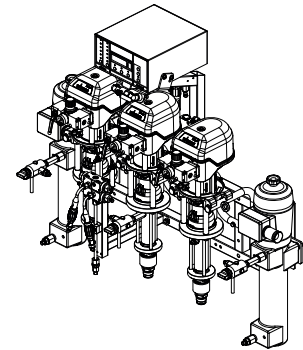
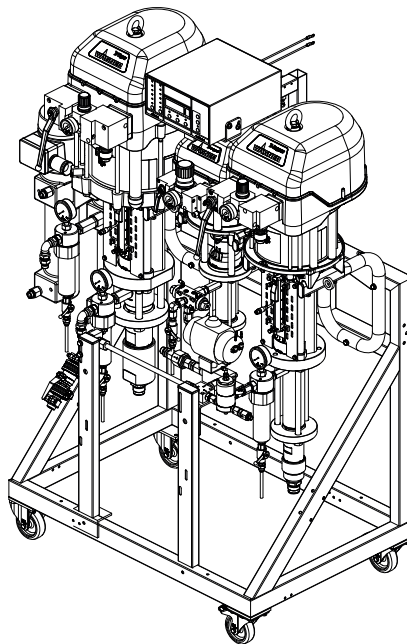


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TwinControl

Electronically Controlled 2K Systems

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1 ABOUT THESE INSTRUCTIONS

1.1 PREFACE

The operating manual contains information about safely operating, maintaining, cleaning and repairing the device.

The operating manual is part of the device and must be available to the operating and service personnel.






The device may only be operated by trained personnel and in compliance with this operating manual.

Operating and service personnel should be instructed according to the safety instructions. This equipment can be dangerous if it is not operated according to the instructions in this operating manual.

1.2 WARNINGS, NOTICES AND SYMBOLS IN THESE INSTRUCTIONS

Warning instructions in this manual highlight particular dangers to users and to the device and state measures for avoiding the hazard.

These warning instructions fall into the following categories:

	DANGER	Immediate risk of danger. Non-observance will result in death or serious injury.
	WARNING	Potential danger. Non-observance may result in death or serious injury.
	CAUTION	Potentially dangerous situation. Non-observance may result in minor injury.
	NOTICE	Potentially dangerous situation. Non-observance may result in damage to property.
	Info	Provides information about particular characteristics and how to proceed.

Explanation of warning notice:

WARNING

This notice warns you of a danger!

Possible consequences of not observing the warning notice.

- ▶ The measures for preventing the hazard and its consequences.



1.3 LANGUAGES

This **TwinControl operating manual** is available in the following languages:

Original operating manual

Language	Order no.
German	2339287

Translation of the original operating manual

Language	Order no.	Language	Order no.	Language	Order no.
English	2339321	Spanish	2339330	Romanian	2372826
French	2339322	Italian	2339323	Polish	2396599
Japanese	2344161	Turkish	2386987	Hungarian	2402460
Chinese	2407458	Czech	2413915		

Additional languages upon request or at: www.wagner-group.com

Spare parts for the TwinControl systems and TwinControl accessories are to be found in two separate spare parts catalogs. The catalogs are available in the following languages:

Spare parts catalog for TwinControl Finishing

(Small frame / small trolley / small wall):

Language	Order no.	Language	Order no.
German	2339290	English	2339331

Spare parts catalog for TwinControl Protective Coating (PC)

(Large frame / large trolley):

Language	Order no.	Language	Order no.
German	2339293	English	2339332

TwinControl CD: see Chapter TwinControl CD [▶▶ 9]

1.3.1 Operating Manuals for the Individual Components

EvoMotion 5-60 operating manual

Language	Order no.	Language	Order no.	Language	Order no.
German	2333562	English	2333563	Spanish	2333566
French	2333564	Italian	2333565	--	--

Operating manual **Wildcat 10-70, 18-40 / Puma 28-40, 21-110 / Leopard 35-70, 35-150, 48-110**

Language	Order no.	Language	Order no.	Language	Order no.
German	2333537	English	2333538	Spanish	2333541
French	2333539	Italian	2333540	--	--

Operating manual **Puma 3-600 / Leopard 8-600**

Language	Order no.	Language	Order no.	Language	Order no.
German	2333547	English	2333548	Spanish	2333551
French	2333549	Italian	2333550	--	--

Operating manual **Protec 95-150, 72-200, 60-240 / Tiger 72-300**

Language	Order no.	Language	Order no.	Language	Order no.
German	2340281	English	2340282	Spanish	2340286
French	2340285	Italian	2340284	--	--

Operating manual **EvoMotion 5-125** (accessory, use as feed pump)

Language	Order no.	Language	Order no.	Language	Order no.
German	2316595	English	2316596	Spanish	2316600
French	2316597	Italian	2316599	--	--

Operating manual **Paint and dosing valves DN 2.6** (for valves PV 400, DV 400, GA 400DV)

Language	Order no.	Language	Order no.	Language	Order no.
German	2343270	English	2343275	Spanish	2343278
French	2343276	Italian	2343277	--	--

Operating manual **Paint valve PV 100-DN4**

Language	Order no.	Language	Order no.	Language	Order no.
German	2343280	English	2343281	Spanish	2343286
French	2343282	Italian	2343284	--	--

Operating manual **Paint and dosing valves PV 530, DV 530**

Language	Order no.	Language	Order no.	Language	Order no.
German	2372892	English	2372893	Spanish	2372900
French	2372895	Italian	2372897	--	--

Operating manual **Automatic Airless spray gun GA 400AL** (for valve GA 400AL / soft circulation)

Language	Order no.	Language	Order no.	Language	Order no.
German	350939	English	350941	Spanish	350949
French	350946	Italian	350948	--	--

Continuous-flow heater operating manual

Language	Order no.	Language	Order no.	Language	Order no.
German	65860	English	65860	Dutch	65860
French	65860	Italian	65860	Danish	65860

Product pressure regulator operating manual

Language	Order no.	Language	Order no.	Language	Order no.
German	ZZB019GER	English	ZZB019ENG	Spanish	ZZB019SPA
French	ZZB019FRE	Italian	ZZB019ITA	--	--

1.4 TWINCONTROL CD

All operating documents specified previously are also available as PDF files on a compact disk (CD). The CD is included in the system's scope of delivery. The **order no.** is: 2339342

1.5 ABBREVIATIONS

Abbreviations in the text

Order no.	Order number
ET	Spare part
K	Marking in the spare parts lists
Pos	Position
Stk	Number of pieces
DH	Double stroke
DN	Nominal diameter
2K	Two components
AIS	Adaptive Injection System
GFB	Gun flush box

TC	TwinControl
TC 1.4404	TwinControl for acidic hardeners
PC	Protective Coating: heavy duty corrosion protection
HP	High pressure 4-50 MPa; 40-500 bar; 580-7250 psi
HPP	Highest pressure over 50 MPa; 500 bar; 7250 psi
ESTA	E lectro s tatically charged device

Materials

SSt	Stainless steel
FEP	Fluorine elastomer
PA	Polyamide
PTFE	Polytetrafluorethylene

Abbreviations in the text and control unit

A	A component
B	B component
S	Flushing agent
AS	Flushing on A-side
BS	Flushing on B side
MR	Mixing ratio
JS	Job total
P	Pot life
F_P	Flow rate / pot life

1.6 TERMINOLOGY FOR THE PURPOSE OF THIS MANUAL

Cleaning

Cleaning	Manual cleaning of devices and device parts with cleaning agent.
Flushing	Internal flushing of paint-wetted parts with flushing agent.

Personnel qualifications

Trained person	Is instructed in the tasks assigned to him/her, the potential risks associated with improper behavior as well as the necessary protective devices and measures.
Electrically trained person	Is instructed by an electrician about the tasks assigned to him/her, the potential risks associated with improper behavior as well as the necessary protective devices and measures.
Electrician	Can assess the work assigned to him/her and detect possible hazards based on his/her technical training, knowledge and experience in relevant provisions.
Skilled person in accordance with TRBS 1203 (2010/Revision 2012)	A person, who, based on his/her technical training, experience and recent vocational experience, has sufficient technical knowledge in the areas of explosion protection, protection from pressure hazards and electric hazards (if applicable) and is familiar with the relevant and generally accepted rules of technology so that he/she can inspect and assess the status of devices and coating systems based on workplace safety.

2 CORRECT USE

2.1 DEVICE TYPES

- A) TwinControl, turbine
- B) TwinControl, cable with mains supply

2.2 TYPE OF USE

A) Systems with a turbine

The device is suitable for processing 2K liquid products such as paints and lacquers in accordance with their classification into explosion classes IIA or IIB.

B) Systems with a mains power supply

The device is suitable for processing 2K liquid products such as paints and lacquers.

WAGNER explicitly prohibits any other use! The device may only be operated under the following conditions:

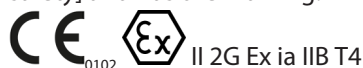
- ▶ Use the device only to work with the products recommended by WAGNER.
- ▶ Do not deactivate safety fixtures.
- ▶ Use only WAGNER original spare parts and accessories.
- ▶ The operating personnel must be trained on the basis of this operating manual.
- ▶ Follow the instructions in the operating manual.

2.3 FOR USE IN POTENTIALLY EXPLOSIVE AREAS



A) Systems with a turbine

The system with turbine complies with the Explosion Protection Directive 2014/34/EU (Atex) and can be used as a Category 2 device in Ex Zone 1. It is designed with the ignition protection type [intrinsic safety] and has the marking:



(See Explosion Protection Identification, Chapter Identification [▶▶ 13])

The remote control (accessory) may be used along with a system with a turbine in potentially explosive areas (zone 1, zone 2). The same applies to the 2A switchbox (accessory).

B) Systems with a mains power supply

The system with mains power supply (cable) must **not** be operated in potentially explosive areas (zone 0, 1, 2).

The remote control (accessory) may **not** be used along with a system with a mains power supply (cable) in potentially explosive areas. The same applies to the 2A switchbox (accessory).

2.4 PROCESSIBLE WORKING MATERIALS

Low-viscosity to high-viscosity 2K lacquers (e.g., epoxy, PU, DD) with a pot life of more than 5 minutes.

- 2K water-based primer
- 2K solvent-based primer
- 2K PUR primer
- 2K PUR lacquers
- 2K epoxy primer
- 2K epoxy lacquers
- 2K high solid primer
- 2K high solid lacquers

- 2K products with acidic hardener (only with TwinControl systems for acidic hardeners)
 - ▶ Solvent and water-based 2K products should not be processed using the same system.

Materials in direct contact with the products: see Chapter Materials of Paint-wetted Parts [▶▶ 25]

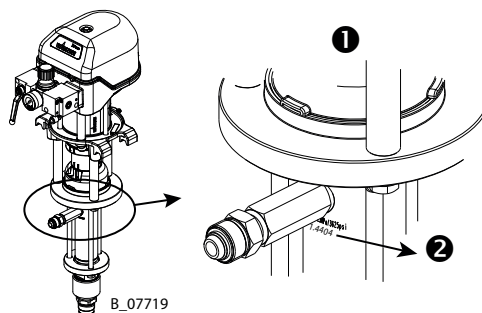
! NOTICE

Abrasive working materials and pigments!

Greater wear of product-wetted parts.

- ▶ Use the application-oriented model (flow rate/cycle, product, valves, etc.) as indicated in the Chapter Technical Data.
- ▶ Check if the fluids and solvents being used are compatible with the pump construction materials as indicated in the Chapter Materials of Paint-wetted Parts.

Wear caused by abrasive working materials is not covered by the warranty.



1	Example of hardener pump	2	Description 1.4404
---	--------------------------	---	--------------------

TwinControl for acidic hardeners

Check products for compatibility: see Chapter Materials of Paint-wetted Parts [▶▶ 25]

Parts made of stainless steel 1.4404 are labeled with [1.4404] (see example).

! WARNING

Acidic hardeners!

Risk of burns and injury for skin, tissue and organs.

- ▶ Observe the lacquer manufacturer's safety data sheets and take prescribed safety measures.



2.5 IMPROPER USE

Misuse can lead to physical injury and/or property damage! Special attention must be paid that:

- ▶ no dry coating products, e.g. powder are processed;
- ▶ no food, medicine or cosmetics are processed.

3 IDENTIFICATION

3.1 EXPLOSION-PROOF MARKING FOR DEVICES WITH TURBINES

TwinControl – Turbine

As defined in the Directive 2014/34/EU (ATEX), the TwinControl control unit (turbine) is suitable for use in potentially explosive areas.

Device type	TwinControl
Manufacturer	Wagner International AG 9450 Altstätten Switzerland



0102  II 2 G Ex ia IIB T4 ZELM 08 ATEX 0385 X +5 °C < Ta +40 °C

CE	European Communities
0102	Number of the notified body that is used by WAGNER in the production monitoring phase (PTB Germany in this case)
Ex	Symbol for explosion protection
II	Device class II
2	Category 2 (zone 1)
G	Ex-atmosphere gas
Ex	Ignition protection
ia	Ignition protection type [Intrinsic safety] EN 60079-11, safety level [ia]
IIB	Device category (gas) IIB (ethylene, city gas)
T4	Temperature class T4: maximum surface temperature 135 °C; 275 °F
ZELM 08	Test center and year of issue
ATEX	French abbreviation for [ATmosphères EXplosibles]
0385	Certificate number
X	Special notes (see Chapter)
Ta	Permissible ambient temperature range during operation: +5 °C < Ta < +40 °C +41 °F < Ta < +104 °F



Explosion protection identification and special notices regarding pumps

- ▶ See operating manuals for pumps

3.1.1 Use in Areas Subject to Explosion Hazards

Safe Handling of WAGNER Spray Devices

Mechanical sparks can form if the device comes into contact with metal. In an explosive atmosphere:

- ▶ knocking or pushing metal against metal is to be avoided;
- ▶ do not drop the device.

Ignition temperature of the coating product

- ▶ Ensure that the ignition temperature of the coating product is above the maximum surface temperature.

Medium supporting atomizing

- ▶ To atomize the product, use only weakly oxidizing gases, e.g., air.

Operation without fluid

Avoid running the pump so that it sucks in air (without fluid inside). The air, combined with the vapor of flammable fluids, can generate internal areas with an explosion hazard.

- ▶ Periodically check that the pumps are working smoothly, paying special attention to the presence of air in the pumped fluid, which may be caused by damaged packings.
- ▶ Avoid operating the pump with damaged packing.
- ▶ Ensure that the separating agent tank is filled with sufficient separating agent.

Electrostatic surface spraying

- ▶ Do not spray device parts using electrostatic equipment.

Cleaning

If there are deposits on the surfaces, the device may form electrostatic charges. Flames or sparks can form during discharge.

1. Remove deposits from the surfaces to maintain conductivity.
2. Use only a damp cloth to clean the device.



3.2 IDENTIFICATION FOR DEVICES WITH A MAINS POWER SUPPLY

TwinControl, cable with mains supply

The system with mains power supply (cable) must **not** be operated in potentially explosive areas (zone 0, 1, 2).

The remote control (accessory) may not be used along with a system with a mains power supply (cable) in potentially explosive areas. The same applies to the 2A switchbox (accessory).

