



INSTRUCTION MANUAL

**MANUAL ELECTROSTATIC GUN
SERIE KM.3 Ex**

Manual : 1209 573.149.112

*Date : 20/09/12 - Supersede : 26/09/11
Modif : § 3, § 4 et § 8*

TRANSLATION OF THE ORIGINAL MANUAL

IMPORTANT : Before assembly and start-up, please read and clearly understand all the documents relating to this equipment (professional use only).

THE PICTURES AND DRAWINGS ARE NON CONTRACTUAL. WE RESERVE THE RIGHT TO MAKE CHANGES WITHOUT PRIOR NOTICE.

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SERIE KM.3 Ex

TABLE OF CONTENTS

1. GENERAL SAFETY INSTRUCTIONS2

2. OPERATING PRINCIPLE.....4

3. SPECIFICATIONS5

4. INSTALLATION8

5. STARTING UP9

6. DAILY CARE AND CLEANING11

7. TROUBLESHOOTING AND ELECTRICAL TESTS13

8. MAINTENANCE.....15

ADDITIONAL DOCUMENTATIONS :

EC Declaration of Conformity	578.015.130-UK
	Parts Identification List
Electrostatic guns : specific spare parts	573.163.050
KMP 3 Ex manual electrostatic gun	573.164.050
KMV 3 Ex manual electrostatic gun	573.165.050
KMC 3 Ex manual electrostatic gun	573.166.050
KMX 3 Ex manual electrostatic gun	573.167.050

Dear Customer,

We would like to take this opportunity to thank you for buying a **new manual electrostatic** gun. We are confident that you have made the right choice.

We have taken every care, from original design to final manufacture, to ensure that this product gives you complete satisfaction.

To obtain the best performance and reliability from this equipment, we would strongly advise you to read this instruction manual attentively before attempting to use the equipment.

1. GENERAL SAFETY INSTRUCTIONS

1 - The non-compliance with the safety requirements and precautions stated in this manual could result in unsafe conditions.

2 - The personnel involved in operating and servicing the electrostatic coating equipment must be fully aware of all the safety requirements stated in this manual.

3 - The workshop supervisor must be certain that the personnel has perfectly understood the safety instructions and complies with them. These instructions cover the precautions required for solvent-based paint spraying and the specific precautions in connection with the use of equipment requiring high voltage.

The electrostatic coating system shall be used by qualified personnel only. The personnel must also be familiar with the local safety standards which can be in force in certain countries.

WARNING : failure to observe the safety precautions contained herein could result in operating troubles and create unsafe conditions (body injury, explosion fire or electric shock).

■ INSTALLATION

☞ **The EN 50 053 standard covers the select, installation and use requirements of the electrostatic projection equipments for ignitable materials. The part 1 of that standard covers the paint electrostatic projection manual guns.**

The KM.3 Ex gun is a gun designed **only** for the application of paints and varnishes.

4 - Spraying, cleaning and servicing must be made in a ventilated area so that solvent vapours are properly drained.

5 - **STD 9 power supply unit must be installed in a non-hazardous area.** Moreover, it must be located 4 meters (13 ft) at least away from any flammable vapour emissions. **Ground the earth terminal.**

6 - All metallic parts located within 3 meters (10 ft) around the gun (such as pumps, drums, conveyor, etc...) must be correctly grounded.

7 - Storage of paint and solvent drums near or inside the spraying area is prohibited. Keep all fluid containers properly closed in a non-hazardous area.

☞ **Use cleaning solvents with the highest flash point - If possible, higher than the ambient temperature.**

8 - Remove the useless parts from the spraying area and keep this area clean. Part holders and conveyor hooks must be removed and frequently cleaned.

9 - The floor must be electrically conductive and grounded. Maximum resistivity of the floor : 1 MΩ as per EN 50 053-7-2.

10 - The warning sign must be affixed in the spraying area and located where it can be easily seen and read by all operators.

■ SPRAYING

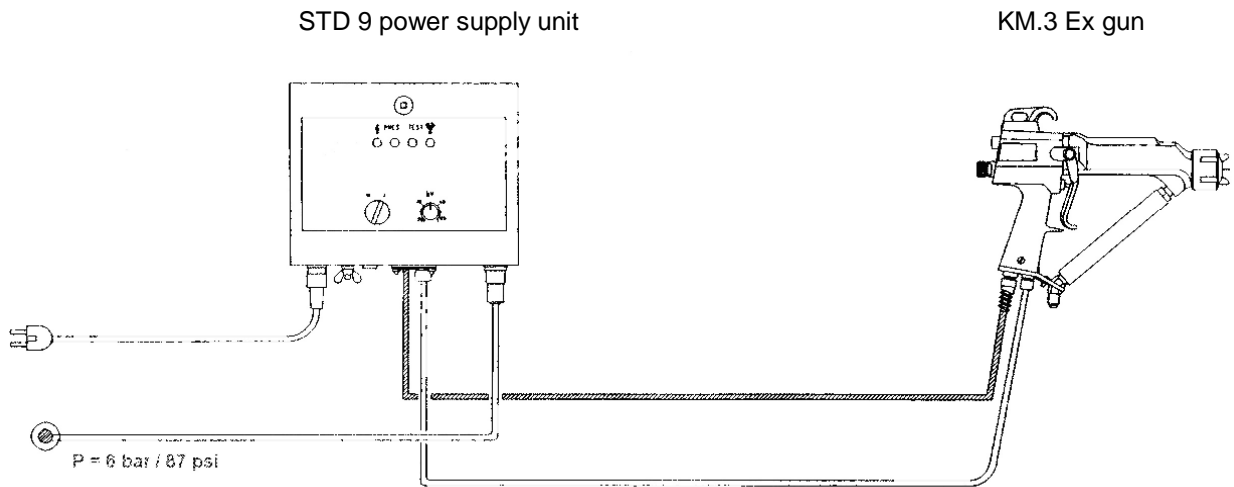
11 - Never point the spray gun to anyone or at any part of the body.

- 12 - Never throw or drop the electrostatic manual gun. Any misuse of the spray gun equipment or accessories can damage them and result in serious body injury, fire or explosion.
- 13 - The parts to be painted must be properly grounded. Any incorrect electrical continuity might result in shock hazard.
- 14 - Never operate the electrostatic spray gun if air leaks are detected on the gun. Never use air hoses on which air leaks can occur.
- 15 - Be sure that tip and air cap are in position and hand tightened with the retaining ring onto the gun before turning on the power supply.
- 16 - Verify that any person entering the spray area is correctly grounded with conductive sole shoes (in accordance with EN 50 053 standard).
The operator must not wear gloves which insulate the hand from the conductive gun handle. If using gloves, check that they are conductive (in accordance with EN 50 053) or that a square has been cut-out in the glove palm.

