028 - BSR 163P Nozzle**	**4**	**1**

8.2. SRV 228 QUADRIGUN spray gun detachable part - Part No: 1520190



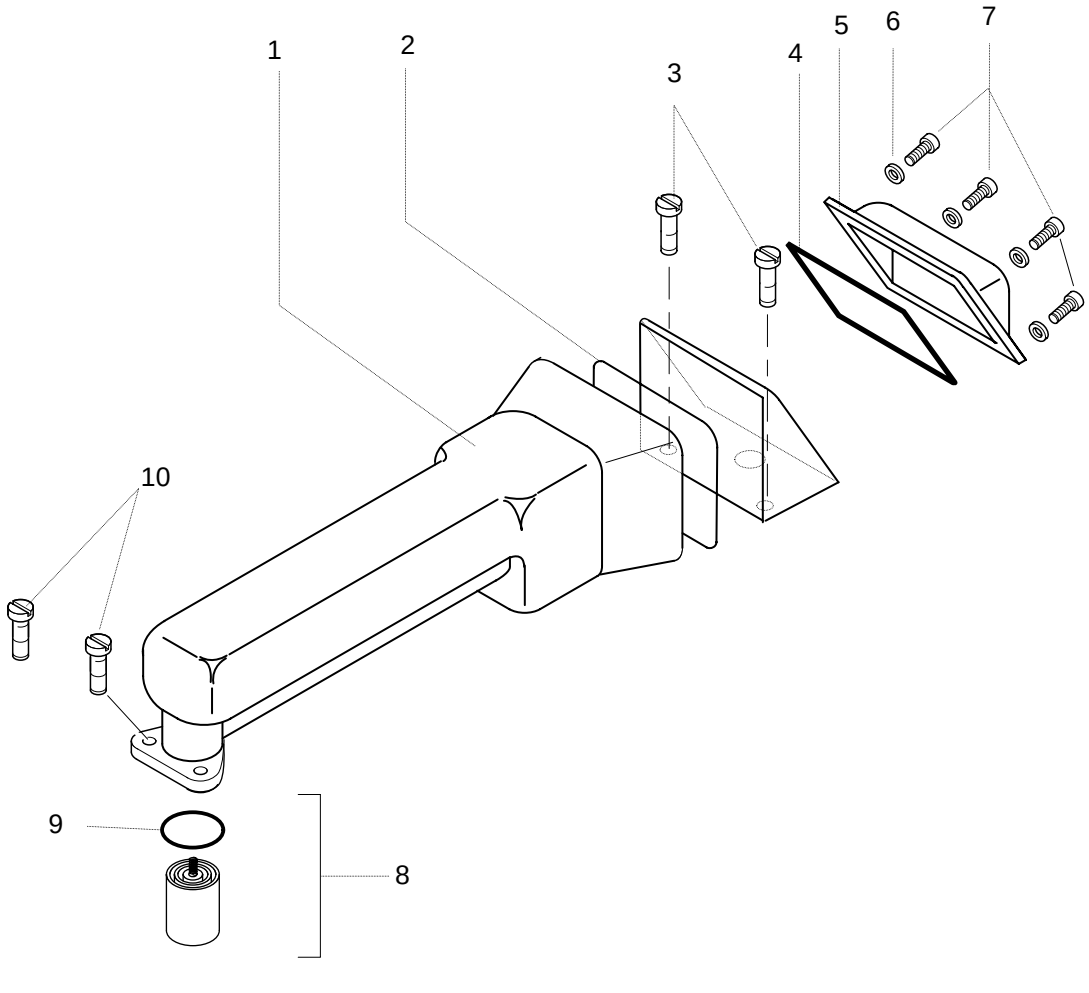
Item	Part Number	Description	Qty	Unit of sale
	1520190	**SRV 228 QUADRIGUN spray gun - detachable part**	**1**	**1**
1	1203464	Cover	1	1
2	X9NVFB183	Screw, instrument head, M5 x 16 - glass reinforced nylon	3	1
3	1312100	Cover mounting	1	1
4	U1FGBA092	Pipe, 11 x 15	1m	m
5	**855474**	**SRV 028 - BSR 163P Nozzle** see § 8.2.3 page 24	**1**	**1**
6	X4FVSY184	Allen screw, M5 x 16 - stainless steel	5	1
7	J3ETOR020	O-ring (set of 2)	4	2
8	X4FVSY117	Allen screw, M4 x 8 - stainless steel	1	1
9	1409537	Plug, 5 pin	1	1
10	X9NVCB226	Screw, cheese-head, M6 x 20 - nylon	2	1
11	428881	Clam-shell	1	1
12	546442	Powder inlet	4	1
13	1203457	Detachable flange	1	1
14	1407512	Fixed flange lock ring	1	1
15	**1520191**	**Manifold** see § 8.2.1 page 22	**1**	**1**
16	X9SVCB183	Screw, cheese-head, M5 x 15 - glass-reinforced nylon	2	1
17	**757474**	**UHT 151 RM high voltage unit** see § 8.2.2 page 23	**1**	**1**

