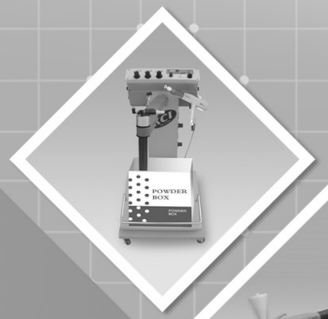
# POWDER COATING EQUIPMENT





KCI Koryo Coating Machine Industrial Co.,Ltd.

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# Pulse Coating System, KCI-201
## Pulse coating reduces coating material consumption by 20 % to bring about the enhancement of coating quality.

### Summary of Pulse Coating

The existing corona coating was difficult to coat a corner or recessed place with powder charged with a high current because of electrostatic repulsion. In an attempt to resolve such a problem, if you lower voltage and charge powder with a low current, it leads to weaken electrostatic force to cause powder to run down.

What is required to resolve those problems above is to charge powder with a low current and a high voltage, which makes it possible to resolve through the new pulse coating such problems that the existing corona coating style failed.

### What is Pulse Coating?

Pulse coating is a great and new style of powder coating that repeatedly charges powder with a low current and a high voltage at intervals of short time (15 ~ 30 clock per second)



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### Merits of Pulse Coating

1. Enhancement of Coating Quality

The existing style of corona coating generally forms an approximate 50 ~ 90 ㎛ of film, while a new style of pulse coating does a relatively regular coating thickness of 40 ~ 70 ㎛, contributing to the enhancement of coating quality.

2. Reduction in Coating Material Consumption

Pulse coating could form a relatively regular thickness of coating film (70㎛ for corona coating and 50㎛ for pulse coating in average thickness) compared with the existing corona coating, which leads to reduce coating material consumption by approximately 20 %.

3. Effective Coating for Recessed Places

While powder charged with a high voltage is sprayed to reach recessed places of targets, it is considerably weakened in electrostatic force. Pulse coating can resolve this problem by repeatedly recharging powder, enabling those recessed places to be coated.

4. Effective Recoating

To charge powder with a low current and a high voltage, which is one of the merits of pulse coating, makes it easier to do recoating without a separate control of voltage or current.

5. Decrease in Orange Peel

Pulse coating can significantly decrease orange peel, which is generally caused by a thick powder coating, since it provides more thinner coating than the existing corona style does.

## WARNING

### INSTALLATION

- Properly ground all equipment in the spray area to an earth ground and maintain this ground.
- Remove all containers of volatiles from the spray area.
- Establish and maintain a grounded area for the spray operator.
- The Gun of KCI-200 Series must be connect to KCI-201 Control unit.

### HANDLING

- Do not puncture or roughly handle the containers of powder.
  If the contents are scattered, powder may contaminate the air inhaled by operators.

### OPERATION

- The operator should hold the gun in his bare hand.
  If gloves are worn, the palm should be out to assure skin-to-metal contact.
- The operator should wear shoes with conductive shoes, e. g., leather.
  Rubber shoes are not conductive.
- Ground the tip of the gun before cleaning or changing nozzles.
  when the gun is not in use, it should be hung so that the nozzle is within four inches of a grounded conductor.
- The operator should wear a filter-type respirator anytime he is exposed to dusty conditions.
- High pressure powder may cause injury, Keep the rear switch "OFF" position in no-use condition

### MAINTENANCE

- Make a periodic confirmation of grounding to earth of all equipment in the spray area.
- Exercise good housekeeping practices, do not allow dirt or powder to accumulate on the feeder/powder unit, cable, or gun.
- Keep the cabinet door closed, wipe with a clean dry cloth or with clean, dry air the prevent powder build-up.
- In case of powder such as spraying paint, dust density of 10g/㎥ or more could cause explosion, and the internal booth should be maintained in good and clean condition.

### PERSONNEL

- Use soap and water to remove powder from the skin washing with solvents can cause reactions resulting in allergies and disorders.
- Wash hands before eating and smoking.
- Do not use compressed air to blow powder off the hands and clothing.
  This practice may result in damage to the ear drums or eyes.



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# KCI Powder Electrostatic Coating Machine

## Manual Book for Model 201, 203, 204, 206, 207

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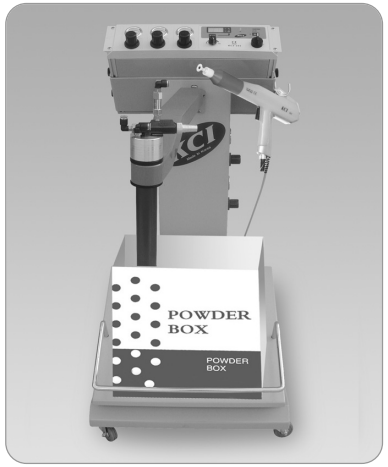
## 1. POWDER COATING UNIT TYPE

● KCI-201 : Manual Spray(Standard Model)




● KCI-206 : Hopperless type
(Vibrating Plate instead of Powder Container)

● KCI-203 : GUN & Control Unit with
Mini Hopper (4ℓ)

● KCI-207 : Auto Gun & Control Unit

● KCI-204 : 204 Cup Gun and Control Unit
usually for Laboratory

### APPLICATION

The equipments are designed to be suitable especially for conveyor line or hand job conducted in manual booth.



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## POWDER COATING UNIT TYPE 201, 203, 204, 206, 207

### FUNCTIONS

- The fluidized powder in the powder hopper is sucked up in the injector by the conveying air. Through the powder hose the powder/air mixture reaches the gun.
- The powder is electrostatically charged immediately it reaches the gun nozzle. An intense field also exists between the gun nozzle and the grounded workpiece. The electrostatically charged powder sprayed onto the workpiece adheres to the latter's surfaces.
- This line voltage is converted in the control module to high-frequency current This currents stepped up by the high-voltage transformer and the HV-cascade in the gun to -100kV and applied to the electrodes.
- The conveying air and the dosing air is to be regulated on the control module, the fluidizing air on the pneumatic unit.
- The powder is fluidized by forcing air from below through a porous plastic plate. The fluidized powder gets liquid-like properties.

### Technical data

#### Power

| | |
|---|---|
| Singe-phase range | 220VAC |
| Frequency | 50/60HZ |
| Type | 201,203,204,206,207 |
| Temperature range in use | -10℃+50℃ |

#### Powder GUN

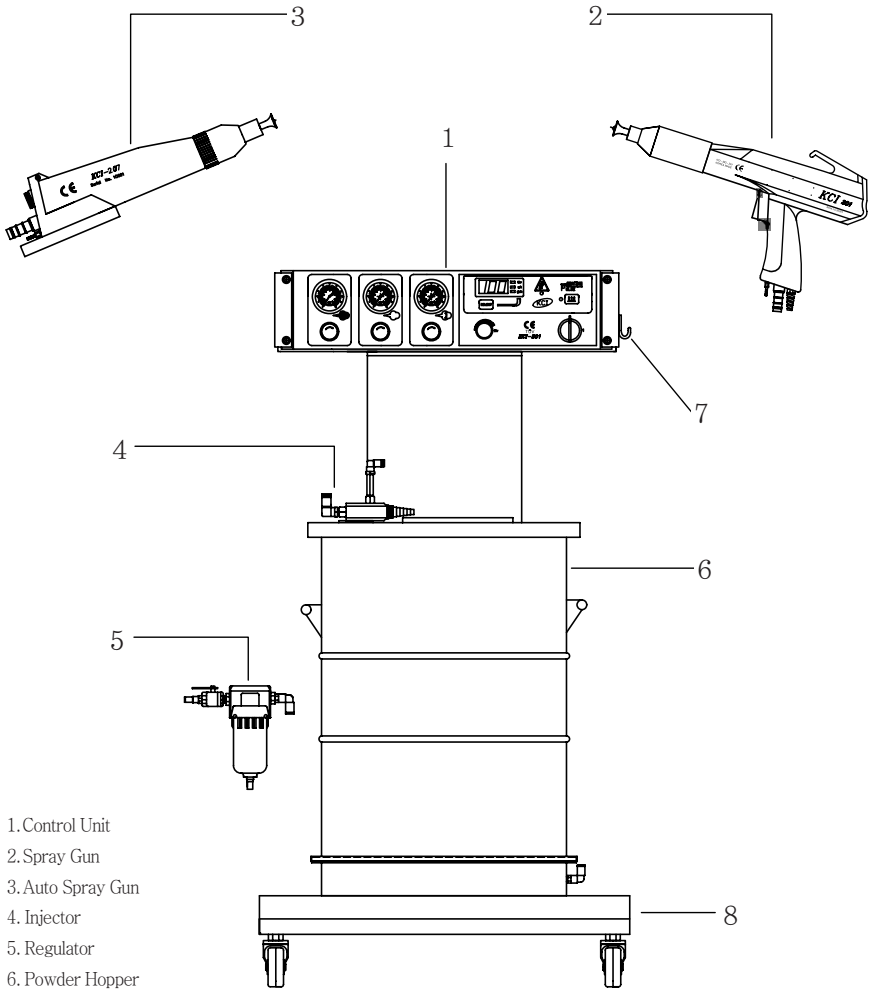
| | |
|---|---|
| Length of Gun | 330mm |
| Gun weight | 420g |
| Rated output voltage | 24VDC |
| Input voltage | - 100kV |
| Maximum output current | 180㎂(MAX.) |
| Maximum powder injection | 600g/min |
| Polarity | negative(-) |