■ SERVICING

- 17 - After any servicing or cleaning, never switch on the power supply tip and air cap are in position and secured with the retaining ring onto the gun.
- 18 - Never immerse the gun or plastic parts of the gun in solvent.
This could seriously damage the gun and cause fire, explosion or body injury. To clean the gun use soft cloth or bristle brush with a moderate amount of non-conductive solvent, wipe the front of the gun at fluid nozzle with the gun pointed down to prevent from flowing back into the air passages.
- 19 - Before disconnecting the hoses, check that they are no more under pressure and that the power supply is off.
- 20 - The personnel involved in the electrostatic coating system servicing must be trained and qualified. If you face any trouble which cannot be repaired, do not try to start up the equipment. Consult immediately your local authorized KREMLIN distributor for assistance.

2. OPERATING PRINCIPLE



An electrostatic coating system consists of an electrostatic manual gun, a power supply unit, connecting air hoses and low voltage electrical link cable.

■ STD 9 POWER SUPPLY

The STD 9 power supply transforms the network voltage into an adjustable continuous low voltage by means of an electronic system.

An electronic regulator built into the power supply unit automatically reduces the intensity and voltage when the electrode on the spray gun is close to a grounded object (less than 100 mm or 4 inches) thereby preventing any electric discharge.

➔ **The power supply unit includes a 3-pin plug and cable assembly so as guarantee a safe grounded AC input power system. Failure to ground the power supply may result in an electrical shock hazard.**

Interconnect the STD 9 power supply unit with the air pressure network (maximum pressure 6 bar / 87 psi). The STD 9 power supply incorporates a flow switch to ensure gun safety.

FLOW SWITCH :

A flow switch is an electropneumatic device detecting any downstream air consumption so that the power supply unit provides low voltage to the gun only when the atomizing air flows from the front of the gun.

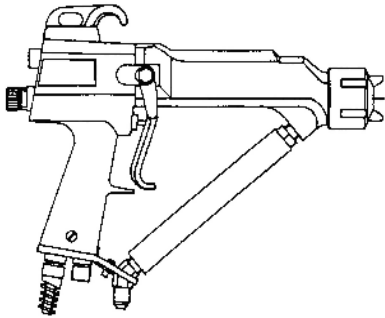
■ KM.3 Ex MANUAL ELECTROSTATIC GUN

The KM.3 Ex manual electrostatic gun is designed to negatively charge the material being sprayed, so that it is drawn to the positively grounded conductive object being coated.

As a result of the electrostatic charge of the paint particules, a more efficient and uniform application of the coating material is applied to the front but also on the sides, edges and back of the grounded workpieces.

3. SPECIFICATIONS

■ COMMON FEATURES TO ALL KM.3 Ex MANUAL ELECTROSTATIC GUNS



The KM.3 Ex manual gun is supplied in a case with a complete range of accessories, electric cable, a gun cover, a detailed instruction manual and a warning sign.

Weight (without hoses) : 800 g.

Gun length : 285 mm / 11.2"

Electric specifications

Type	integrated generator
Operating voltage (electrode).....	20 kV to 85 kV (negative)
Maximum current at the electrode	100 µA.
Low voltage	adjustable from 3 V to 12 Vdc (refer to STD 9 instruction manual).
Low voltage display	by a red indicator LED on the STD 9
Electrostatic effect ON/OFF	by an ON/OFF switch (on the back of the gun)
Maximum current consumption.....	0,65 A at 12 V.
Low voltage cable length	10 m / 32.8", 15 m / 49.2" or 30 m / 98.5"

Fluid specification

Fluid resistivity	> 5 MΩ (standard assembly with rigid tube) from 0 to 5 MΩ or water-based materials (remove the rigid tube and install instead of it a insulated specific hose - length : 10 m / 32.8", 15 m / 49.2" or 30 m / 98.5" - refer to SPARE PARTS, Doc. 573.163.050) 0 MΩ (water based paint) (⊘ - refer to nota above)
Fluid connections	M 1/2 " JIC

Air specifications

Maximum operating air pressure	7 bar (100 psi)
Air inlet	M 1/4 NPS
Recommended air hose	antistatic hose 8 mm (5/16") diameter
Fan width adjustment	by a knurled knob located on the left of the gun handle



Gun operating temperature range..... From 0 to 40° C / from 32° to 104° F

(⊘) Nota : When using non-flammable water-based paints, the paint equipment must be insulated in a bubble.

The installation will consist of an insulating **Iso Bubble II**, a **STD 9 B** power supply, a **KM 3 H2O** gun.

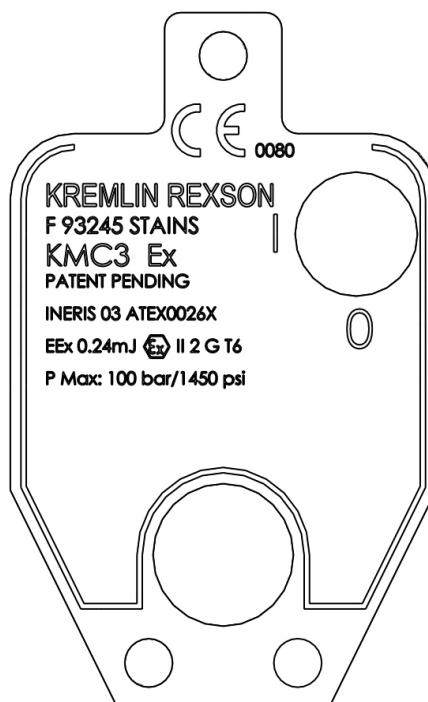
➡ Please refer to the instruction manuals of the different equipments.