8.2.1. SRV 028 4-way manifold - Part No: 1520191



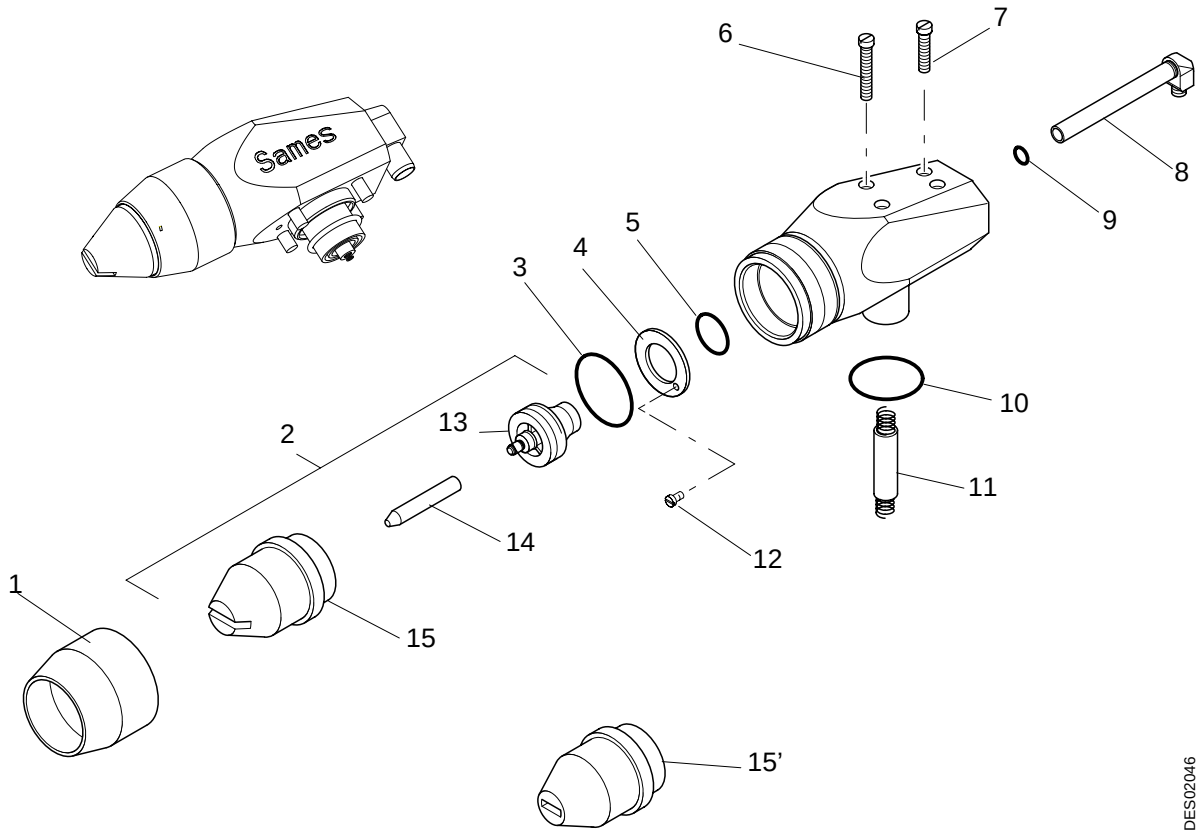
Item	Part number	Description	Qty	Unit of sale
	1520191	**Assembled manifold**	**1**	**1**

