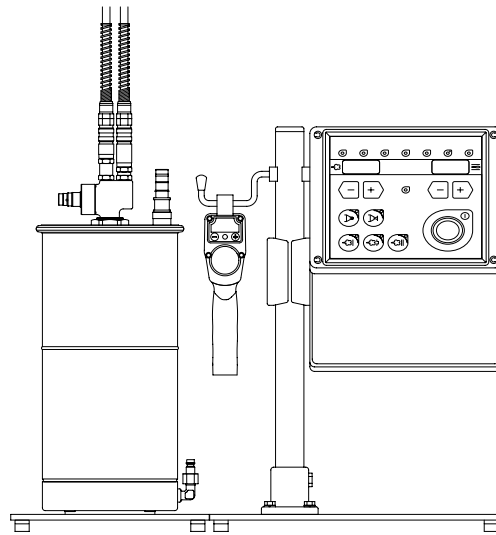Operating Instructions and Spare parts list

EASY 1-L
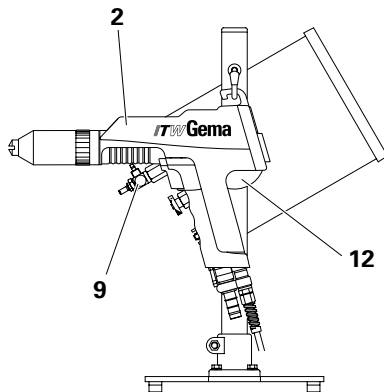# Powder Coating Equipment
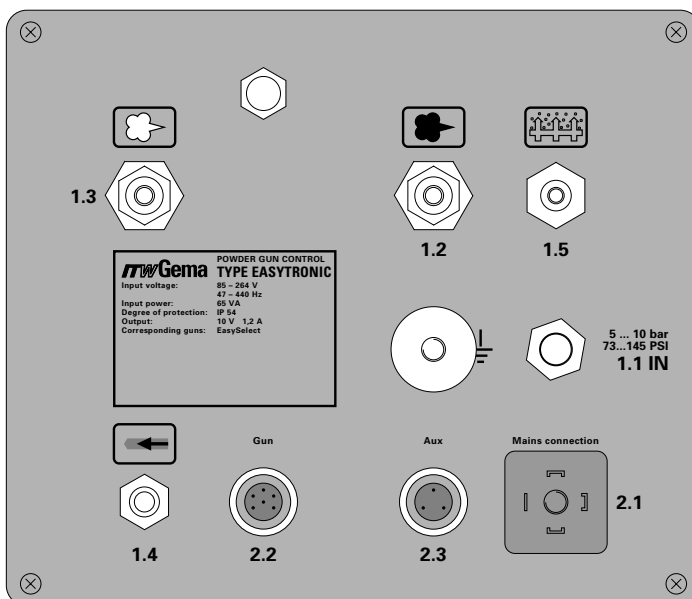

//TW Gema

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EASY 1-L ELECTROSTATIC POWER MANUAL EQUIPMENT
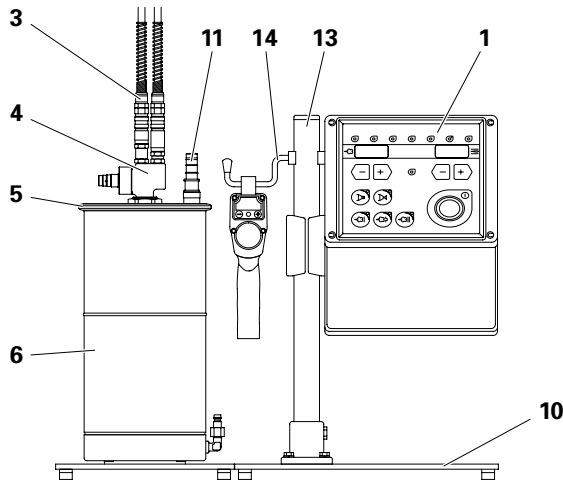
1 EasyTronic control unit

2 EasySelect Manual powder gun

3 Pneumatic hose with quick-release connection

4 OptiFlow Injector

5 Powder hopper cover

6 Powder hopper

9 Fluidizing air unit

10 Base plate

11 Venting connector

12 Clamping element

13 Tube

14 Gun/Hose holder

CONNECTIONS ON THE REAR OF THE EASYTRONIC CONTROL UNIT

POWDER GUN CONTROL
TYPE EASYTRONIC
Input voltage: 85 – 264 V
47 – 440 Hz
Input power: 65 VA
Degree of protection: IP 54
Output: 10 V 1,2 A
Corresponding guns: EasySelect

5 ... 10 bar
73...145 PSI
1.1 IN

1.1 IN Compressed air input

1.2 Conveying air connection

1.3 Supplementary air connection

1.4 Rinsing air connection

1.5 Fluidizing air connection

2.1 Power supply (85–264 V)

2.2 Gun connection for the EasySelect Manual gun. PG 1 Manual gun **cannot** be connected!

2.3 Output for Vibrator (EASY 1-B only) and Stirrer control (EASY 1-S only)

⏚ Grounding connection

Table of Contents

Directions for use

      Safety rules for electrostatic Powder coating

Technical Data of the EASY 1-L Powder Manual coating Equipment

DIRECTIONS FOR USE

ELECTROSTATIC MANUAL SPRAYING EQUIPMENT FOR COATING POWDER

consists of: - EasySelect Electrostatic Manual Spray Gun
                - EasyTronic Control unit
                - 4 l fluidized powder hopper

This equipment is matched and should only be operated in this configuration.