■ SPECIFIC FEATURES OF THE KM.3 EX GUNS

	AIRMIX [®] GUNS		PNEUMATIC GUNS	
	KMX 3 EX	KMC 3 EX	KMP 3 EX	KMV 3 EX
Gun assembly with air cap and nozzle	<i>KX 16 air cap or KVX 14 air cap</i> <i>09/135 nozzle</i>	<i>KXC 5 air cap</i> <i>K 30 nozzle</i>	<i>KP 3 air cap</i> <i>Ø 1,2 nozzle</i>	<i>KMV air cap</i> <i>Swirling fan nozzle</i>
Fluid specifications				
Fan pattern	Airmix [®] - Adjustable flat pattern	Airmix [®] - Round hollow spray	Pneumatic - Flat pattern	Pneumatic - round pattern
Maximum viscosity	40 s CA 4 - For upper viscosity, please contact KREMLIN REXSON	40 s CA 4 - For upper viscosity, please contact KREMLIN REXSON	40 s CA 4 - For upper viscosity, please contact KREMLIN REXSON	40 s CA 4 - For upper viscosity, please contact KREMLIN REXSON
Maximum fluid pressure	100 bar / 1450 psi	100 bar / 1450 psi	10 bar / 145 psi	10 bar / 145 psi
Fluid flow rate and fan width	Adjustable by air flow rate variation on the air cap - Refer to AIRMIX [®] nozzle chart - Doc. 573.167.050.	Refer to AIRMIX [®] nozzle chart - Doc. 573.166.050.	Maxi 1 litre/minute Fan width at 25 cm : 30 cm	Maxi 1 litre/minute Fan width at 25 cm : 20 cm
Maximum fluid temperature	60° C / 140°F	60° C / 140°F	60° C / 140°F	60° C / 140°F
Wetted parts	Stainless steel - Polyamide - PETP - Nickel-plated brass - PTFE elastomer - Tungsten carbide - Polyacetale	Stainless steel - Polyamide - PETP - Nickel-plated brass - PTFE elastomer - Tungsten carbide - Polyacetale	Stainless steel - Polyamide - PETP - Nickel-plated brass - PTFE elastomer - Polyacetale - Polyethylene	Stainless steel - Polyamide - PETP - Nickel-plated brass - PTFE elastomer - Polyacetale - Polyethylene
Air specification	KX 16 air cap flow rate: 8 Nm ³ /h.	KXC 5 air cap flow rate: 8 Nm ³ /h.	KP 3 air cap flow rate : maxi 20 Nm ³ /h at 4 bar (58 psi)	KMV air cap flow rate: 16 Nm ³ /h at 4 bar (58 psi)

■ DESCRIPTION OF THE MARKING LABEL

KMC3 Ex Gun
(identical marking for
KMP3 Ex
KMX3 Ex
KMV3 Ex)



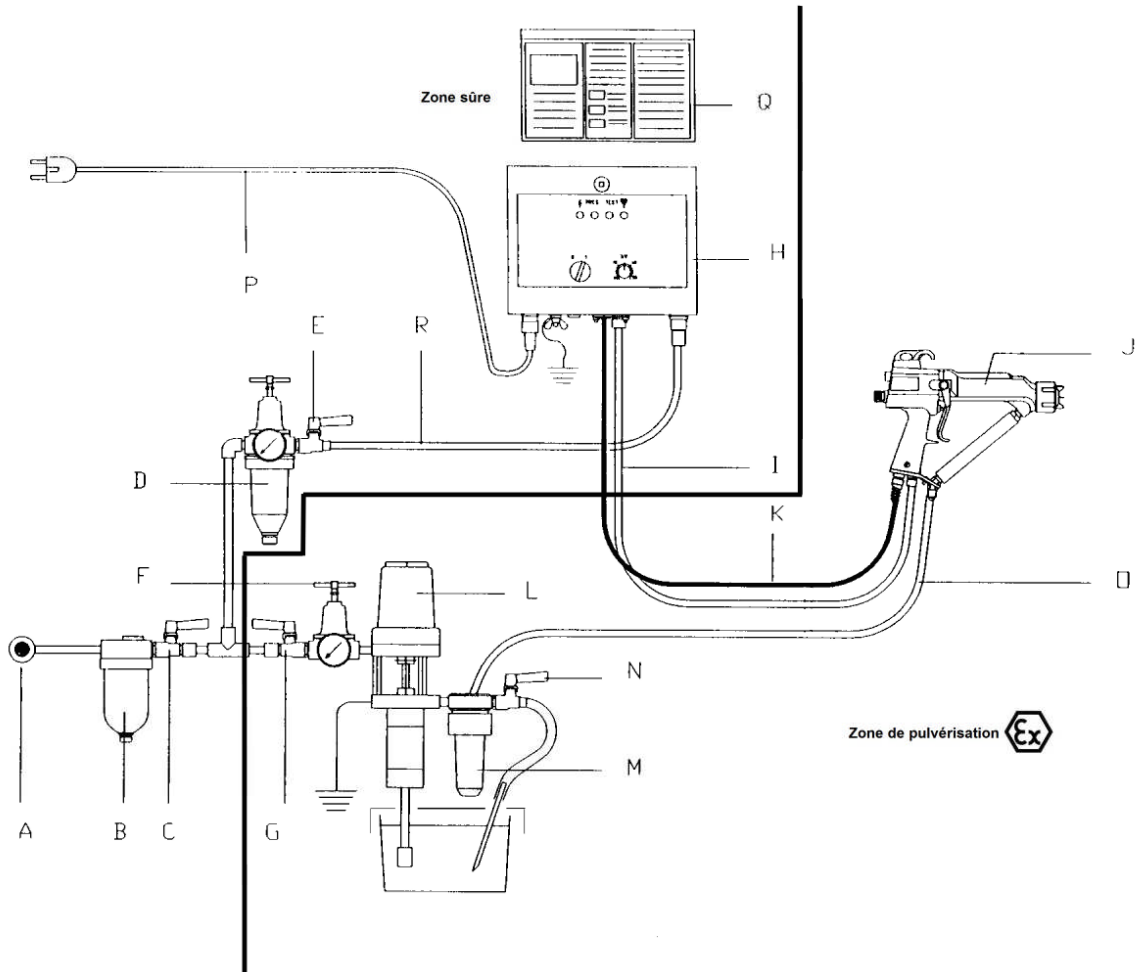
COMMON MARKING TO GUNS	DESCRIPTION
CE 0080	0080 : INERIS code which notified the Quality Management System
KREMLIN REXSON F 93245 STAINS FRANCE	Name and address of the manufacturer
KMP3 Ex or KMV3 Ex or KMX3 Ex or KMC3 Ex	Gun version
PATENT PENDING	Registered patent
INERIS 03 ATEX 0026X	Material certificate N° given by INERIS
EEx 0.24mJ  II 2 G T6	EEx 0.24mJ : marking corresponding to the projection guns for paints for the non-flammable paints or flock in association with non-flammable adhesive vapours with an energy less than 0.25 mJ (En 50 050 standard). II : group II 2 : class 2 Surface equipment meant to be in an area where explosive atmospheres due to gas, vapours, mists are liable to appear from time to time in usual operating G : gas T6 : Maximum surface temperature : 85° C / 185° F
P max : xxx bar / xxx psi	Maximum fluid pressure (depending on gun version : 100 bar / 1450 psi for the KMX3 Ex and KMC3 Ex 10 bar / 145 psi for the KMP3 Ex and KMV3 Ex)
N° Serie /Serial Nb (engraved under the front body near the handle)	Number given by KREMLIN REXSON. The two first numbers indicate the manufacturing year.

4. INSTALLATION

➔ REFER TO GENERAL SAFETY INSTRUCTIONS

A safe electrostatic system installation requires compliance with all applicable safety standards and requirements outlined in this manual. Any improper installation or misuse of the electrostatic coating system can cause serious body injury, fire, explosion or electric shock hazard.

The European safety standard EN 50 053 covers installation and operation regulations of electrostatic coating system.