8.2.2. UHT 151 RM high voltage unit - Part No: 757474



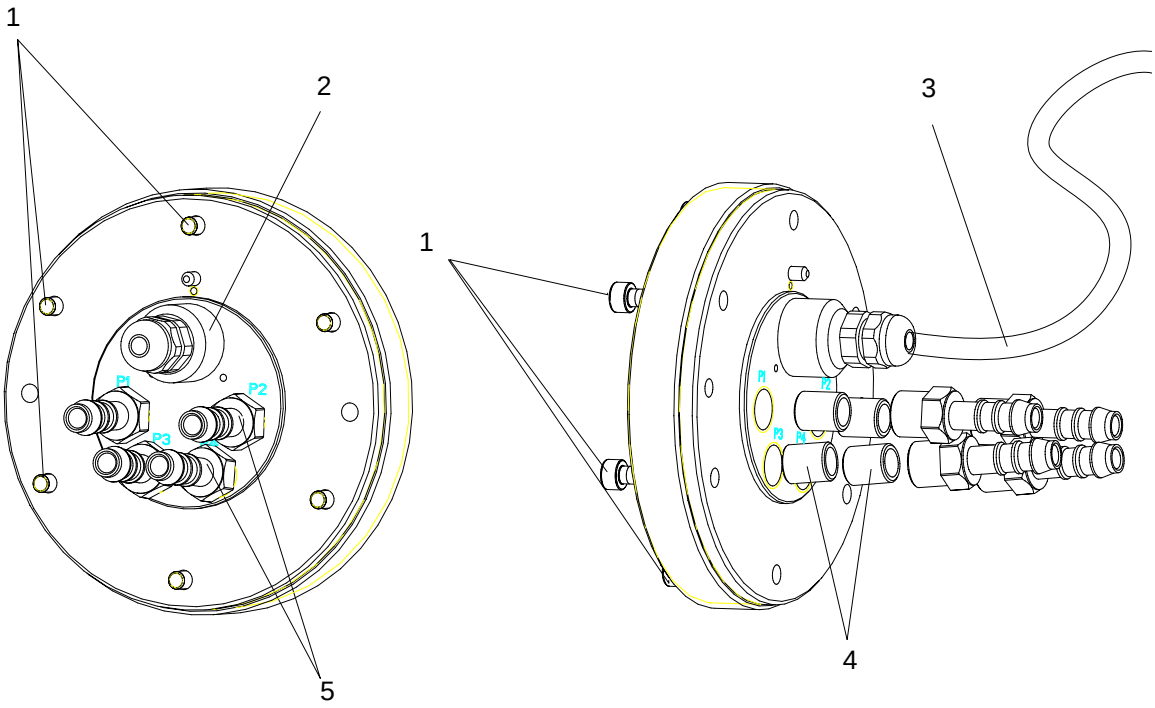
Item	Part number	Description	Qty	Unit of sale
1	**757474**	**High voltage unit UHT 151 RM**	**1**	1
2	J2CTEP605	O-ring	1	1
3	X9NVCB223	Screw, cheese head, M6 x 16 - nylon	2	1
4	J2CTEP605	O-ring	1	1
5	438704	Cover	1	1
6	J2CRAN041	Sealing washer	4	1
7	X2BVKY118	Screw, fillister head, M4 x 10, stainless steel	4	1
8	448768	Assembled insulator	1	1
9	J3ETOR046	O-ring	1	1
10	X9NVCB181	Screw, cheese-head, M5 x 10 - nylon	2	1