#### Pneumatic technical spec

| | |
|---|---|
| Maximum input-air pressure | 8 kg/㎠ |
| Optimum input-air pressure | 6 kg/㎠ |
| Minimum input-air pressure | 4 kg/㎠ |
| Maximum water vapor content or compressed Air | 1.4g/N㎥ |
| Maximum oil vapor content of compressed air | 0.1ppm |
| Maximum compressed-air Consumption | 13.2N㎥/h |

#### KCI 201 [ Net weight: 37kg Size(WxLxH) : 480x550x950mm ]

## POWDER COATING UNIT TYPE 201, 207




1. Control Unit
2. Spray Gun
3. Auto Spray Gun
4. Injector
5. Regulator
6. Powder Hopper
7. Gun Hanger
8. Trolley



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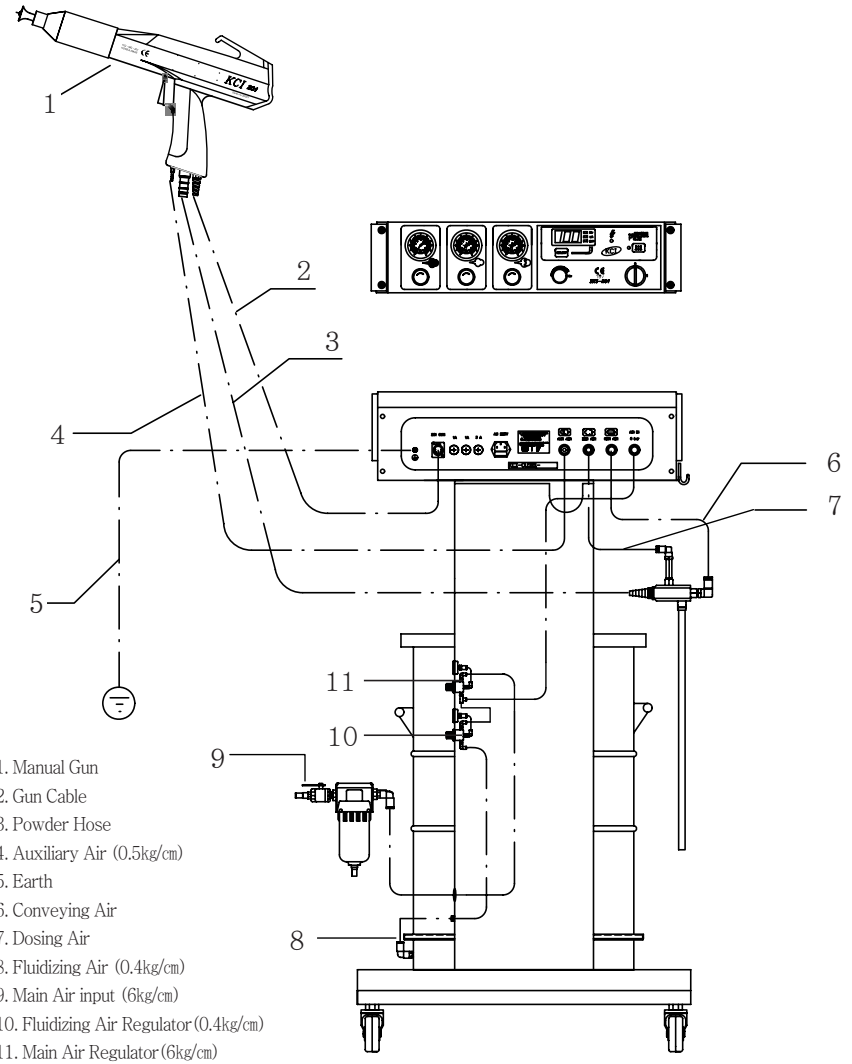
## KCI-201 Drawing of Connection




1. Manual Gun
2. Gun Cable
3. Powder Hose
4. Auxiliary Air (0.5kg/㎠)
5. Earth
6. Conveying Air
7. Dosing Air
8. Fluidizing Air (0.4kg/㎠)
9. Main Air input (6kg/㎠)
10. Fluidizing Air Regulator(0.4kg/㎠)
11. Main Air Regulator(6kg/㎠)

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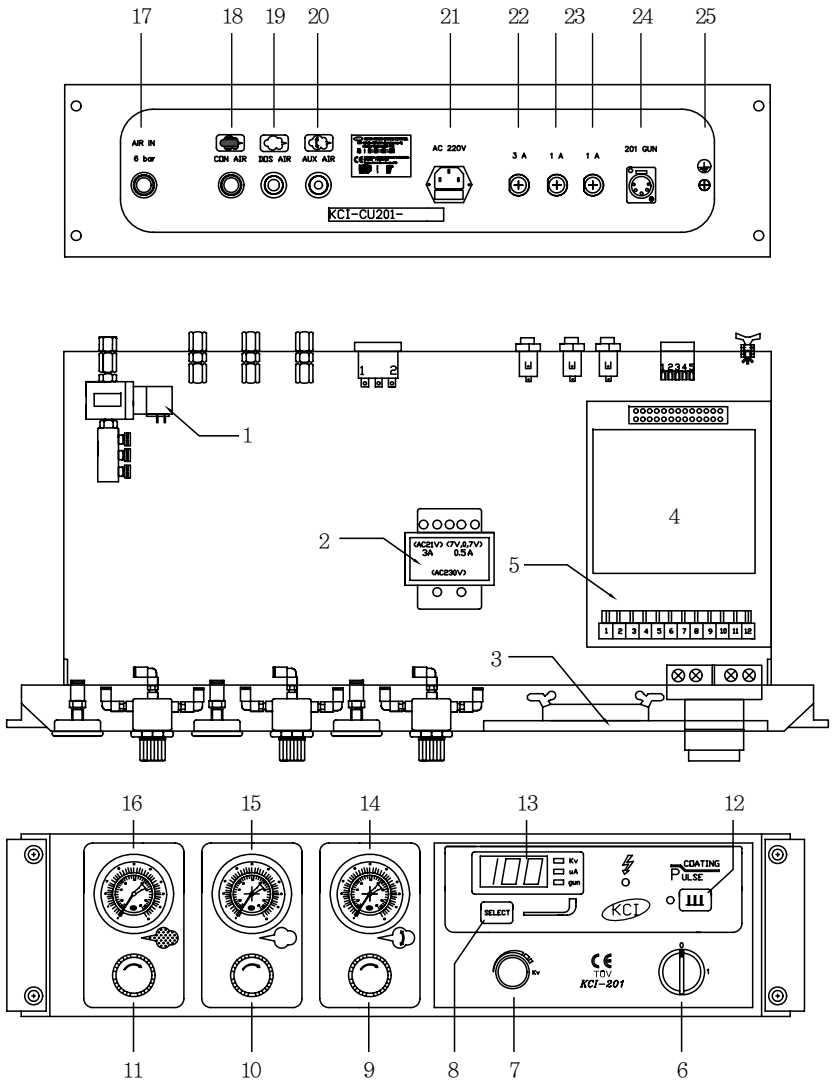
## CONTROL UNIT KCI-201, 203, 204, 205, 206, 207 -A-




## PARTS LIST -A-

Control Unit for type 201,203,204,206,207

| Drawing No. | Part No. | Unit | Q'ty | Description | Specification |
|---|---|---|---|---|---|
| 1 | 2201 | EA | 1 | Solenoid Valve | DC 24V |
| 2 | 2102 | EA | 1 | Transformer | AC 230V (7v, 0v, 7v, 21v) |
| 3 | 2103 | EA | 1 | DISPLAY P.C.B | 142×45×1.6t |
| 4 | 2104 | EA | 1 | SUB P.C.B | 87×80×1.6t |
| 5 | 2105 | EA | 1 | MAIN P.C.B | 160×92×1.6t |
| 6 | 2131 | EA | 1 | Power Switch | AC 220/5A |
| 7 | 2132 | EA | 1 | Hi-Voltage volume knob | φ25 5kΩ |
| 8 | 2133 | EA | 1 | Select Switch | kV, uA, gun |
| 9 | 2136 | EA | 1 | Auxiliary air Regulator | inlet 10kg/㎠ outlet 4kg/㎠ |
| 10 | 2135 | EA | 1 | Dosing air Regulator | inlet 10kg/㎠ outlet 4kg/㎠ |
| 11 | 2134 | EA | 1 | Conveying air Regulator | inlet 10kg/㎠ outlet 6kg/㎠ |
| 12 | 2137 | EA | 1 | Pulse Switch | Corona, Pulse (kV, uA) |
| 13 | 2138 | EA | 1 | Display | Corona, Pulse |
| 14 | 2141 | EA | 1 | Auxiliary air Manometer | φ41 4kg/㎠ |
| 15 | 2140 | EA | 1 | Dosing air Manometer | φ41 4kg/㎠ |
| 16 | 2139 | EA | 1 | Conveying air Manometer | φ41 6kg/㎠ |
| 17 | 2161 | EA | 1 | Main air one touch nipple | φ8×φ6 |
| 18 | 2162 | EA | 1 | Conveying air nipple | φ8×φ6 |
| 19 | 2163 | EA | 1 | Dosing air nipple | φ6×φ4 |
| 20 | 2164 | EA | 1 | Auxiliary air nipple | φ5×φ3 |
| 21 | 2165 | EA | 1 | Main power cable socket | 0.5A 230Vac |
| 22 | 2166 | EA | 1 | Fuse holder with fuse 3A | 3A |
| 23 | 2167 | EA | 2 | Fuse holder with fuse 1A | 1A |
| 24 | 2168 | EA | 1 | Gun cable socket 5pins | 5Pins(MG201) |
| 25 | 2169 | EA | 1 | Ground nut | M6 |