Drawing of an installation for solvanted paint with a resistivity > 5 MΩ

A	Main air supply line	K	Low voltage cable
B	Air and water separator.	L	Pump
C	Air supply shut off valve.	M	Fluid filter
D	Air filter with air pressure regulator	N	Fluid drain valve
E	Atomizing air shut off valve	O	Connecting fluid line
F	Air pressure regulator (pump)	P	Three wire cable (230 V + ground) or (115 V + ground)
G	Air supply shut off valve (pump)	Q	Warning sign
H	STD 9 power supply unit	R	Air supply hose of the power supply
I-R	Connecting air lines		
J	K M.3 Ex electrostatic manual gun		

The **typical installation** shown above is only a guide for selecting and installing an electrostatic coating system. Other installations can be used (with diaphragm pump, circulating, heated coating system, etc...).

■ **COMPRESSED AIR SUPPLY CONNECTION**
(Refer to the typical installation drawing)

Compressed air supply to the electrostatic coating system must be dry and clean. Dirt or moisture can ruin the quality of your finished workpiece and can cause the gun to malfunction.

To reduce the risk of electric shock or other serious injury, use only KREMLIN electrically conductive air hose (with green mark).

For correct operation of the electrostatic coating system, interconnect the air hose between the outlet on the air filter/air pressure regulator (D) and the air inlet connection on the power supply (H).

Interconnect the air hose between the air outlet connection on the power supply (H) and the air inlet connection on the electrostatic gun (J).

If necessary install an air line lubricator between the air pressure regulator (F) and the pump (L).

■ **PRODUCT SUPPLY CONNECTION**
(Refer to the typical installation drawing)

Before connecting the fluid line (O), check that the hose is suited to the pump working pressure. Blow it out with air and flush it with solvent.

Never use damaged fluid hoses. Use only KREMLIN fluid hose designed for the resistivity range of the fluid to be sprayed.

Connect the fluid filter (M) onto the pump fluid outlet (L).

Connect the fluid drain valve (N) onto the fluid filter outlet (M).

Interconnect the fluid filter outlet (M) and the KM.Ex electrostatic gun (J) with a fluid hose (O).

■ **VENTILATE THE SPRAY BOOTH**

To prevent hazardous concentrations of toxic and/or flammable vapors, spray only in a correctly ventilated spray booth.

Never operate the spray gun when the ventilation system is stopped.

High velocity air exhaust will decrease the operating efficiency of the electrostatic system. (Air exhaust velocity of 30 meters (98.5 ft)/minute should be sufficient).

Nevertheless, before operating the electrostatic coating system, make sure that the air velocity of the spray booth complies with the local regulations.

■ **ELECTRICAL CHECKS**
(Refer to the typical installation drawing)

Before connecting the power supply unit on the main power source, be sure is compatible with the local voltage source (110 VAC or 220 VAC).

With a megohmmeter check the electrical grounding continuity between the ground connection of the power supply (H) and the grounded AC input power source (real earth connection).

With a megohmmeter check the electrical grounding continuity between the conductive gun handle and this grounded AC Input power source (real earth connection).

Do not attempt to by-pass or defeat the ground interconnections : it may result in an electric shock hazard, fire or explosion.

5. STARTING UP

➞ **REFER TO GENERAL SAFETY INSTRUCTIONS**

■ **SAFETY REQUIREMENTS**

Before using the electrostatic coating system :

Check that the operators have fully understood the safety instructions stated in this manual.

The operators must not wear gloves which could insulate the hand from the conductive gun handle. If using gloves, check that they are conductive (in accordance with EN 50 053) or that a square has been cut out in the glove palm.

Be sure that the personnel entering the spraying area has read and understood the safety requirements stated in this manual and/or on the warning sign. Verify that any person entering the spray area is correctly grounded with conductive sole shoes or personal grounding straps.

Check that fans are in good operating condition.

Remove any useless parts from the spraying area and keep this area clean. Part holders and conveyor hooks must be cleaned frequently. All conductive objects must be electrically grounded as well.

■ PROCEDURE

To prime the pump and the connecting fluid line :

- Set the air pressure regulator (F) to 0 bar (0 Psi).
- Open the fluid drain valve (N).
- Immerse the suction and discharge hoses into the paint drum.
- Increase the air pressure by opening the air pressure regulator (F) so that the pump runs slowly.
- When the fluid begins to flow regularly from the discharge hose, close the fluid drain valve (N).

Remove the air cap, the nozzle and the air cap retaining ring from the Airmix ® guns.

Turn off the atomizing air.

Trigger the gun to dispense fluid into the fluid container.

If necessary turn on the knob assembly at the rear of the gun (J) counter clockwise, to open the gun needle valve.

If necessary increase the fluid pump air pressure.

Release gun trigger when the fluid flows regularly from the gun nozzle.

If necessary install a clean tip into the air cap (KMX 3 Ex and KMC 3 Ex). Position the air cap assembly over the needle seat or tip (KMP 3 Ex and KMC 3 Ex) and secure in position with the retaining ring hand tightened onto the gun.

Adjust the atomizing air pressure on the air pressure regulator (D).

Caution : Be certain there is no air leak between the power supply air outlet (H) and the gun air inlet (J).

Turn on the fan air control valve located on the gun (J).

Trigger the gun to dispense spray coating material out of the gun air cap.

Release the trigger.

Turn the ON / OFF power supply switch to "I" :

The green indicator LED (VOLTAGE) illuminates.

The green indicator LED (TEST) illuminates.

Set up the high voltage adjustment knob fully clockwise to 85 kV.

Turn the ON / OFF gun switch to "I".

Trigger the gun toward the grounded part to be coated.

When spraying :

The red and yellow indicator LEDs should illuminate.

The green indicator LED (TEST) should be off.

Adjust the following parameters :

Fluid flow rate :

On the air spray guns (KMP 3 Ex and KMV 3 Ex) adjust the fluid flow rate using the knob assembly at the rear of the gun (turn it counterclockwise to increase the flow rate or clockwise to decrease the flow rate).

Atomizing air :

Use the air pressure regulator (D) to adjust the atomizing air pressure.

Whenever possible, use the lowest air pressure to obtain efficient electrostatic wrap around. Use the fan air control valve to adjust the spray pattern.

Electrostatic effect :

Set up the electrostatic wrap-around effect with the high voltage adjustment knob (from 20 to 85 kV).

