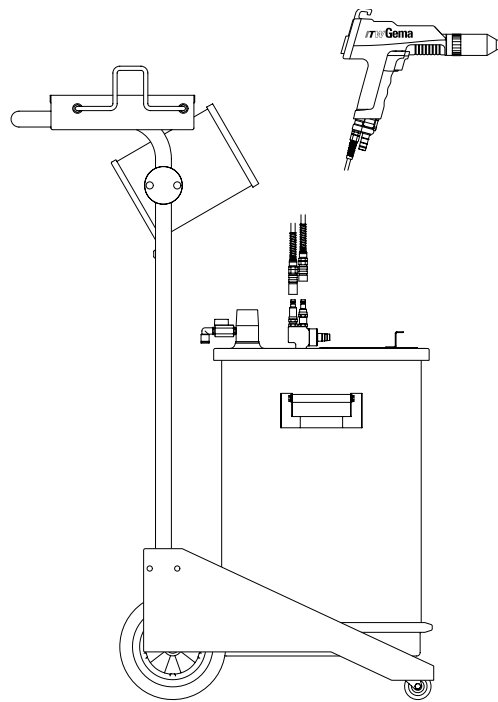
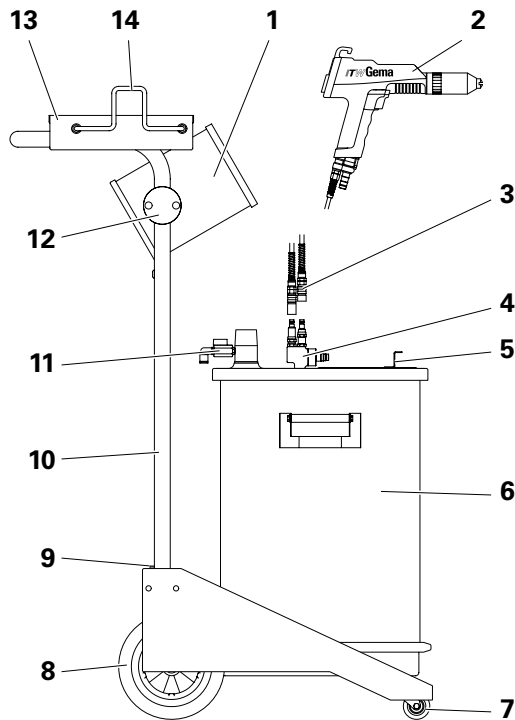


Operating Instructions and Spare parts list

# EASY 1-F Powder Coating Equipment

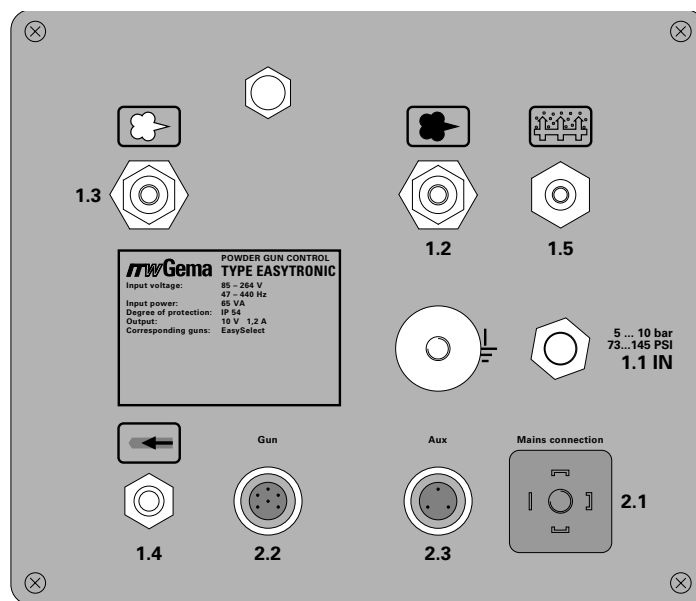


## EASY 1-F ELECTROSTATIC POWER MANUAL EQUIPMENT



- 1 EasyTronic control unit
- 2 EasySelect Manual powder gun
- 3 Pneumatic hose with quick-release connection
- 4 EasyFlow Injector
- 5 Powder hopper cover
- 6 Powder hopper
- 7 Swivel wheel
- 8 Pneumatic wheel
- 9 Fluidizing air unit
- 10 Mobile frame with hand rail
- 11 Venting tube (AIRMOVER) with Ball valve
- 12 Clamping element
- 13 Shelf
- 14 Gun/Hose holder

## CONNECTIONS ON THE REAR OF THE EASYTRONIC CONTROL UNIT



- 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

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## Safety regulations for electrostatic manual powder spraying equipment

### 1 Safety symbols (Pictograms)

This chapter sets out the fundamental safety regulations that must be followed by the user and third parties using the powder spraying equipment. These safety regulations must be read and understood before the powder spraying equipment is used.

The following warnings for ITW Gema operating instructions are shown here with their meanings. The general safety precautions must also be followed as well as the regulations in the operating instructions.



#### **Danger!**

Danger due to live electricity or moving parts. Possible consequences: Death or serious injury.



#### **Warning!**

Improper use of the equipment could damage the machine or cause it to malfunction. Possible consequences: minor injuries or damage to equipment.



#### **Information!**

useful tips and other information.

### 2 Conformity of use

1. The manual powder spraying equipment is built exclusively for the normal application of powder coating according to current recognized technological and safety regulations.
2. Any other use is considered as non-conform. The manufacturer is not responsible for damage resulting from improper use of this equipment; the end-user alone is responsible. If the manual powder spraying equipment is to be used for other purposes or other substances outside of our guidelines then ITW Gema AG should be consulted.
3. Observance of the operating, service and maintenance instructions specified by the manufacturer is also part of conformity of use. The hand held powder spraying equipment should only be used, maintained and started up by trained personnel who are informed about and are familiar with the possible hazards involved.
4. Unauthorized modifications to powder spraying equipment exempts the manufacturer from any liability from resulting damage.
5. The relevant accident prevention regulations, as well as other generally recognized safety regulations, occupational health and structural regulations are to be observed. (see appendix "Standards")
6. Furthermore the country-specific safety regulations must be observed.