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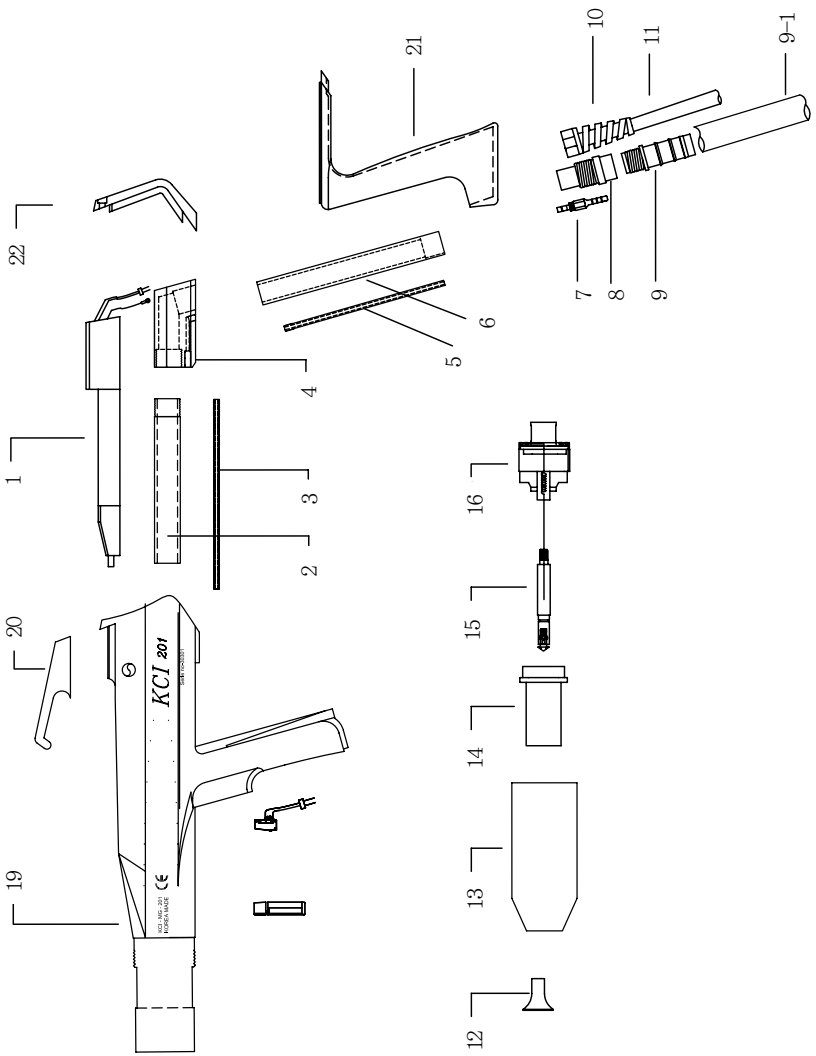
## MANUAL GUN 201 -B-




## PARTS LIST -B-

KCI-201/Manual Spray Gun 201

| Drawing No. | Part No. | Unit | Q'ty | Description | Specification |
|---|---|---|---|---|---|
| 1 | 2201 | EA | 1 | High- Voltage pack | 227×31×35 |
| 2 | 2202 | EA | 1 | Powder Channel(A) | φ15.6×113 |
| 3 | 2203 | EA | 1 | Auxiliary Channel(A) | φ6×110 |
| 4 | 2204 | EA | 1 | Channel bracket | 63×31×20 |
| 5 | 2205 | EA | 1 | Auxiliary Channel(B) | φ6×114 |
| 6 | 2206 | EA | 1 | Powder Channel(B) | φ14.6×120 |
| 7 | 2207 | EA | 1 | Auxiliary air nipple | |
| 8 | 2208 | EA | 1 | Channel holder | φ17.6×36 |
| 9 | 2209 | EA | 1 | Powder hose nipple | φ16×45 |
| 9-1 | 2239 | M | 1 | Powder hose | 4.5M |
| 10 | 2210 | EA | 1 | Cable bracket | 14×53 |
| 11 | 2211 | EA | 1 | Gun Cable with connector | φ6×4.5M |
| 12 | 2213-1 | EA | 1 | Deflector(Small) | φ19 |
| | 2213-2 | EA | 1 | Deflector(Medium) | φ24 |
| | 2213-3 | EA | 1 | Deflector(Large) | φ32 |
| 13 | 2234 | EA | 1 | Gun Cap | |
| 14 | 2214 | EA | 1 | Gun Muzzle | φ30×49.5 |
| 15 | 2216 | EA | 1 | Rod | φ8×60 |
| 16 | 2218 | EA | 1 | Rod holder with spring | φ31×48.5 |
| 17 | 2221 | EA | 1 | Gun trigger | 12×35×11 |
| 18 | 2223 | EA | 1 | Gun switch | 20×6.5×11 |
| 19 | 2235 | EA | 1 | Gun body | 260mm |
| 20 | 2236 | EA | 1 | Hook | |
| 21 | 2237 | EA | 1 | Gun Handle | |
| 22 | 2238 | EA | 1 | Gun Back Cover | |

Assembled

KCI-201 Manual Gun

Disassembled
High Voltage Generator

Disassembled
front of Gun



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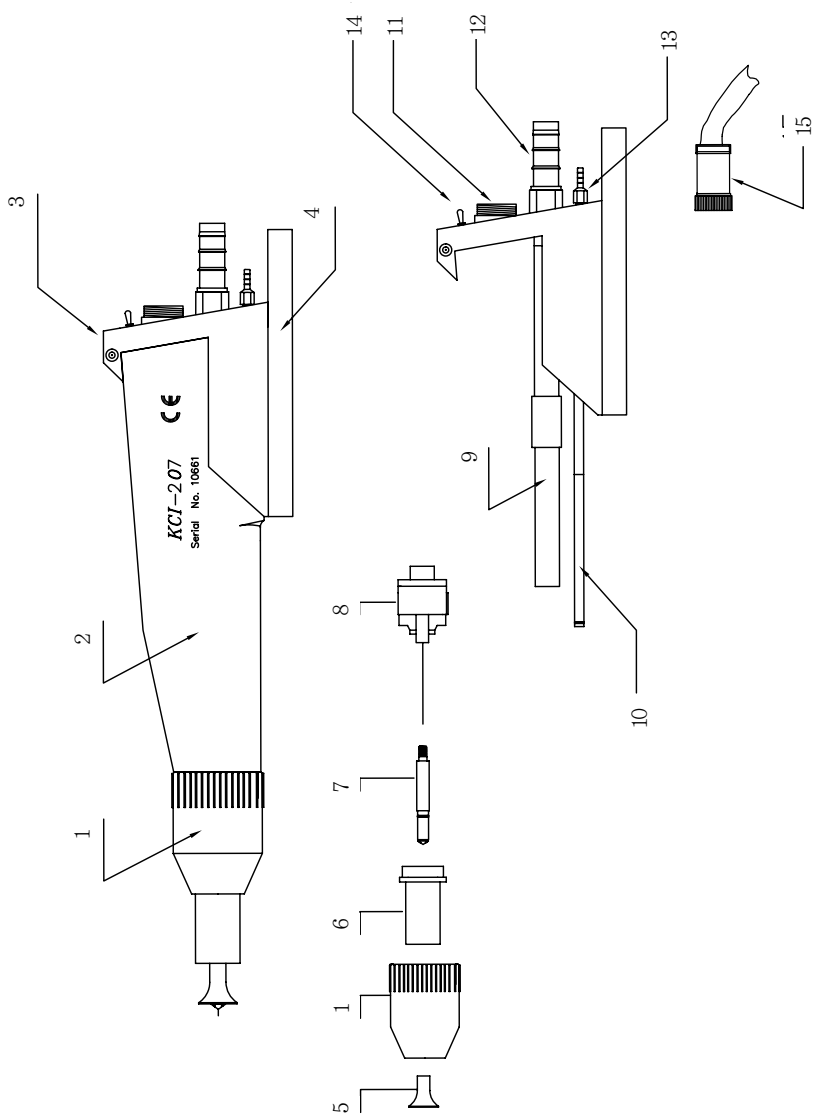
## AUTO GUN TYPE 207 -C-