Device type	TwinControl
Manufacturer	Wagner International AG 9450 Altstätten Switzerland



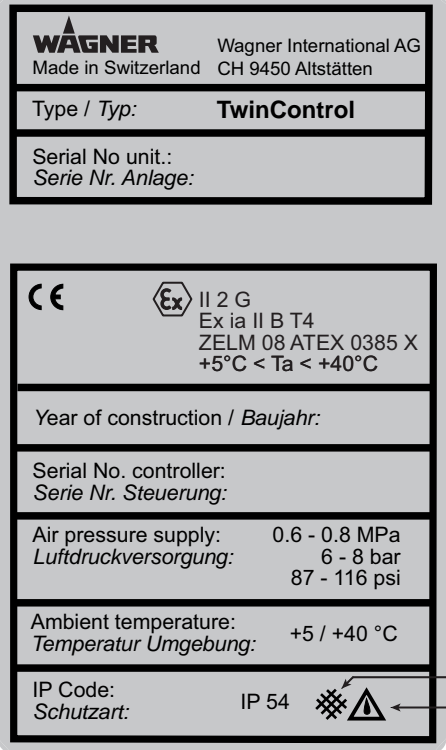
CE European Communities

Identification and special notices regarding pumps

- ▶ See operating manuals for pumps

3.3 TYPE PLATES

TwinControl - Turbine



1 **WAGNER** Wagner International AG
 Made in Switzerland CH 9450 Altstätten

2 Type / Typ: **TwinControl**

3 Serial No unit.:
 Serie Nr. Anlage:



4 **CE** **Ex** II 2 G
 Ex ia II B T4
 ZELM 08 ATEX 0385 X
 +5°C < Ta < +40°C


5 Year of construction / Baujahr:

6 Serial No. controller:
 Serie Nr. Steuerung:

7 Air pressure supply: 0.6 - 0.8 MPa
 Luftdruckversorgung: 6 - 8 bar
 87 - 116 psi

8 Ambient temperature: +5 / +40 °C
 Temperatur Umgebung:





9 IP Code: IP 54   ← 10
 Schutzart: ← 11


12  13
 Check manual before use!
 Vor Gebrauch Betriebsanleitung beachten!

B_06434

1	Manufacturer	2	Device type: TwinControl
3	Serial number of system	4	CE identification
5	Year of manufacture	6	Serial number of controller
7	Air pressure supply	8	Ambient temperature
9	IP Code	10	Dust-protected
11	Splash-water protected	12	Do not dispose of used electrical equipment with household refuse
13	Read operating manual before use!		

TwinControl – Cable with mains supply

1	 Made in Switzerland Wagner International AG CH 9450 Altstätten 
2	Type / Typ: TwinControl
3	Year of construction / Baujahr:
4	Serial No. unit.: Serie Nr. Anlage:
5	Serial No. controller: Serie Nr. Steuerung:
6	Voltage: Spannung: 85-260 VAC 47-60 Hz
7	Line Power: Eingangsleistung: max. 40 W
8	Ambient temperature: Temperatur Umgebung: +5 / +40 °C
9	IP Code: Schutzart: IP 54  

12  13 ↓

Check manual before use!
 Vor Gebrauch Betriebsanleitung beachten!

B_06435

1	Manufacturer and CE mark	2	Device type: TwinControl
3	Year of manufacture	4	Serial number of system
5	Serial number of controller	6	Voltage
7	Maximum input power	8	Ambient temperature
9	IP Code	10	Dust-protected
11	Splash-water protected	12	Do not dispose of used electrical equipment with household refuse
13	Read operating manual before use!		

4 BASIC SAFETY INSTRUCTIONS

4.1 SAFETY INSTRUCTIONS FOR THE OPERATOR

- ▶ Keep this operating manual at hand near the device at all times.
- ▶ Always follow local regulations concerning occupational safety and accident prevention regulations.



4.1.1 Electrical Devices and Equipment

Danger of electric shock!

Danger to life from electric shock:

- ▶ Prepare device in accordance with the local safety requirements with regard to the operating mode and ambient influences.
- ▶ May only be maintained by skilled electricians or under their supervision. With open housings, the mains voltage poses a danger.
- ▶ Operate device in accordance with the safety regulations and electrotechnical regulations.
- ▶ Do not disconnect any plug connections during operation.
- ▶ Label plug connections with the warning "Do not disconnect when energized".
- ▶ Must be repaired immediately in the event of problems.
- ▶ Decommission if device poses a danger or is damaged.
- ▶ Must be de-energized before work is commenced.
 - ▶ Secure the device against being switched back on without authorization.
 - ▶ Inform personnel about planned work.
 - ▶ Observe electrical safety regulations.
- ▶ Ground all devices to a common grounding point.
- ▶ Only operate the device with a properly installed socket with a protective ground wire connection.
- ▶ Keep liquids away from electrical devices.



4.1.2 A Safe Work Environment

Danger due to dangerous fluids or vapors!

Severe or fatal injuries due to explosion danger or inhalation, swallowing or contact with the skin or eyes.

- ▶ Ensure that the floor in the working area is static dissipative in accordance with EN 61340-4-1 (resistance must not exceed 100 MΩ).
- ▶ Paint mist extraction systems/ventilation systems must be fitted on site according to local regulations.
- ▶ Make sure that the ground connection and potential equalization of all system parts are reliable and continuous and can withstand the expected stress (e.g., mechanical stress, corrosion).
- ▶ Ensure that product hoses/air hoses adapted to the working pressure are used.
- ▶ Ensure that personal protective equipment is available and is used.



- ▶ Ensure that all persons within the working area wear static dissipative shoes. Footwear must comply with EN 20344. The measured insulation resistance must not exceed 100 MΩ.
- ▶ Ensure that during spraying, persons wear static dissipative gloves. The grounding takes place via the spray gun's handle or its trigger.
- ▶ Protective clothing, including gloves, must comply with EN 1149-5. The measured insulation resistance must not exceed 100 MΩ.
- ▶ Ensure that there are no ignition sources such as naked flames, sparks, glowing wires, or hot surfaces in the vicinity. No smoking.
- ▶ Ensure that the pipe joints, hoses, equipment parts and connections are permanently, technically leak-proof:
 - ▶ Periodic preventative maintenance and service (replacing hoses, checking tightness strength of connections, etc.)
 - ▶ Regular monitoring of leaks and defects via visual inspection and odor testing, e.g., daily before commissioning, at the end of work or weekly.
- ▶ Ensure that maintenance and safety checks are performed regularly.
- ▶ In the event of defects, immediately bring the device or system to a stop and arrange to have repairs carried out immediately.

4.1.3 Personnel Qualifications

Danger due to incorrect use of device!

Risk of death due to untrained personnel.

- ▶ Ensure that the operating personnel has been instructed by the operator in accordance with the operating manual and the operating instructions. The device must only be operated, maintained and repaired by trained personnel. Refer to the operating instructions for information about the required personnel qualifications.

4.2 SAFETY INSTRUCTIONS FOR THE PERSONNEL

- ▶ Always observe the information in this manual, particularly the safety instructions and the warning instructions.
- ▶ Always follow local regulations concerning occupational safety and accident prevention regulations.



Danger due to high-voltage field!

Danger to life from malfunction of active implants.

- ▶ Persons belonging to a risk group according to EMF guideline 2013/35/EU (e.g., carriers of active implants), must not enter the high-voltage area.



4.2.1 Personal Safety Equipment

Danger due to dangerous fluids or vapors!

Serious or fatal injuries due to inhalation, swallowing or contact with the skin or eyes.

- ▶ When preparing or working with lacquer and when cleaning the device, follow the working instructions of the manufacturer of the lacquers, solvents and cleaning agents being used.
- ▶ Implement the prescribed safety measures, in particular the wearing of safety glasses, safety clothing and protective gloves as well as the use of protective hand cream.
- ▶ Use a mask or breathing apparatus if necessary.



- ▶ For sufficient health and environmental safety: Operate the device in a spray booth or on a spraying wall with the ventilation (extraction) switched on.
- ▶ Wear suitable protective clothing when working with hot products.

4.2.2 Safe Handling of WAGNER Spray Devices

Danger due to injection of lacquer or flushing agent into the skin!

The spray jet is under pressure and can cause dangerous injuries.

Avoid injection of lacquer or flushing agents:

- ▶ Never point the spray gun at people.
- ▶ Never reach into the spray jet.
- ▶ Perform the following measures before any work on the device, in the event of work interruptions and malfunctions:
 - ▶ Switch off the energy/compressed air supply
 - ▶ Relieve the pressure from the spray gun and device
 - ▶ Securing the Spray Gun Against Actuation
 - ▶ Disconnect the control unit from the mains
 - ▶ In the event of functional faults, remedy the fault as described in the Troubleshooting chapter
- ▶ If needed, the liquid ejection devices must be checked by experts (e.g., WAGNER service technician) at least every 12 months for their work-safe condition in accordance with DGUV regulation 100-500 Chapter 2.29 and Chapter 2.36.
 - ▶ For shut down devices, the examination can be suspended until the next start-up.



In the event of skin injuries caused by lacquer or flushing agents:

- ▶ Note the lacquer or flushing agent that you have been using.
- ▶ Consult a doctor immediately.

Danger due to recoil forces!

Actuating the trigger can cause strong recoil forces. Thereby, the user can lose his balance and injure himself when falling.

Avoid risk of injury from recoil forces:

- ▶ Ensure that you have firm footing when operating the spray gun.



4.2.3 Grounding the Device

Danger due to electrostatic charge!

Risk of injury, explosion hazard and damage to the device.

Friction, flowing liquids and air or electrostatic coating processes create charges. Flames or sparks can form during discharge. Correct grounding of the entire spraying system prevents electrostatic charges.

- ▶ Ensure that all devices and tanks are grounded before each spraying process.
- ▶ Make sure that the ground and potential equalization of all system parts are performed reliably and continuously and can withstand the expected stress (e.g., mechanical stress, corrosion).
- ▶ Ground the work pieces to be coated.
- ▶ Ensure that all persons inside the working area are grounded, e.g., that they are wearing static dissipative shoes.



- ▶ Wear static dissipative gloves when spraying. The grounding takes place via the spray gun's handle or its trigger.

4.2.4 Product Hoses

Danger due to bursting of product hose!

The product hose is under pressure and may cause dangerous injuries.

- ▶ Ensure that the hose material is chemically resistant to the sprayed products and the flushing agents used.
- ▶ Ensure that the product hoses and the fittings are suitable for the pressure generated.
- ▶ Ensure that the following information can be seen on the high-pressure hose:
 - ▶ Manufacturer
 - ▶ permissible operating pressure
 - ▶ Date of manufacture
- ▶ Make sure that the hoses are laid only in suitable places. Hoses should not be laid in the following places under any circumstances:
 - ▶ in high traffic areas
 - ▶ on sharp edges
 - ▶ on moving parts
 - ▶ on hot surfaces
- ▶ Ensure that the hoses are never run over by vehicles (e.g., fork lifts), or that the hoses are never put under pressure from the outside in any other way.
- ▶ Ensure that the hoses are never kinked. Observe maximum bending radii.
- ▶ Ensure that no work is ever performed with a damaged hose.
- ▶ Make sure that the hoses are never used to pull or move the device.
- ▶ The electrical resistance of the product hose, measured at both valves, must be less than 1 MΩ.
- ▶ Suction hoses may not be subjected to pressure.



Several liquids have a high expansion coefficient. In some cases, their volume can rise with consequent damage to pipes, fittings, etc. and cause fluid leakage.

When the pump sucks liquid from a closed tank, ensure that air or a suitable gas can enter the tank. In this way a negative pressure is avoided. The vacuum could implode the tank (squeeze) and can cause it to break. The tank would leak and the liquid would flow out.

The pressure created by the pump can be a multiple of the input air pressure.

4.2.5 Cleaning and Flushing

Danger due to cleaning and flushing!

Explosion hazard and damage to the device.

- ▶ Non-ignitable cleaning agents and flushing agents should preferably be used.
- ▶ When carrying out cleaning work with flammable cleaning agents, make sure that all equipment and resources (e.g., collection tank, funnel, transport cart) are conductive or static dissipative and grounded.
- ▶ Observe the specifications of the lacquer manufacturer.
- ▶ Ensure that the flash point of the cleaning agent is at least 15 K above the ambient temperature or that cleaning is undertaken at a cleaning station with technical ventilation.



- ▶ Never use chloride or halogenated solvents (such as trichloroethane and methylene chloride) with devices containing aluminium or galvanized/zinc-plated parts. They may react chemically thus producing an explosion danger.
- ▶ Take measures for workplace safety.
- ▶ It should be noted that when the device is put into operation or emptied: depending on the coating product used, depending on the rinsing agent (solvent) used, there may briefly be a mixture inside the pipes and equipment which can ignite.
- ▶ Only use electrically conductive tanks for cleaning and flushing agents.
- ▶ The tanks must be grounded.

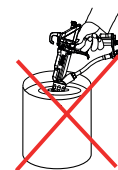
An explosive gas/air mixture forms in closed tanks.

- ▶ Never spray into a closed tank when using solvents for flushing.

External Cleaning

When cleaning the exterior of the device or its parts, also observe the following:

- ▶ Relieve the pressure from the device.
- ▶ De-energize the device electrically.
- ▶ Disconnect the pneumatic supply line.
- ▶ Use only moistened cloths and brushes. Never use abrasive agents or hard objects and never spray cleaning agents with a gun. Cleaning the device must not damage it in any way.
- ▶ Ensure that no electric component is cleaned with or immersed into solvent.
- ▶ Which cleaning agent is used to clean the spray gun depends on which parts of the spray gun have to be cleaned and which product has to be removed.
 - ▶ When cleaning the spray gun, only use **non-polar cleaning agents** to prevent conductive residues on the surface of the spray gun.
 - ▶ Should it still be necessary to use a polar cleaning agent, all residues of this cleaning agent have to be removed by using a non-conductive and non-polar cleaning agent, once the cleaning is finished.



4.2.6 Touching Hot Surfaces

Danger due to hot surfaces because of hot coating products!

Risk of burn injuries

- ▶ Only touch hot surfaces if you are wearing protective gloves.
- ▶ When operating the device with a coating product with a temperature of $> 43\text{ }^{\circ}\text{C}$; $109\text{ }^{\circ}\text{F}$, apply a warning label to the device that says "Warning - Hot Surface."

Instruction label: Order no. 9998910

Protection label: Order no. 9998911



Info

Order the two labels together.



4.2.7 Maintenance and Repair

Danger due to improper maintenance and repair!

Danger to life and equipment damage.

- ▶ Only a WAGNER service center or a suitably trained person may carry out repairs and replace parts.
- ▶ Repair or replacement of devices or parts of devices are only allowed to be performed outside the hazard area by qualified personnel.
- ▶ Use only WAGNER original spare parts and accessories.
- ▶ Do not change or modify the device; if change is necessary, contact WAGNER.
- ▶ Only repair and replace parts that are listed in the accessories and spare parts chapter and that are assigned to the device.
- ▶ Do not use any defective components.
- ▶ Before all work on the device and in the event of work interruptions:
 - ▶ Relieve the pressure from the spray gun, product hoses and all devices.
 - ▶ Secure the spray gun against actuation.
 - ▶ Switch off the energy and compressed air supply.
 - ▶ Disconnect the control unit from the mains.
- ▶ Observe the operating and service manual for all work.