Explosion protection	Type of protection	Temperature class
CE <sub>0102</sub> ⚡ II (2) D	IP54	T6 (zone 21) T4 (zone 22)

## 3 Safety Technical Information

### 3.1 General information

The powder spraying equipment from ITW Gema is safe to operate and is built according to the latest technological specifications. This equipment can be dangerous if it is not used for its specified purpose. It should also be noted that because of this there exists:

- A danger to life and limb of the user or third party.
- A danger of damage to the equipment and other machinery belonging to the user.
- A hazard to the efficient operation of the equipment.

1. The powder spraying equipment should only be started up and used once the operating instructions have been carefully studied.
2. Before every Start-up check the equipment for operational safety (regular servicing is essential)!
3. Safety regulations BGI 764 and VDE regulations DIN VDE 0147, Part 1, must be observed for safe operation.
4. Safety precautions specified by local legislation must be observed.
5. The plug must be disconnected before the machine is opened for repair.
6. Only original ITW-Gema replacement parts should be used, because the explosion protection will also be preserved that way. Damage caused by other parts is not covered by guarantee.
7. If ITW-Gema powder spraying equipment is used in conjunction with machinery from other manufacturers then their safety regulations must also be taken into account.
8. Caution must be exercised when working with a powder/air mixture! A powder/air mixture in the right concentration is flammable! No smoking during powder coating.
9. As a general rule for all powder spraying installations, persons with pacemakers should never enter high voltage areas or areas with electromagnetic fields. Persons with pacemakers should not enter areas with powder spraying installations!



#### **Warning!**

**We emphasize that the customer themselves is responsible for safe operation of equipment. ITW-Gema is in no way responsible for any resulting damages.**

### 3.2 Safety conscious working

Each person responsible for the assembly, start-up, operation, service and repair of powder spraying equipment must have read and understood the operating instructions and the "Safety" chapter. The operator must ensure that the user has had the appropriate training for powder spraying equipment and is aware of the possible sources of danger.

The control devices for the spray guns must only be set up and used inside of the zone 22, and the spray guns should be used in the zone 21.

### **3.3 Individual safety regulations for the operating firm and/or operating personnel**

1. Any operating method which will negatively influence the technical safety of the powder spraying equipment is to be avoided.
2. The operator is under obligation to check the powder spraying equipment at least once a month for signs of external damage, defects or changes (including the operating characteristics) which could influence safety and to report them immediately.
3. The operator is obliged to check that the powder spraying equipment is only operated when in satisfactory condition.
4. As far as is necessary, the operating firm must ensure that the operating personnel wear protective clothing (e.g. facemasks).
5. The operating firm must guarantee cleanliness and an overview of the workplace with suitable instructions and checks in and around the powder spraying equipment.

### **3.4 Notes on special types of hazard**

#### **3.4.1 Power**

High voltage equipment must not be opened - the plug must first be taken out – otherwise there is the danger of electric shock.

#### **3.4.2 Powder**

Powder/air mixtures can be ignited by sparks. There must be sufficient ventilation in the powder coating booth. Powder lying on the floor around the powder spraying device is a potentially dangerous source of slipping.

#### **3.4.3 Static charges**

Static charges can have the following consequences: Charges from people, electric shocks, sparking. Charges from objects must be avoided – see Earthing

#### **3.4.4 Earthing**

All electricity conducting parts and machinery found in the workplace (according to DIN VDE 0745, Part 102) must be earthed 1.5 m either side and 2.5 m around each booth opening. The earthing resistance of each piece of machinery must amount to 1 M $\Omega$ . The resistance must be tested on a regular basis. The condition of the machinery surroundings as well as the suspension gear must ensure that the machinery remains earthed. If the earthing of the machinery includes the suspension arrangements then these this must constantly be kept clean in order to keep the necessary conductivity. The appropriate measuring devices must be kept ready in the workplace in order to carry out the testing.

#### **3.4.5 Compressed air**

When there are to be longer pauses or stand-still times between working then the powder spraying equipment should be drained of compressed air. There is a danger of injury when pneumatic hoses are damaged and from the uncontrolled release and improper use of compressed air.

### **3.5 Prohibition of unauthorized conversions and modifications to equipment**

All unauthorized conversions and modifications to powder spraying equipment are forbidden for safety reasons.

The powder spraying equipment should not be used if damaged, the faulty part must be immediately replaced or repaired. Only original ITW-Gema replacement parts should be used. Damage caused by other parts is not covered by guarantee.

Repairs must only be carried out by specialists or in ITW-Gema workshops. Unauthorized modifications can lead to personal injury and damage to machinery. The ITW Gema AG guarantee would no longer be valid.