SAFETY RULES FOR ELECTROSTATIC POWDER COATING

1. This equipment can be 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 electrically conductive parts, within 5 m of the coating area, especially the workpieces, must be 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 (i.e. leather soles).

5. The operating personnel should hold the powder gun in the bare hand. If gloves are worn they must be electrostatically conductive.

6. Connect the grounding cable (green/yellow) supplied to the grounding screw of the electrostatic manual powder coating equipment. The grounding cable must have a good metal to metal connection with the powder coating booth, the powder recovery equipment and the chain conveyor or the hangers of the objects.

7. The electrical cables and powder hose to the guns must be laid out so that they are protected from possible mechanical damage.

8. The powder coating equipment must switch on only after the powder booth is in operation. If the booth breaks down, then the powder coating equipment must switch off.

9. The grounding of all conductive parts is to be checked at least once a week.

10. When cleaning the powder gun and when replacing nozzles the control unit must be switched off.

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TECHNICAL DATA OF THE EASY 1-L POWDER MANUAL COATING EQUIPMENT

Type   **EASY 1-L**

Electrical data

   Input voltage: 85 – 264 V

   Frequency: 47 – 440 Hz
   Connected load: 65 VA
   Rated output voltage (to powder gun):   max. 12 V_s
   Rated output current (to powder gun):   max. 1 A
   Type of protection: IP 54
   Temperature range: 0 °C to +40 °C (+32 °F to 104 °F)
   Approval:

Pneumatic data

   Main compressed air input: G   1/4" (Female)
   Max. Input pressure: 10 bar
   Min. Input pressure: 6 bar
   Max. Water vapour content of the compressed air: 1.3 g/m^3
   Max. Oil vapour content of the compressed air: 0.1 mg/kg
                                                             (Oil/Water)

   Max. Compressed air consumption
   Powder hose - ø 11 mm: 8 m^3/h

Dimensions

   Width: 520 mm
   Depth: 285 mm
   Height: 428 mm
   Weight: 17 kg
   Volume: 4 l (approx. 2 kg)

⚠ **IMPORTANT**   The Easy 1-L Manual coating equipment can only be used with the
EasySelect Manual Powder Gun!

ABOUT THESE OPERATING INSTRUCTIONS

These operating instructions contain all the important information which is required to operate the EASY powder coating equipment. It will guide you safely through the installation stage, and give you also notes and tips for the optimum use of your new powder coating system.
The information about the functioning of the individual system components - EasyTronic powder gun control, EasySelect Manual powder gun or OptiFlow powder injector will be found in the respective accompanying documentation.

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EASY 1-L ELECTROSTATIC POWDER MANUAL EQUIPMENT

1. FIELD OF APPLICATION

The EASY 1-L Electrostatic manual powder coating system with the EasySelect powder gun is especially suited for manual coating of workpieces in laboratories, test or demonstration coating, and for powder quality control tests.

2. SCOPE OF DELIVERY FOR EASY 1-L

An EasyTronic control unit (**1**) in a metal housing with a Mains connection cable.

A base plate (**10**) with a tube (**13**) and a holder (**14**) for guns and hoses.

A powder hopper (**6**) with cover and venting connector (**11**).

A pressure reducing valve for the fluidizing air (**9**), mounted on the control unit.

A plug-in OptiFlow injector (**4**)

An EasySelect Manual powder gun (**2**) with electric cable, powder hose, rinsing air hose and standard nozzle set (see EasySelect Manual powder gun operating instructions).

Pneumatic hoses (**3**) for conveying air (red), supplementary air (black), and pneumatic hose for fluidizing air (black)

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CONNECTION INSTRUCTIONS

The Manual Powder equipment is partially assembled in the factory. Only certain cables and hoses must be connected by the customer (see separate Assembly Instructions).

1. Connect the hose for the compressed air supply from compressed air circuit directly to the main air connection - **1.1 IN** on the rear of the control unit (female thread: 1/4" B.S.P.).

⚠ **NOTICE**   The compressed air must be free from oil and water.

2. Connect the black hose for the fluidizing air to the corresponding output (**1.5**) on the rear of the control unit and to the pressure reducing valve (**9**) on the back of the control unit.

3. Fit the grounding connection cable on the control unit $\perp$ with the grounding screw, and the 5 m long grounding cable with the clamping clip on the booth or on the hanger device.

4. Connect the gun cable with the 7 pole plug on the rear of the control unit on the socket - **2.2** (Gun).

⚠ **NOTICE**   The PG 1 Manual powder gun cannot be connected!

5. Connect the hose for rinsing air on the rinsing air output - **1.4** and on the powder gun.

6. Plug the injector in, and connect the powder hose on the injector and on the powder gun.

7. Connect the red hose for conveying air to the corresponding output - **1.2** on the rear of the control unit and to the injector.