4.2.8 Protective and Monitoring Equipment

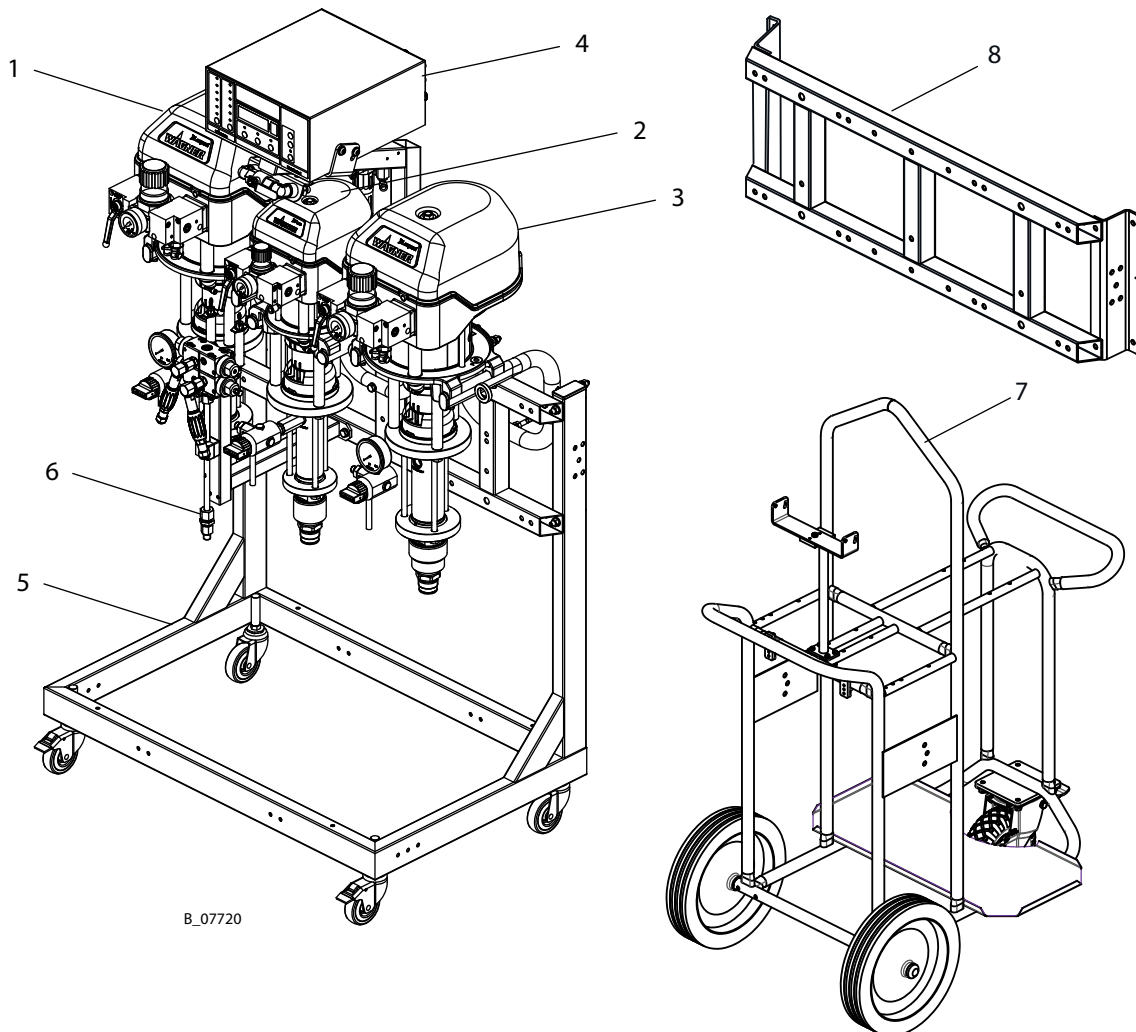
Danger due to removal of protective and monitoring equipment!

Danger to life and equipment damage.

- ▶ Protective and monitoring equipment must not be removed, modified or rendered unusable.
- ▶ Regularly check for perfect functioning.
- ▶ If defects are detected on protective and monitoring equipment, the system must not be operated until these defects are remedied.

5 DESCRIPTION

5.1 COMPONENTS



B_07720

1	Pneumatic pump for A-component	2	Flushing pump [S]
3	Pneumatic pump for B component	4	TwinControl control unit
5	Frame	6	Mixing unit
7	Trolley	8	Wall mount

5.1.1 TwinControl Finishing and Protective Coating

Depending on size, various suspensions are available for TwinControl systems:

	TwinControl Finishing	TwinControl Protective Coating (PC)
Suspension	Small frame small trolley small wall	Large frame large trolley
Pump A	5-60*, 10-70, 28-40, 21-110, 26-200, 3-600, 35-70, 35-150, 48-110, 8-600	95-150, 72-200, 60-240
Spraying procedure	Airless AirSpray AirCoat	Airless

* 5-60 not on trolley

5.2 MODE OF OPERATION

The TwinControl system consists of 5 function units: The pneumatically operated high-pressure pumps for A and B components and for flushing agents, the mixing unit and the control unit. The two product components are brought to high-pressure by the pumps and an adjustable, predefined mixing ratio is intermixed in the static mixer, from where it is conveyed to the spray gun.

The system can be operated with one or more spray guns, depending on size and output. Various functions are controlled by the control unit, such as: flushing, pot life monitoring or mixing ratio.

Basic principle

The lacquer flows continuously and the hardener is metered (injected) into the lacquer in portions in intermittent cycles with a slightly higher pressure.

Operation

The required mixing ratio is entered on the electronic controller, and the system can then be started by pressing the button on the electronic controller. This opens product valve A. The hardener valve B is then opened in pulses, and hardener is metered in according to requirements (mixing ratio).

5.3 PROTECTIVE AND MONITORING EQUIPMENT

The following functions are provided for system safety:

- ▶ External release: e.g., interlock with spray booth's exhaust air

5.4 SCOPE OF DELIVERY

TwinControl systems consist of the following:

- pneumatic pump with stroke measurement for the A-component
- pneumatic pump with stroke measurement for the B-component
- pneumatic pump for flushing agent (versions without also possible)
- control unit (turbine or cable connection)
- frame or trolley or wall mount (wall mount not with PC)
- static mixing unit (only with internal mixer)
- diverse product valves

The system's scope of delivery also includes:

Description	Order no.
Separating agent 250 ml; 250 cc	9992504
CE Declaration of Conformity	See Chapter Declaration of Conformity [▶▶ 129]
Operating manual, in German	2339287
Operating manual in the local language	See Chapter Languages [▶▶ 7]
TwinControl compact disc (CD, see Chapter TwinControl CD [▶▶ 9])	2339342
Instruction sheet – transportation	2305117
Supplement for TwinControl with password protection	2304064

The delivery note shows the exact scope of delivery. Accessories: see Chapter Accessories [▶▶ 117].

5.5 TECHNICAL DATA

5.5.1 Materials of Paint-wetted Parts

Materials in direct contact with the products	
TwinControl (without pumps)	Stainless steel, FEP, HM, PA, PE, POM, PTFE
Pumps	
TwinControl systems for acidic hardeners:	
– from B pump (input) to mixing head valve (output)	1.4404, 1.4408, 1.4571, FEP, HM, PE, PTFE
– Mixing tube, additional	1.4301

FEP = fluorine elastomer

HM = carbide

PA = polyamide




PE = polyethylene

POM = polyoxymethylene

PTFE = polytetrafluorethylene

5.5.2 Control Units with Turbines

	Unit	TwinControl control units with turbines
Minimum/maximum input air pressure	MPa; bar; psi	0.6–0.8; 6–8; 87–116
Nominal air consumption	NL/min	125
Permissible ambient temperature range	°C °F	+5 to +40 +41 to +104

	Unit	TwinControl control units with turbines
IP Code		IP 54
Compressed air quality: free from oil and water	Quality standard 7.5.4 in accordance with ISO 8573.1, 2010 7: Particle concentration 5–10 mg/m ³ 5: Humidity: Pressure condensation point ≤ +7 °C 4: Oil content ≤ 5 mg/m ³	
Explosion protection identification (see Chapter Explosion-Proof Marking for Devices with Turbines [▶▶ 13])	   II 2G Ex ia IIB T4	

Rated safety data

Potentiometer connection A or B in Ex ia IIB type ignition protection		
Connection of maximum values	Unit	Potentiometer A and B
Maximum high voltage	U ₀ [V]	12.6
Maximum current	I ₀ [mA]	73.6
Maximum power	P ₀ [mW]	232
Maximum external capacity	C ₀ [uF]	7.3
Maximum external inductivity	L ₀ [mH]	26

The above-mentioned values for the maximum permissible external capacities and inductances are only valid as long as they do not occur simultaneously. If the external reactances are present simultaneously, the values are to be taken from the following table.

Maximum permissible external inductance	L ₀ [mH]	0.1	0.2	0.5	1	2	5	10	20
Maximum permissible external capacity	C ₀ [uF]	7.3	6	4.6	3.7	3.1	2.3	1.9	1.4

Remote control connection in Ex ia IIB type ignition protection		
Connection of maximum values	Unit	Connection RC
Maximum high voltage	U ₀ [V]	12.6
Maximum current	I ₀ [mA]	154
Maximum power	P ₀ [mW]	484
Maximum external capacity	C ₀ [uF]	7.3
Maximum external inductivity	L ₀ [mH]	6

The above-mentioned values for the maximum permissible external capacities and inductances are only valid as long as they do not occur simultaneously. If the external reactances are present simultaneously, the values are to be taken from the following table.

Maximum permissible external inductance	L ₀ [mH]	0.1	0.2	0.5	1	2	5
Maximum permissible external capacity	C ₀ [uF]	7.3	5.9	4.4	3.5	2.7	1.8

Service connection

Only for connection to relevant programming devices and only outside the potentially explosive area, or if an atmosphere not capable of explosion is present.

5.5.2.1 Identification "X"

1. The notices in the operating manual must be observed, particularly regarding grounding and connecting the potential equalization, and integrating the equipment into an existing system for potential equalization.

2. Opening the housing in environments with explosive gas atmospheres is not permitted.
3. Plugging in the service connector in explosive environments is not permitted, and may only be carried out by authorized maintenance personnel.
4. Maintenance and service tasks inside the housing may only be performed by authorized personnel.
5. No changes at the pressure regulator (inside the housing of the TwinControl controller) for the turbine or at the relief valves may be made.
6. A maintenance plan must be prepared for the equipment controller (type TwinControl), or this controller must be integrated into an existing maintenance plan.
7. In order to prevent soiling inside the housing of the TwinControl controller, the integrity of the front film must be checked at regular intervals. In the event of damage, the equipment must be removed from the Ex zone immediately and put out of operation, and repaired by WAGNER.
8. When designing and installing the compressed air system, it must be ensured that no explosive atmosphere can arise within the system.
9. Only WAGNER potentiometers may be connected to the potentiometer connections.
10. The remote control may only be used in an environment at risk of explosion if used along with a system with a turbine. The remote control cable must be laid securely and safely protected from damage. The maximum permitted cable length is 75 m; 246 ft.
11. If the complete TwinControl system is operated as part of a water varnish coating system connected to high voltage, the green-yellow ground cables must be removed and replaced with black cables with the same cross-section. Grounding symbols must be made unrecognizable.
12. The device does not comply with Chap. 6.3.12 of DIN EN 60079-11: 2007-08.
13. The device is suitable for overvoltage category II and may only be operated if all connections are inserted or provided with protective caps. Degree of pollution 3 for the environment is then permissible.
 Permissible storage temperature: -20 °C; -4 °F ... +60 °C; +140 °F. Relative humidity (no dew) < 95%.
14. The 2A switchbox may only be used in an environment at risk of explosion if used along with a system with a turbine.

5.5.3 Control Units with Mains Power Supply (Cable)

	Unit	TwinControl control units with cable connection
Input voltage	VAC	85–260
Input power	W	maximum 40
Input frequency	Hz	47-440
Permissible ambient temperature range	°C °F	+5 < Ta < +40 +41 < Ta < +104
IP Code		IP 54
Compressed air quality: free from oil and water		Quality standard 7.5.4 in accordance with ISO 8573.1, 2010 7: Particle concentration 5–10 mg/m ³ 5: Humidity: Pressure condensation point ≤ +7 °C 4: Oil content ≤ 5 mg/m ³

5.5.4 Entire System

Working areas		Unit	Limits
Input air pressure		MPa bar psi	0.6–0.8 6–8 87–116
Maximum permissible number of strokes by pumps in two-component operation		DH/min	30
Maximum recommended strokes per minute of pumps in 2K operation		DH/min	20
Maximum product pressure levels			see Chapter Pumps [▶▶ 29]
Product pH value	without acidic hardeners	pH	3.5–9
	System for acidic hardeners: Check products for compatibility (see Chapter Materials of Paint-wetted Parts [▶▶ 25])		
Product temperature		°C; °F	+5 ... +60; +41 ... +140
Ambient temperature	Operation	°C; °F	+5 ... +40; +41 ... +104
	Assembly	°C; °F	0 ... +40; +32 ... +104
	Storage	°C; °F	-20 ... +60; -4 ... +140
Relative humidity		10–95% (without condensation)	

Minimum flow rate

The minimum flow rate depends on the pump size, mixing ratio, static mixer and setting for pressure and hardener valve stroke. Tests are required for volumes of less than 1 stroke a minute (of A or B).

WARNING

Exhaust air containing oil!

Risk of poisoning if inhaled.

- ▶ Provide compressed air free from oil and water.



Inputs / outputs and mixing ratio	Unit	for A-pump			
		EvoMotion 5-60	Puma 28-40	Puma 21-110	Puma 3-600
TwinControl air input	inch	G 1/2"			
Mixer product output	inch	NPS 1/4		NPS 3/8	
A/B mixing ratio volume		0.1:1–20:1		0.1:1 – 10:1	
Dosing precision *	%	± 2			

Inputs / outputs and mixing ratio	Unit	for A-pump							
		Leopard 35-70	Leopard 35-150	Leopard 48-110	Leopard 8-600	Protec 95-150	Protec 72-200	Protec 60-240	Protec 60-240 (270 bar)
TwinControl air input	inch	G 1/2"				G 1"			
Mixer product output	inch	NPS 1/4		NPS 3/8					
A/B mixing ratio volume		0.1:1–20:1			0.1:1–10:1				
Dosing precision *	%	± 2							

* The target mixing ratio at a precision level of $\pm 2\%$ is achieved after each completed cycle (injection of hardener into base lacquer).

A precision of 2% is achieved under the following conditions:

- Proper use of the system in compliance with the operating manuals.
- Correct calibration and function of volume measuring sensors in accordance with Chapter Calibrating the System [▶▶ 61].
- Correct adjustment of the compression ratio between the base lacquer and hardener in accordance with Chapter Spraying mode [▶▶ 83].
- Correct adjustment of the hardener dosing valve stroke, or use of the AIS.
- Exact setting of the system to suit the product used, in accordance with the processing specifications stipulated by the product manufacturer.
- For a homogenous density of the base lacquer and hardener it might be necessary to make respective preparations in tanks, for example by applying an agitator.
- Correct use of the system in accordance with the specific operating conditions such as the permitted product and ambient temperature, suitable viscosity and flow rate.
- Regular maintenance has to be carried out by a qualified person (e.g., WAGNER service technician) in accordance with Chapter Maintenance [▶▶ 100].

