Operating Instructions and Spare parts list

EasySelect-Cup Manual Powder Gun





EasySelect-Cup

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SAFETY RULES

SAFETY RULES FOR ELECTROSTATIC POWDER COATING OPERATIONS

- This equipment is dangerous when not operated according to the following standards: EN 50 050 (or VDE 0745, Part 100), EN 50 053, Part 2 (or VDE 0745, Part 102), and specification sheet, ZH 1/443 Electrostatic Powder Coating.
- 2. All electrostatically conductive parts located within 5 m of the coating area and especially the workpieces *must* be properly grounded.
- 3. The floor in the coating area *must* be electrostatically conductive. Normal concrete is generally conductive
- 4. The operating personnel *must* wear electrostatically conductive footwear (e.g. leather soles).
- 5. The operating personnel should hold the gun in the bare hand. If gloves are worn, they *must* be electrostatically conductive.
- 6. Connect the grounding cable (yellow/green) supplied to the grounding terminal on the control module. The grounding cable *must* have a good metal to metal connection with the coating booth, recovery unit, and the workpiece conveyor system, especially with the workpiece suspension.
- 7. The electrical and the powder feed lines to the guns must be laid out so that they are protected from possible mechanical damage.
- 8. The powder coating equipment should only be switched on after the booth is in operation. If the booth breaks down then the powder coating equipment *must* also switch off.
- 9. Check the grounding of all electrostatic conductive parts at least once a week.
- 10. When cleaning the gun or changing nozzles the control module *must* be switched off

EasySelect-Cup

EASYSELECT-CUP MANUAL POWDER GUN

The very light EasySelect-Cup Manual Powder gun with an integrated High-voltage cascade has very good penetration and because of the patented, vented electrode a high, and constant transfer efficiency. The gun can be easily dismantled, making it maintenance and repairfriendly. It is particularly suitable for manually coating of small series especially for trails with coating powders

SCOPE OF DELIVERY:

- EasySelect-Cup Manual Powder gun with a 6 m gun cable
- Type D100 Cup
- Pneumatic connection (Conveying air) 6 m
- Rinsing air hose 6 m
- 40 mm Nozzle holder
- ø 16, ø 24, and ø 32 mm vented deflector plates
- Deflector plate holder with electrode, and nozzle
- Flat jet nozzle with electrode, and holder
- Cable binding with Velcro straps
- Gun cleaning brush
- Spare parts set

Available options:

- Gun cable 12 m
- Type D 125 Cup
- Fluidized Cup
- Pneumatic connection (Conveying air) 12 m

TECHNICAL DATA FOR EASYSELECT-CUP MANUAL POWDER GUN

Nominal input voltage:	0–12 V DC (depending on mode and opera-
tion)	
Nominal output voltage:	80 kV
Polarity:	Negative (Option - Positive)
Max. Output current:	150 μΑ
High-voltage display:	2 Light emitting diodes - LEDs (for displaying 3 modes, and gun triggering

Flash protection: Approval:

Connection: The EasySelect-Cup must only be connected to the EasyTronic Control unit.

EASYSELECT-CUP MANUAL POWDER GUN



- 1 Spray Nozzle system
- 2 Threaded sleeve
- 3 Shaft
- 4 H-V cascade
- 5 End plate with hook
- 6 LEDs
- 7 Remote control keys
- 9 Grip
- 11 Powder gun cable connection
- 15 Conveying air hose connection
- 16 Rinsing air hose connection
- 17 Trigger
- 21 Setting knob
- 24 Venting plug (connection for fluidized cup) 27 Injector
- 28 Cup

The EasySelect-Cup Manual gun can be fitted with following Spray nozzles:

40 mm Nozzle



Round jet nozzle with vented deflector plate and vented central electrode

150 mm Nozzle (does not belong to the standard set, available separately – see Spare parts list)



300 mm Nozzle

(not shown - does not belong to the standard set, available separately – see Spare parts list)

1. HIGH-VOLTAGE GENERATION

The control unit supplies DC voltage to the gun. This is fed through the powder gun cable (**11**) to the high-voltage generation section (**4**). The integrated electronics (**c**) in the gun generates an alternating current from the direct current. This alternating current is stepped up in the multiplier (**d**) to the rectified high-voltage required for the application. The High-voltage is now fed to the electrode (**e**) in the spray nozzle (compare Figs 5 and 6).

The coating mode chosen - Flat parts, Complicated parts, Over-spraying - is indicated through a red, and a green LED (Light emitting diode).

2. SWITCHING

In addition to the low voltage a switching current is fed into the gun through the gun cable.