#### **4 Safety requirements for electrostatic powder coating**

1. This equipment is dangerous if the instructions in this operating manual are not followed.
2. All electrostatic conductive parts and in particular the machinery, within 5m of the coating equipment must be earthed.
3. The floor of the coating area must conduct electricity (normal concrete is generally conductive).
4. The operating personnel must wear electricity conducting footwear (e.g. leather soles).
5. The operating personnel should hold the gun with bare hands. If gloves are worn, these must also conduct electricity.
6. The supplied earthing cable (green/ yellow) must be connected to the earthing screw of the electrostatic powder spraying hand appliance. The earthing cable must have a good metallic connection with the coating booth, the recovery unit and the conveyor chain and with the suspension arrangement of the objects.
7. The electricity and powder supply to the hand guns must be set up so that they are fully protected against heat and chemical damage.
8. The powder coating device may only be switched on, once the booth has been started up. If the booth cuts out then the powder coating device must be switched off.
9. The earthing of all electricity conducting devices (e.g. hooks, conveyor chains) must be checked on a weekly basis. The earthing resistance must amount to  $\leq 1 \text{ M}\Omega$ .
10. The control device must be switched off if the hand gun is cleaned or the nozzle is changed. The control device is also to be switched off when filling powder, so that ex atmosphere is not produced unnecessarily.
11. When working with cleaning agents there may be a risk of hazardous fumes. The manufactures information must be observed when using such cleaning agents.
12. The manufacturers instructions and the applicable environmental requirements must be observed when disposing of powder lacquer and cleaning agents.
13. If any part of the spray gun is damaged (broken parts, tears) or missing then it should not be used.
14. For your own safety, only use accessories and attachments listed in the operating instructions. The use of other parts can lead to risk of injury. Only original ITW-Gema replacement parts should be used.
15. Repairs must only be carried out by specialists and under no circumstances should they be carried out in the operating area. All unauthorized conversions and modifications may lead to injury or damage to machinery. The former protection must not be reduced.
16. Conditions leading to dangerous levels of dust concentration in the powder spraying booths or in the powder spraying areas must be avoided. There must be sufficient technical ventilation available, to prevent a dust concentration of more than 50% of the lower explosion limit (UEG) (UEG = max. permissible powder/air concentration) If the UEG is not known then a value of  $20 \text{ g/m}^3$  should be used.



## 5 A summary of the rules and regulations

The following is a list of relevant rules and regulations which are to be observed:

### 5.1 Guidelines and Regulations, German professional association

<b>BGV A1</b>	General Regulations.
<b>BGV A2</b>	Electrical equipment and material.
<b>BGI764</b>	Electrostatic coating
<b>BGR132</b>	Guidelines for the avoidance of the dangers of ignition due to electrostatic charging (Guideline "Static Electricity")
<b>VDMA 24371</b>	Guidelines for electrostatic coating with synthetic powder <sup>1)</sup> - Part 1 General requirements. - Part 2 Examples of use.

### 5.2 Leaflets

<b>ZH 1/310</b>	Leaflet on the use of tools in locations where there is danger of explosion. <sup>1)</sup>
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### 5.3 European Standards EN

<b>RL94/9/EG</b>	The approximation of the laws of the Member States relating to apparatus and safety systems for their intended use in potentially explosive atmospheres
<b>EN 292-1 EN 292-2</b>	Machine safety <sup>2)</sup>
<b>EN 50 014 to EN 50 020</b> identical <b>DIN VDE 0170/0171</b>	Electrical equipment for locations where there is danger of explosion <sup>3)</sup>
<b>EN 50 050</b>	Electrical apparatus for potentially explosive atmospheres - Electrostatic hand-held spraying equipment <sup>2)</sup>
<b>EN 50 053 Part 2</b>	Requirements for the selection, installation and use of electrostatic spraying equipment for flammable materials - Hand-held electrostatic powder spray guns <sup>2)</sup>
<b>PR EN 12981</b>	Coating plants - Spray booths for application of organic powder coating material - Safety requirements
<b>EN 60529</b> identical <b>DIN 40050</b>	IP-Type protection: contact, foreign bodies and water protection for electrical equipment. <sup>2)</sup>
<b>EN 60 204</b> identical <b>DIN VDE 0113</b>	VDE Regulations for the setting up of high-voltage electrical machine tools and processing machines with nominal voltages up to 1000 V <sup>3)</sup>

### 5.4 VDE (Association of German Engineers) Regulations

<b>DIN VDE 0100</b>	Regulations for setting-up high voltage equipment with nominal voltages up to 1000 V. <sup>4)</sup>
<b>DIN VDE 0105</b>	VDE Regulations for the operation of high voltage equipment. <sup>4)</sup>
<b>Part 1</b>	General regulations.
<b>Part 4</b>	Supplementary definitions for stationary electrical spraying equipment.
<b>DIN VDE 0147</b>	Setting up stationary electrostatic spraying equipment <sup>4)</sup>
<b>Part 1</b>	
<b>DIN VDE 0165</b>	Setting up electrical equipment in locations where there is a danger of explosion. <sup>4)</sup>

Source:

<sup>1)</sup> Carl Heymanns Verlag KG, Luxemburger Strasse 449, 5000 Köln 41, or from the appropriate employers association.

<sup>2)</sup> Beuth Verlag GmbH, Burggrafenstrasse 4, 1000 Berlin 30

<sup>3)</sup> Generalsecretariat, Rue Bréderode 2, B-1000 Brüssel, or the appropriate national committee.

<sup>4)</sup> VDE Verlag GmbH, Bismarckstrasse 33, 1000 Berlin 12

**TECHNICAL DATA OF THE EASY 1-F / EASY 2-F POWDER MANUAL COATING EQUIPMENT**

<i>Type</i>	<b>EASY 1-F</b>	<b>EASY 2-F</b>
<i>Electrical data</i>		
Input voltage:	85 – 264 V	
Frequency:	47 – 440 Hz	
Connected load:	65 VA	130 VA
Rated output voltage (to powder gun):	max. 12 V <sub>s</sub>	max. 12 V <sub>s</sub>
Rated output current (to powder gun):	max. 1 A	max. 1 A
Type of protection:	IP 54	
Temperature range:	10 °C to +40 °C (+50 °F to 104 °F)	
Approval:		
<i>Pneumatic data</i>		
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 <sup>3</sup>	
Max. Oil vapour content of the compressed air:	0.1 mg/kg (Oil/Water)	
Max. Compressed air consumption Powder hose - ø 11 mm:	14 m <sup>3</sup> /h	21 m <sup>3</sup> /h
<i>Dimensions</i>		
Width:	608 mm	692 mm
Depth:	823 mm	823 mm
Height:	1195 mm	1195 mm
Weight:	42 kg	51 kg
Volume:	50 l (approx. 25 kg)	50 l (approx. 25 kg)

**IMPORTANT**

The Easy 1-F / Easy 2-F 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, give you information to convert your EASY 1 system to an EASY 2 system, 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 EasyFlow powder injector will be found in the respective accompanying documentation.

