
Operating Instructions and Spare Parts List

OptiPlus A2 Pneumatic / Fluidizing unit (CA02)

ITW Gema



Documentation OptiPlus A2 Pneumatic / Fluidizing unit

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General safety regulations

This chapter sets out the fundamental safety regulations that must be followed by the user and third parties using the OptiPlus A2 Pneumatic / Fluidizing unit.

These safety regulations must be read and understood before the OptiPlus A2 Pneumatic / Fluidizing unit is used.

Safety symbols (pictograms)

The following warnings with their meanings can be found in the ITW Gema operating instructions. 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

Conformity of use

1. The OptiPlus A2 Pneumatic / Fluidizing unit is built to the latest specification and conforms to the recognized technical safety regulations. It is designed for the normal application of powder coating.
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 OptiPlus A2 Pneumatic / Fluidizing unit 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 OptiPlus A2 Pneumatic / Fluidizing unit should only be used, maintained and started up by trained personnel, who are informed about and are familiar with the possible hazards involved.
4. Start-up (i.e. the execution of a particular operation) is forbidden until it has been established that the OptiPlus A2 Pneumatic / Fluidizing unit has been set up and wired according to the guidelines for machinery (98/37 EG). EN 60204-1 (machine safety) must also be observed.
5. Unauthorized modifications to OptiPlus A2 Pneumatic / Fluidizing unit exempts the manufacturer from any liability from resulting damage.
6. The relevant accident prevention regulations, as well as other generally recognized safety regulations, occupational health and structural regulations are to be observed.
7. Furthermore the country-specific safety regulations must be observed.

Explosion protection	Protection type	Temperature class
0102 II (2) D	IP54	T6 (zone 21) T4 (zone 22)

Technical safety regulations for stationary electro-static powder spraying equipment

General information

The powder spraying equipment from ITW Gema is designed with safety in mind and is built according to the latest technological specifications. This equipment can be dangerous if it is not used for its specified purpose. Consequently it should be noted that 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 and 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. Improper use of the controlling device can lead to accidents, malfunction or damage to the control itself.
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. The plug and socket connection between the powder spraying equipment and the mains network should only be taken out when the power is switched off.

7. The connecting cable between the controlling device and the spray gun must be set up so that it cannot be damaged during operation. Safety precautions specified by local legislation must be observed!
8. Only original ITW-Gema spare parts should be used, because the explosion protection will also be preserved that way. Damage caused by other parts is not covered by guarantee.
9. 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.
10. Before starting work familiarize yourself with all installations and operating elements, as well as with their functions! Familiarization during operation is too late!
11. Caution must be exercised when working with a powder/air mixture! A powder/air mixture in the right concentration is flammable! Smoking is forbidden in the entire plant area!
12. 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 himself is responsible for the safe operation of equipment. ITW-Gema is in no way responsible for any resulting damages!

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 regulations"-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 in zone 22. Only the spray gun should be used in zone 21.

The powder spraying equipment should only be used by trained and authorized personnel. This applies to modifications to the electrical equipment, which should only be carried out by a specialist.

The operating instructions and the necessary closing down procedures must be followed before any work is carried out concerning the set-up, start-up, operation, modification, operating conditions, mode of operation, servicing, inspection or repairs.

The powder spray equipment can be turned off by using the main switch or failing that, the emergency shut-down. Individual components can be turned off during operation by using the appropriate switches.

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 should care about no non-authorized personnel works on the powder spraying equipment (e.g. this also includes using the equipment for non-conform work).
3. For dangerous materials, the employer has to provide an operating instructions manual for specifying the dangers arising for humans and environment by handling dangerous materials, as well as the necessary preventive measures and behavior rules. The operating instructions manual has to be written in an understandable form and in the language of the persons employed, and has to be announced in a suitable place in the working area.
4. The operator is under obligation to check the powder spraying equipment at least once every shift for signs of external damage, defects or changes (including the operating characteristics) which could influence safety and to report them immediately.
5. The operator is obliged to check that the powder spraying equipment is only operated when in satisfactory condition.
6. As far as it is necessary, the operating firm must ensure that the operating personnel wear protective clothing (e.g. facemasks).
7. The operating firm must guarantee cleanliness and an overview of the workplace with suitable instructions and checks in and around the powder spraying equipment.
8. No safety devices should be dismantled or put out of operation. If the dismantling of a safety device for set-up, repair or servicing is necessary, reassembly of the safety devices must take place immediately after the maintenance or repair work is finished. The powder spraying device must be turned off while servicing is carried out. The operator must train and commit the responsible personnel to this.
9. Activities such as checking powder fluidization or checking the high-voltage spray gun etc. must be carried out with the powder spraying equipment switched on.