8. Connect the black hose for supplementary air to the corresponding output - **1.3** on the rear of the control unit and to the injector.

9. Fit one end of the venting hose onto the venting connector (**11**) of the cover, and place the other end in the opening of the booth.
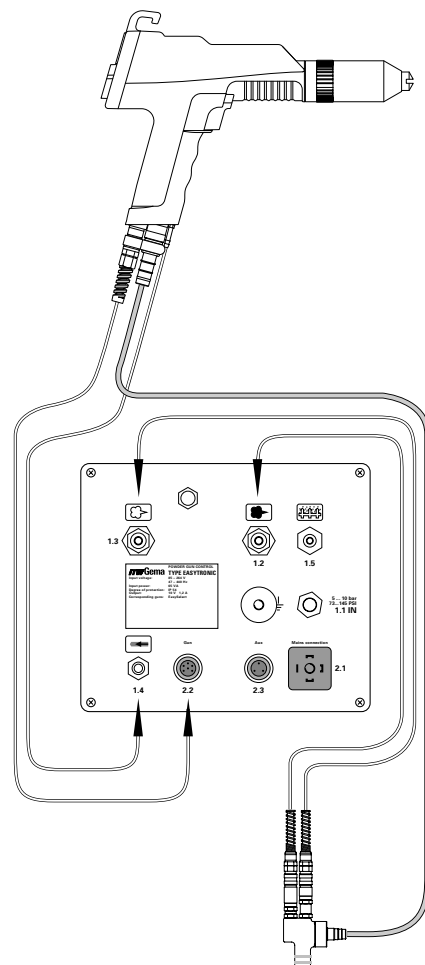
Figure 1

⚠ **NOTICE**   Atmospheric pressure must be present in the powder hopper during operation!

10. Connect the Mains cable to the socket - **2.1**.

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DESCRIPTION OF FUNCTION

The fluidized powder in the powder hopper is sucked into the injector by means of the conveying air (**1** - red hose). The powder/air mixture reaches the powder gun through the powder hose (**2**). The powder is electrostatically charged at the nozzle of the gun. In addition, an electrostatic field is created between the gun nozzle and the grounded object. The charged, and sprayed powder adheres to the surface of the object.

The powder is fluidized by air forced through a porous plastic plate from below. The powder acquires, thereby, fluid-like characteristics. The conveying air, supplementary air, and rinsing air are set on the control unit, and the fluidizing air is set on the fluidizing unit (**3**) on the rear side of the control unit. The functioning of the injector is described in the OptiFlow injector operating instructions.

Main compressed air connection
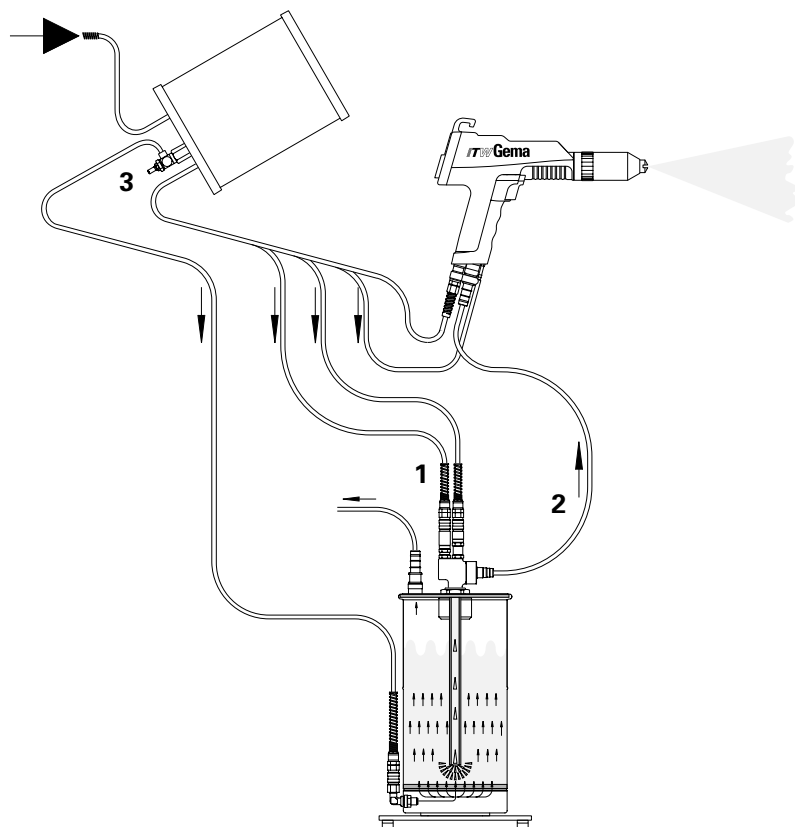
The arrows always show the direction of flow

Figure 2

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EASYTRONIC CONTROL UNIT

The operating panel of the EasyTronic control unit consists of 4 main areas: *Diagnosis LEDs, Displays, "+/–" Keys, and Function keys.*

1. The **Diagnosis LEDs** 1 – 8 serve to show the status of the equipment, and equipment faults. Detailed information is found in Chapter "Troubleshooting guide".