**EASY 1-F / EASY 2-F ELECTROSTATIC POWDER MANUAL EQUIPMENT****1. Field of Application**

The EASY 1-F / EASY 2-F Electrostatic Powder Manual equipment with the EasySelect Manual powder gun is ideally suited for manual coating of objects in small series.

**2. Scope of delivery for EASY 1-F (Standard)**

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

A mobile trolley **(10)** with a shelf **(13)** and a holder **(14)** for guns and hoses.

A powder hopper **(6)** with cover and venting tube with ball valve **(11)**.

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

A plug-in EasyFlow 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)

**3. Supplementary material for EASY 2-F (Standard)**

- An EasyTronic control unit, control unit housing, complete with gun holder, special Mains connecting cable and connecting material
- A plug-in EasyFlow injector, a suction tube, Lock nut, and a pneumatic kit
- An EasySelect Manual powder gun with electric cable, powder hose, rinsing air hose and standard nozzle set
- Pneumatic hoses for conveying air (red), supplementary air (black), and a pneumatic connection with a double air connection adapter from the pressure reducing valve to the control unit.

**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).

**NOTICE**

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.).

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 trolley.
3. Fit the grounding connection cable on the control unit 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 tube (**11**) of the cover, and place the other end in the opening of the booth.

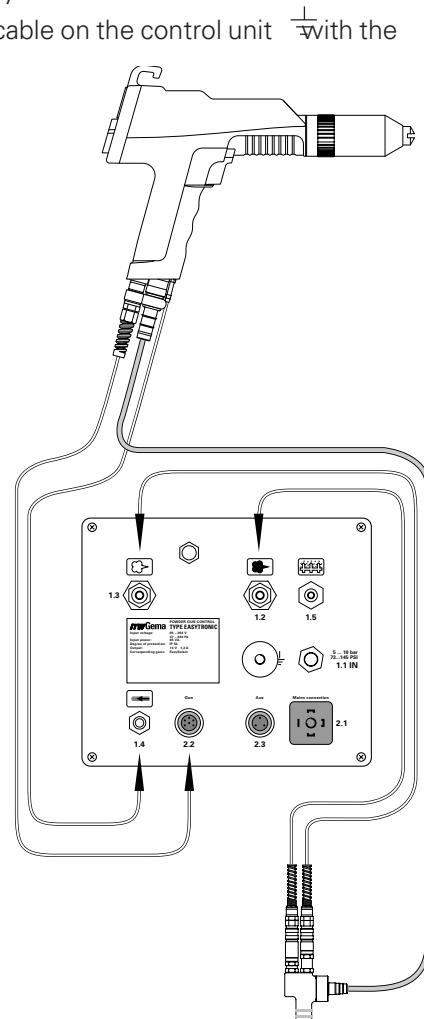


Figure 1

**NOTICE**

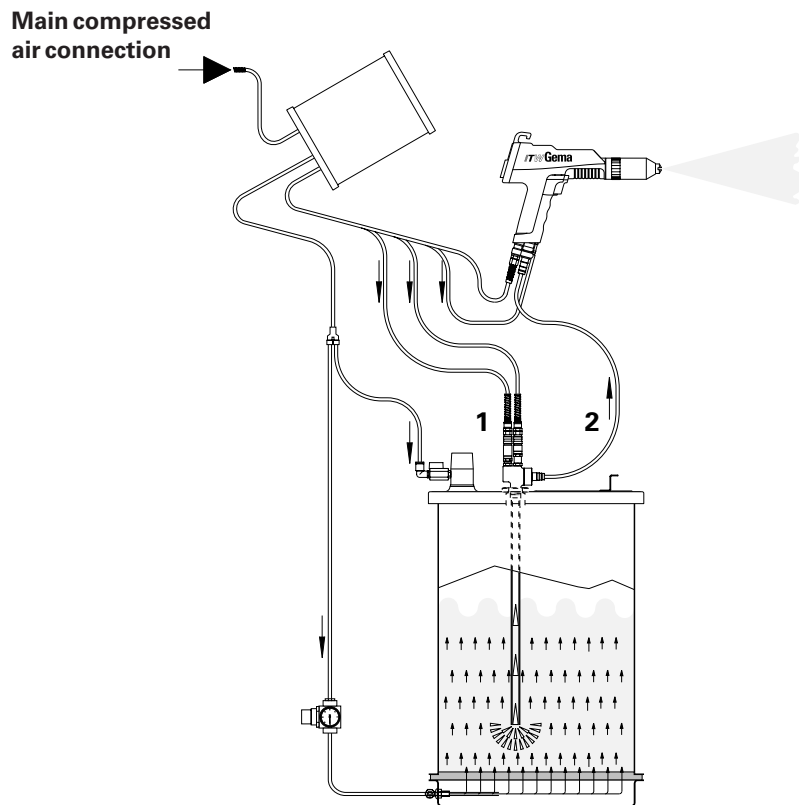
Atmospheric pressure must be present in the powder hopper during operation!

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

## 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 on the trolley. The functioning of the injector is described in the EasyFlow injector operating instructions.



The arrows always show the direction of flow

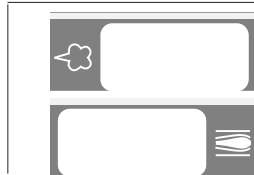
Figure 2

## 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".



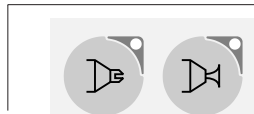
2. There are two **Displays** with whose help the following values are displayed:

- **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 Nm<sup>3</sup>/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.