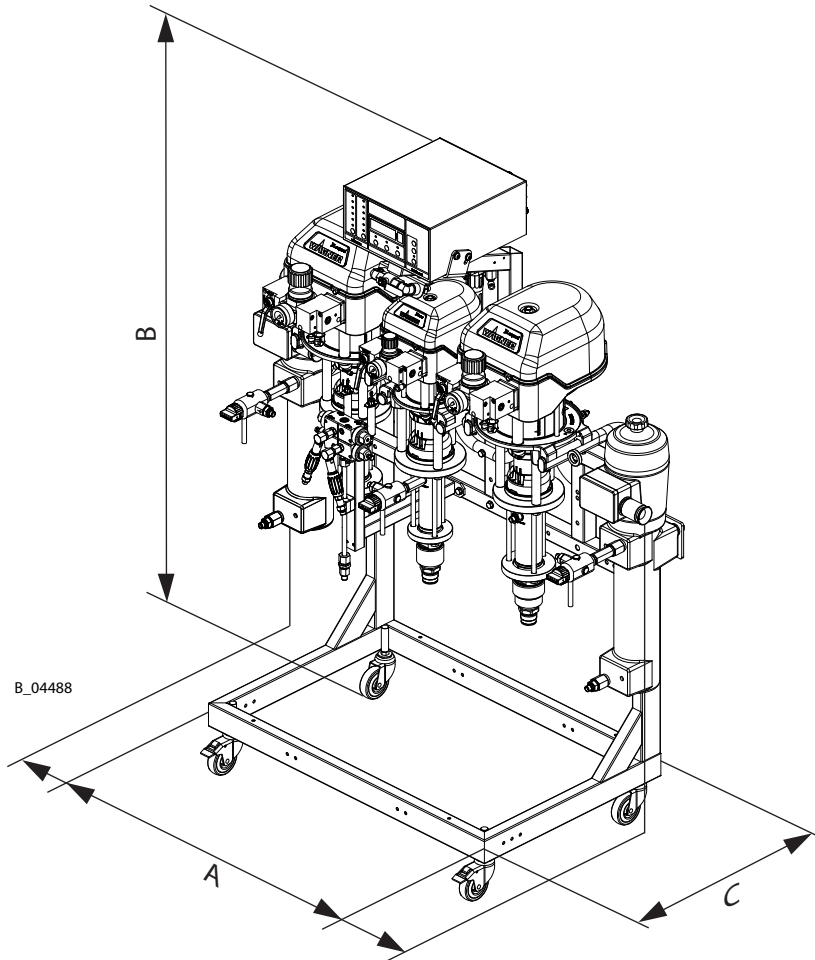
5.5.5 Pumps

EvoMotion / Wildcat / Puma	Unit	EvoMotion	Wildcat	Wildcat	Puma	Puma	Puma
		5-60	10-70	18-40	28-40	21-110	3-600
Pump ratio		5:1	10:1	18:1	28:1	21:1	3:1
Volume flow per double stroke (DH)	cm ³ ; cc	60	70	40	40	110	600
Maximum product pressure on mixer **	MPa	4.0		14.4	22.4	16.8	2.4
	bar	40		144	224	168	24
	psi	580		2089	3249	2436	348
Maximum product pressure at pump inlet	MPa	0.5		2.0		0.5	
	bar	5		20		5	
	psi	73		290		73	
Product input (outside thread)		M 36x2					G1½"
Pump product outlet (outside thread)	mm	/	M 24x1.5				
Pump product output (inside thread)	inch	G 3/8"		/			

EvoMotion / Wildcat / Puma	Unit	EvoMotion 5-60	Wildcat 10-70	Wildcat 18-40	Puma 28-40	Puma 21-110	Puma 3-600		
Pump air inlet diameter (inside thread)	inch	/	G 1/2"						
Pump air input diameter	mm; inch	8.0; 0.31	/						
Sound pressure level	See operating manuals for pumps and valves								
Leopard / Protec / (Jaguar) / Tiger	Unit	Leopard 35-70	Leopard 35-150	Leopard 48-110	Leopard 8-600	Protec 95-150	Protec 72-200	Protec 60-240	Protec 60-240 (270 bar)
Pump ratio		35:1	35:1	48:1	8:1	75:1	72:1	60:1	60:1
Volume flow per double stroke (DH)	cm ³ ; cc	70	150	110	600	150	200	240	240
Maximum product pressure on mixer **	MPa bar psi	25.0 250 3626	27.0 270 3916	38.0 380 5511	6.2 62 900	53 530 7687	53 530 7687	48 480 6962	27 270 3916
Maximum product pressure at pump inlet	MPa bar psi	2.0 20 290							
Product input (outside thread)		M 36x2			G1½"	/			
Product inlet (inside thread)		/			/	G1½"			
Pump product outlet (outside thread)	mm	M 24x1.5							
Pump air inlet diameter (inside thread)	inch	G 1/2"				G 1"			
Sound pressure level	See operating manuals for pumps and valves								

** All high-pressure components must be designed in line with the highest maximum pressure of the pumps used.

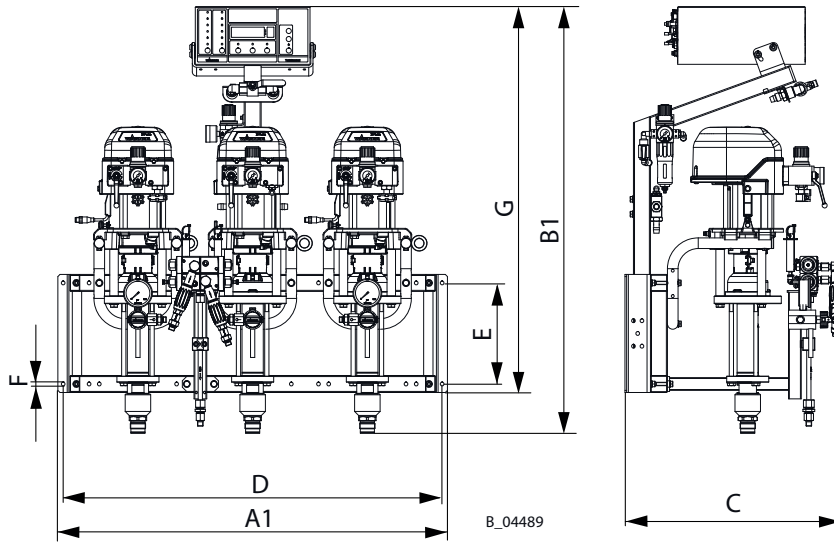
5.5.6 Dimensions



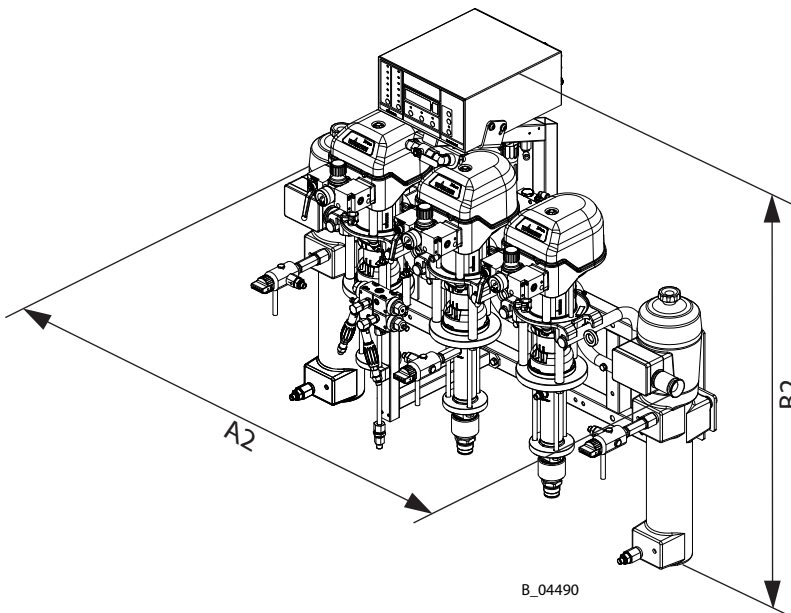
TwinControl on small frame		
Pumps	EvoMotion, Wildcat, Puma, Leopard	
	without heater	with heater A + B
	mm; inch	mm; inch
A	860; 33.9	1205; 47.5
B	1551; 61.1	
C	550; 21.7	

TwinControl on large frame		
Pump	Protec	
	without heater	with heater A + B
	mm; inch	mm; inch
A	1015; 40.0	1428; 56.2
B	1655; 65.2	
C	738; 29.1	

Without heater

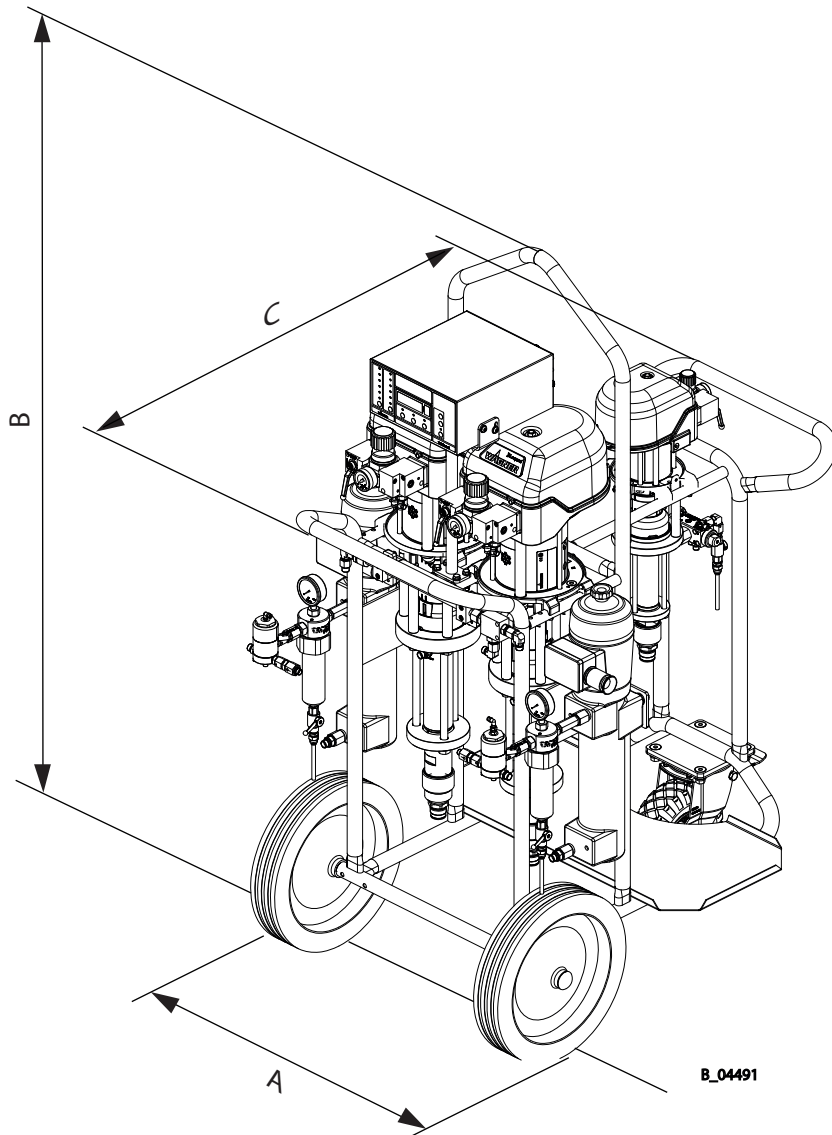


With heater



TwinControl on wall								
Type	5-60	28-40	21-110	3-600	35-70	35-150	48-110	8-600
	mm; inch							
A1	917; 36.1							
B1	1022; 40.2	1005; 39.6	1243; 48.9	1202; 47.3	1015; 40.0	1239; 48.8	1183; 46.6	1197; 47.1
C	512; 20.2							
D	892; 35.1							
E	238; 9.4							
F	9; 0.35							
G	909; 35.8							

TwinControl on wall								
Type	5-60	28-40	21-110	3-600	35-70	35-150	48-110	8-600
with heater								
A2	1210; 47.6							
B2	1114; 43.9	1243; 48.9	1202; 47.3	1114; 43.9	1239; 48.8	1183; 46.6	1197; 47.1	



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TwinControl on small trolley		
Pumps	Wildcat, Puma, Leopard	
	without heater	with heater A + B
	mm; inch	mm; inch
A	820; 32.3	899; 35.4
B	1787; 70.4	
C	1225; 48.2	1243; 48.9

TwinControl on large trolley		
Pumps	Protec	
	without heater	with heater A + B
	mm; inch	mm; inch
A	1035; 40.8	
B	1845; 72.6	
C	1314; 51.7	1377; 54.2

5.5.7 Weights

Sample configurations		Weight			
Suspension	Pumps	Turbine		Cable	
		kg	lb	kg	lb
Frame	3x EvoMotion 5-60	87	192	86	190
Wall	3x EvoMotion 5-60	76	168	75	165
Frame	3x Puma 28-40	95	209	94	207
Frame	2x Leopard 35-70, 1x Puma 28-40	113	249	112	247
Frame	2x Leopard 48-110, 1x Puma 28-40	142	313	141	311
Trolley	2x Leopard 48-110, 1x Puma 28-40	159	351	158	349
Frame	2x Protec 95-150, 1x Leopard 35-70	198	437	197	434
Trolley	2x Protec 95-150, 1x Leopard 35-70	224	494	223	492
Frame	1x Protec 60-240, 1x Protec 95-150, 1x Leopard 35-70	235	518	234	516
Frame	2x Protec 60-240, 1x Leopard 35-70	264	582	263	580

5.6 OVERVIEW OF TWINCONTROL CONTROLLERS

	Controller							
	1	2	3	6	8	9	10	
A-pump = 5-60, 10-70, 28-40, 21-110, 35-70, 35-150	×	×	×	×	×	×	×	
A-pump = 48-110, 95-150, 26-200, 72-200, 3-600, 60-240, 8-600		×	×	×	×			
Circulation A, B			×	×	×			
Circulation soft			×	×	×			
GFB (gun flush box)	(*)	(*)	×		×	(*)	(*)	
AIS				×	×	×	×	
Flushing B		×	×	×	×			
External mixer			×	×		×		
Automatic electrostatic system	(**)	(**)	(**)			(**)	(**)	
Air flushing	×						×	
Product pressure regulator (low-pressure)	×	×	×	×	×	×	×	
External horn	×	×	×	×	×	×	×	
External release	×	×	×	×	×	×	×	