2. There are two **Displays** with whose help the following values are displayed:
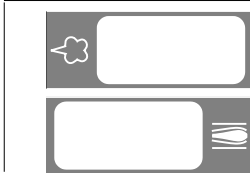
   • **Powder output** (Setting range 0 – 100 %) Powder output in % always refers to the max. possible output volume to the total air volume setting.

   • **Total air volume** (Setting range 1.6 – 6.0 Nm³/h)

3. The **Keys "+"** and **"–"** are for setting the powder output, and the total air volume used.

   If the Key is pressed once, the value is increased or decreases, respectively, by one step. If the Key is pressed continuously, the setting change rapidly.

4. The **Function keys** have the following functions:

   • **Electrode rinsing air for flat jet nozzles**
   • **Electrode rinsing air for round jet nozzles**

   When a Key is pressed once, the corresponding function is activated, and the corresponding LED illuminates.

   If a Key with an illuminated LED is pressed for longer than 1 second, the function is deactivated.

   ITW Gema recommends leaving the electrode rinsing air switched on, but can, however, remain switched off with application with very small amounts of powder.

   • **Application keys:** With these keys the electrostatic (High-voltage, and current) are automatically set so that the setting for the selected application is the optimum.

     – Settings for flat parts

     – Settings for complicated parts with depressions

     – Settings for coating parts already coated

   The High-voltage and current can be deactivated when the appropriate key is pressed for more than 1 second when the LED illuminates

The EasyTronic control unit is switched on and off with a **Push button**. If the equipment is switched on, the yellow lamp is illuminated.
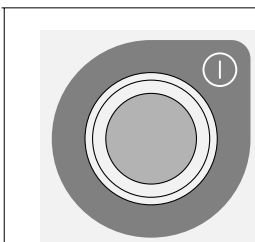
When the equipment is first switched on the preselected factory settings displayed:

<div align="center">

60%   **4.0 Nm³/h**
Flat jet rinsing   **Complicated parts**

</div>

After switching the equipment off (also when the equipment is disconnected from the Mains) the actual settings are retained.

Figure 3

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PREPARATION FOR START UP

A) FILLING THE POWDER HOPPER

1. Release the clamp ring holding the cover, and lift off (complete with the injector, and the venting hose) from the powder hopper.
   Take care that the suction tube is not damaged.
2. Fill the hopper max. 2 dm³ (2 liter) with powder. Do not overfill because the fluidized powder can escape from the cover.
3. Carefully replace the cover and refasten the clamp ring.

B) SWITCH THE BOOTH ON

Switch the powder coating booth on according to the operating instructions.

C) FUNCTION CHECK

1. Press the main switch on the control unit. The yellow control lamp in the switch illuminates.
   The equipment carries out the calibration automatically. An increase in sound can be heard inside the control unit. Both displays show 888. The equipment is ready for operation after not more than 20 seconds and switches to the factory settings.
2. Take the powder gun in the hand and point at a **grounded** object in the booth, distance approx. 20 cm.
3. Press the gun trigger.
   The LED No. 8 illuminates. The High-voltage is switched on and powder is conveyed.

If all tests are positive, the control unit, and the powder gun are ready for operation. If one of the functions is not operating as expected, check this in the "Troubleshooting Guide", on pages 11 and 12.

DAILY START UP

A) POWDER FLUIDIZING

The fluidizing of the powder is dependent on the type of powder, the humidity of the air and the ambient temperature. The fluidizing functions with the switching on of the control unit.
Proceed as follows:

1. Release the clamp holding the cover, and lift off (complete with the injector, and the venting hose) from the powder hopper.

   Take care that the suction tube is not damaged.

2. Slowly increase the fluidizing air on the fluidizing air unit (**9**)

   The powder should only "boil" lightly, but evenly. If necessary, stir the powder with a stick.

3. Replace the cover and refasten the clamp.

B) REGULATING THE POWDER OUTPUT, AND POWDER CLOUD

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

1. Switch on the control unit

SET TOTAL AIR VOLUME

2. Set the total air volume (For further information see the OptiFlow Operating Instructions)

   The total air volume is dependent on the powder hose length, the number of turns of the hose, the hose diameter, and the object to be coated.

   The value set for the total air volume can be left as it is, as long as the same powder hose is used. If the hose length and/or the hose diameter are changed, then the total air volume must be reset.

SELECT POWDER OUTPUT VOLUME

3. Select the powder output volume according to the desired coating thickness.

   The selection takes place with the aid of the Keys + and – either on the control unit or on the rear of the powder gun.
   To start, a standard setting of 60% is recommended. The total air volume is maintained constant automatically.

4. Check the fluidizing of the powder

5. Point the powder gun into the booth and press the powder gun trigger

SELECT ELECTRODE RINSING

6. Select the correct electrode rinsing

   When using flat jet nozzles:

   - Press the Key with the corresponding symbol ▷. The LED of the corresponding Key illuminates.

   When using round jet nozzles with air rinsed deflector plates:

   - Press the Key with the corresponding symbol ▷. The LED of the corresponding Key illuminates.