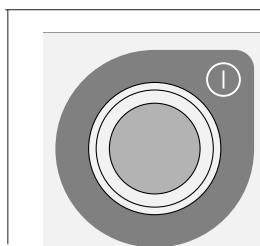


Figure 3

When the equipment is first switched on the preselected factory settings displayed:

<b>60%</b>	<b>4.0 Nm<sup>3</sup>/h</b>
<b>Flat jet rinsing</b>	<b>Complicated parts</b>

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

## PREPARATION FOR START UP

### a) Filling the Powder hopper

1. Open the powder hopper filling cover.
2. Set the Airmover (if present) by turning the air valve
3. Fill with maximum 25 kg (50 l) powder or the powder must reach to a maximum of 5-10 cm below the handles of the powder hopper, otherwise the fluidized powder can escape from the cover.
4. Close the filling cover of the powder hopper again.

### 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. Set the Airmover (if fitted) by turning the air valve
2. Open the filling cover of the powder hopper
3. Slowly increase the fluidizing air on the fluidizing air pressure gauge (9)  
*The powder should only "boil" lightly, but evenly. If necessary, stir the powder with a stick.*
4. Fix the position of the pressure reducing valve by pressing the knob down
5. Close the filling cover again
6. Switch the Airmover off

### b) Regulating the Powder output, and Powder cloud

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

- |                                    |  |
|------------------------------------|--|
| <b>Set Total air volume</b>        | <ol style="list-style-type: none"> <li>1. Switch on the control unit</li> <li>2. Set the total air volume (For further information see the EasyFlow Operating Instructions)<br/>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.<br/>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.</li> </ol>   |
| <b>Select Powder output volume</b> | <ol style="list-style-type: none"> <li>3. Select the powder output volume according to the desired coating thickness.<br/>The selection takes place with the aid of the Keys + and – either on the control unit or on the rear of the powder gun.<br/>To start, a standard setting of 60% is recommended. The total air volume is maintained constant automatically.</li> <li>4. Check the fluidizing of the powder</li> <li>5. Point the powder gun into the booth and press the powder gun trigger</li> </ol>  |
| <b>Select electrode rinsing</b>    | <ol style="list-style-type: none"> <li>6. Select the correct electrode rinsing<br/>When using flat jet nozzles:             <ul style="list-style-type: none"> <li>- Press the Key with the corresponding symbol . The LED of the corresponding Key illuminates.</li> </ul>             When using round jet nozzles with air rinsed deflector plates:             <ul style="list-style-type: none"> <li>- Press the Key with the corresponding symbol . The LED of the corresponding Key illuminates.</li> </ul> </li> </ol> |


(continued)

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 againWhen 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



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 EasyFlow 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 EasyFlow 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

## 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.

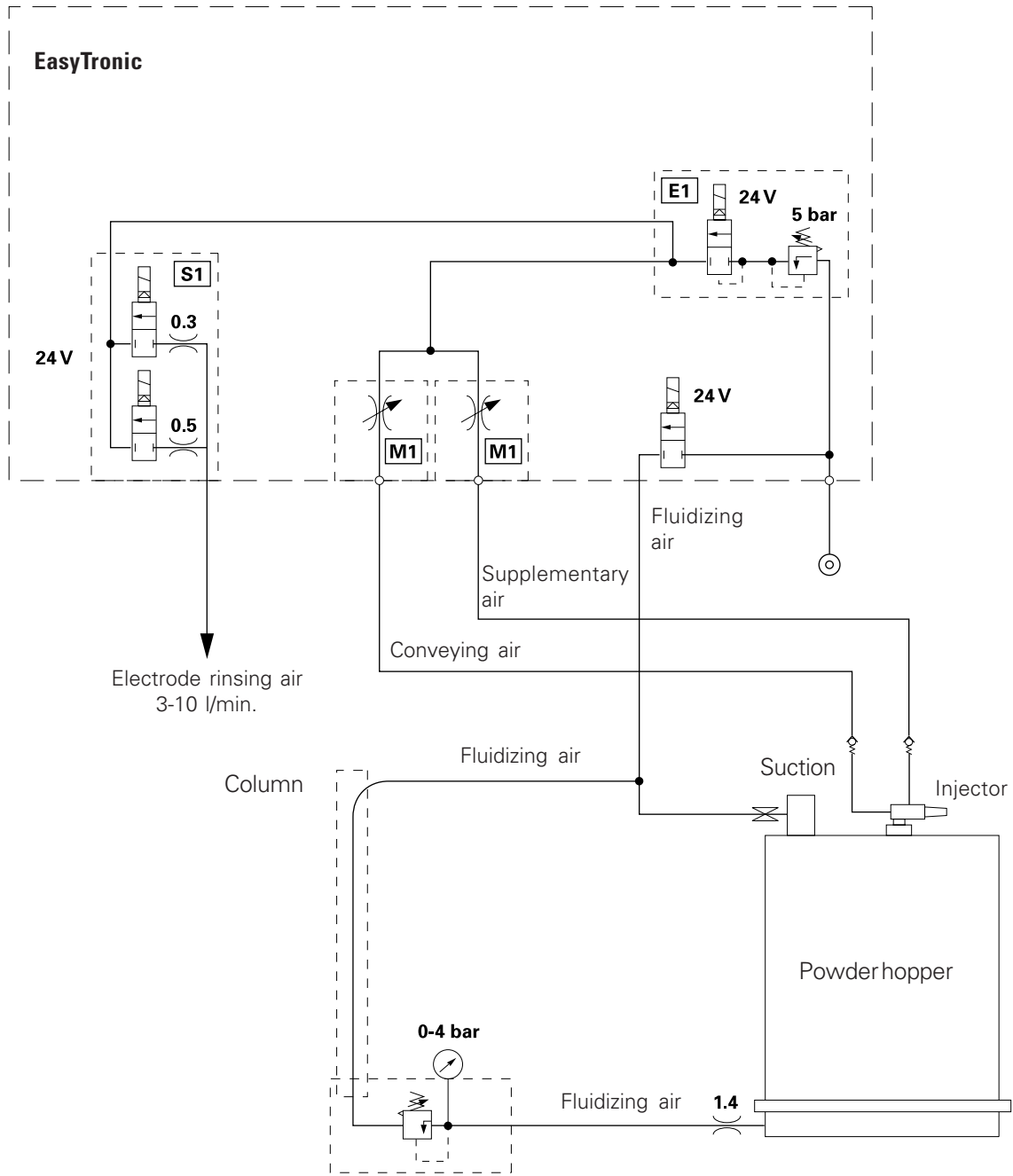
<b>Faults</b>	<b>Causes</b>	<b>Remedies</b>
LED 1-3 unilluminated	Mains supply unit defect	Replace Mains supply unit
LED 4 illuminates red	Main valve defect	Replace main valve
LED 5 illuminates red	<ul style="list-style-type: none"> <li>- Gun not connected</li> <li>- Gun plug, gun cable or gun cable connection defect</li> <li>- Remote control on the gun defect</li> </ul>	<p>Connect the gun</p> <p>Replace corresponding part or send in for repair</p> <p>Exchange remote control (gun cover)</p>
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.	<ul style="list-style-type: none"> <li>- Gun plug, gun cable or gun connection defect</li> <li>- Remote control on the gun defect</li> </ul>	<p>Replace corresponding part or send in for repair</p> <p>Exchange remote control (gun cover)</p>
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.	<ul style="list-style-type: none"> <li>- Deactivate the High-voltage and current.</li> <li>- High-voltage cascade defect.</li> <li>- The objects are poorly grounded.</li> </ul>	<p>Press the selection key (Application key)</p> <p>Send the gun in for repair</p> <p>Check grounding, see also "Safety rules"</p>
The control lamp in the push button does not illuminate, in spite of the control unit being switched on.	<p>No current:</p> <ul style="list-style-type: none"> <li>- Control unit is not connected to the Mains.</li> </ul> <p>In the equipment:</p> <ul style="list-style-type: none"> <li>- Bulb burnt out.</li> <li>- Power pack defect</li> </ul>	<p>Connect the mains cable to the unit</p> <p>Replace</p> <p>Replace</p>