(*) GFB connection kit must be installed, order no. 2302563

(**) Automatic electrostatic system must be installed, order no. 2334530

5.7 PRINCIPLE DIAGRAM

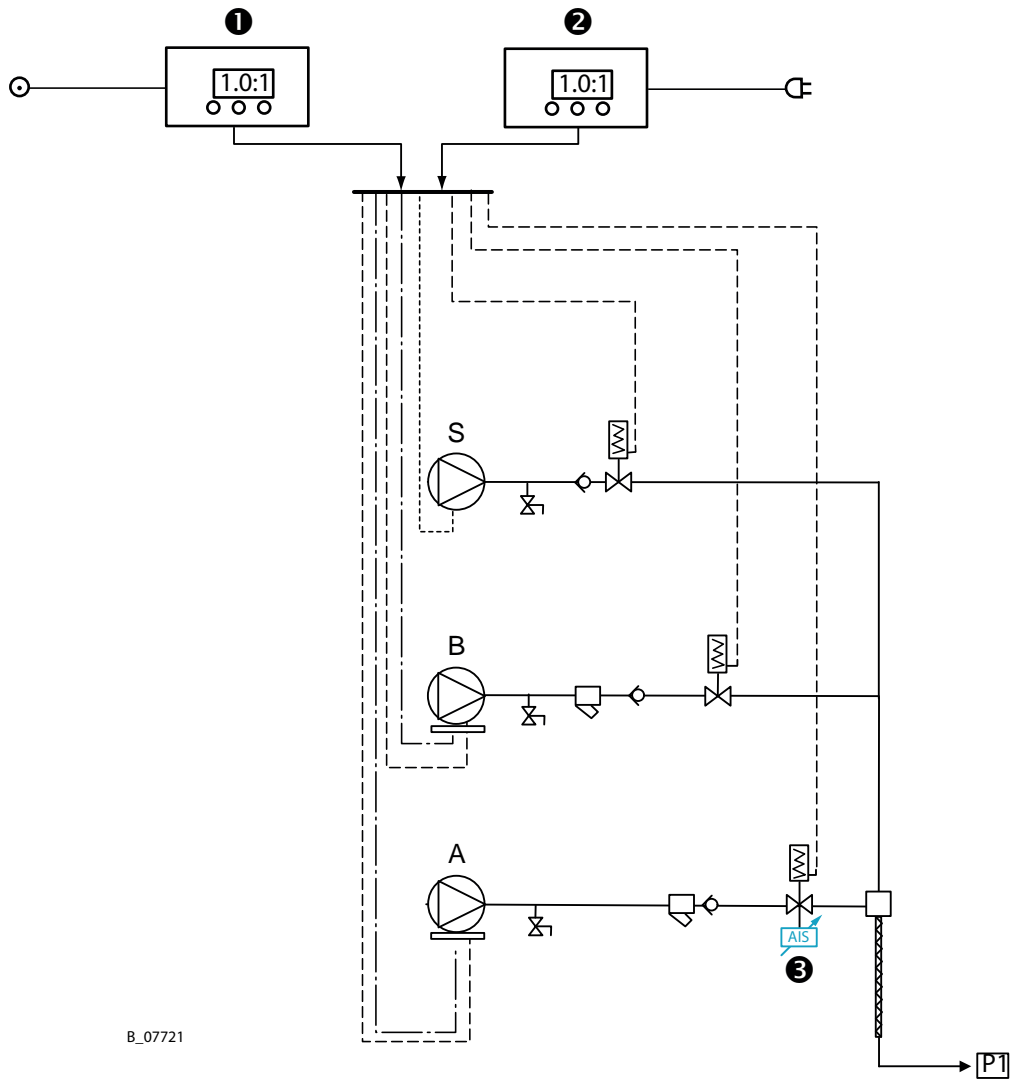
5.7.1 Controller 1 / 9 / 10 for Pumps 5-60 to 35-150

Use with A-pumps 5-60, 10-70, 28-40, 21-110, 35-70, 35-150 with single-acting product valves with spring reset.

Controllers 1 / 9 / 10 for turbine: The turbine generates the current from compressed air.

Controller 1 for cable: Controller with electrical mains connection.

For differences in controllers 1, 9 and 10: see Chapter 5.6



1	TwinControl controllers 1 / 9 / 10 turbine	2	TwinControl controller 1 cable
1	AIS only with controller 9 or 10		

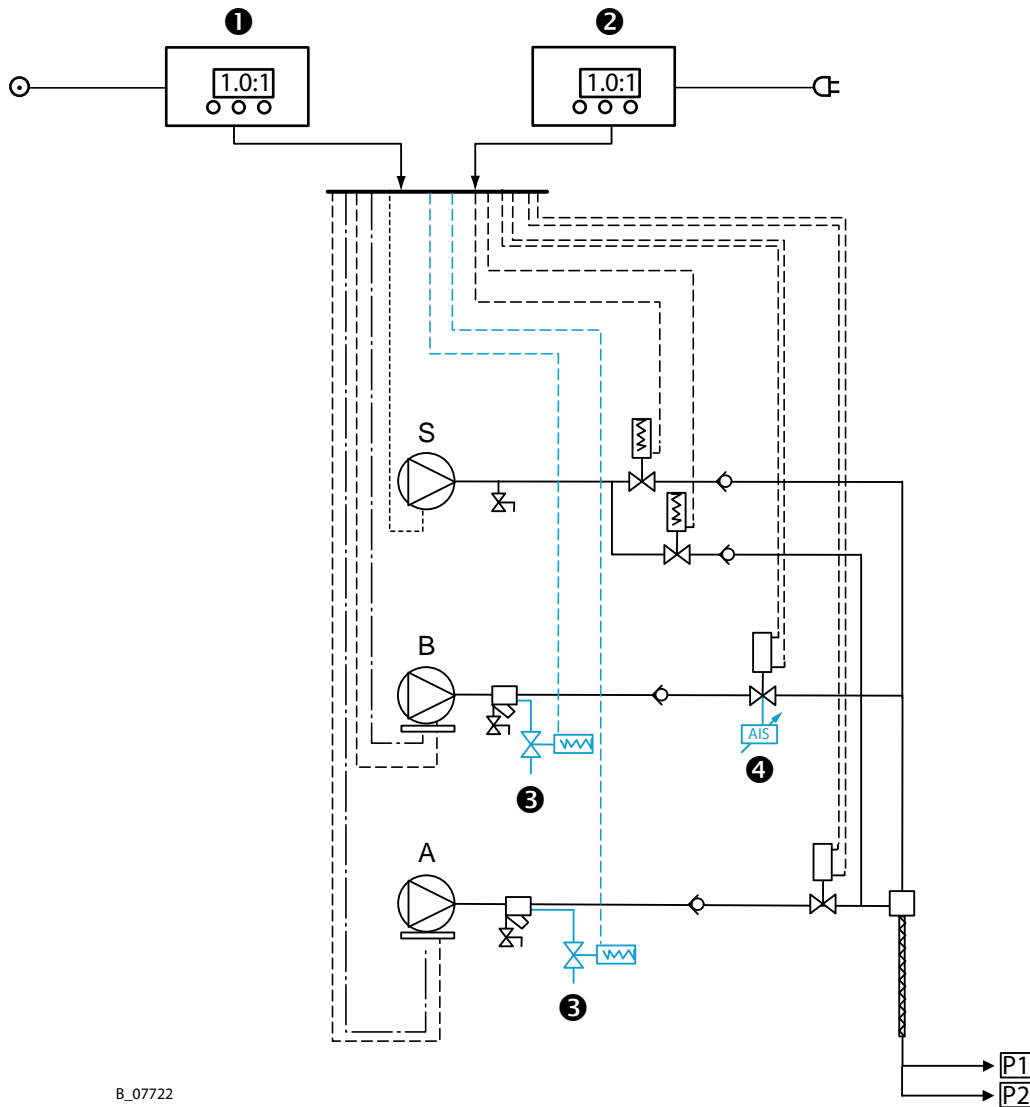
5.7.2 Controllers 2 / 3 / 6 / 8 for Pumps 48-110 to 8-600

Use with A-pumps 48-110, 95-150, 26-200, 72-200, 60-240, 3-600, 8-600 with double-acting product valves.

Controllers 2 / 3 / 6 / 8 for turbine: The turbine generates the current from compressed air.

Controllers 2 / 3 for cable: Controller with electrical mains connection.

For differences in controllers 2, 3, 6 and 8: see Chapter 5.6



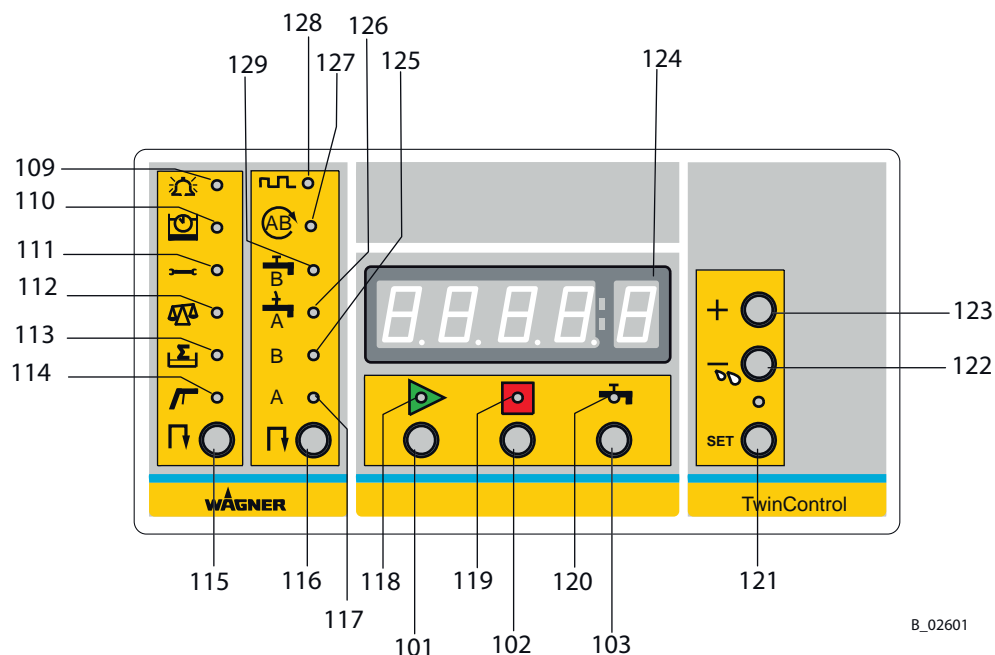
B_07722

1	TwinControl controllers 2 / 3 / 6 / 8 turbine	2	TwinControl controllers 2 / 3 cable
3	Soft circulation only with controller 3, 6 or 8	4	AIS only with controller 6 or 8

5.8 OPERATING ELEMENTS AND CONTROL UNIT CONNECTIONS

Front side

The front side of the TwinControl control unit is the same on all 6 device variants.

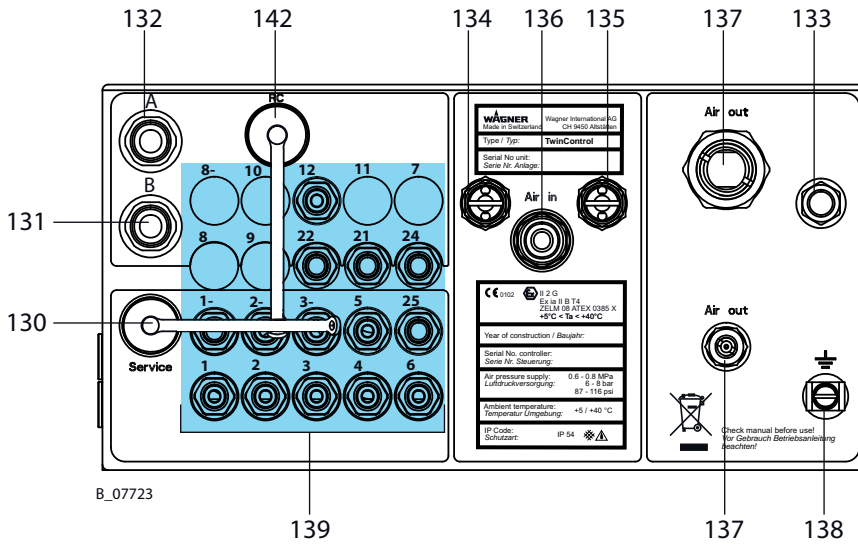


B_02601

101	Push button [Start]	102	Push button [Stop]
103	Push button [Flush AB]	109	Alarm illuminated display
110	Pot life illuminated display	111	Service functions illuminated display
112	Calibration illuminated display	113	Totals illuminated display
114	Work illuminated display	115	Push button [Main menu selection]
116	Push button [Sub-menu selection]	117	A-component illuminated display
118	Start illuminated display	119	Alarm illuminated display
120	Flush AB illuminated display	121	Push button [SET]
122	a) Push button [-] b) push button [Check for leaks]	123	Push button [+]
124	Display in the display unit	125	B-component illuminated display
126	Flushing agent A illuminated display	127	Circulation mode illuminated display (option)
128	B-valve cycle LED	129	Flushing agent B illuminated display

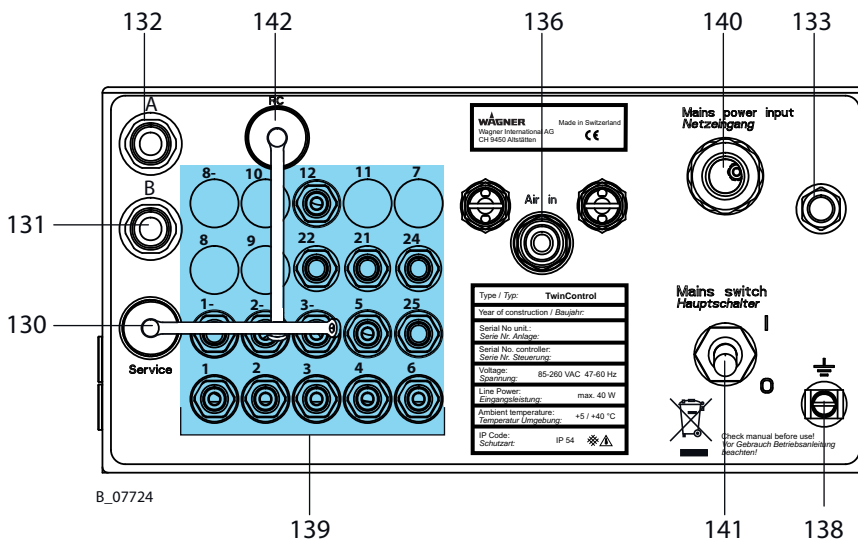
Basic operating principles: see Chapter 7.3

Rear wall TwinControl control unit with turbine



! NOTICE
Item 130 may only be used when no explosive atmosphere is present.