If the gun trigger (**17**) is pulled, a reed switch closes the current circuit. The control unit switches the modulated low voltage, powder conveying, and the rinsing air on.

The reed switch complies with the safety regulations of all recognized standards.





3. POWDER FLOW AND RINSING AIR



Figure 4

The rinsing air is connected to the corresponding connection on the rear of the control unit when using vented spray nozzles (see Control unit Operating Instructions).

The function of the spray nozzles are described in the corresponding section (see page 6).

4. FLAT JET NOZZLE WITH VENTED CENTRAL ELECTRODE



Figure 5

The vented Flat jet nozzle serves to spray, and charge the powder. The powder cloud acquires an oval spray profile from the slotted opening. The powder is charged by means of a central electrode. The High-voltage, generated in the powder gun is fed through the black contact ring of the nozzle holder to the central electrode.

To avoid powder sintering on the electrode, it is rinsed with compressed air during spraying. The rinsing air is fed through the small hole in the black contact of the nozzle holder in the electrode holder.

The adjustment of the rinsing air on the control unit is explained in the "Operating Instructions of the Control unit").

5. ROUND JET NOZZLE WITH VENTED DEFLECTOR PLATE AND VENTED CENTRAL ELECTRODE



Figure 6

In order to give the powder stream leaving the powder gun the shape of a powder cloud, a deflector plate is used. The powder is charged by means of a shaft electrode. High-voltage is generated in the powder gun, and is fed through the black contact ring of the nozzle holder to the central electrode.

Because powder sinters on the back of the deflector plate it must be rinsed with air. Rinsing air is fed through the small hole in the black contact ring of the nozzle holder in the electrode holder and so deflected that it flows over the back surface of the deflector plate. The strength of the rinsing air is dependent on the powder, and its sintering properties.

Regulation of the rinsing air on the control unit is explained in the "Operating Instructions of the Control unit").

PREPARATION FOR START UP

A) CONNECTING THE EASYSELECT-CUP POWDER GUN

- 1. Connect the gun cable (2) to the control unit (see Control unit Operating Instructions)
- 2. Connect the conveying air hose (5) from the control unit to the gun
- 3. Connect the rinsing air hose (1) from the control unit to the powder gun
- 4. Screw the nuts and cap plug supplied (**3** and **4**) onto respective Supplementary air or Fluidizing air connections



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B) FUNCTION CHECK

If a fault is present, see "Troubleshooting Guide", page 19. (also consult the Control unit Operating Instructions)

- 1. Switch on the control unit
- 2. Press the desired application key on the control unit. (See also the Control unit Operating Instructions).
- 3. Pick the gun up and point it at a *grounded* object, at a distance of approx. 20 cm.
- 4. Press the gun trigger
- The LED No. 8 for the High-voltage display illuminates on the control unit. High-voltage is present in the EasySelect-Cup Manual Powder gun.
- The High-voltage can be set with the corresponding keys (See also the Control unit Operating Instructions).
- 5. Press the gun trigger and select the powder output and total air volume.
- The display indicates the powder output and total air volume.
- 6. Press the corresponding key for the rinsing air on the control unit (according to the nozzle used).

When all the checks are positive, the gun is ready for operation. When a malfunction occurs the cause of fault can determined with the aid of the "Troubleshooting Guide" page 19.

START UP

A) SETTING THE POWDER OUTPUT AND POWDER CLOUD

The powder output is dependent on the powder, and the total air volume.

	1.	Switch on the control unit
SETTING THE TOTAL	2.	Set the Total air volume to maximum 4 m ³ /h
AIR VOLUME		Selection is done with the aid the keys + and - on the control unit
	3.	Select the powder output volume to 100 %
		Selection is done with the aid the keys + and – on the control unit. The total air volume is held constant automatically.
	4.	Check the fluidizing of the powder (on the fluidized Cup)
	5.	Point the gun into the booth and press the gun trigger
SELECT THE POWDER OUTPUT VOLUME	6.	Turn the powder setting knob (21) on the gun clockwise to the end stop = Maximum powder output.
		To decrease the powder output turn the knob counter-clockwise.
	7.	Select the correct electrode rinsing
		When using Flat jet nozzles
	-	Press the key with the corresponding symbol $$
		the corresponding key illuminates.
		When using Round jet nozzles with vented deflector plate
SELECT ELECTRODE	-	Press the key with the corresponding symbol 🔊. The LED of
RINSING		the corresponding key illuminates.
	8.	Adjust the powder cloud on a test piece
		When using Flat jet nozzles
	-	Loosen the threaded sleeve by turning it approx. 45°, so that the Flat jet nozzle (or extension) can barely be turned
	-	Turn the Flat jet nozzle in the desired axial direction
	-	Retighten the threaded sleeve
		When using Round jet nozzles with vented deflector plate
	-	Change the deflector plate (${\it \emptyset}$ 16, 24, and 32 mm) are supplied with the powder gun.
		Caution: Never turn the deflectors, they are pushed on an O-
		ring titting!