(continued)

**TROUBLESHOOTING GUIDE (continued)**

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

**EASY 1-F / EASY 2-F PNEUMATIC DIAGRAM**



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

Figure4

**WIRING DIAGRAM**

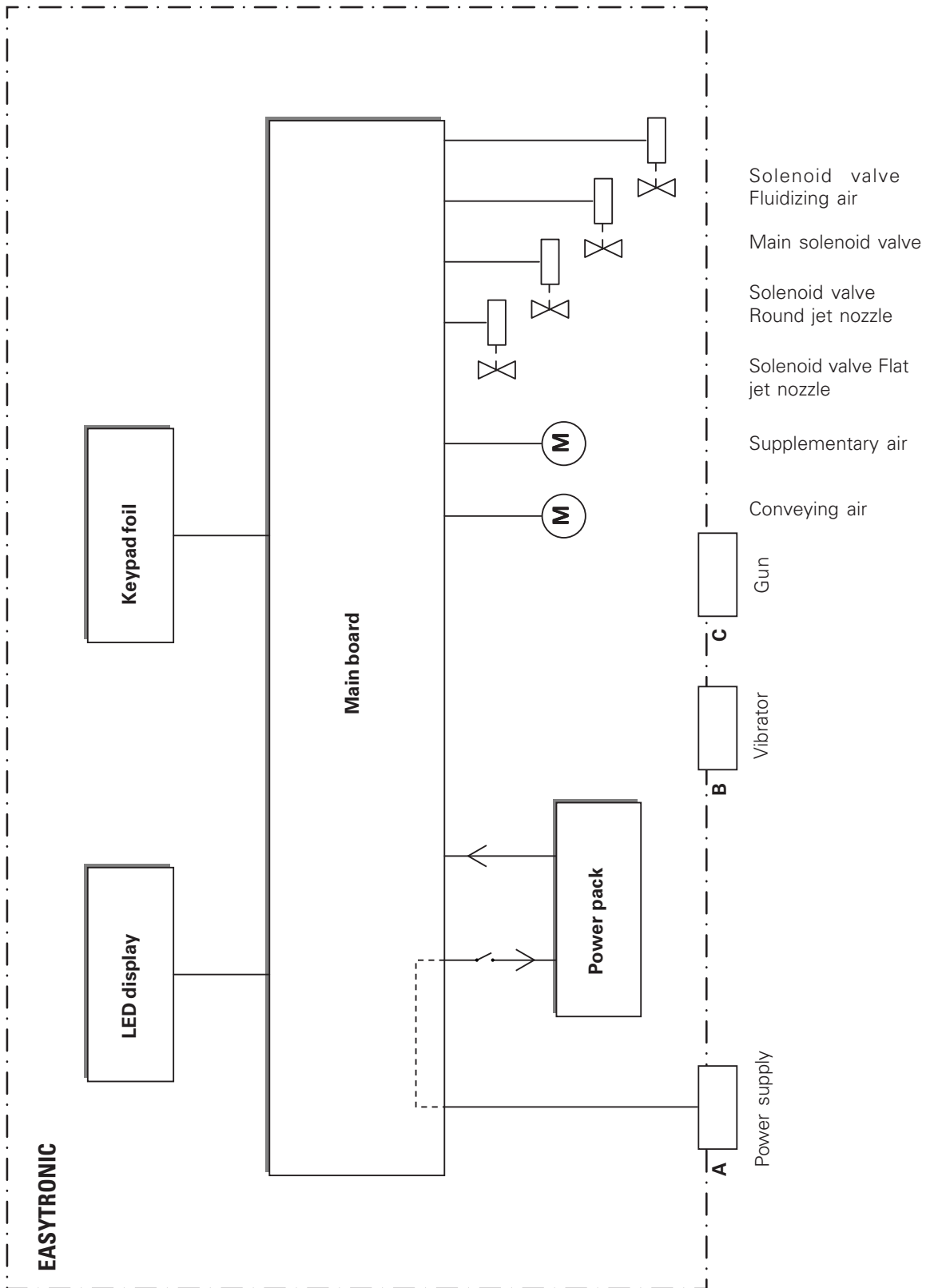


Figure 5



## 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-F*, **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.  $\varnothing$  8 / 6 mm, 8 mm outside diameter / 6 mm inside diameter (i/d).