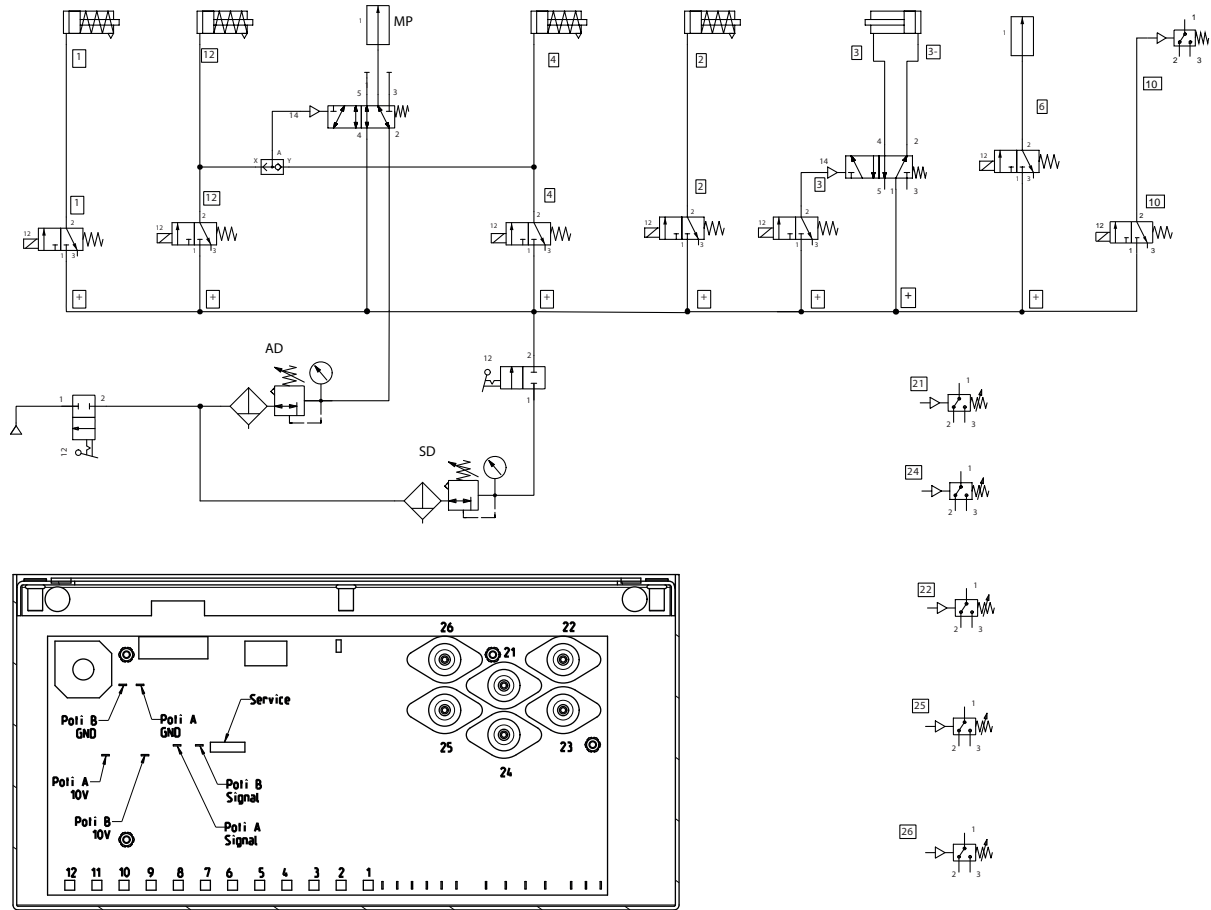
Rear wall TwinControl control unit with cable connection



130	Connection socket Service / TwinData	131	Connection for stroke measurement B / sensor B
132	Connection for stroke measurement A / sensor A	133	Silencer
134	Pressure relief valve 1 turbine	135	Pressure relief valve 2 turbine
136	Air input	137	Air output – Exhaust air
138	Grounding connection	139	Connections for control air ▶ For connection numbers, see pneumatic diagram (Chapter 5.9)
140	Mains cable	141	Main switch
142	Remote control connection		

5.9 PNEUMATIC DIAGRAM

5.9.1 TwinControl 1



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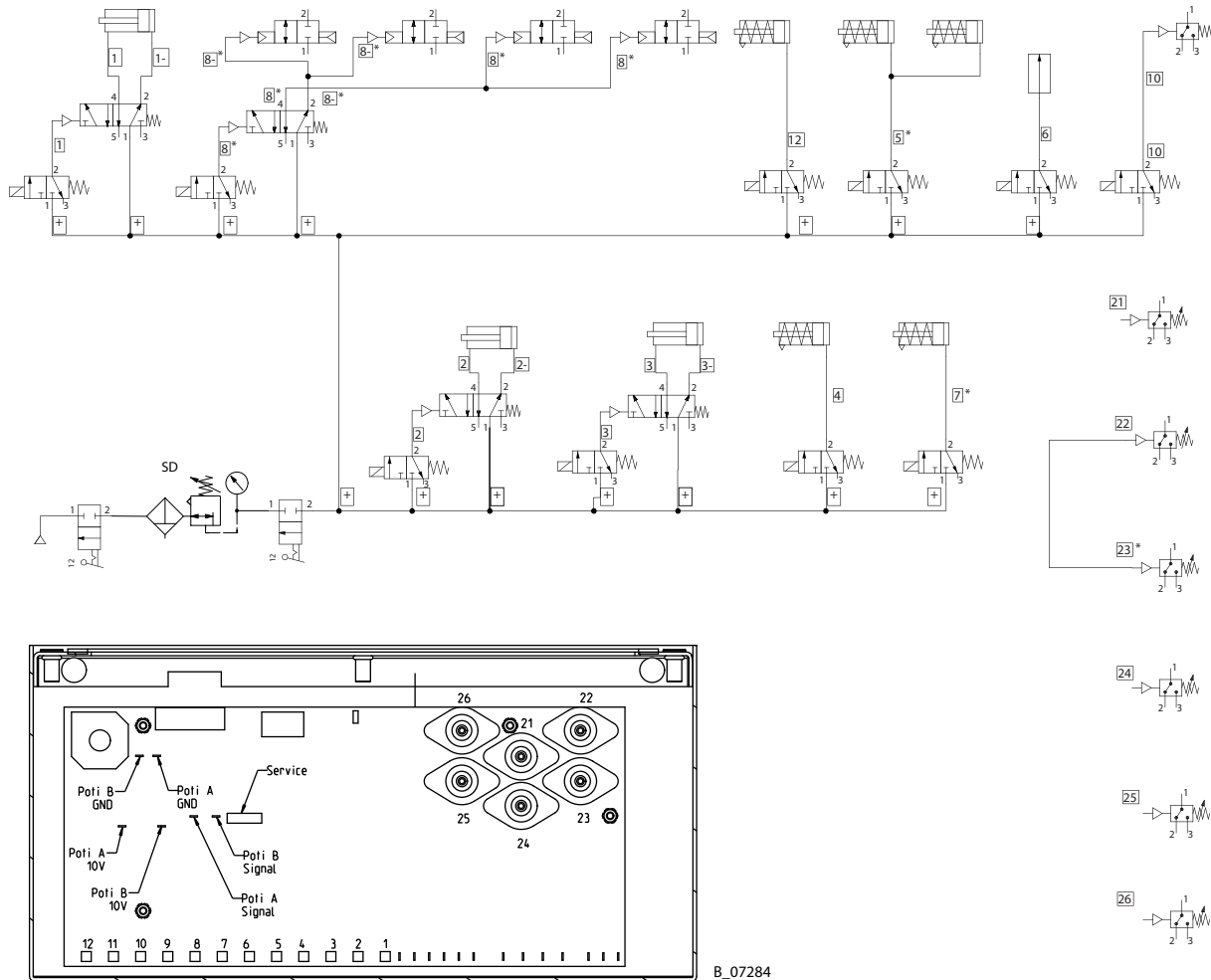
Connection numbers for control unit 1 (at rear)

Pos	Designation
1	Product valve A
2	Hardener valve B
3	Gun flush box (option)
4	Flushing valve air
6	External horn
10	Automatic electrostatic system (option)
12	Flushing
21	Changeover signal – pump A
22	Changeover signal – flushing pump
24	Changeover signal – pump B
25	External release

Further designations

Pos	Designation
+	Air supply
26	System compressed air monitoring
AD	Air regulator for operating pressure
SD	Control air pressure 0.6–0.8 MPa; 6–8 bar; 87–116 psi
MP	Product pressure regulator, pneumatic

5.9.2 TwinControl 2 / TwinControl 3



Connection numbers for control units 2/3 at rear

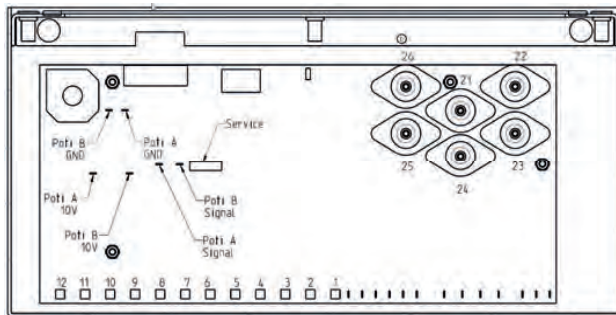
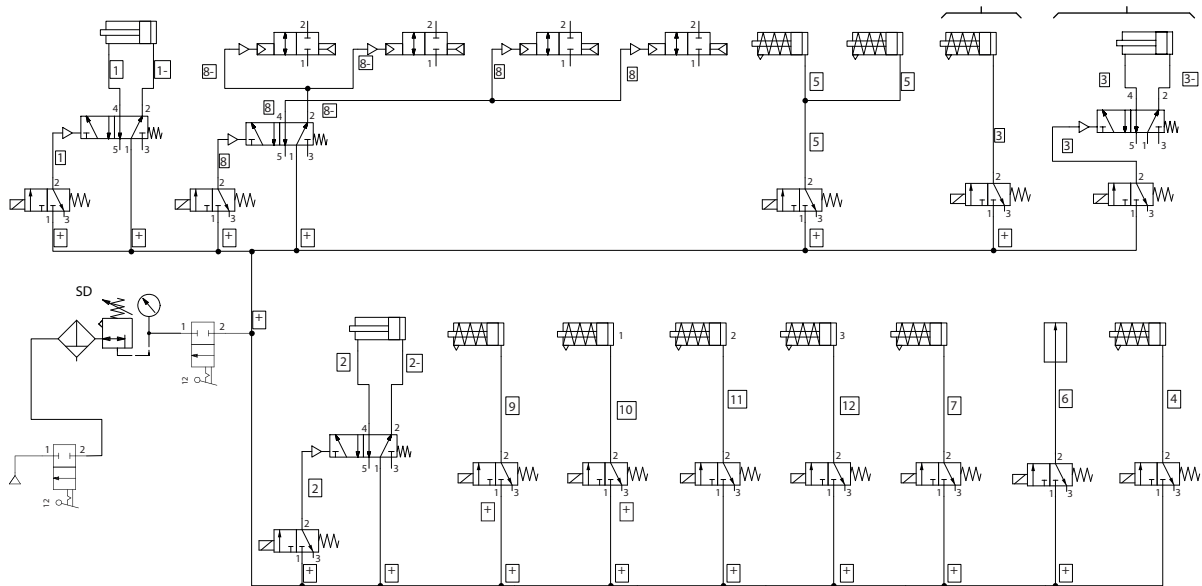
Pos	Designation
1	Product valve A
2	Hardener valve B
3 *	Gun flush box
4	Flushing BS
5 *	Circulation valve A, B
6	External horn
7 *	Hardener valve, external mixer

Pos	Designation
8 *	Air motor for spraying / air motor for soft circulation A+B
10	Automatic electrostatic system (option)
12	Flushing AS
21	Changeover signal – pump A
22	Changeover signal – flushing pump A
23	Changeover signal – flushing pump B
24	Changeover signal – pump B
25	External release

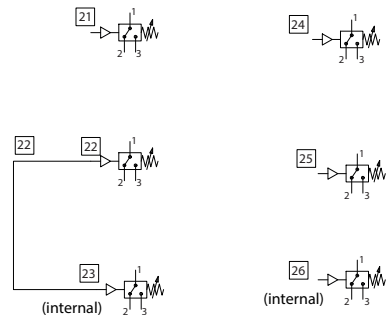
Further designations

Pos	Designation
+	Air supply
26	System compressed air monitoring
SD	Control air pressure 0.6–0.8 MPa; 6–8 bar; 87–116 psi

5.9.3 TwinControl 6 / TwinControl 8



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Connection numbers for control units 6/8 at rear

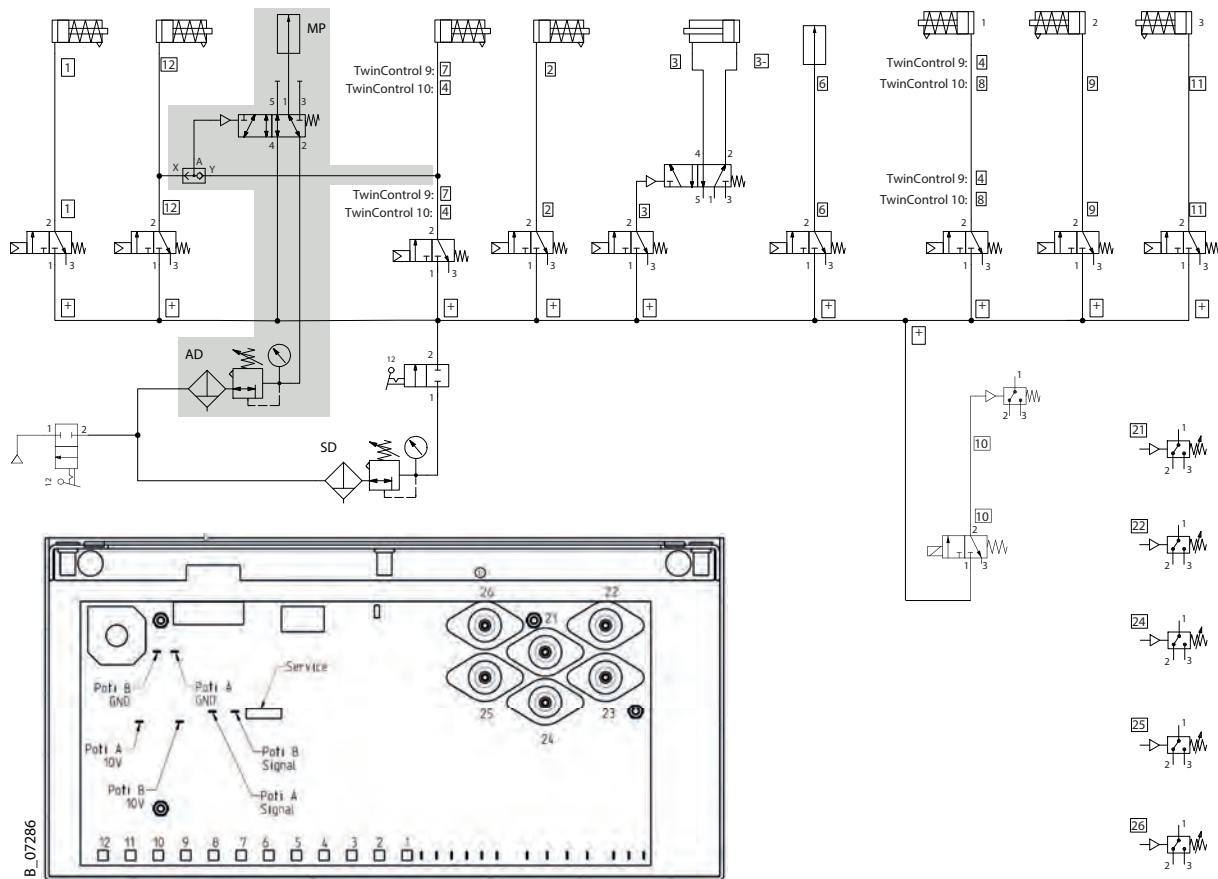
Pos	Designation
1	Product valve A
2	Hardener valve B
3	TwinControl 6: AS flushing TwinControl 8: gun flush box
4	Flushing BS
5	Circulation valve A, B
6	External horn
7	TwinControl 6 external mixer hardener valve TwinControl 8: AS flushing
8	Air motor for spraying / air motor for soft circulation A+B
9	AIS / control valve B (for AIS assembly on large valves)
10	AIS / stepping motor B Z1
11	AIS / stepping motor B Z2
12	AIS / stepping motor B Z3
21	Changeover signal – pump A
22	Changeover signal – flushing pump A
23	Changeover signal – flushing pump B
24	Changeover signal – pump B
25	External release