## PARTS LIST -C-

KCI-207/Auto Spray Gun 207

| Drawing No. | Part No. | Unit | Q'ty | Description | Specification |
|---|---|---|---|---|---|
| 1 | 2701 | EA | 1 | Gun Cap | φ44×62 |
| 2 | 2702 | EA | 1 | Gun Body | 260mm |
| 3 | 2703 | EA | 1 | Hook | |
| 4 | 2704 | EA | 1 | Gun Bracket | 35×120×8 |
| 5 | 2705-1 | EA | 1 | Deflector(Small) | φ19 |
| | 2705-2 | EA | 1 | Deflector(Medium) | φ24 |
| | 2705-3 | EA | 1 | Deflector(Large) | φ32 |
| 6 | 2706 | EA | 1 | Gun muzzle | φ30×49.5 |
| 7 | 2707 | EA | 1 | Rod | φ8×60 |
| 8 | 2708 | EA | 1 | Rod holder | φ31×48.5 |
| 9 | 2709 | EA | 1 | Powder channel | |
| 10 | 2710 | EA | 1 | Auxiliary channel | |
| 11 | 2711 | EA | 1 | Gun cable Jack | |
| 12 | 2712 | EA | 1 | Powder hose nipple | φ16×45 |
| 13 | 2713 | EA | 1 | Auxiliary air nipple | 8×35 |
| 14 | 2755 | EA | 1 | Gun switch | 250V/1A |
| 15 | 2751 | M | 1 | Gun cable with connector | 4P×8m |
| 16 | 2752 | M | 1 | High – Voltage Pack | 227×31×35 |

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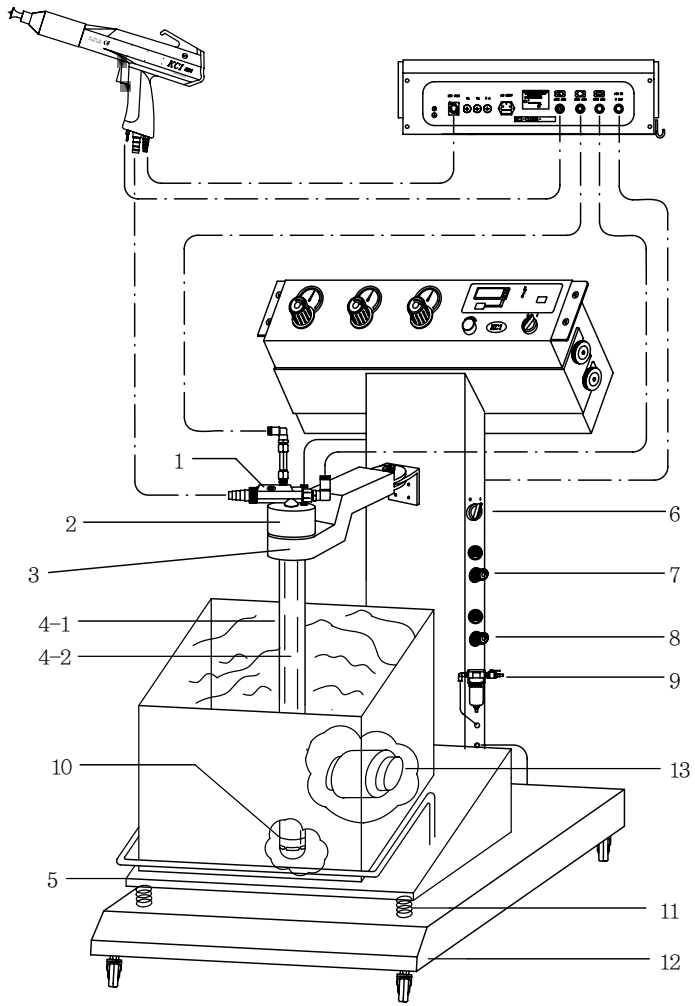
## POWDER HOPPERLESS 206 -D-




## PARTS LIST -D-

KCI-206 Hopperless Sprayer

| Drawing No. | Part No. | Unit | Q'ty | Description | Specification |
|---|---|---|---|---|---|
| 1 | 400 | SET | 1 | Injector Unit | |
| 2 | 2632 | EA | 1 | Injector holder | |
| 3 | 2631 | EA | 1 | Stand arm | |
| 4-1 | 2630-1 | EA | 1 | Injector powder pipe | |
| 4-2 | 2630-2 | EA | 1 | Injector air pipe | |
| 5 | 2609 | EA | 1 | Powder box plate | |
| 6 | 2629 | EA | 1 | Vibrator switch | |
| 7 | 2621 | EA | 1 | Main air regulator | |
| 8 | 2607 | EA | 1 | Fludizing air regulator | |
| 9 | 2628 | EA | 1 | Air filter | |
| 10 | 2624 | EA | 1 | Fluidizing pocket | |
| 11 | 2625 | EA | 1 | Plate spring | |
| 12 | 2626 | EA | 1 | Trolley | |
| 13 | 2610 | EA | 1 | Vibrator | |

## How to use KCI-206(HOPPERLESS)

▶ The operating way of KCI-206 control unit is same with KCI-201 basically.
But KCI-206 do not need hopper but using vibrator to fluidize powder.

## Operating

① Turn regulator which control vibrator air clock wise in order to getting up
② Then vibrator start to working the powder box would be vibrating and fluidizing powder.
③ Turn powder auxiliary air regulator to clock wise slightly to fluidzing powder.
④ Turn the Conveying air regulator.
⑤ Others are same with KCI-201 operation.



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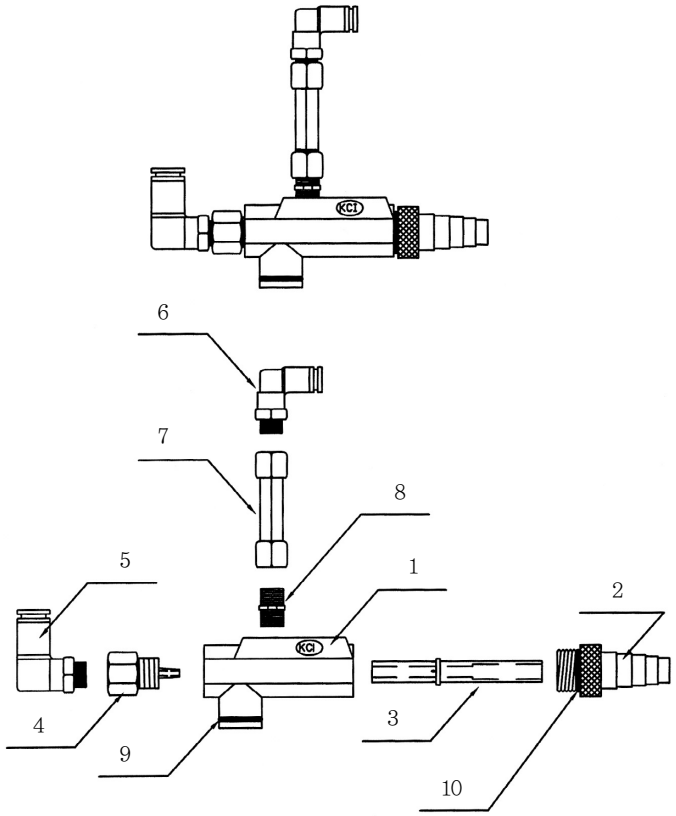
## INJECTOR -E-



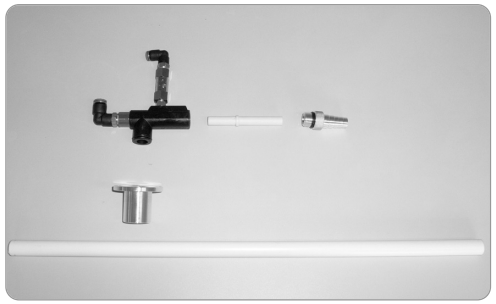

## PARTS LIST -E-

**Injector Unit**

| Drawing No. | Part No. | Unit | Q'ty | Description | Specification |
|---|---|---|---|---|---|
| 1 | 401 | EA | 1 | Injector body | 64×40×20 |
| 2 | 405 | EA | 1 | Sleeve holder | φ20×48 |
| 3 | 440 | EA | 1 | Insert Sleeve | φ9.8×80 |
| 4 | 415 | EA | 1 | Injector nozzle | 28.5× φ1.8 |
| 5 | 410 | EA | 1 | Conveying air one touch fitting | PL 1/8×φ8 |
| 6 | 430 | EA | 1 | Dosing air one touch fitting | PL 1/8×φ6 |
| 7 | 425 | EA | 1 | Check valve | 1/8, V18 |
| 8 | 420 | EA | 1 | Check valve bolt | PT 1/8 |
| 9 | 446 | EA | 1 | O-Ring | φ16×1.8t |
| 10 | 445 | EA | 1 | O-Ring | φ13×1.8t |
| 11 | 400 | Unit | 1 | Injector Unit | |

## INJECTOR -E-

Injector & Injector Pipe



Disassembled Injector

### The principle of injector and influence of injected air flowing through injector nozzle create vacuum

- The vacuum provides the suction powder for getting powder into suction tube, in which the air and powder are mixed.
- The mixing density of air and powder, as well as powder–extraction amount depend on factors such as injected air, dosing air, powder quality, the length and diameter of powder hose, the height difference between GUN and injector, and the type of hoses.
- Pressure gauge indicates the operating pressure.
- Lowering the level of air pressure decrease the output amount of the powder. To implement this, DOSING AIR should take the role of secondary air, which should be injected turn.
- Increasing DOSING AIR decreases the amount of powder output, and accelerates the speed of injected air.
- CONVEYING AIR is measured by "BAR" unit.
- The pressure gauge of DOSING AIR dose not indicate pressure but has something to do with the output amount of paint.