## EASY 1-F POWDER COATING EQUIPMENT

	Quick Reference Guide	262714
1	Trolley (without fittings)	375560
2	Axle	375608
3	Clamping element - ø 30 mm - complete	376183
4	Hand rail	375640
6	EasyTronic Powder gun control unit - complete	375900
7	Shelf	375616
8	Powder gun / Hose holder	375705
9	Fluidizing air unit	375683
10	EasyFlow injector - see separate Spare parts list	
11	EasySelect Manual powder gun - see separate Spare parts list	
12	Mains cable Easy 1-F	378771
	Mains cable Easy 2-F	375233
13	Plastic hose (Conveying air)	
	incl. Quick-release connector	378682
14	Plastic hose (Supplementary air)	
	incl. Quick-release connector	378690
15	Plastic hose (Fluidizing air)	
	incl. Quick-release connector	378704
16	Plastic hose (Venting air)	
	incl. Quick-release connector	378720
17	Powder hopper carrier plate	375594
18	Hopper body - complete (see also page 18)	390208
22	Venting tube	375845
23	Counter nut	342343
25	Suction tube - complete	339130
27	Tubing 6/4 mm	110318*
28	Grounding cable complete	301140
31	Pressure reducing valve 1/4" 0 - 4 bar	262358
32	Locking nut M30 x 1,5 mm	201170
33	Pressure gauge connection 1/8" - D8 mm	262374
34	Pressure gauge 1/8" 0 - 6 bar	262366
35	Airmover - complete (incl. Items 22, 23, 46, 50-52)	380202
40	Rubber wheel - ø 200 mm	260592
41	Swivel wheel - ø 50 mm	260606
43	Kabeltülle ø 8 mm	260622
44	Plastic clamp band - Pks21	260630
45	Grounding spring - 0.6 x 4.4 / 7.4 x 25 mm	260924
46	O-Ring - ø 38 x 4 mm - Nitril	239151
47	Counter nut - PG21 - Plastic	234869
48	Adapter - 1/4"-6 mm	234826
49	Y-Connecting piece - 3 x 6 mm	244937
50	Adapter - 1/8"- 8 mm	237272
51	Ball valve - 1/8"-1/8"	260967
52	Double nipple - 1/8"-1/8"	202258
58	Plastic hose	378720
60	Locking ring - A-25	237094
61	Shakeproof screw - M10 x 20 mm	260584
75	Air connection adapter 1/4" - 1/4" - single	261700
76	Air connection ring ø 8 mm - 1/4" - single	261718
77	Air connection adapter 1/4" - single	261742
78	Plastic hose ø 8/6 mm - Antistatic (black)	103756*
79	Adapter 1/8" - ø 8 mm	261653
80	Adapter 1/8" - 3/8"	223212
81	Elbow joint 1/8" - ø 8 mm	261661
82	Nut 3/8"	261106