■ FAN PATTERN ADJUSTMENTS (KM.3 Ex GUNS)

	KMP 3 Ex	KMV 3 Ex	KMX 3 Ex	KMC 3 Ex
AIR CAP ADAPTER	black	white	black	white
FRONT VIEW				
SPRAY FAN	atomization fan width	wide fan narrow fan	atomization narrow fan	wide fan narrow fan
ADJUSTED BY	general air supply air adjust. knob	air adjust. knob general air supply	general air supply air adjust. knob	air adjust. knob general air supply
FAN PATTERN				

6. DAILY CARE AND CLEANING

➔ REFER TO GENERAL SAFETY INSTRUCTIONS

The fluid and air hoses and the gun must remain clean. **The electrostatic wrap effect efficiency decreases quickly when gun and hoses are dirty.**

■ FLUID NETWORK CLEANING METHOD

Important recommendations

Cleaning and flushing of the electrostatic coating system must be carried out in a ventilated area. The ON / OFF switches on the power supply and gun must be OFF before starting cleaning operation.

All metallic parts located within 4 m (13 ft) around the gun must be correctly connected to the ground. The floor must be electrically conductive and grounded.

Use cleaning solvents with the highest flash point – If possible, higher than the ambient temperature.

Only apply a moderate amount of solvent onto a clean soft cloth or bristle brush to clean the gun and hoses.

Synthetic resins used in the fabrication of the electrostatic manual guns can react with certain solvents.

Avoid using the most toxic solvents. Do not use chlorinated solvents.

Clean all parts with a non-conductive (1) solvent, compatible with the fluid being sprayed (conductive (1) solvent can cause the gun to malfunction). If cleaning requires the use of a conductive (1) solvent, never leave this solvent inside the fluid network. Flush it with a non-conductive (1) solvent, blow the fluid hose out with air and dry the gun carefully.

(1) non-conductive solvents are also called non polar solvents; conductive solvents are also called polar solvents.

Before switching ON the electrostatic effect :

- Install the air cap assembly over the needle seat or tip and secure in position with retaining ring onto the gun.

- After applying solvent onto the gun and hoses check they are completely dried.

- Check the cleaning solvent vapors due to the cleaning operation are totally evacuated.

Procedure

Turn the ON / OFF switch on the power supply and gun to OFF "O" (All indicator lights switch off).

Turn off the atomizing air shut off valve (E).

Fully screw clockwise the needle stop at the rear of the gun.

Trigger the gun until the atomizing air stops flowing from the front of the gun.

Empty all material from the container, then fill the material container with a solvent compatible with the material just emptied.

Remove the air cap and tip from the gun.

Fully unscrew counterclockwise the needle stop at the rear of the gun (fluid passage open).

Decrease the air pressure on the pump air motor.

Trigger the gun to dispense solvent into a grounded waste container until the solvent is clean. If necessary, increase the fluid pump air pressure.

When clear solvent flows from the gun, turn down the air pressure regulator (F).

Remove the fluid pump suction hose from the solvent. Go on to triggering the gun until the fluid pump starts to overspeed denoting that all solvent has cleared the pump. Release the gun trigger.

Blow up the fluid hose with compressed air and reassemble the air cap and tip onto the spray gun.

■ **GUN CLEANING METHOD RECOMMENDED**

Never immerse the gun in solvent.

Do not use metal tools to clean the gun or the air cap holes, as they scratch them and create a distortion of the spray pattern.

Only use soft cloth or bristle brush.

Clean the front of the gun and the fluid nozzle with the gun pointed down, to prevent dirty solvent from flowing back into the air passages.

■ **AIR CAP CLEANING METHOD RECOMMENDED**

Make sure that the fluid pressure has been released in fluid hose.

Remove the air cap ring and air cap from the spray gun.

Clean them with a soft brush and some solvent (do not leave these items immersed in solvent).

Blow up the air cap and air cap ring with compressed air.

After cleaning, store the air cap, tip, nozzle and needle seat or reinstall them onto the gun.

On KMX 3 Ex and KMC 3 Ex, check the electrode wire :

the wire is bent : straighten it.

the wire is broken or damaged : replace it.

Never start up a gun whose electrode wire is damaged or broken.

7. TROUBLESHOOTING AND ELECTRICAL TESTS

■ GUN OPERATION TROUBLESHOOTING CHART

TROUBLE	PROBABLE CAUSE	SOLUTION
Jerking or spitting spray	Air is being suctioned into material stream.	Check pump suction hose for leaks and tighten fittings. If necessary use thread sealant on male thread.
	Unsufficient fluid pressure.	Increase pump air pressure and/or clean fluid filter.
	Dirt in the fluid line.	Clean the fluid line, clean the fluid filter.
	Not enough fluid in the fluid container.	Fill the fluid container.
No fluid output.	Tip blocked. Dirt in the fluid being applied.	Clean air cap and tip. Use a finer fluid filter or replace a damaged filter.
	Fluid passage in gun obstructed.	Clean the fluid passage and check for obstructed needle valve. If necessary use an inline fluid filter.
	Fluid filter clogged.	Clean the fluid filter.
	Low fluid pressure.	Increase pump air pressure / check the fluid filter.
Fluid continuously leaking from gun tip.	Needle tip or seat worn.	Replace needle tip and seat.
	Needle tip not fully seated.	Replace a weak or damaged needle spring.
Fluid leaks above the gun trigger.	Worn cartridge.	Replace cartridge assembly.
Fluid leaks through holes in air cap.	Improper position of tip over the needle seat (KMX 3 Ex - KMC 3 Ex).	Clean the air cap and tip. Check that fluid did not flow back in the air passages.
	O Ring on seat worn or damaged.	Replace O Ring
Poor atomization.	Tip obstructed / Tip clogged (KMX 3 Ex - KMC 3 Ex).	Clean tip or replace tip.
	Low fluid pressure (KMX 3 Ex - KMC 3 Ex).	Increase pump air pressure and / or clean fluid filter.
	Fluid viscosity too high.	Reduce viscosity adding compatible solvent (or heating material where appropriate).
	Atomizing air pressure too low.	Increase atomized air pressure.
	Fluid flow rate too high (KMX 3 Ex - KMC 3 Ex).	Decrease the fluid flow rate (decrease pump air pressure)
"Orange peel" finish.	Evaporation of solvent too fast.	Use slower evaporation solvent.
	Improper distance between gun and work part.	Adjust spraying distance and work closer.
	Improper thinner of fluid being sprayed.	Dilute fluid with solvent.
	Poor atomization.	Increase air atomization pressure. Increase pump air pressure. Use smaller tip size (KMX3 Ex-KMC3 Ex).

■ GUN OPERATION TROUBLESHOOTING CHART (CONT'D)

Fluid runs.	Evaporation of solvent too slow. Excessive delivery.	Use faster evaporating solvent. Spray at a greater distance. Reduce pump air pressure. Use smaller tip size (KMX3 Ex-KMC3 Ex). Increase air atomization pressure.
Excessive delivery in middle of spray (non homogeneous spraying)	Excessive fluid flow rate (KMP 3 Ex - KMV 3 Ex). Improper tip size (KMX 3 Ex). Improper fluid thinner. Air holes in air cap obstructed.	Reduce fluid flow rate. Increase air atomization pressure. Use a smaller tip. Dilute fluid with solvent or heating fluid where appropriate. Clean air cap thoroughly with solvent. Blow air holes clean with compressed air.