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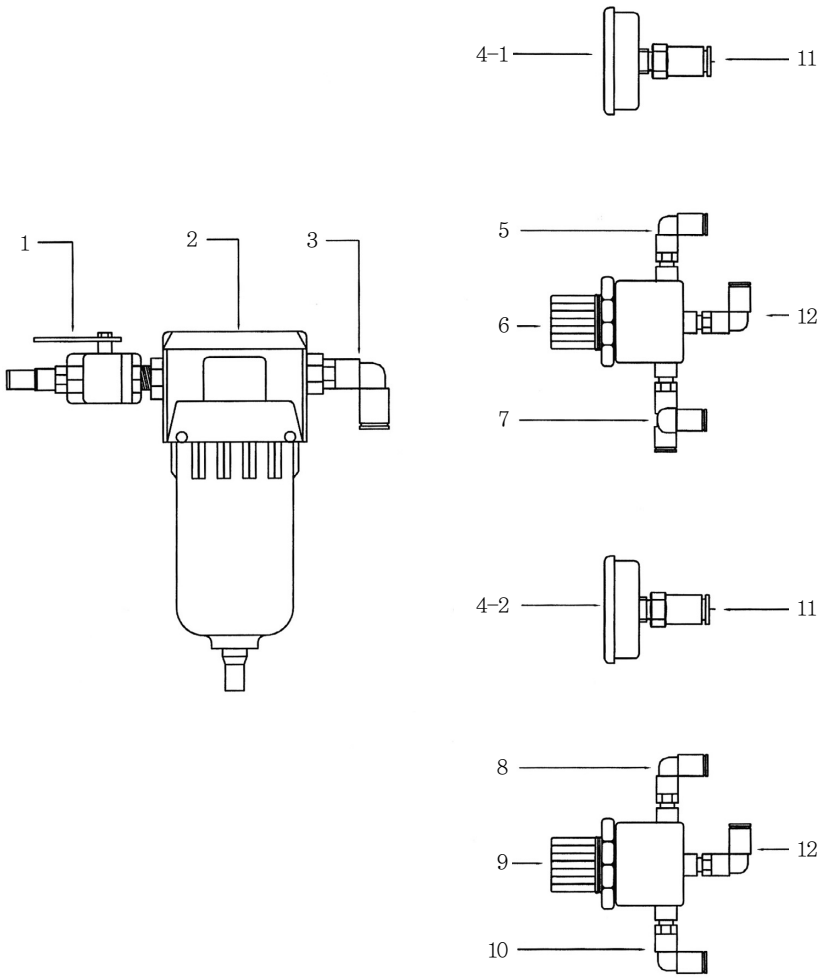
## PNEUMATIC INPUT UNIT -F-




## PARTS LIST -F-

**Regulator Unit**

| Drawing No. | Part No. | Unit | Q'ty | Description | Specification |
|---|---|---|---|---|---|
| 1 | 450 | EA | 1 | Main air coupler | |
| 2 | 455 | EA | 1 | Pressure reducing valve | 3/8x3/8 |
| 3 | 496 | EA | 1 | One-touch fitting | PL 3/8x10Φ |
| 4-1 | 460 | EA | 1 | Main manometer | Φ47 10kg/cm |
| 4-2 | 495 | EA | 1 | Fluidizing manometer | Φ47 2kg/cm |
| 5 | 494 | EA | 1 | One-touch fitting | PL 1/4x10Φ |
| 6 | 486 | EA | 1 | Main air Regulator | |
| 7 | 480 | EA | 1 | One-touch fitting | PST 1/4x8Φ |
| 8 | 490 | EA | 1 | One-touch fitting | PL 1/4x8Φ |
| 9 | 485 | EA | 1 | Fluidizing air Regulator | |
| 10 | 491 | EA | 1 | One-touch fitting | PL 1/4x6Φ |
| 11 | 492 | EA | 1 | One-touch fitting | PCF 1/8x6Φ |
| 12 | 493 | EA | 1 | One-touch fitting | PL 1/8x6Φ |

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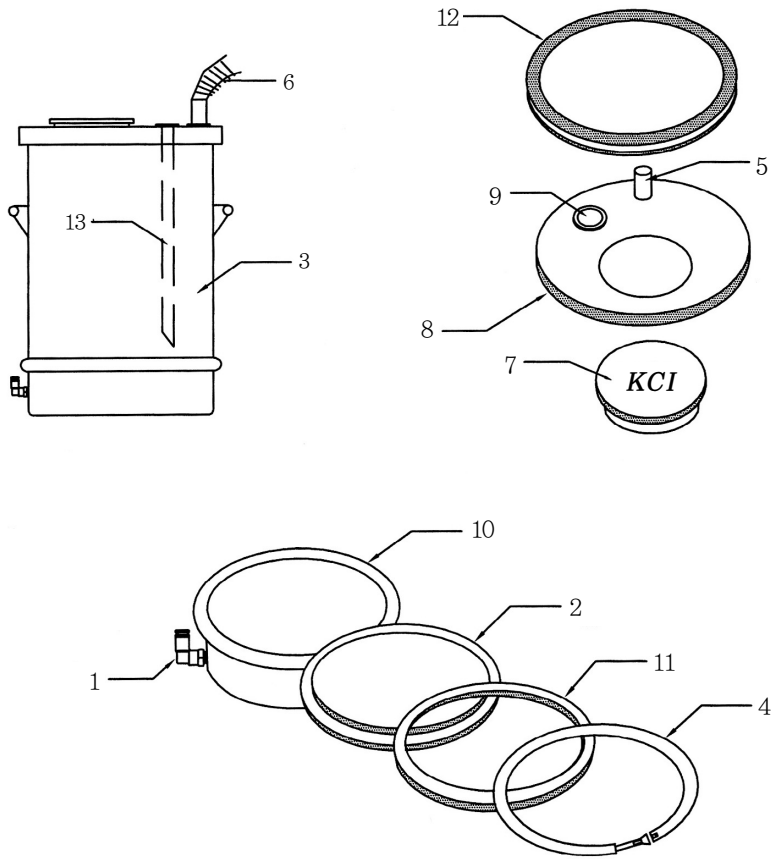
## POWDER HOPPER -G-




## PARTS LIST -G-

**Powder Hopper(40 Liter) Unit**

| Drawing No. | Part No. | Unit | Q'ty | Description | Specification |
|---|---|---|---|---|---|
| 1 | 355 | EA | 1 | Fluidzing one-touch fitting | PL1/8 x φ6 |
| 2 | 315 | EA | 1 | Fluiding Plate | φ400×10T |
| 3 | 301 | EA | 1 | Hopper Body | φ370×500H |
| 4 | 320 | EA | 1 | Snap Lock | φ400 |
| 5 | 330 | EA | 1 | Vent | φ30×70H |
| 6 | 335 | EA | 1 | Powder Vent Hose | φ30 |
| 7 | 325 | EA | 1 | Rubber Lid | φ230 |
| 8 | 305 | EA | 1 | Hopper Cover | φ410×15H |
| 9 | 340 | EA | 1 | Injector Holder | φ45×15H |
| 10 | 310 | EA | 1 | Hopper bottom case | φ370×50H |
| 11 | 313 | EA | 1 | Rubber gasket | φ400×10H |
| 12 | 314 | EA | 1 | Rubber Packing | φ400×15H |
| 13 | 315 | EA | 1 | Injector Pipe | φ22×L470 |

## 2. INSTALLATION

### TYPE KCI-201

- By default, the powder equipment are shipped as assembled by factory.
- The complete status of assembly is shown in the illustration of figure KCI-201,206.
- The support for GUN is installed at the left or right sides of control box.
- Connects the control box's MAIN AIR(A-17) to MAIN AIR(REGULATOR, F7) output unit with air hose 8Φ.
- Connects the control box's DOSING AIR(A-19) to INJECTOR(E-6) with air hose 6Φ
- Connects the FLUIDIZING AIR(REGULATOR) output unit to HOPPER(G-1) with air hose 6Φ.
- Connects the control box's AUXILIARY AIR(A-20) to GUN(B-7) with air hose 5Φ
- Connects the POWDER HOSE to INJECTOR
- Connects the GUN CABLE(B-11) to CONTROL BOX(A-24) with air hose 5Φ.
- Connects ground connection cable from ground nut(A-25) to the booth and trolley.
- Connect main power cable to AC 230V.