Notes on special types of hazard

Power

It is necessary to refer once more to the danger of life from high-voltage current if the shut-down procedures are not observed. High voltage equipment must not be opened - the plug must first be taken out - otherwise there is danger of electric shock.

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.

Static charges

Static charges can have the following consequences: Charges to people, electric shocks, sparking. Charging of objects must be avoided - see "Earthing".

Grounding/Earthing

All electricity conducting parts and machinery found in the workplace (according to DIN VDE 0745, part 102) must be earthed 1.5 meters either

side and 2.5 meters around each booth opening. The earthing resistance must amount to maximally 1 MΩ. 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 must constantly be kept clean in order to guarantee the necessary conductivity. The appropriate measuring devices must be kept ready in the workplace in order to check the earthing.

Compressed air

When there are longer pauses or stand-still times between working, 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.

Crushing and cutting

During operation, moving parts may automatically start to move in the operating area. It must be ensured that only instructed and trained personnel go near these parts. The operator should ensure that barriers comply with the local security regulations.

Access under exceptional circumstances

The operating firm must ensure that local conditions are met when repairs are made to the electronic parts or when the equipment is restarted so that there are additional measures such as barriers to prevent unauthorized access.

Prohibition of unauthorized conversions and modifications to machines

All unauthorized conversions and modifications to electrostatic 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 conversions and modifications may lead to injury or damage to machinery. The ITW Gema AG guarantee would no longer be valid.

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, in particular the machinery within 5 meters 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 foot-wear (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 maximally 1 MΩ.
10. The control device must be switched off if the hand gun is cleaned or the nozzle is changed.
11. When working with cleaning agents there may be a risk of hazardous fumes. The manufacturers instructions 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. 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 10 g/m³ should be used.

A summary of the rules and regulations

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

Guidelines and regulations, German professional association

BGV A1	General regulations
BGV A2	Electrical equipment and material
BGI 764	Electrostatic coating
BGR 132	Guidelines for the avoidance of the dangers of ignition due to electrostatic charging (Guideline "Static Electricity")
VDMA 24371	Guidelines for electrostatic coating with synthetic pow-

	der ¹⁾ - Part 1 General requirements - Part 2 Examples of use
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Leaflets

ZH 1/310	Leaflet for the use of tools in locations where there is danger of explosion ¹⁾
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EN European standards

RL94/9/EC	The approximation of the laws of the Member States relating to apparatus and safety systems for their intended use in potentially explosive atmospheres
EN 292-1 EN 292-2	Machine safety ²⁾
EN 50 014 to EN 50 020, identical: DIN VDE 0170/0171	Electrical equipment for locations where there is danger of explosion ³⁾
EN 50 050	Electrical apparatus for potentially explosive atmospheres - Electrostatic hand-held spraying equipment ²⁾
EN 50 053, part 2	Requirements for the selection, installation and use of electrostatic spraying equipment for flammable materials - Hand-held electrostatic powder spray guns ²⁾
EN 50 177	Stationary electrostatic spraying equipment for flammable coating powder ²⁾
PR EN 12981	Coating plants - Spray booths for application of organic powder coating material - Safety requirements
EN 60 529, identical: DIN 40050	IP-Type protection: contact, foreign bodies and water protection for electrical equipment ²⁾
EN 60 204 identical: DIN VDE 0113	VDE regulations for the setting up of high-voltage electrical machine tools and processing machines with nominal voltages up to 1000 V ³⁾

VDE (Association of German Engineers) Regulations

DIN VDE 0100	Regulations for setting-up high voltage equipment with nominal voltages up to 1000V ⁴⁾
DIN VDE 0105 part 1 part 4	VDE regulations for the operation of high voltage equipment ⁴⁾ General regulations Supplementary definitions for stationary electrical spraying equipment
DIN VDE 0147 part 1	Setting up stationary electrostatic spraying equipment ⁴⁾
DIN VDE 0165	Setting up electrical equipment in locations in areas with danger of explosion ⁴⁾