B) START UP - POWDER COATING

Make sure that all electrically conductive parts within a 5 m radius around powder coating stand are grounded!

- 1. Switch on the control unit.
- 2. Pick up the gun and hold it in the powder coating booth, however, do not point it at the object to be coated.
- 3. Choose the application setting

Press the corresponding application key a a on the control unit. The LED of the corresponding key illuminates.

- 4. Press the gun trigger
- 5. Set the High-voltage:
 - High-voltage control on the LED 8 on the control unit
- 6. Wait until the first powder surge has left the gun.
- 7. The workpieces can now be coated.

C) REMOTE CONTROL THROUGH THE GUN

The desired application setting can be selected with the aid of the remote control key on the back of the gun:

 Press the remote control key Check by observing the LED display on the injector block: RED = Flat parts GREEN = Complicated parts RED/GREEN (alternating) = Spraying over

D) SHUTDOWN

- 1. Release the gun trigger.
- 2. Switch off the control unit The settings for High-voltage, rinsing air and powder output remain in the memory.
- 3. For work interruptions such as lunch breaks, overnight, etc., disconnect the compressed air supply.

E) RINSING THE POWDER HOSE

Before long idle periods residual powder must be removed from the powder hose as follows:

- 1. Remove the powder hose from the hose connection on the injector (see "EasyFlow Injector" Operating Instructions)
- 2. Point the manual gun in to the booth

(cont.)

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- Blow the powder hose through with compressed air The powder hoses can be cleaned well when a foam rubber cube, from the packing material, is blown through with compressed air. Our specially designed compressed air gun (Order No. 346 055) should be used for this purpose. Foam cubes can be ordered in sheets of 100 pieces (Order No. 241 717).
- 4. Reconnect the powder hose to the hose connection on the injector.

MAINTENANCE SCHEDULE

Regular, and conscientious maintenance will increase the operating life of the unit and ensure a constant coating quality longer!

A) DAILY MAINTENANCE:

1a Clean the gun, see below

B) WEEKLY MAINTENANCE:

- 1b Clean the powder cup, injector, and gun, and if present the powder hopper. (Only fill the powder hopper shortly before starting the coating operation).
- 2b Check the grounding connections of the control unit with the powder coating booth, the workpiece hangers or the chain conveyor .

CLEANING AND REPAIRS

A) CLEANING

Frequent cleaning the powder gun serves to ensure the quality of the coating.

Switch off the control unit, and disconnect the gun plug (3 - Fig. 7) before cleaning the powder gun.

The compressed air used for cleaning must be free from oil and water.

Daily:

- 1. Empty the powder from the cup (28)
- 2 Unscrew the cup and clean
- 3 Blow off the outside of the gun and wipe clean etc.

Weekly:

- 4. Remove the powder hose from the connection.
- 5. Remove the spray nozzle from the powder gun and clean.
- 6. Blow the gun through with compressed air, from the connection in the direction of flow.
- 7. Clean the gun tube (19, Fig. 13) with the brush supplied.
- 8. Blow the gun through with compressed air again.
- 9. Reassemble the gun and connect.
- 10. Blow the powder hose through and clean.

B) DISMANTLING THE GUN:

The gun should only be dismantled when this is made necessary by a defect or contamination.

The gun should be dismantle only so much to make the desired parts accessible.

The control unit must be switched off and the gun plug disconnected before cleaning the powder gun.

The High-voltage cascade (4) must not be dismantled, as it is assembled with a special process. Should it be defect or the shaft is broken, then the complete shaft (3) must be sent to an authorized ITW Gema Service Centre.



Figure 8

- 1. Unscrew the powder cup (**28**) and place in a safe place
- 2. Loosen the fixing screws (**A**) and remove the injector block (**27**)

























3. Place the powder tube extractor (supplied) into the powder tube, tighten the milled screw, and pull out the powder tube.





C) ASSEMBLING THE POWDER GUN

- The assembly of the gun is carried out in the reverse order to that illustrated above.
- It is to be noted, thereby, that the powder tube is to be pressed in up to the stop.