Installation

Connecting the Venting Hose





Assembled(Front side)


Assembled(Rear side)

Assembled(Injector & Hopper)


Assembled(Air regulator)

Assembled(Gun & control unit)


Fully Assembled

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# 3. OPERATION

## PREPARATION FOR TEST OPERATION

A .Adjustment for voltage selection

- ▶ All the shipped equipments are fixed at 220V.

B. Connection of air supply

- ▶ Coupler : 1/4" pneumatic coupler is used.
- ▶ Compressed air must not contain any oil or moisture.
- ▶ It should be noticed that the oil and moisture contained in the compressed air. Must be filtered out.

※ The fluidified air must be locked in until all connections are complected.

C. Connection outlet hose

- ▶ Connect the hose by pressing it into the hopper's outlet–hose coupling hole.
- ▶ Place the opposite end of the hose within booth.

※ Caution : Atmospheric pressure should be present in the hopper during operation of the equipment.

D. Connect ground line.

- ▶ The ground line should be connected to booth or conveyor with a clip.

E. Safety regulations

① Operator should always take precaution to get grounded to the powder electrostatic machine's GUN handle by marking hold in his/her gloves. He/She should also make it a rule to put on a pair of grounded shoes.
② The floor of workplace should be conducted.
③ All conducting materials within 5 meters around powder booth are completely grounded.
④ Face the GUN to the direction of BOOTH and not to the human body.
⑤ In case of powder such as spraying paint, dust density of 10g/㎥ or more could cause explosion, and the internal booth should be maintained in good and clean condition.

## CHECKING FUNCTION OPERATION

A. Functions

1. Cuts off the powder supply from pressure–decrease valve.
2. Lowers the control box's high–voltage adjustment handle down to bottom–left position.
3. See what happens when the high–voltage adjustment handle is turned from left to right to slowly increase the voltage level.
4. Approach the ground up to the distance of 20cm holding GUN and see the high–voltage display drop.
5. Pull the GUN's trigger.
   - ▶ The high–voltage indicator begins to operate.
   - ▶ Check if the voltage level changes when the high–voltage adjustment handle is turned.
6. Open MAIN AIR and supply air.
7. Pull the GUN's trigger and open the CONVEYING AIR.
   - ▶ The pressure gauge's hand moves.
8. Pull the GUN's trigger close the CONVEYING AIR, and open the DOSING AIR.
   - ▶ The gauge's hand moves.

♣ If all factors suggested above is alright, everything is O.K

- ▶ Remove powder from the nozzle of gun by auxiliary air.
- ▶ Power supply and fluidizing air supply.

B. Loading

1. Open the lid.
2. Fill powder up to the hoper's handle level.
3. Close the lid and assemble hose.

♣ If everything checks alright, the equipment is ready.
Slightest abnormality requires preferring to the emergency–measure guide.

## TEST OPERATION

A. Painting

※ CAUTION : Check if all the conducting materials within 5 meters around powder booth are completely grounded.

1. Check if the powder is fluidified.
2. Turn on the powder switch.
3. Face the GUN to the direction of BOOTH.
4. Pull the trigger.
5. Adjust the high voltage to the required level – The level can Be monitored by a meter.
6. Wait until the first–sprayed powder comes out completely dried.
7. Proceed with spraying object to be powder coated..

B. Taking stop spraying measure

1. Release the GUN's trigger.
2. Turn off the power switch.
   As the powder is still fluid, you shouldn't adjust the amount of high voltage, cleaning air and powder output.
3. Be sure to turn off the power switch and cut off air valve during lunch time or after finishing work.

C. Cleaning the powder hose

※ CAUTION : In case of prolonged unuse of equipment, the powder remaining in hose should be eliminated as follows.

1. Take out injector's hose coupling part from the hopper.
2. Turn the GUN to the direction of BOOTH.
3. Attach the AIR GUN tightly to the hose entrance and blow into it.
4. Reassemble it.



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## FLUIDIZING POWDER

A. Fluidizing powder

The fluid state of powder is closely related to powder type, water content of compressed air and outer temperature.
The fluidizing proceeds independently of control functions.

1. Keep the hopper's lid open.
2. Slowly increase the fluidizing AIR–The powder begins th boil mildly. AIR in the hopper, and adjust to the minimum amount of AIR for uniform boiling.
3. Close the lid.

B. The amount of powder output and control

The amount powder output is determined by powder type, the length and diameter of hose, and the amount of CONVEYING AIR and DOSING AIR.

1. Check if the powder is normally fluidizied.
2. Turn on the power switch.
3. Pull the trigger with the GUN facing to the direction to BOOTH.
4. Open the CONVEYING AIR.
5. Adjust the DOSING AIR
   Turn slowly regulator of dosing air to clock wise form maximum counter clock wise pulling trigger until powder puffing is getting to normal injection.

C. Control

– Circular : The nozzle is replaceable and available in diameter of Φ19,24,32 finishing work.
– Flat : The nozzle is available in diameter finishing work.

## COLOR CHANGE

A. Changing powder color

1. Clean the outlet hose hopper completely.
2. Blow into the powder hose with compressed air.
3. Clean the GUN.
4. Put the powder to be used into hopper and finish all the preparation jobs.
5. Turn and spray the GUN toward BOOTH momentarily before the work begins.

B.How to manage

Routine maintenance of equipment prolongs product life and keeps its performance uniform.

1. Daily check
   - INJECTOR cleaning and INSERT SLEEVE worn-down
   - POWDER HOSE cleaning
   - GUN cleaning
2. Weekly check
   - Cleans the hopper, injector and GUN
   - Powder shouldn't be put in the hopper just before work.
   - Check the ground line between CONTROL BOX, BOOTH, and CONVEYOR.
   - After checking air dehydrator, any water in it should be removed, The air, but for checking the presence of moisture in it.

C. Checking for shutdown lasting 2-3 days

1. Turn off the Power switch.
2. Clean the CONTROL BOX.
3. Remove the imput air and put it away.
4. Check above B-1. Daily check.
5. Remove powder from HOPPER.



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## CLEANING

A.Hopper

1. Remove fluidizing AIR LINE.
2. Remove injector.
3. Take out suction pipe.
4. Wipe the electric line, AIR HOSE, and powder hose cleanly with cloth.
5. Wipe the suction pipe clean.
6. Empty the remaining powder from hopper.
7. Clean the hopper's inner wall, especially the bottom part, with vacuum cleaner.
8. Wipe the hopper's inner surface with clean cloth.
9. Replace the hopper to the original position.

※ CAUTION : The hopper must not be filled with powder until work begins..
Above all, the hopper's inner surface must not be cleaned with thinner or water.

B.Manual Powder Electrostatic GUN

Routine cleaning of GUN ensures trouble-free operation and normal function at all times.

✻ Daily cleaning

1. Remove the powder hose from GUN.
2. Remove nozzle from GUN and clean it.
3. Clean the GUN's powder outlet with AIR along the direction of its flow.
4. Clean the GUN's body with AIR.
5. Assemble it.

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C. Spray Nozzle

✻ Daily cleaning
- Clean the outer surface of nozzle with compressed air. (Don't use thinner or other liquid for cleaning)
- Clean the nozzle's inside with compressed air after removing it. The powder accumulated in the GUN must be removed.
- Check if the nozzle is worn down. (replace it after checking)
- Check if the compressed air's oil and moisture are completely removed.

D. Injector

1. Disconnecting powder Hose.
2. Remove Sleeve Holder.
3. Clean Sleeve and inside of Injector Body.

## 4. TROUBLE SHOOTING

| MALFUNCTION | CAUSE | MEASURE |
|---|---|---|
| High-voltage display does not operates even after powder is on and trigger is pulled. | • Electric faulty–The electric line coming into CONTROL BOX is not properly connected.<br>• Faulty fuse and bad equipment<br>• Faulty fuse and bad equipment on the part of external power source.<br>• Faulty lamp<br>• Faulty printed circuit board(PCB)<br>• Faulty line in GUN<br>• Faulty in high–voltage generation part<br>• Faulty trigger switch | • Connect the power<br>• Replace<br>• Replace<br>• Replace<br>• Replace<br>• Replace<br>• Replace<br>• Replace |
| The powder would not be fluidified. | • The Fluidizing air hose is not connected or compressed air is not input<br>• Faulty Fluidizing plate<br>• Faulty operation of pressure reduction valve | • Connect after checking<br>• Replace<br>• Replace |
| The gauge hands of CONVEYING AIR and DOSING AIR do not move during operation. | • Operation mistake: The power switch is not pressed<br>• The trigger is not pulled<br>• Faulty SOLENOID valve<br>• Faulty PCB | • Turn on the power switch<br>• Check while pulling the trigger during operation<br>• Replace |