*Sources:

¹⁾ Carl Heymanns Verlag KG, Luxemburger Strasse 449, 5000 Köln 41, or from the appropriate employers association

²⁾ Beuth Verlag GmbH, Burgrafenstrasse 4, 1000 Berlin 30

³⁾ General secretariat, Rue Bréderode 2, B-1000 Bruxelles, or the appropriate national committee

⁴⁾ VDE Verlag GmbH, Bismarckstrasse 33, 1000 Berlin 12

Product specific security measures

- The installation work, to be done by the customer, must be carried out according to local regulations
- Before starting up the plant a check must be made that no foreign objects are in the booth or in the ducting (input and exhaust air)

It must be observed, that all components are grounded according to the local regulations, before start-up

About this manual

General information

This operating manual contains all important information which you require for the working with the OptiPlus A2 Pneumatic / Fluidizing unit. It will safely guide you through the start-up process and give you references and tips for the optimal use of your new powder coating system.

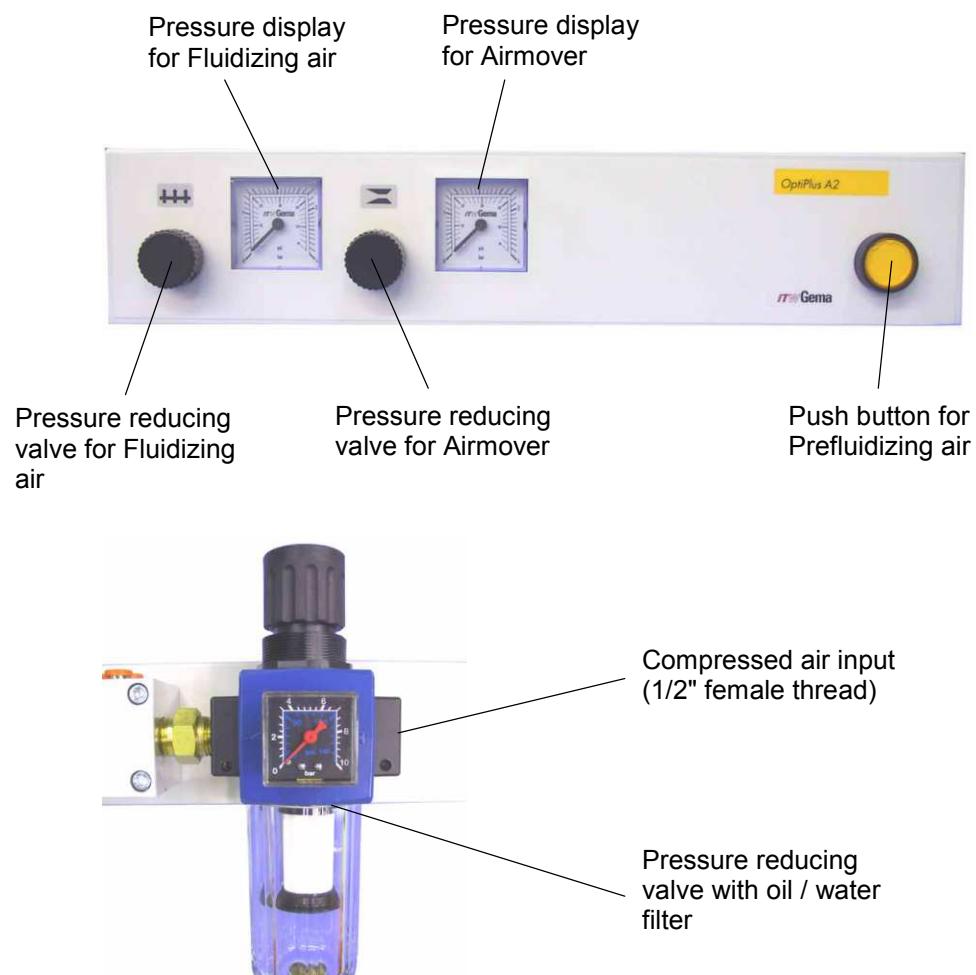
Information about the function mode of the individual system components - reciprocators, booths, powder gun controls, powder guns etc. - you will find in the corresponding enclosed documentations.