Further designations

Pos	Designation
+	Air supply
26	System compressed air monitoring
SD	Control air pressure 0.6–0.8 MPa; 6–8 bar; 87–116 psi

5.9.4 TwinControl 9 / TwinControl 10

From software version 4.2x



Connection numbers for control units 9/10 at rear

Pos	Designation
1	Product valve A
2	Hardener valve B
3	Gun flush box (option)
4	TwinControl 9: stepping motor B Z1 TwinControl 10: air flushing
6	External horn
7	TwinControl 9: external mixer hardener valve TwinControl 10: --
8	TwinControl 9: -- TwinControl 10: stepper motor B Z1
9	Stepping motor B Z2
10	Automatic electrostatic system (option)
11	Stepping motor B Z3
12	Flushing AS
21	Changeover signal – pump A
22	Changeover signal – flushing pump
24	Changeover signal – pump B
25	External release

Further designations

Pos	Designation
+	Air supply
26	System compressed air monitoring
AD	Air regulator for operating pressure
SD	Control air pressure 0.6–0.8 MPa; 6–8 bar; 87–116 psi
MP	TwinControl 10: Product pressure regulator, pneumatic

5.10 LIST OF SERVICE FUNCTIONS

Software version V 4.0x / 4.1x / 4.2x

Pos	Unit	Description	
-----	------	-------------	--

Filling

AB	cc	Mixed product in the hose	Adjustable
A	cc	Volume A product from product valve to mixing block	Adjustable
B	cc	Volume B product from product valve to mixing block	Adjustable

Flushing recipes

F1 to F20	1 or 2	Definition (0=not used; 1=A product; 2=B product)	Adjustable
F20	0-9999.9	Quantity	Adjustable
	cc/sec	Measuring unit (0=cc; 1=sec)	Adjustable
F31	3-20	Starting step for repetition	Adjustable
F32	3-20	Final step for repetition	Adjustable
F33	0-200	Number of repetitions	Adjustable

System parameter

P0	cc	Q Control	Adjustable
P1	cc	Actual value for Q Control	Display
P2	%	Mixing tolerance	Adjustable
P3	%	Actual value for mixing tolerance	Display
P4	ADC	Actual value for position of stroke sensor A	Display
P5	ADC	Actual value for position of stroke sensor B	Display
P6	min-1	Turbine frequency in revolutions per min (set value 38000 to 45000)	Display
P7		Pot life reset	
P100	0 or 1	Password (0 = no, 1 = yes) for level 1	Adjustable
P101		Current software version	Display
P102	DH/min	Running dry protection, pump A	Adjustable
P103	DH/min	Running dry protection, pump B	Adjustable
P104	DH/min	Max. number of double strokes – pump A where not hidden	Adjustable
P105	DH/min	Max. number of double strokes – pump B where not hidden	Adjustable
P106	min	Pot life post-alarm	Adjustable
P107	% of stroke	Tolerance limit A for reversal point	Adjustable
P108	ADC	Actual value reversal point stroke sensor A below	Adjustable
P109	ADC	Actual value reversal point stroke sensor A above	Adjustable

P110	% of stroke	Tolerance limit B for reversal point	Adjustable
P111	ADC	Actual value reversal point stroke sensor B below	Adjustable
P112	ADC	Actual value reversal point stroke sensor B above	Adjustable
P113	0, 1, 2, 3	Measuring unit (0 = liters, 1 = US gallons, 2 = British gallons, 3 = Conversion factor, adjustable)	Adjustable
P114	0 or 1	Gun flush box (0 = no, 1 = yes)	Adjustable
P115	0 or 1	Manual leak inspection (0 = no, 1 = yes)	Adjustable
P116	mm/min	Leak warning limit A	Adjustable
P117	mm/min	Leak error limit A	Adjustable
P118	mm/min	Leak warning limit B	Adjustable
P119	mm/min	Leak error limit B	Adjustable
P120	0-6	Front display in mixing mode and/or if gun is closed: 0 = mixing ratio (MR); 1 = flow rate or pot life (F_P); 2 = job sum (JS); 3 = MR and F_P alternating; 4 = MR and JS alternating; 5 = F_P and JS alternating; 6 = MR and F_P and JS alternating.	Adjustable
P121	0-6	Front display if [Stop] has been pressed: 0 = mixing ratio (MR); 1 = Pot life (P) only; 2 = Job sum (JS); 3 = MR and P alternating; 4 = MR and JS alternating; 5 = P and JS alternating; 6 = MR and P and JS alternating.	Adjustable
P122	0 or 1	Filling function with cycles of A (0 = off, 1 = on)	Adjustable
P123	sec	0.0–10.0s cycle duration of filling function	Adjustable
P124	%	0-100% of the cycle duration A-valve should be open	Adjustable
P125	%	For 0-100% of the filling quantity, filling function should be on	Adjustable
P126	0 or 1	Feed sequence (0 = AB, 1 = BA)	Adjustable
P127	0-9999	Password for level 1	Adjustable
P128	0-9999	Password for level 2	Adjustable
P129	0-9999	Password for level 3	Adjustable
P130	0-9999	Password for level 4	Adjustable
P131	min	Time delay for alarm no. 18 flush program is not running (110 min)	Adjustable
P132	1, 2, 3	1 = Save customer settings; 2 = Load customer settings; 3 = Load factory settings (only displayed in stop mode)	Adjustable
P133	0-999 DH/min	Maximum double strokes of flushing pump A per min.	Adjustable
P134	0-999 DH/min	Maximum double strokes of flushing pump B per min.	Adjustable
P135	0-99999	Number of A-cycles* 1000 for service message	Adjustable
P136	0-99999	Number of B-valve cycles* 1000 for service message	Adjustable
P137	0 or 1	0 = batch mode off; 1 = batch mode on	Adjustable
P138	0 or 1	Batch mode start via external signal (0 off, 1 = on)	Adjustable
P139	0 or 1	0 = normal start, 1 = If start is pressed for more than 2 sec, separate filling of A and B will not be undertaken.	Adjustable
P140	0 or 1	0 = emergency flushing off; 1 = emergency flushing on	Adjustable
P141	0 or 1	0 = No flushing after error message; 1 = Flushing after Error message	Adjustable
P142	0 or 1	= Password for mixing ratio and batch mode quantity; = No password for MR and batch mode quantity	Adjustable

P143	0 or 1	0 = flow monitoring off; 1 = flow monitoring on	Adjustable
P144	0-99999 cc/min	Minimum flow	Adjustable
P145	0-99999 cc/min	Maximum flow	Adjustable
P146	0.0-20.0 s	Delay time until alarm if flow is outside of limits.	Adjustable
P147	0 or 1	Calibration of the components A and B with predefined quantity	Adjustable
P148	0-99999 cc/min	Calibration quantity for component A	Adjustable
P149	0-99999 cc/min	Calibration quantity for component B	Adjustable
P150	0, 1, 2	= No calibration in mixing mode. = Calibration in mixing mode (A-valve is in mixing block and is not opened). = Calibration in mixing mode (A-valve is not in mixing block and is opened).	Adjustable
P151	0 or 1	Calibration in mixing mode with predefined quantity	Adjustable
P152	0 or 1	Start calibration in mixing mode with predefined quantity via external signal (0 = off, 1 = on)	Adjustable
P153	0-99999 cc/min	Calibration quantity for calibration in mixing mode	Adjustable
P154	0, 1, 2, 3	0 = no circulation, 1 = soft circulation, 2 = circulation at operating pressure	Adjustable
P155	0.1	Circulation A = Product valve A remains closed during during circulation. = Product valve A opens during circulation.	Adjustable
P156	0.1	Circulation B = Product valve B remains closed during during circulation. = Product valve B opens during circulation.	Adjustable

Totals

P200	Liters	Total A not zero adjustable	Display
P201	Liters	Total A not zero adjustable x * 100000 liters	Display
P202	Liters	Total B not zero adjustable	Display
P203	Liters	Total B not zero adjustable x * 100000 liters	Display
P204	Liters	Total for flushing A not zero adjustable	Display
P205	Liters	Total for flushing B not zero adjustable	Display
P206	Cycles	Number of A cycles zero adjustable	Display
P207	Cycles	Number of A cycles * 100000 zero adjustable	Display
P208	Cycles	Number of A valve cycles not zero adjustable	Display
P209	Cycles	Number of A cycles * 100000 not zero adjustable	Display
P210	Cycles	Number of B valve cycles zero adjustable	Display
P211	Cycles	Number of B cycles * 100000 zero adjustable	Display
P212	Cycles	Number of B valve cycles not zero adjustable	Display
P213	Cycles	Number of B cycles * 100000 not zero adjustable	Display

AIS

P300	Cycles	Number of dosing valve cycles after the AIS has performed a calculation (3–100)	Adjustable
P301	%	AIS warning limit (opening time of the dosing valve in percent)	Adjustable
P302	%	AIS lower limit (opening time of the dosing valve in percent)	Adjustable
P303	%	AIS upper limit (opening time of the dosing valve in percent)	Adjustable
P304	sec	Valve > open, AIS open	Adjustable
P305	sec	Repetition interval AIS open (for P304)	Adjustable
P306	Steps	AIS open at stop	Adjustable
P307	cc/min	AIS min flow	Adjustable
P308	%	Current opening time of the dosing valve in percent	Display
P309	Steps	Current AIS position. Start value = 1000	Display

5.11 DRY RUNNING PROTECTION

In the event of hose rupture on the high-pressure side or idle running, due to lack of product, the pump runs too quickly. The system automatically closes the product valves and issues a fault message.

Prevention

1. Perform daily maintenance work as stated in Chapter Maintenance [▶▶ 100]
2. Ensure a sufficient product supply at all times.
3. In the case of unforeseen occurrences, immediately perform emergency stop in accordance with Chapter Emergency Deactivation [▶▶ 80].

5.12 HEATER (OPTION)

The electric, continuous-flow heater with explosion protection is downstream of the pump. The coating product can only be heated to maximum 80 °C. The continuous-flow heater is fitted with a temperature limiter.

The temperature is set using the temperature regulator. The coating product temperature can be read off the thermometer on the coating product output.

- ▶ For description, see heater operating manual.

5.13 AIS DOSING SYSTEM (OPTION)

The hardener dosing valve's stroke is regulated automatically via the AIS (option). The AIS (Adaptive Injection System) dosing system optimizes injection amounts and cycles and adapts these continually to the changing flow rates. Thereby, the AIS ensures optimum dosing and constant coating quality.

Prerequisite: control unit 6, 8, 9 or 10.

AIS sets including conversion for control units 1 / 2 see Chapter AIS [▶▶ 121].

5.14 AUTOMATIC ELECTROSTATIC SYSTEM FOR GM5000 ELECTROSTATIC GUN (OPTION)

The TC VM 5000 automatic electrostatic system serves as an additional safety device for the safe use of the TwinControl 2K system with a GM 5000 electrostatic gun.

However, the user has a duty to proceed in compliance with the instructions in Chapter Automatic Electrostatic System Set for Electrostatic Gun GM 5000 (Option) [▶▶ 89].

The automatic electrostatic system transmits the approval signal from a TwinControl system (as of version 4.03) to a VM 5000 control unit. If the electrostatic system for the gun may be switched on (after filling), the TwinControl system transmits the pneumatic approval signal to the pressure switch. The pressure switch switches at a set pressure of, for instance, 2 bar. The pressure switch is connected to the VM 5000 control unit via the interface cable. The remote control function must be adjusted in the VM 5000.

Control for the automatic electrostatic system: For installation possibilities in TwinControl control units, see Chapter Overview of TwinControl Controllers [▶▶ 34].

5.15 CONNECTION KIT FOR GUN FLUSH BOX (OPTION)

The GFB connection kit is used as a link between the TwinControl system and a gun flush box. The installed connection kit records the following test functions:

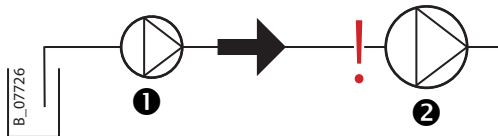
1. is a gun used in the gun flush box,
2. is the GFB lid closed,
3. is the gun in the gun flush box for flushing open.

The GFB connection kit is included in the control units 3 and 8. For installation possibilities in other control units, see Chapter Overview of TwinControl Controllers [▶▶ 34].

5.16 FEED PUMP (OPTION)

A feed pump can be used with high-viscosity products or longer feed lines.

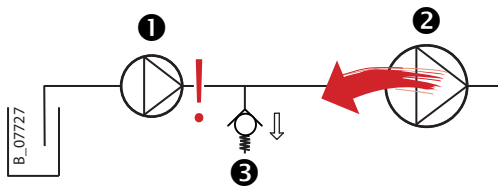
Dimensioning of the feed pump



1	Feed pump	2	Main pump
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1. The piston pumps pump the working product to the product output with up and down strokes but only draw in new product on the up stroke. The feed pump therefore has to pump twice the volumetric flow.
2. The maximum product pressure at the pump inlet of the TwinControl pump must not be exceeded.

Protection of feed pump

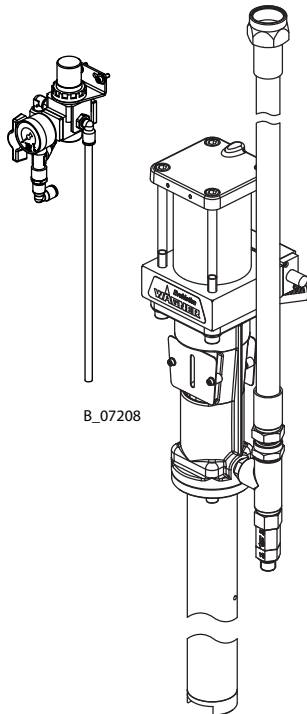


1	Feed pump	2	Main pump
3	Pressure relief valve		

1. If the maximum pressure of the feed pump is lower than that of the main pump, the maximum pressure could be exceeded if the main pump malfunctions. The feed pump and connection line must therefore be protected from excessive overpressure. To do so, an overpressure valve must be installed between the feed pump and main pump. During installation, note that the flow direction is from the feed pump to the main pump.

- The pressure-relief valve must be cleaned regularly and after each activation: Flush with solvent.

5.16.1 EvoMotion 5-125 feed pump



Use with Protective Coating systems with pumps 95-150, 72-200. With these pumps, the maximum product pressure at the pump inlet is 2 MPa; 20 bar; 290 psi. With a pump ratio of 5:1, the feed pump's input air pressure must be limited to 0.4 MPa; 4 bar; 58 psi.

EvoMotion 5-125	Unit	Values
Pump ratio		5:1
Volume flow per double stroke (DH)	cm ³ ; cc	125
Maximum possible strokes in operation	DH/min	60
Input air pressure*	MPa; bar; psi	0.2–0.8; 2–8; 28–116
Maximum operating overpressure*	MPa; bar; psi	4; 40; 581

* Observe the information below:

⚠ NOTICE

Maximum product pressure at pump inlet

Damage to pump and seals.

- ▶ Operate feed pump 5-125 at maximum 0.4 MPa; 4 bar; 58 psi air pressure.

5.17 MAINTENANCE WORK ON THE PUMPS

⚠ NOTICE

Hardened working product in the spraying system!

Destruction of the spraying system.

- ▶ Ensure that no mixed product is in the system during maintenance work.