D) REPAIRS ON THE POWDER GUN

Except for the replacement of possibly defect parts, there are hardly any repairs to be made. Replacement of the cascade, and the repair of the powder gun cable connection (**11** - Fig. 8) is **only** permitted by an *authorized* ITW Gema Repair Centre. Contact your ITW Gema representative.

E) CLEANING THE SPRAY NOZZLE

Daily or after every shift:

	 Clean the spay nozzle externally with compressed air. Solvents or other liquids can also be used for cleaning the spray nozzle.
	Only use a cloth <i>dipped</i> in solvent for cleaning, <i>never</i> im- merse the parts in solvents!
	 Check the seating of the spray nozzle: Make sure that the threaded sleeve is always well tightened. If the spray nozzle is only loosely fitted, the danger exists that the High-voltage from the powder gun can flash over, which will inevitably lead to damage to the powder gun.
Weekly:	
	 Remove the spray nozzle and clean inside with compressed air: If sintering has occur, then this must be removed.
Monthly:	
	 Check the spray nozzle for wear:
	Flat jet nozzles must be replaced when :
	 the spray pattern is no longer a regular oval shape.
	 there are deep grooves in the nozzle slot, or the wall thickness is no longer recognizable.
	 the wedge of the electrode holder worn away.
	Nozzles with a deflector plate:
	 when the wedge of the electrode holder is worn away, the electrode holder is to be replaced.

TROUBLESHOOTING GUIDE

The Diagnostic LEDs 1 - 7 on the control unit illuminate green when switching on, and LED 8 remains dark. It illuminates red, only when the powder gun trigger is pulled.

Fault	Causes	Remedies
LED 5 illuminates red	– The gun is not connected	Connect the gun
	 Gun plug, gun cable or gun cable connection defect 	Replace corresponding part or send in for repair
	 Remote control on the gun defect 	Replace remote control (gun cover)
LED 6 illuminates red	Solenoid valve for rinsing air of the Flat jet nozzle defect	Replace solenoid valve spool
LED 7 illuminates red	Solenoid valve for rinsing air of the Round jet nozzle defect	Replace solenoid valve spool
LED 8 remains dark, in spite of the gun trigger being pulled and the LED 5 illuminates green.	Gun plug, gun cable or gun cable connection defect	Replace corresponding part or send in for repair
The gun LED remains dark, in spite of the gun trigger being pulled and the LED 8 illuminates red.	 Gun plug, gun cable or gun cable connection defect 	Replace corresponding part or send in for repair
	 Remote control on the gun defect 	Replace remote control (gun cover)
Powder does not adhere to the workpiece, in spite of the gun trigger being pulled and and the gun sprays powder, the gun LED and the LED 9	 High-voltage and current deac- tivated 	Press the selection button (application button)
	 High-voltage cascade defect 	Send the gun in for repair
illuminate.	 the workpieces are poorly grounded 	Check the grounding, see also "Directions of Use"
		(cont.)

TROUBLESHOOTING GUIDE (CONT.)

Fault	Causes	Remedies
The gun does not spray powder, in spite of the control unit being switched	No compressed air present	Connect the equipment to the compressed air
on, and the trigger is pressed.	 Conveying vacuum to low 	Increase the powder output and/or the total air volume on the control unit
	 Injector, nozzle on the injector or gun clogged 	Clean the corresponding part
	 Sleeve in the injector worn or not present 	Replace or insert
	- Sleeve in the injector clogged	Replace
	– Fluidizing does not function	Check the fluidizing
	No conveying air: – Reduction valve defect	Replace
	 Solenoid valve defect 	Replace
	 Electronic card defect 	Send in for possible repair

SPARE PARTS LIST

ORDERING SPARE PARTS

When ordering spare parts for powder coating equipment, please indicate the following specifications:

- **1.** Type, and serial number of your powder coating equipment
- 2. Order number, quantity, and description of *each* spare part

Example:

- 1. Type EasySelect-Cup Serial no: xxxx xxxx
- **2.** Order no: 232 670, 5 pieces, O-ring ø 13.1 x 1.6 mm

When ordering cable or hose material the lengths required must also be given.

The spare part numbers of yard/metre ware always begins with 1..... and are always marked with an * in the spare parts list.

Wear parts are always marked with a #.

All dimensions of plastic powder hoses are quoted as external (o/d), and internal (i/d) diameters :

e.g. Ø 8 / 6 mm = 8 mm outside diameter (o/d) / 6 mm inside diameter (i/d).