Description of function

Field of application

The OptiPlus A2 Pneumatic/ Fluidizing unit serves to distribute compressed air to the OptiTronic CG03 control unit and regulates the fluidizing air, and Airmover pressure.

The prefluidizing must be done manually by pressing the „Prefluidizing“ button. The fluidizing functions directly from the connection of the OptiPlus A2 with the compressed air.



Technical data

OptiPlus A2 Pneumatic / Fluidizing unit

Pneumatic data

OptiPlus A2 Pneumatic / Fluidizing unit	
Compressed air input	7-10 bar
Air consumption	dependent on the number of powder guns connected
Max. water content	1,3 g/m ³
Max. oil content	0,1 mg/m ³

Start-up and operation

Setting the fluidization

The fluidization of the powder depends on the type of powder, the air humidity, and the ambient temperature.

The OptiPlus A2 Pneumatics / Fluidizing unit consists a push button for prefluidizing, as well as a pressure control valve and pressure gauge for Fluidizing air, and Airmover.

The OptiPlus A2 Pneumatic / Fluidizing unit should be connected to a compressed air network with 7-10 bar.

The fluidization can be set as follows:

1. Connect or open the main air connection. Compressed air should now flow through the OptiPlus A2 Pneumatic / Fluidizing unit. The fluidizing functions immediately with connecting the OptiPlus A2 to the compressed air.
2. Adjust the compressed air on the Pressure reducing valve to 7 bar.
3. Check the fluidization of the powder in the powder hopper. If the powder does not "boil" lightly, press the push button for prefluidizing briefly several times. The prefluidizing compressed air should "loosen" the powder.
If the powder starts to "boil" regulate the Fluidizing air with the suitable pressure control valve in such a way, that "boiling" is uniformly distributed over the powder surface. The pressure the Fluidizing air can monitored on the pressure gauge.

Connect the Airmover of the powder hopper

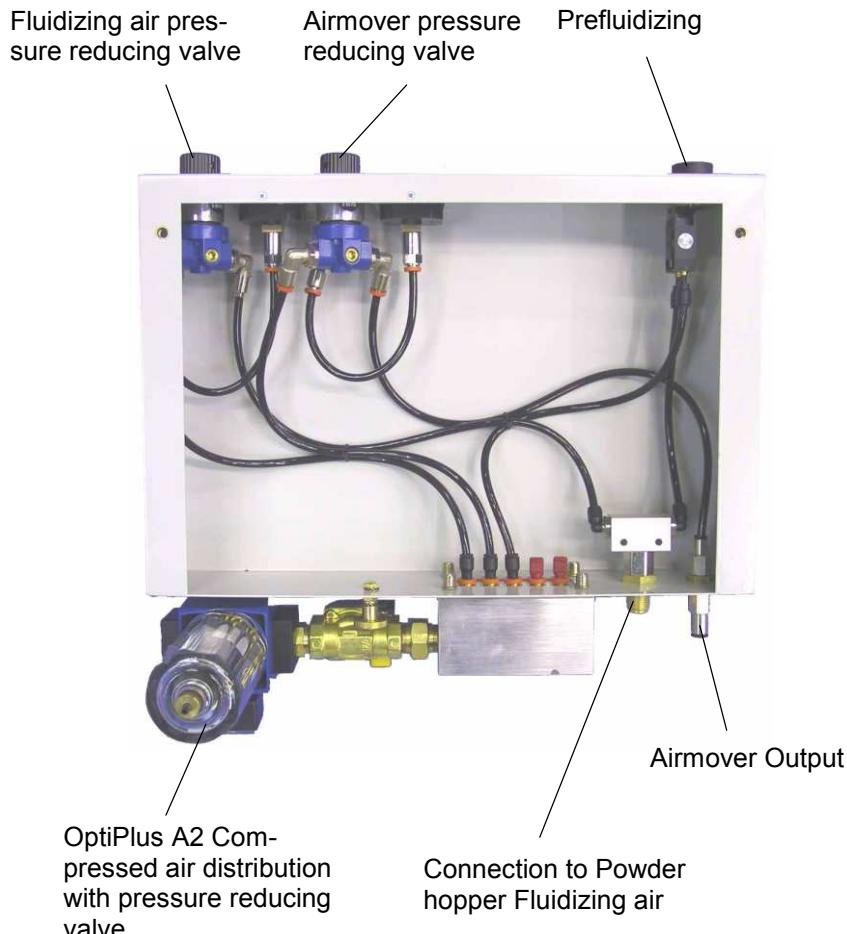
Fluidizing air creates an over-pressure in the powder hopper. This over-pressure obstructs the powder conveying and must be eliminated. An Airmover is installed for this purpose, which similarly to an injector on the powder hopper sucks off the over-pressure and mixes the powder with the air.