(continued)

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7. Adjust the powder cloud to a test object
   When using flat jet nozzles:

   - Unscrew the threaded sleeve approximately 45°, so that the flat jet nozzle (or extension) can be turned slightly
   - Turn the flat jet nozzle to the desired axial position
   - Tighten the threaded sleeve again
   *When using round jet nozzles with air rinsed deflector plates*
   - Exchange the deflector plate (ø 16, 24, and 32 mm supplied with the powder gun)

C) POWDER COATING

⚠ **CAUTION** Make sure that all electrically conductive parts within 5 m of the coating booth are grounded!

1. Take the powder gun in hand and point it into the coating booth, however, do not point it at the object to be coated yet
2. Select the application settings

   Press the corresponding application key ⬲ ⬲ ⬲ on the control unit. The LED of the corresponding Key illuminates.
3. Press the powder gun trigger
4. Coat the object(s)

D) REMOTE CONTROL THROUGH THE POWDER GUN

With the aid of the Keys + and – on the rear of the powder gun different functions can be remotely controlled:

1. Select the application settings
   *Press the Keys **+** and **–** on the powder gun **simultaneously***
   Check by observing the LED display on the powder gun:

   > *Red = Flat parts*
   > *Green = Complicated parts*
   > *Red/Green (alternating) = Spraying over*
2. Change the powder output
   *Press the Key **+** or **–** on the powder gun. The powder output is correspondingly increased or decreased.*

E) SWITCHING OFF

1. Release the powder gun trigger
2. Switch off the control unit
   The settings for High-voltage, rinsing air, and powder output are retained.

F) POWDER HOSE RINSING

After longer stillstand periods the powder hose should be cleaned of powder. Proceed as follows:

1. Remove the powder hose from the hose connection on the injector
2. Point the powder gun into the booth
3. Blow the hoses through manually with a compressed air gun
4. Replace the powder hose on the hose connection of the injector again.

COLOUR CHANGE

1. Empty the powder hopper and clean (see page 10)
2. Blow out the powder hose with compressed air

   *Powder hoses are easily cleaned by taking a cube of foam packing material and blowing it through the hose with compressed air. Use our specially designed compressed air gun (**Order No. 346 055**).*

   *The foam cubes can be ordered in sheets of 100 pieces (**Order No. 241 717**).*
3. Dismantle the powder gun and clean (see EasySelect Manual powder gun operating instructions).
4. Clean the injector (see OptiFlow Injector operating instructions).
5. Prepare the coating equipment for start-up with new powder (see "Filling the powder hopper" page 6).

MAINTENANCE SCHEDULE

Regular and conscientious maintenance increases the operating life of the unit and ensures a longer constant coating quality!

A) DAILY MAINTENANCE:

1a Clean the injector, see OptiFlow Injector operating instructions
2a Clean the powder gun, see EasySelect Manual powder gun operating instructions.
3a Clean the Manual powder gun powder hose, see Colour change, Point 2.

B) WEEKLY MAINTENANCE:

1b Clean the powder hopper, injector and powder gun.
   Only fill the powder hopper shortly before restarting operation
2b Check the grounding connection between the control unit and the coating booth, the object hanger device or the chain conveyor

C) WHEN THE POWDER COATING EQUIPMENT IS NOT USED FOR A NUMBER OF DAYS:

1c Remove the Mains plug
2c Clean the coating equipment, see Point 1b
3c Turn off the main compressed air supply

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CLEANING

CLEANING THE POWDER HOPPER

1. Disconnect the fluidizing air supply
2. Remove the injector
3. Remove the cover, blow out with compressed air and clean with a clean dry brush and cloth
4. Clean the suction tube, and injector
5. Empty the remaining powder into a container
6. Vacuum the hopper and, above all, the floor of the hopper
7. Clean the hopper with a cloth
8. Reassemble the powder hopper

⚠ **NOTICE**	Refill the powder hopper shortly before reusing! Never clean the powder hopper with solvents or water!

CLEANING THE EASYSELECT MANUAL POWDER GUN

Frequent cleaning of the powder gun ensures the quality of the coating.

⚠ **CAUTION**	Switched off the control unit before cleaning the powder gun. The compressed air used for cleaning must be free from oil and water.

Daily:

1. Blow off the exterior of the powder gun, and wiping clean etc.

Weekly:

2. Remove the powder hose from the connection.
3. Remove the nozzle from the powder gun and clean.
4. Remove the powder gun from the connection and blow through with compressed air in the direction of flow.
5. Clean the powder gun tube with the spiral brush supplied.
6. Blow the powder gun through with compressed air again.
7. Clean the powder hose.
8. Assemble the powder gun and reconnect.