EASYSELECT-CUP MANUAL GUN

REMARKS:

- 1. Only parts those which the customer can replace himself, without problems, are given in the Spare parts list.
- 2. Should a part of the shaft (3) be broken or the High-voltage cascade in the shaft is defect, then the complete shaft must be sent in for checking and repair. The High-voltage cascade is fitted in a special process and should, therefore, never be dismantled by the customer.
- 3. If the powder gun cable (**11**) is defect, then the complete cable is to be sent in for repair.





EASYSELECT-CUP MANUAL GUN

A	EasySelect-Cup Manual Powder gun - complete Negative polarity, incl.: Powder gun cable - 6 m, Rinsing air hose - 6 m, Pneumatic connectionn 6 m, Flat jet nozzle, Cup - Type D100, Brush, and parts set	381250
В	EasySelect-Cup Manual Powder gun, incl. Cascade Polarity – (negative) Polarity + (positive)	9 381179 381187
1	Nozzle - see over	
2	Threaded sleeve - see over	
5	End plate with hook	378283
6	End plate seal (for Item 5)	377848
9	Grounding plate	379301
10	Cylinder screw - M 3 x 6 mm	262021
11	Powder gun cable - complete - 6 m	378232
	Powder gun cable - complete - 12 m	378240
12	O-Ring (for Item 11)	261416
13	"PT" Special screw	261785
14	Sealing ring - ø 9.8 / 14 x 1.8 mm (for Item 15)	
15	Conveying air connection - NW 5.2 - 1/8"	237272 #
16	Rinsing air connection	378003
17	Trigger complete incl. Item 18	379093
18	Return spring (for Item 17)	261572
19	Powder tube	380466 #
20	Air tube	379255
21	Quick-release socket	377953
22	O-Ring (for Item 21)	261564
23	Cup - Type D100 - complete Cup - Type D125 - complete Fluidizing cup	357570 302651 358606
24	Cover - Type D100	357588
	Cover - Type D125	302678
25	Injector housing	379182
26	Rinsing air hose - 6 m - complete (incl. Items 27 and 28) Rinsing air hose - 12 m - complete	339954
	(incl. Items 27 and 28)	380261
27	Quick-release connection - ø 6 / 4 mm	200840
28	Rinsing air hose - ø 6 / 4 mm Brush for powder tube (for Item 19)	100854 * 333514
29	PT Screw	261947
30	Cup insert	379212
31	Seal	379263
32	O-ring - ø 7 x 2 mm - Nitril	261904
33	Air tube	379174
34	O-ring - ø 3.1 x 1.6 - Nitril	262617
 Please indicate 36 length required # Wear parts 	Push button	379204 (cont.)

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EASYSELECT-CUP MANUAL GUN (CONT.)

37	Pressure spring - ø 0.8 x 5 x 17.5 mm	261890
38	Push rod with return spring - Right	On request
	Push rod with return spring - Left	On request
39	Blind grommet - 1/8"	203297
40	Stop screw	357464
41	Setting knob - complete	358649
42	Inner sleeve with nozzle	On request
43	O-ring - ø 7.6 x 2.4 mm	204951
44	Setting knob	357391
	Pin for Item 44	357383
45	Injector sleeve with thread	357359
	Brush for pwder tube (Item 19)	
	Parts Set consisting of:	381195
	 Round jet nozzle - complete (incl. ø 16, 24, 32 mm Deflector plates 	
	- Cable binders with Velcro straps	303070
	- O Ring (Item 22 and 43)	
	- Cylinder screw (Item 10)	
	- Extractor	357553
	- Cap plug ø 6 mm	263044
	- Nut M10x1- ø 6 mm	263052
	- Cap plug ø 8 mm	263060
	- Nut M12x1- ø 8 mm	263079

* Please indicate length required

NOZZLE COMBINATIONS FOR EASYSELECT-CUP



	Nozzle set - Flat jet (Items 1, 2)	379 620
	Nozzle set - Round jet (Items 4, 5, 6, 7)	379 611
1	Electrode holder (Flat jet nozzle)	379 140 #
2	Flat jet nozzle	377 856 #
3	Threaded sleeve	379 166
4	Electrode holder, incl. Item 5	379 107 #
	(Round jet nozzle - double electrode)	
5	O-Ring - ø 5 x 1 mm	231 606 #
6	Round jet nozzle	378 518 #
7	Deflector plate - ø 16 mm	331 341 #
7.1	Deflector plate - ø 24 mm	331 333 #
7.2	Deflector plate - ø 32 mm	331 325 #
8	Extension - 150 mm	378 852 #
8.1	Extension - 300 mm	378 860 #

Wear parts

Documentation EasySelect-Cup

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