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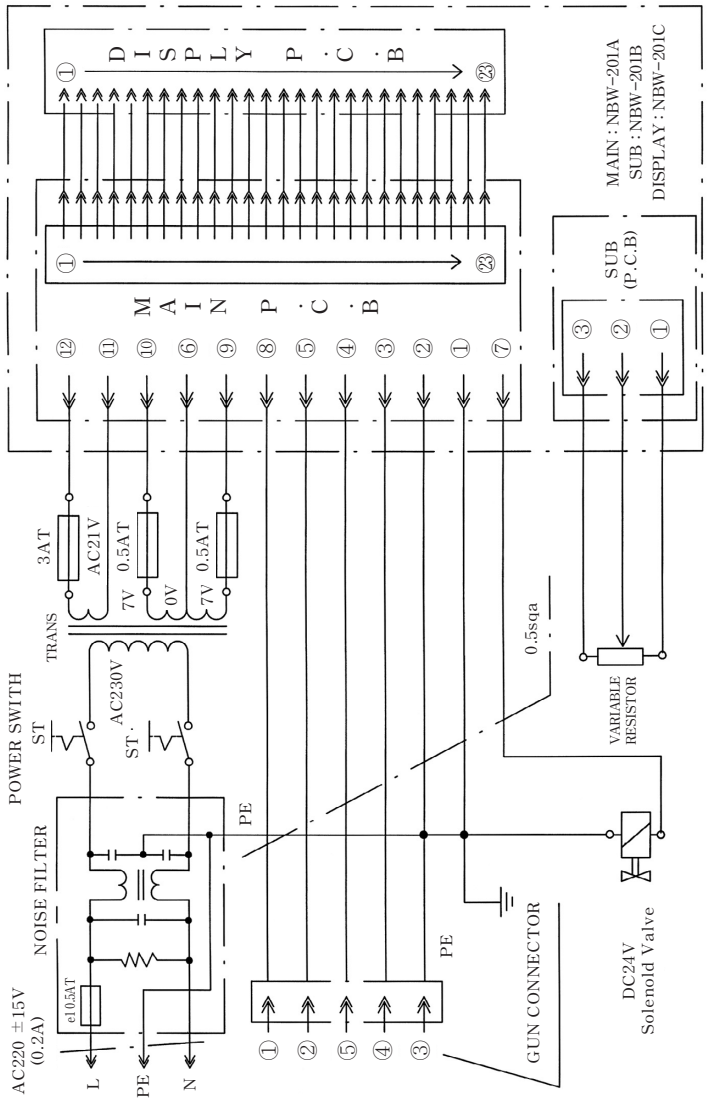
| MALFUNCTION | CAUSE | MEASURE |
|---|---|---|
| The powder would not be ejected even after power switch is on and trigger is pulled. | • Blockage generated in injector, check valve, sleeve in the injector, paint hose or GUN<br>• Worn-down sleeve<br>• Poor fluidifying operation<br>• CONVEYING AIR is not supplied.<br>• Faulty air-adjustment valve.<br>• Faulty solenoid valve.<br>• Faulty PCB.<br>• Oil and moisture contained in the compressed air. | • Disassemble and clean<br>• Replace<br>• Replace<br>• Check above issues<br>• Replace<br>• Replace<br>• Replace<br>• Install an air dehydrator |
| Powder is ejected from GUN but with its electrostatic intensity low. | • High-voltage assembly is low<br>• Faulty GUN connector, wire and wire connector<br>• Faulty PCB<br>• Faulty high-voltage cascade (H-V CASCADE)<br>• Faulty Rod holder | • Increase the voltage level<br>• Replace the faulty part<br>• Replace<br>• Replace |
| Powder ejection and electrostatic intensity is good, but its attach efficiency is poor. | • Faulty earth of powder object<br>• Too much paint on the conveyor hangar and powder object area<br>• The high voltage pin caved in | • Check the earth state<br>• Remove powder from hangar and powder-object area<br>• Replace the rod holder |



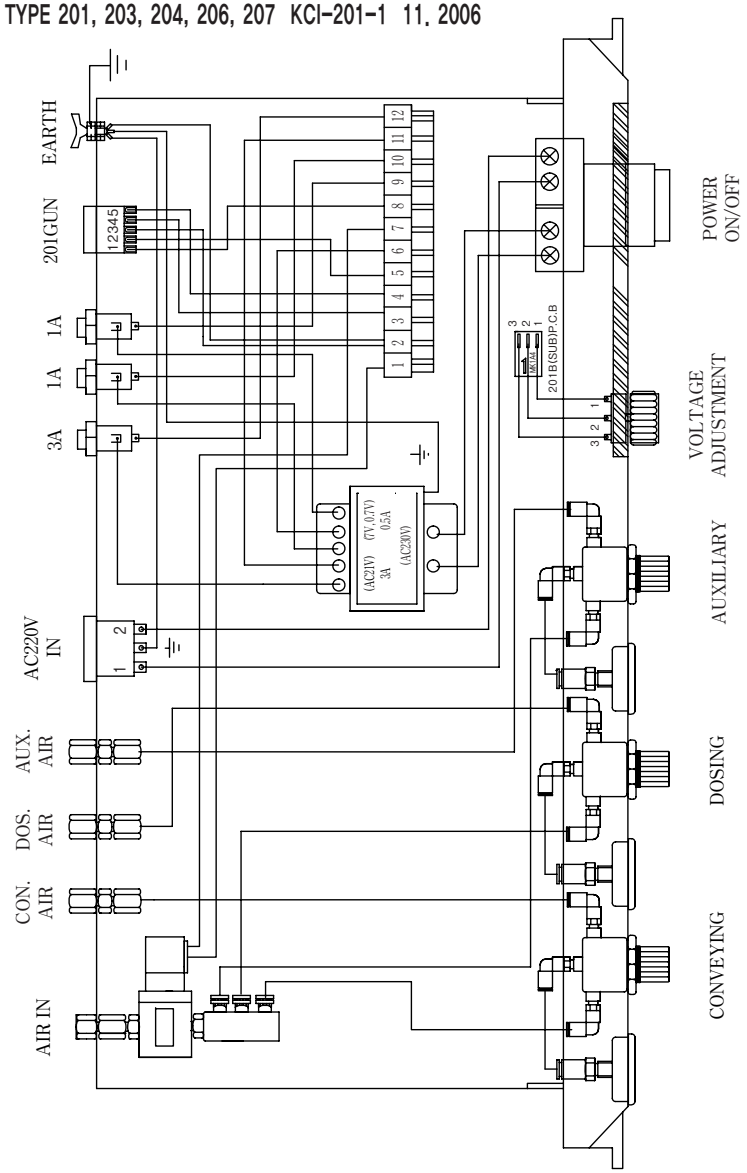
## 5. APPENDIX

(P.C.B)WIRING DIAGRAM
KCI TYPE 201, 203, 204, 206, 207 KCI-201-1 11. 2006



## WIRING DIAGRAM

KCI TYPE 201, 203, 204, 206, 207 KCI-201-1 11. 2006

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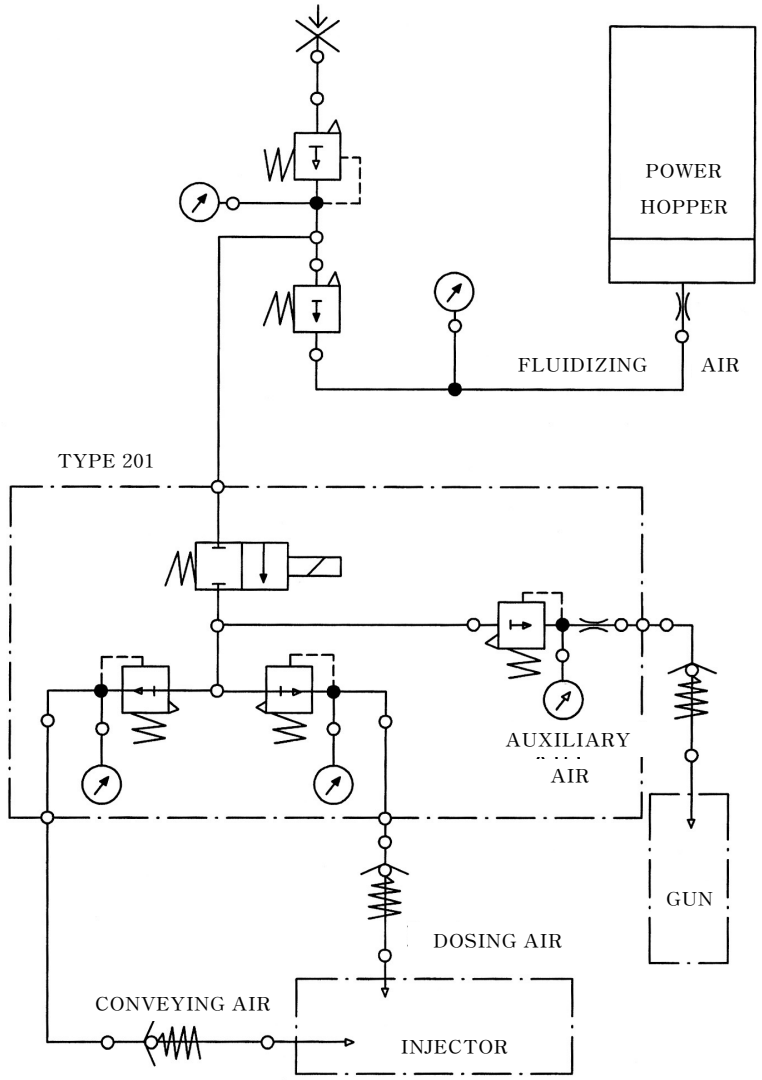
## PNEUMATIC DIAFRAM

KCI TYPE 201, 203, 204, 206, 207 KCI-201-1 11. 2006



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KCI

# GUARANTY

◆ We here by certificate quality of our products and guarantee quality and after sales service.