TROUBLESHOOTING GUIDE

The diagnosis LEDs 1-7 illuminate green when switched on, and LED 8 remains unilluminated. It illuminates red when the gun trigger is pulled.
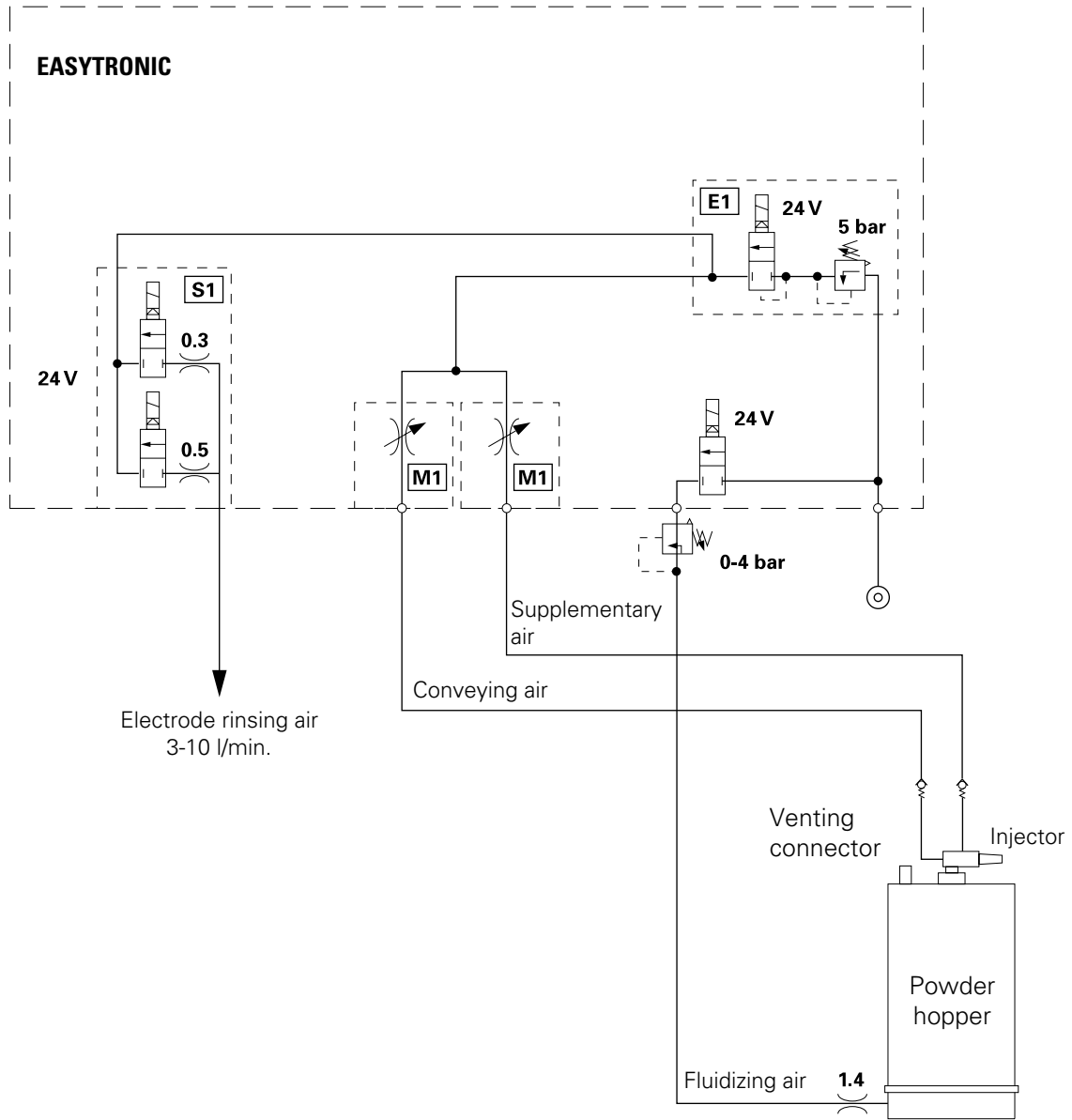
Fault	Cause	Remedies
LED 1-3 unilluminated	Mains supply unit defect	Replace Mains supply unit
LED 4 illuminates red	Main valve defect	Replace main valve
LED 5 illuminates red	- Gun not connected	Connect the gun
	- Gun plug, gun cable or gun cable connection defect	Replace corresponding part or send in for repair
	- Remote control on the gun defect	Exchange remote control (gun cover)
LED 6 illuminates red	Solenoid for rinsing air of the flat jet nozzle defect	Replace solenoid spool
LED 7 illuminates red	Solenoid for rinsing air of the round jet nozzle defect	Replace solenoid spool
LED 8 unilluminated, in spite of the trigger being pulled and the LED 5 illuminates green.	Gun plug, gun cable or gun connection defect	Replace corresponding part or send in for repair
The gun LED remains unilluminated, in spite of the trigger being pulled, and the LED 8 illuminates red.	- Gun plug, gun cable or gun connection defect	Replace corresponding part or send in for repair
	- Remote control on the gun defect	Exchange remote control (gun cover)
Powder does not adhere to the object, in spite of the trigger being pulled, and the gun sprays powder, the gun LED, and the LED 8 are illuminated.	- Deactivate the High-voltage and current.	Press the selection key (Application key)
	- High-voltage cascade defect.	Send the gun in for repair
	- The objects are poorly grounded.	Check grounding, see also "Safety rules"
The control lamp in the push button does not illuminate, in spite of the control unit being switched on.	No current: - Control unit is not connected to the Mains.	Connect the mains cable to the unit
	In the equipment: - Bulb burnt out.	Replace
	- Power pack defect	Replace