8.2.3. SRV 028 - BSR 163P Nozzle- Part No: 855458



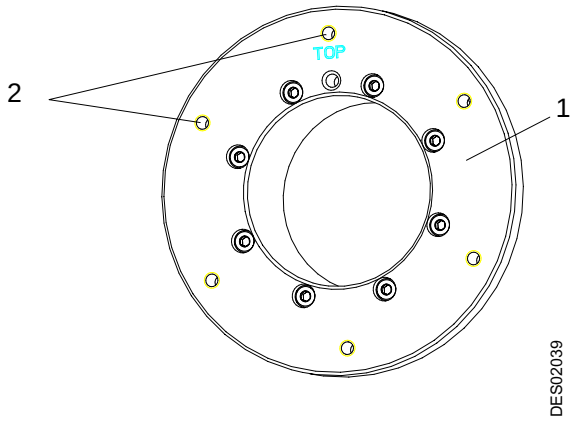
Item	Part number	Description	Qty.	Unit of sale
	855458	**SRV 028 with BSR 163P nozzle**	**1**	**1**
1	747004	Nozzle retaining ring	1	1
2	458290	Nozzle, BSR 163 P	1	1
3	J2CTPC376	O-ring (set of 5)	1	5
4	449156	Contact washer	1	1
5	J3ETOR031	O-ring	1	1
6	X9SVCB232	Screw, cheese head, M6 x 50 - glass reinforced nylon	2	1
7	X9SVCB230	Screw, cheese-head, M6 x 40 - glass reinforced nylon	2	1
8	736222	Powder inlet	1	1
9	J2FTCF178	O-ring	1	1
10	J2FTCF051	O-ring (set of 2)	1	2
11	740532	Assembled resistor	1	1
12	X7CVCB064	Screw, cheese-head, M3 x 6 - brass	1	1
13	733817	Nozzle body, rear	1	1
14	458086	Insulated nozzle pin	1	1
15	743793	Nozzle body, front	1	1
15'	1401430	Nozzle body, front	1	1

8.3. Fixed flange - Part No: 1520189



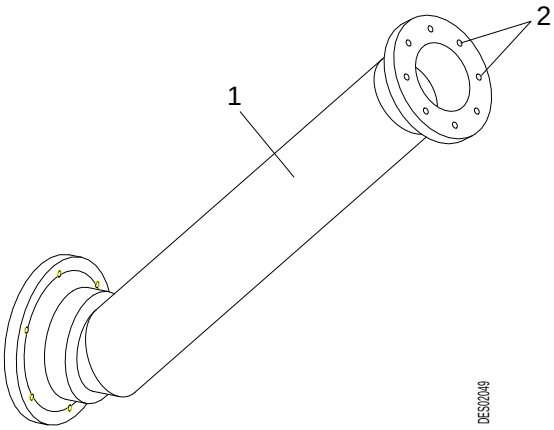
Item	Part number	Description	Qty	Unit of sale
	1520189	**Assembled fixed flange**	**1**	**1**
1	X4FVSY186	Retaining screw, Allen -head, M5 x 20 - stainless steel	6	1
2	**1502860**	**Assembled 5-pin socket**	**1**	**1**
3	E2WMAG050	Cable, 7 x 0.5 mm^2 shielded	6 m	m
4	1409425	Powder transport bush	4	1
5	F6RPQF150	Male connector for 8mm internal diameter pipe.	4	1
	F6RPQF153	Male connector for 10mm internal diameter pipe.	4 (optional extra)	1

8.4. Adapter flange



Item	Part number	Description	Qty.	Unit of sale
1	428914	Adapter flange	1	1
2	X3AVSY127	Allen screw, M4 x 40 - (white) galvanised steel	8	1

8.5. Robot arm (optional extra)



Item	Part number	Description	Qty.	Unit of sale
1	1203508	Robot arm	1	1
2	X3AVSY127	Allen screw, M4 x 40 - (white) galvanised steel	8	1