The Airmover creates a vacuum in the powder hopper for this purpose. The volume of air which can be sucked off by the Airmover is dependent on the size of the powder hopper and the volume of the Fluidizing air.

Airmover air should be adjusted if a powder cloud rises above the surface of the powder and flows out through the openings of the powder hopper. In addition the Airmover pressure at the suitable can be adjusted with the

suitable Adjusting knob and be monitored on the Pressure gauge. The pressure should be increased so far until the powder no longer flows out of the powder hopper.

Once these adjustments are made, they can be left also with interruptions in working. A reset of the adjusted values is thereby unnecessary. The AS01 main switch can now be switched on and the powder guns can be adjusted or operated (see the powder gun, and OptiTronic CG03 control unit Operating Instructions).



Airmover connection (OptiPlus A2 view from below)

Spare Parts

Ordering spare parts

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

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

Example:

- **Type** OptiPlus A2 Pneumatic / Fluidizing unit,
- Serial number** 1234 5678
- **Order no.** 203 386, 1 piece, Clamp - Ø 18/15 mm

When ordering cable or hose material, the required length must also be given. The spare part numbers of this yard/meter ware is always marked with an *.

The wear parts are always marked with a #.

All dimensions of plastic hoses are specified with the external and internal diameter:

Example:

Ø 8/6 mm, 8 mm outside diameter (o/d) / 6 mm inside diameter (i/d)



WARNING!

Only original ITW-Gema spare parts should be used, because the explosion protection will also be preserved that way. The use of spare parts from other manufacturers will invalidate the ITW Gema guarantee conditions!

OptiPlus A2 Pneumatic / Fluidizing unit - Spare Parts List

	OptiPlus A2 - Version A (complete)	390 011
	OptiPlus A2 - Version B (complete)	390 020
1	Drawer unit housing	389 978
2	Distributor block	390 054
3	Front foil	389 994
6	Pressure gauge mounting - general	340 030
7	Nut - M14 x 1 mm	302 163
11	Reducing valve / Filter unit	240 133
12	Pressure reducing valve - 101-1/4	241 369
13	Pressure reducing valve - 3/8"	244 384
14	Pressure gauge - 1/8" 0-10 bar	203 289
15	Pressure gauge - 1/8" 0-4 bar	235 814
16	Fluidizing air valve body	225 843
17	Solenoid valve – 1/2" - NW13.5 - 230VAC	259 500
18	"OR" valve – 1/4"	259 217
19	Blind plug - D08	238 023
20	Coupling sleeve 1/4"-D08	233 390
21	Coupling sleeve 1/4"-D06	233 404
22	Coupling sleeve - 1/8"-D06	233 412
23	Adaptor - 3/8" -1/4"	202 550
24	Adaptor - 1/8" -1/4"	231 932
25	Adaptors - 3/8" -D08	259 659
26	Dividing double nipple – 1/2"-1/2"	243 582
27	Lead-through - D08-D08	200 883
28	Lead-through - 3/8"-3/8"	202 975
29	Elbow – 1/4"-D06	203 041
30	Elbow - 1/8"-1/8"	235 733
31	Adaptor - D04-D06	225 835
41	Push button - yellow	265 187
42	Rotary knob	200 069
43	Grounding tag - D12.5 mm	200 735
51	Cheese head screw - M6 X 65 mm	230 340
52	Pan Head screw - M6 X 12 mm ms	256 706
53	C/sk screw - M 3 X 6 mm	238 295
54	Nut - M6	200 417

55	Washer - D06.4/12.5 X 1.6 mm	200 476
56	Spring washer - M6	200 450
61	Plastic tube D06/04 - black	103 144*
62	Plastic tube - D08/06 - black	103 152*

* Please indicate length.