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Faults	Causes	Remedies
The powder does not fluidize.	No compressed air present	Connect the equipment to the compressed air supply
	- Reducing valve closed	Open
	- Reducing valve defect	Replace
The gun does not spraypowder in spite of the control unit being switched on and the trigger being pressed	No compressed air present	Connect the equipment to the compressed air supply
	- Injector, check valve or nozzle on the injector, powder hose or gun clogged	Clean corresponding part
	- Valve in the injector clogged	Replace
	- Valve not fitted	Fit valve
	- Fluidizing does not function	See above
	No conveying air:	
	- Reduction valve defect	Replace
	- Solenoid valve defect	Replace
	- Electronic board defect	Send in for possible repair

EASY 1-L   PNEUMATIC DIAGRAM

EASYTRONIC

E1   24 V

5 bar

S1

0.3

24 V

0.5

24 V

M1   M1

0-4 bar

Supplementary
air

Conveying air

Electrode rinsing air
3-10 l/min.

Venting
connector

Injector

Powder
hopper

Fluidizing air   1.4

S1 = Rinsing air unit
M1 = Motor throttle
E1 = Input unit

Figure 4

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EASYTRONIC

LED display

Keypad foil

Main board

Power pack

Power supply

A

B   Vibrator

C   Gun

Conveying air

Supplementary air

Solenoid valve Flat jet nozzle

Solenoid valve Round jet nozzle

Main solenoid valve
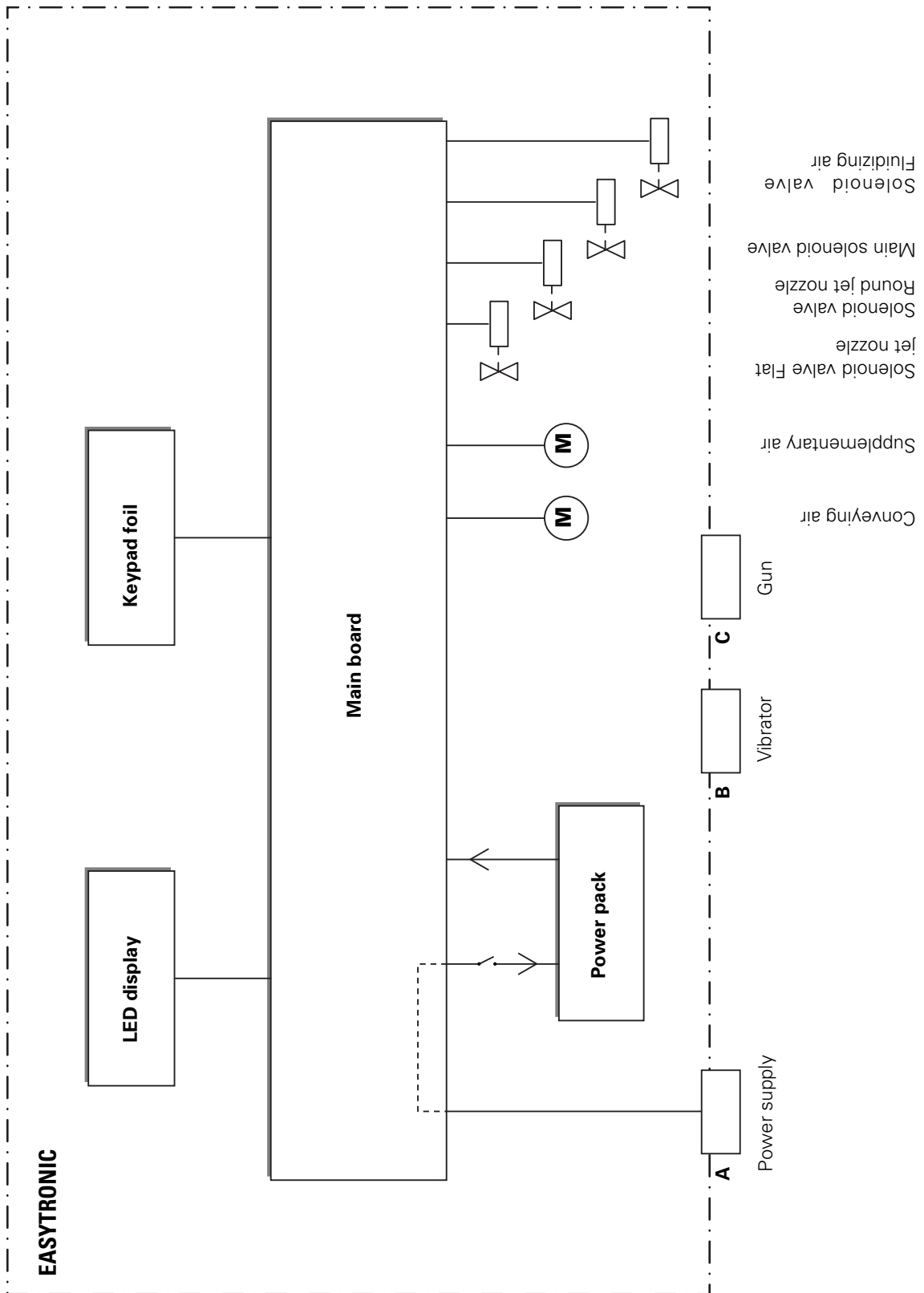
Solenoid valve Fluidizing air

Figure 5

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** *EASY 1-L,* **Serial No.:** *XXX XXX*

2.   **Order No.:** *201 073, 5 pieces, Fine wire fuse*

When ordering cable and hose material the length required must be given.
The spare part numbers of yard/meter 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 for plastic powder hoses are given as external diameter (o/d) and internal diameter (i/d):

e. g. ø 8 / 6 mm, 8 mm outside diameter / 6 mm inside diameter (i/d).