■ ELECTRICAL TROUBLESHOOTING CHART

TROUBLE	PROBABLE CAUSE	SOLUTION
No electrostatic effect (no wrap around).	No high voltage.	Check for low voltage from power supply, check power supply manual, troubleshooting. Check the electrical interconnection.
	Improper distance between gun and work part.	Adjust spraying distance between 200 and 300 mm (8" to 12").
	Poorly grounded parts.	Check that parts, holder and conveyors are correctly grounded. Clean where necessary.
	High exhaust velocity in booth.	Reduce exhaust velocity (within standard limit).
	Excessive fluid pressure.	Reduce pump air pressure.
	Atomizing air pressure too high (KMP 3 Ex – KMV 3 Ex).	Reduce air atomization pressure.
	Improper fluid viscosity.	Check with supplier for proper fluid for electrostatic spraying.
	Fluid too conductive.	Increase electrical resistance with a non polar or low polar solvent. Check fluid resistance with KREMLIN resistivity meter.
	Fluid is non-conductive.	Add polar solvents or polar additive to achieve correct conductivity. Check fluid resistance with KREMLIN resistivity meter.
	<u>Short circuit between the gun electrode and the grounded handle through :</u>	
- the outside of the gun,	Clean with a non-polar solvent (> 15 MΩ.cm) and dry the outside of the gun. Install a new clean and dry gun cover.	
- the fluid needle,	Replace the worn cartridge as well as the needle.	
- the air channel,	Replace tip and seat O Rings. Supply the gun with dry compressed air.	
- the fluid hose.	Use a hose appropriate for the fluid resistivity.	

■ **ELECTRICAL TROUBLESHOOTING CHART (CONT'D)**

Operator receives mild shocks.	Operator not properly grounded or in contact with a non-grounded object.	Be certain that floor is properly grounded. Wear shoes with conductive soles and wear personal grounding strap. Be sure the operator is in contact with metallic parts on the gun handle. If wearing gloves they must be conductive or modified as explained chapters 2 and 6. Be sure that the operator is not in contact with any metallic items which could build up electrical charge.
Operator receives mild shocks when touching the work part.	Gun and work part not properly grounded.	Check the parts, hook and conveyor systems are properly grounded. Clean holders and conveyor systems, scrape if necessary.

■ **ELECTRICAL TEST**

The following electrical test must only be carried out by qualified electricians; these tests must not be carried out when the electrostatic coating system is working. Tests must always be carried out in a non hazardous area.

Check the electrical grounding

Use a megohmmeter to check that all metallic parts located in the spraying area are properly grounded.

With a megohmmeter, check the electrical grounding continuity between the ground connection of the power supply and :

- metallic parts on the gun handle,
- air fittings on the gun handle and the grounded air hose,
- the needle stop at the rear of the gun,
- screws securing the rear part of the gun.

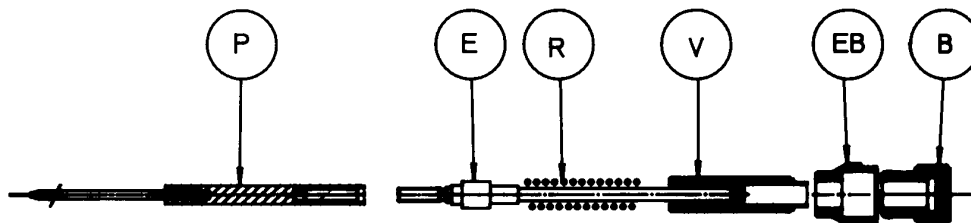
If you notice an improper electrical grounding continuity on the gun, consult immediately your local authorized KREMLIN distributor for assistance.

8. MAINTENANCE

➡ **REFER TO GENERAL SAFETY INSTRUCTIONS**

■ **REPLACEMENT OF NEEDLE**

Turn off the air and fluid supply. Trigger the gun into a grounded metal waste container and fully relieve fluid pressure before disassembly the needle.



Removal

Unscrew needle stop (B).

Unscrew stop nut (EB) using KREMLIN wrench.

Unscrew screw (V) using the small wrench.

Take care to spring (R) release. Remove spring (R).

Pull metallic carrier (E).

Unscrew assembled needle (P) (plastic section) from metallic carrier (E) to remove the needle.

Installation

Screw the new assembled needle on carrier (E).

Grease the needle - Insert needle line.

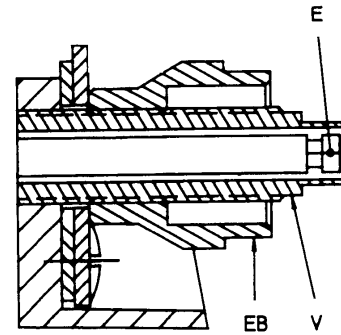
Position spring (R).

Retighten screw (V).

Important : carrier (E) must be flush with screw end (V) (as shown on the opposite drawing).

Block with lock nut (EB).

Re-screw needle stop (B).



■ SEAT REPLACEMENT

Important note :

The KM.3 Ex guns are supplied with seat seals made of special quality material (Polyfluid) – To maximize fluid proofness, we recommend the replacement with seals of same quality. Refer to part breakdown and list for part numbers.

Removal

Check the fluid pressure has been relieve in the paint circuit.

Remove the air cap and retaining ring.

Unscrew needle seat with the supplied KREMLIN wrench.

Installation

Before installing the new seat, check that needle stop (B) at the back is fully unscrewed.

Grease seal of new seat using insulating grease.

Screw and slightly block the seat.

Install the cap and retaining ring.

Pressurize.

■ CARTRIDGE REPLACEMENT

Removal

Proceed as above indicated for needle line and seat removal.

Insert the screwdriver supplied with the equipment at the back of gun. Turn the screwdriver clockwise for unscrewing the cartridge.

When the cartridge is unscrewed, push it with the screwdriver and remove it from the front.

Installation

Lubricate the new cartridge using insulating grease. **Insert it at the front part of the gun.**

Screw it at the back part of the gun using the screwdriver.

Install needle line as previously indicated.

Pressurize.

If you notice a light leak at the cartridge, tighten it slightly **round the front**.

■ TRIGGER REPLACEMENT

Unscrew on 5 mm length the 2 screws retaining the trigger.

Pull on trigger – Install new trigger.

Re-tighten (by hand) until trigger easily turns on the axis of the screws.