\* Indicate length required

# Wear parts

**EASY 1-F powder coating equipment**

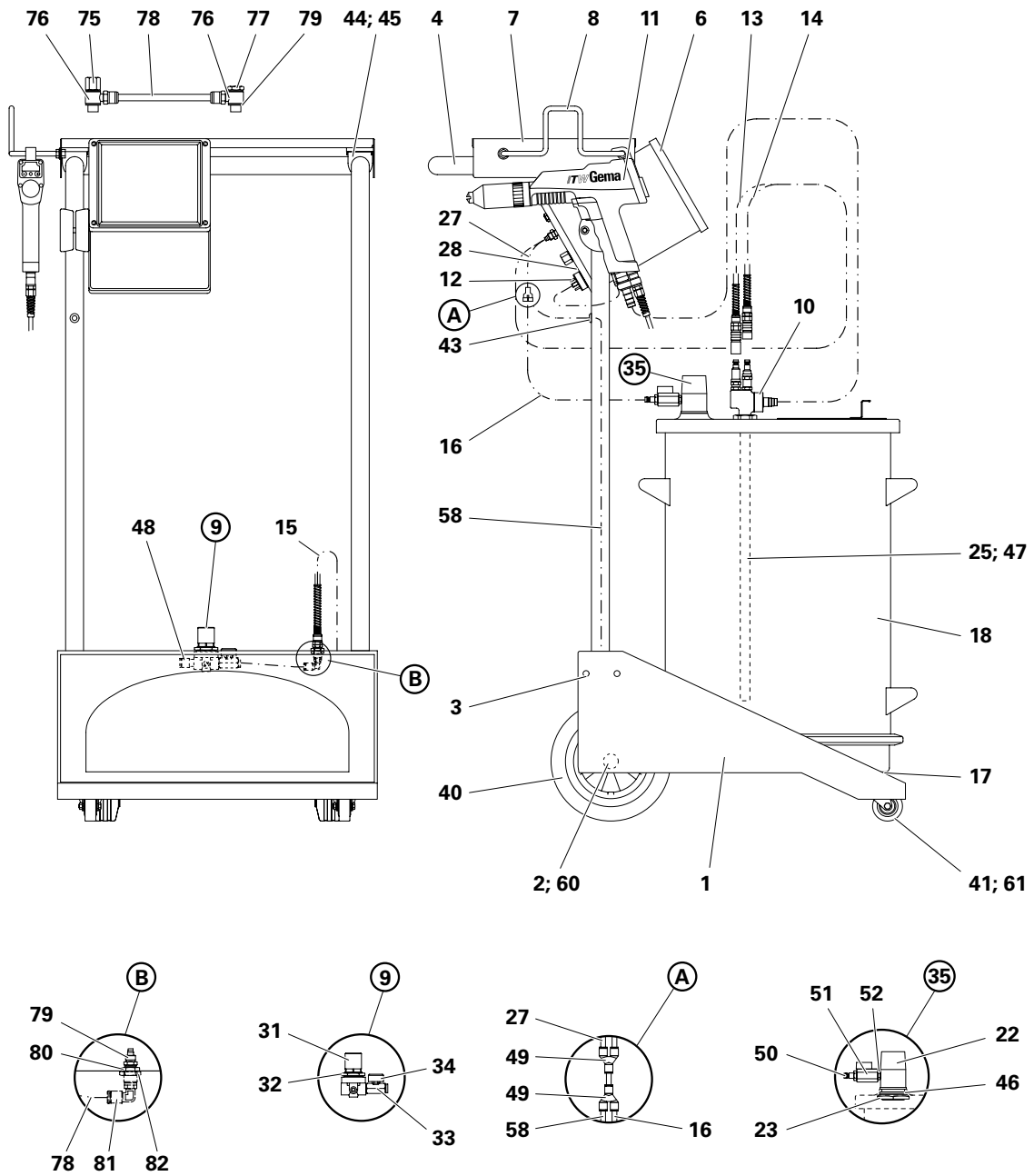


Figure 6

**POWDER HOPPER**

<b>A</b>	Hopper cover complete (fitted with Flap + Hinge)	380180
<b>B</b>	Hopper body - complete (Item 1 - 14)	390208
1	Hopper body	375810
2	Floor plate - HF02-50-2	390143
3	Fluidizing plate - HF02-50-2	390151
4	Clamp ring - HF02-50-2	390194
5	Hand grip	375837
6	Fluidizing plate seal - HF02-50-2	390186
7	Valve - ø 1.4 mm	371912
10	Protective strip - No.209-0206	103837
11	Sealing ring - ø 10.2 / 17. x 3.8 mm	230626
12	Elbow joint - ø 6-6 mm	200875
13	Connector - NW5.2-1/8"	200859
14	Screw - M6 x 12 mm	238163
15	Quick-release coupling ø 6 mm	200840
20	Filler flap	375870
21	Hinge	375853
57	Blind grommet	238333
65	C/sk Screw - M4 x 10 mm	214655

\* Indicate length required

**Powder hopper**

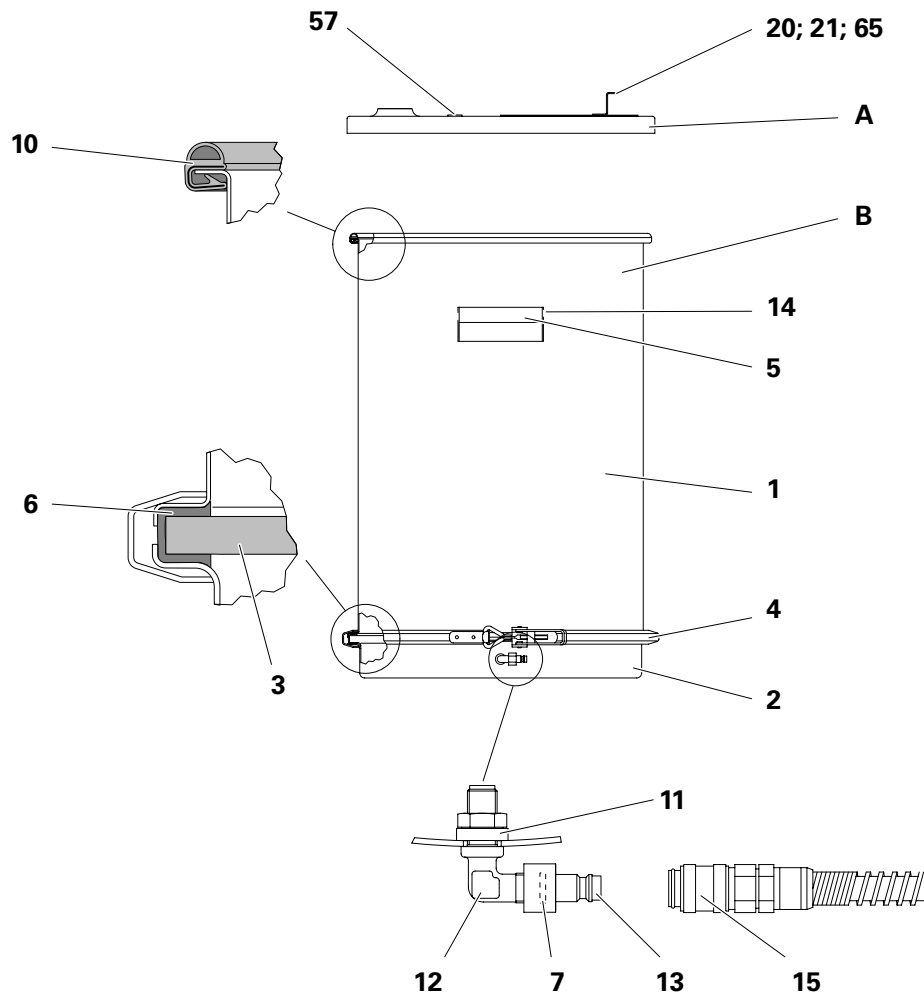


Figure 7

Documentation EASY 1-F / EASY 2-F

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