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EASY 1-L POWDER COATING EQUIPMENT

	Quick Reference Guide	262714
1	EasyTronic Powder gun control unit - complete	375900
2	EasySelect Manual powder gun - see separate Spare parts list	
3	Pneumatic connection (Conveying air) - red incl. Quick-release connector	382213
3.1	Pneumatic connection (Supplementary air) - black incl. Quick-release connector	382221
4	OptiFlow injector - see separate Spare parts list	
6	Powder hopper complete (w/o items 4 and 11)	379441
9	Fluidizing unit complete (incl. items 9.1 and 9.2)	382949
9.1	Throtle-Check valve R-65-6/4	224375
9.2	Adapter	382930
9.3	Pneumatic connection (Fluidizing air) - black incl. Cap nut and Quick-release connector	382230
10	Base plate	382205
11	Venting connector	377988
12	Clamping element - ø 30 mm - complete	376183
13	Tube complete	382302
14	Powder gun / Hose holder	382108
	Grounding cable complete	301140
	Double adapter ø 1/4" - 1/4" (for Main connection 1.1 IN)	262510

* Indicate length required
# Wear parts

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EASY 1-L POWDER COATING EQUIPMENT

Figure 6

EASY 1-L

17

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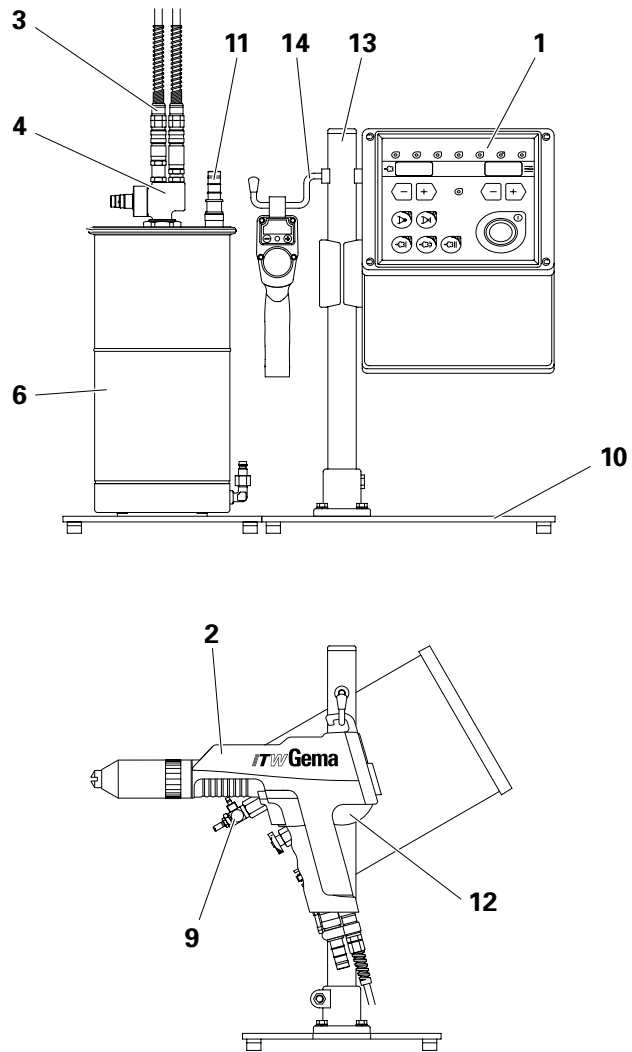
POWDER HOPPER

1	Hopper body only	379484
3	Spacer	382191
5	Hopper cover	379450
6	Suction tube holder	371890
7	Suction tube L=233 mm	371939
8	Quick-connection socket	379468
9	Throttle ø 0,7 mm	371904
15	Clamping ring - Type 160-05	258237
16	Lock nut PG21	234869
17	Lock nut PG09 black	262056
18	Rubber pad ø15x8-M4	234915
19	Elbow joint ø 6 - ø 6 mm	200875
20	Quick-release connection NW5.2 mm -1/8"	200859
21	Sealing ring ø 10.2 / 17.0 x 3.8 mm	230626
22	O-Ring ø 15 x 1,50 mm Nitril	261564
25	Counter-sink screw I-6kt M5x16 mm	262986
26	Pneumatic connection (Fluidizing air) - black	
	incl. Cap nut and Quick-release connector	382230
	Cap nut M10 - ø 6 mm	201308
	Quick-release connectorø 6 mm	200840
27	Venting connector	377988
	Venting hose 1004 - ø 16/11 mm	103128*

* Indicate length required

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POWDER HOPPER

EASY 1-L

Figure 7

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