◆ Our products were manufactured with first class workmanship and designed to be convenience for customer.

◆ We guarantee free service for 15 months after products are alienated to customer. In case, defect of products is being caused by us. But, incase, responsibility of breakdown are caused by user, service charge could be claimed.

◆ Products : KCI-201, KCI-203, KCI-204, KCI-206, KCI-207, KCI-C-500, KCI-P-603, KCI-R-1500, and equipments of powder coating etc...

Signed by Youn Chung / president

Koryo Coating Machine, Industrial Co., Ltd.
President BY YOUN CHUNG

Koryo Coating Machine Industrial Co., Ltd.
Tel : 82-31-656-8610 Fax : 82-31-655-8694
Address : 258-1, Banje-Ri, Wonkok-Myun,
Ansung-Si, Kyeonggi-Do, Korea. (456-811)


Certificate of Approval

KORYO COATING MACHINE INDUSTRIAL CO., LTD.
258-1, Banje-ri, Wongok-myeon, Ansung-city, Gyonggi-do, Korea.

has been approved by International Technology Quality Assurance CO., Ltd. to the following quality management system standards :

KS A 9001 : 2001 / ISO 9001 : 2000

The scope of quality management system is applicable to :

Design, Development, Production and Servicing of Electric Powder Coating

Valid Date
From 08th.FEB.2002 TO 07th.FEB.2005
Current Certificate : 07th.FEB.2002

president

International Technology Quality Assurance

Acquired ISO/KS A 9001 Certification


Attestation
No. D1 99 11 37249 002
TÜV PRODUCT SERVICE

CE

TÜV PRODUCT SERVICE GMBH

CE(TÜV/P.S)


Certificate of Registration

This is to certify that the Environmental Management System of
KORYO COATING MACHINE INDUSTRIAL CO., LTD.
258-1, Banje-ri, Wongok-myeon, Ansung-si, Gyonggi-do, Korea
has been found to conform to the Environmental Management System Standard :

KS A 14001:2004 / ISO 14001:2004

This certificate is valid for the following product or service ranges:
EMS for Design, Development, Manufacturing, Installation & Servicing of Powder Coating Machine & Powder Coating Systems

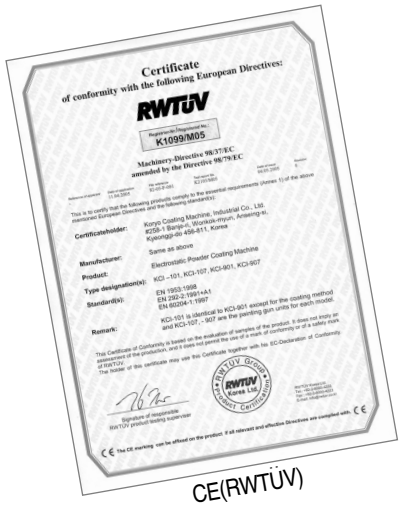
Certificate No. : ESC 0673
Valid until : 13-July-2009
Certificate Date : 14-July-2006

KOREA INT'L STANDARDS CERTIFICATION

Approved by : Cha-young Lee (CEO) of KSC

Environmental Management System

Acquired ISO/KS A 14001 Certification


Certificate
of conformity with the following European Directives:

RWTÜV
K1099/M05

Machinery-Directive 98/37/EC
amended by the Directive 98/79/EC

Certificateholder: Koryo Coating Machine, Industrial Co., Ltd. 258-1 Banje-ri, Wonkok-myun, Ansaung-si, Kyeonggi-do 456-811, Korea

Manufacturer: Same as above

Product: Electrostatic Powder Coating Machine

Type designation(s): KCI -101, KCI-107, KCI-901, KCI-907

Standard(s): EN 1953:1998
EN 292-2:1991+A1
EN 60204-1:1997

Remark: KCI-101 is identical to KCI-901 except for the coating method) and KCI-107 , 907 are the painting gun units for each model.

This Certificate of Conformity is based on the evaluation of samples of the product. It does not imply an assessment of the production and it does not permit the use of a mark of conformity or of a safety mark of RWTÜV.
The holder of this certificate may use this Certificate together with his EC-Declaration of Conformity

RWTÜV Korea Ltd.

CE The CE marking can be affixed on the product. If all relevant and effective Directives are complied with.

CE(RWTÜV)

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KCI

# GUARANTEE CARD

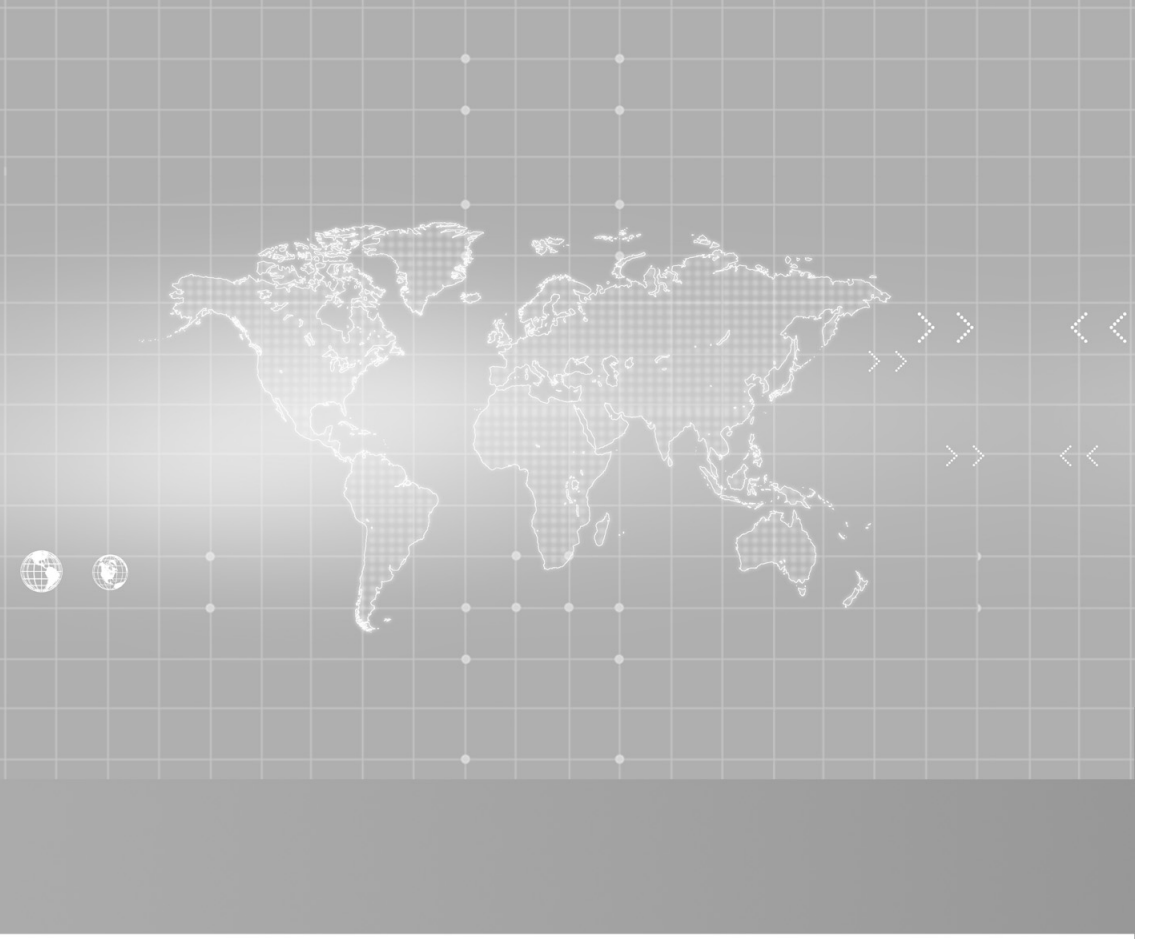
| | |
|---|---|
| PRODUCT NAME | ELECTROSTATIC POWDER COATING SPRAYER |
| MODEL | KCI-201, 203, 204, 206, 207 |
| Serial No. | |
| PURCHASE DATE | |

| | |
|---|---|
| AGENT | |
| TEL | - - |

## BUYER CARD

| | |
|---|---|
| NAME | |
| TEL | - - |
| ADDRESS | |

**Koryo Coating Machine Industrial Co.,Ltd.**



CE(RWTUV) ISO/KS A 9001 KAB-QC-26 ISO/KS A 14001 KAB-EC-14

- Acquired CE Mark
- Acquired ISO 9001 Certification
- Acquired ISO 14001 Certification
- Patent right for HV-power switching system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