■ AIR VALVE REPLACEMENT

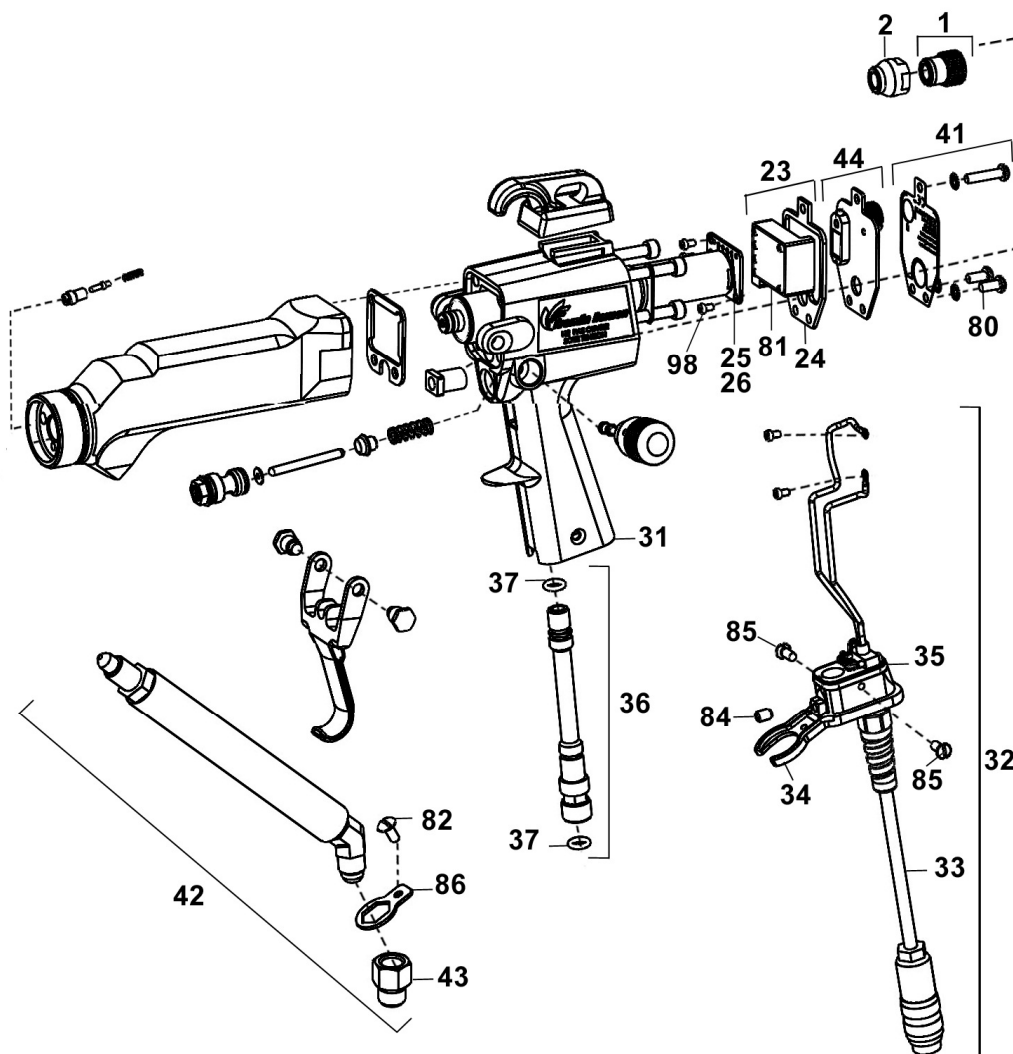
- Switch off air pressure to gun.
- Trigger the gun to de-pressurize the hoses.
- Remove the trigger.
- Unscrew valve with the hexagon key supplied.
- Grease seals of new valve.
- Screw new valve to stop, slightly block.
- Install the trigger and pressurize.

■ HOOK REPLACEMENT

- Unscrew nut located at the back using the screwdriver supplied.
- Slide the hook to the front.
- Install new hook. Slightly tighten the screw at the back of gun to block the hook.

■ HIGH VOLTAGE GENERATOR AND OSCILLATOR REPLACEMENT

View n° 1



Removal

- 1 - Unscrew the 3 fastening screws (80) from the identification plate (41) (refer to view n°1).
- 2 - Remove needle stop (1) and unscrew stop nut (2).
- 3 - Remove identification plate (41), rear plate (44) and rear seal (24)
- 4 - Tilt gun backwards for sliding the generator-oscillator assembly (25 + 81) out of its housing.

→ never use tools for this operation.

If the generator /oscillator assembly does not slide easily, gently hit back of the gun for easier extraction.

Handle generator and oscillator with care.

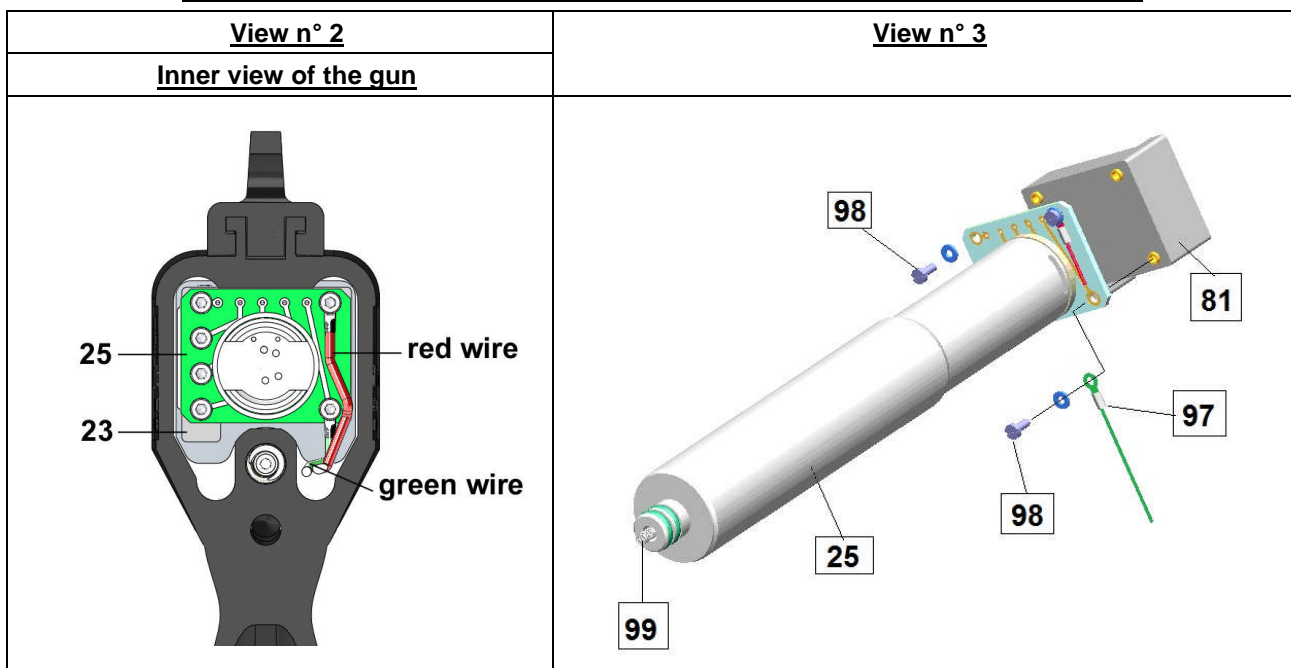
- 5 - Unscrew the 6 screws (98) to separate generator (25) from oscillator (81).
- 6 - Replace generator or oscillator.

Installation

- 1 - Connect generator and oscillator with 4 screws (98) and 4 washers which are supplied with the spare 'generator assembly' and 'oscillator assembly'.
- 2 - Fix the 2 cable supply rope-thimbles (97) on the spare 'generator assembly' and 'oscillator assembly' with 2 washers and 2 screws (98).

Do not forget the washers.

Comply with position and orientations of thimbles as well as the wire colours (refer to views n°2 & n°3).



3 - Before introducing new spare HV generator and oscillator, lightly lubricate O-Ring on the new generator and make sure the spring (99) is protruding on 3-4 mm.

4 - Slide the generator / oscillator assembly. Make sure the red wire goes above the generator barrel.

5 - Replace the rear flat seal (24) which is supplied with the spare 'oscillator assembly' and 'high voltage generator'.

6 - Position rear plate (44).

Do not squeeze the cable between the rear plate and the gun handle.

7 - Position identification plate (41).

8 - Screw stop nut (2) then the 3 fastening screws (80).

9 - Tighten stop screw (2).

10 - Lock screws (80).

11 - Re-tighten needle stop (1).

COMPLY WITH INSTALLATION ORDER - CORRECT TIGHTENING IS REQUIRED.

Incorrect installation may cause product leakage in the electronic parts and damage them.

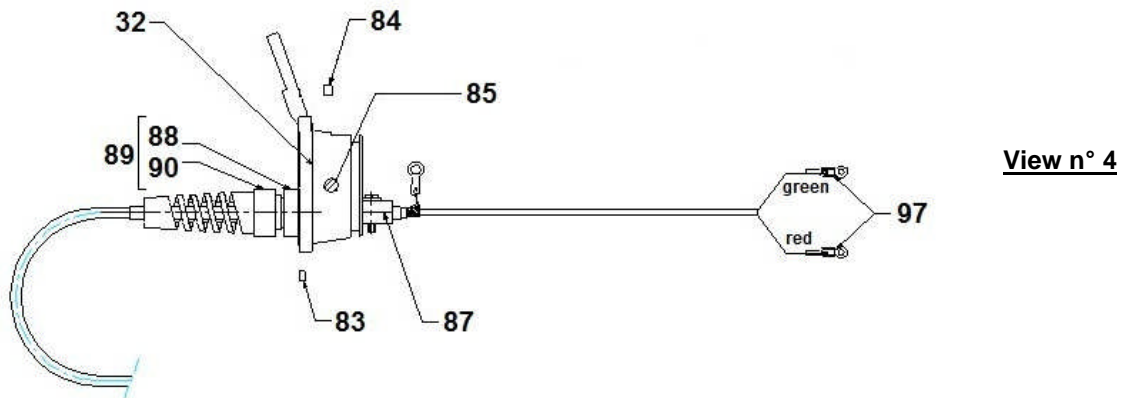
■ HIGH VOLTAGE CABLE ASSEMBLY REPLACEMENT

Removal

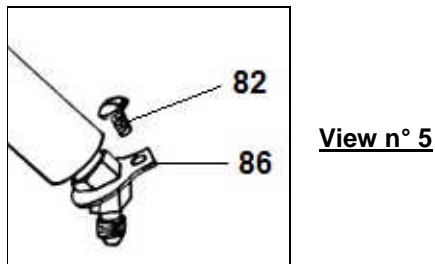
- 1 - Carry out operations **1 to 4** of generator and oscillator replacement.
- 5 - Unscrew 2 of the 6 screws (98) to separate green and red wires of the supply cable (34) from the generator / oscillator assembly (refer to view n°3).
- 6 - Put the generator /oscillator assembly aside.**
- 7 - Remove screw (82).
- 8 - Loosen screw (84).
- 9 - Unscrew the air hose (36).
- 10 - Remove the 2 screws (85).
- 11 - Remove bracket (34) to come out the cable from the gun body by guiding it. Handle plate for fitting (86) with care.

Installation

The high voltage cable is supplied with a guide wire (brass) mounted on each rope-thimble (refer to view n°4).



- 1 - Install the plate (86) on the fitting (refer to view n°5).

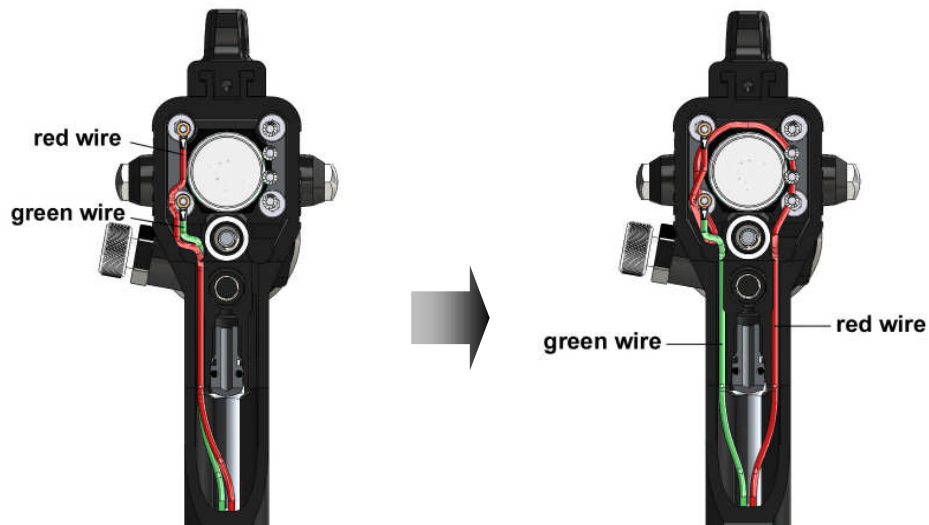


2 - Introduce the high voltage cable into the gun thanks to the guide wires (refer to view n°6b).

View n° 6a - Old installation

View n° 6b - New installation

Gun rear views



3 - Pull the wires until the bracket rests on its handle (31) (refer to view n°7a).

4 - Enter the bracket (34) in and fix it with the 2 screws (85) (refer to view n°7b).

5 - Screw the air hose (36).

6 - Fasten the screw (84).

7 - Re-tighten the screw (82).

8 - Take off the guide wires of the rope-thimble (97).

9 - Carry out the operations **2 to 11** of generator and oscillator installation.

View n° 7a

View n° 7b