For maintenance work on the pumps, proceed as follows:

1. Flush and clean the system. Chapter Cleaning the system [▶▶ 99]
2. Close and secure spray guns.
3. Consecutively for each pump.
 - Switch off the compressed air supply (close ball valve).
 - TwinControl control unit: Select [Work] in the main menu. Select the respective component (e. g. [A]) in the sub-menu and press [Start].
 - Relieve the respective pump of pressure in accordance with pump's operating manual.
 - Carry out desired work in accordance with pump's operating manual.
 - Relieve the pump of pressure in accordance with pump's operating manual.
 - TwinControl control unit: [Stop]
 - TwinControl control unit: [Flush]
4. Close and secure spray guns.

6 ASSEMBLY AND COMMISSIONING

6.1 TRAINING OF ASSEMBLY/COMMISSIONING PERSONNEL

1. The assembly and commissioning personnel must have the technical skills to safely commission the device.
2. When assembling, commissioning and carrying out all work, read and follow the operating manuals and safety regulations for the additionally required system components.

A skilled person must check to ensure that the device is in a reliable state after it is assembled and commissioned.

6.2 STORAGE AND INSTALLATION CONDITIONS

Until the point of assembly, the device must be stored in a dry location, free from vibrations and with a minimum of dust. The device must be stored in closed rooms.

For ambient temperature and air humidity, see Chapter Entire System [▶▶ 28].

Long-term Storage

- ▶ See Chapter Long-term Storage [▶▶ 100].

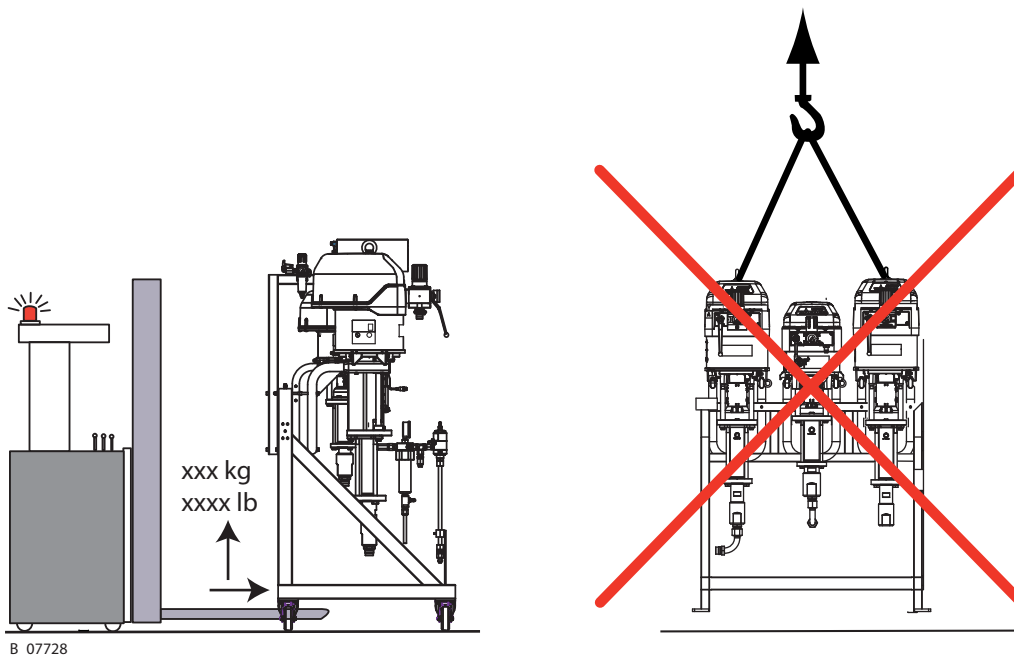
6.3 TRANSPORTATION

The complete system can be safely transported in a wooden crate.

The dimensions of the transport crate can be defined with the aid of the information on device dimensions in Chapter Dimensions [▶▶ 31]. Weights for sample configurations can be found in Chapter Weights [▶▶ 34].

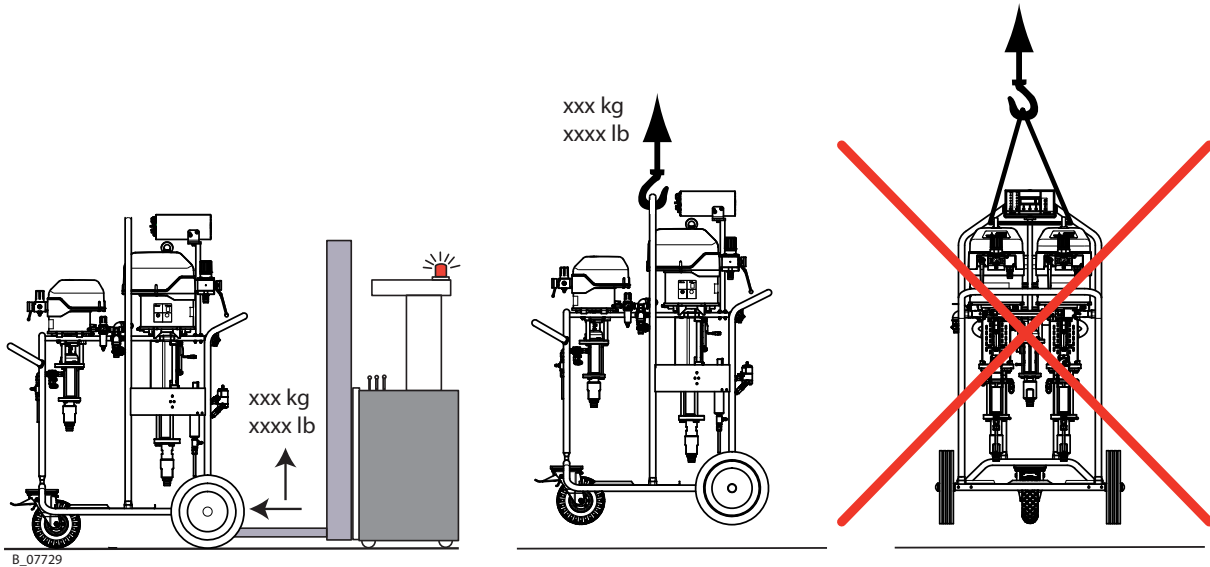
- ▶ When lifting the system, always make sure that it remains balanced.

Devices mounted on frame



B_07728

Device mounted on trolley



B_07729

WARNING

Inclined ground!

Risk of accidents if the device rolls away/falls.

- ▶ Place the device on horizontal floor.
- ▶ The rollers should be fixed or replaced by leveling feet and secured.
- ▶ Do not tilt the device when pushing/during transport.



6.4 ASSEMBLY AND INSTALLATION

The system is installed and commissioned by the WAGNER service department or by an expert representative. When removing from the packaging, check the system parts for possible transport damage.

⚠ WARNING

Danger of electric shock inside the control unit!

Danger to life from electric shock.

- ▶ May only be installed/maintained by skilled electricians or under their supervision.
- ▶ Operation according to the safety regulations, fire protection and electrotechnical rules.
- ▶ Must be de-energized before work is commenced on active parts.



⚠ WARNING

Toxic and/or flammable vapor mixtures!

Risk of poisoning and burns.

- ▶ Operate the device in a spray booth approved for the working materials.
Or:
- ▶ Operate the device on an appropriate spraying wall with the ventilation (extraction) switched on.
- ▶ Observe national and local regulations for the exhaust air speed.



6.4.1 Pneumatic connections

- ▶ Check whether the line pressure is sufficient. It must be between 0.6–0.8 MPa; 6–8 bar; 87–116 psi.

⚠ WARNING

Overpressure!

Risk of injury from bursting components.

- ▶ The operating pressure must not exceed the value shown on the type plate.
- ▶ Check whether efficient filter systems and condensate precipitators are available in the air line.
- ▶ The compressed air must be free of oil and water. Quality standard 7.5.4 according to ISO 8573.1, 2010 must be observed:
 - ⇒ 7: Particle concentration 5 – 10 mg/m³
 - ⇒ 5: Humidity: pressure dew point ≤ +7 °C
 - ⇒ 4: Oil content ≤ 5 mg/m³
- ▶ Every day, discharge all impurities and the condensate (if any) accumulated in the system air filter.



⚠ WARNING

Brittle pressure regulator with filter!

The tank on the pressure regulator with filter becomes brittle through contact with solvents and can burst. Flying parts can cause injury.

- ▶ Do not clean the tank on the pressure regulator with filter using solvent.



6.4.2 Product connections

- ▶ Fit suction systems in accordance with operating manuals for pumps.
- ▶ Connect high-pressure hose and gun to the TwinControl mixer unit as laid down in the operating manual for the gun.

6.5 GROUNDING

⚠ DANGER

Discharge of electrostatically charged components in atmospheres containing solvents!

Explosion hazard from electrostatic sparks or flames.

- ▶ Ground all device components.
- ▶ Ground the work pieces to be coated.



⚠ WARNING

Danger due to fire, explosion and electric shock!

Danger to life from electric shock and explosion.

- ▶ The device must be connected to the potential equalization (ground); the ground in the electrical system is not sufficient.
- ▶ A qualified electrician must complete all grounding and wiring connections and check the resistance.
- ▶ Operation according to the safety regulations, fire protection and electrotechnical rules.
- ▶ Must be de-energized before work is commenced on active parts.



⚠ WARNING

Heavy paint mist if grounding is insufficient!

Danger of poisoning.

Insufficient paint application quality.

- ▶ Ground all device components.
- ▶ Ground the work pieces to be coated.

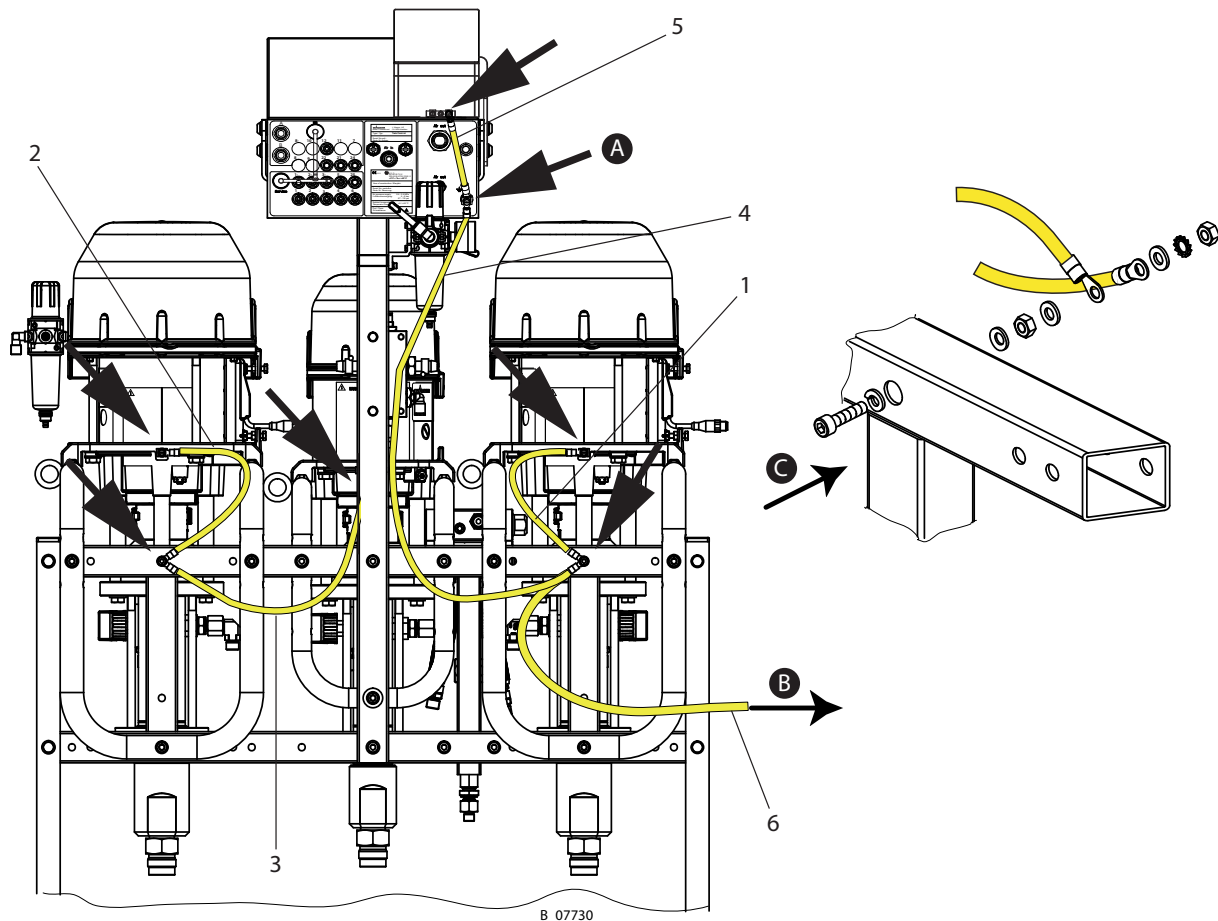


Ex zone

All devices and equipment must be suitable for use in potentially explosive areas.

6.5.1 Grounding of Components on Frame or Trolley

View from the rear side of the system.



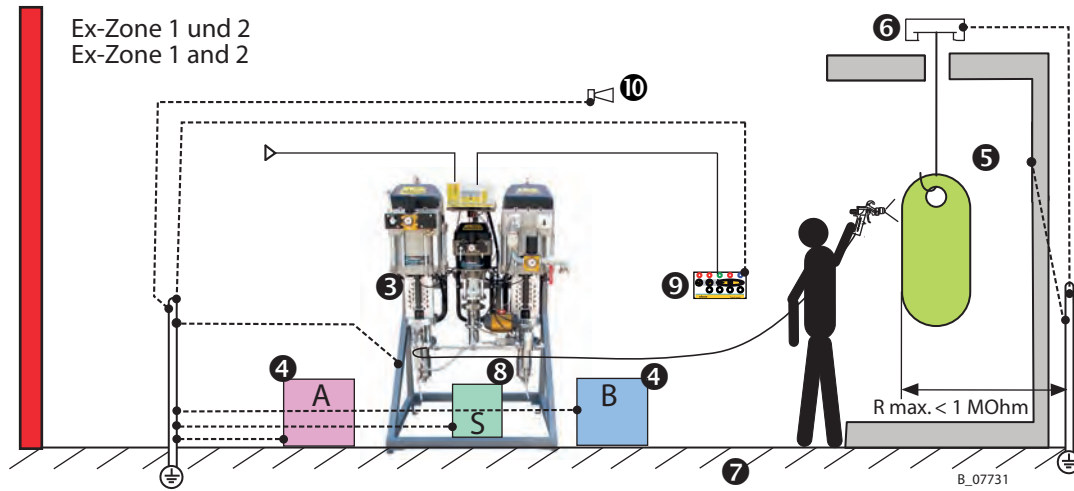
A	Grounding connections	B	On the potential equalization (signal ground)
C	Grounding connection point on frame. View of operating side of system.		

Connect all **grounding cables** using a short and direct route.

Pos	from - to	Line
1	A-pump on frame	4 mm ² ; AWG 12
2	B-pump on frame	4 mm ² ; AWG 12
3	Flushing pump on frame	4 mm ² ; AWG 12
4	Control unit on frame	4 mm ² ; AWG 12
5	Switchbox 2A (option) or Switchbox (ESTA remote control, option) on the control unit	4 mm ² ; AWG 12
6	Frame to signal ground	4 mm ² ; AWG 12

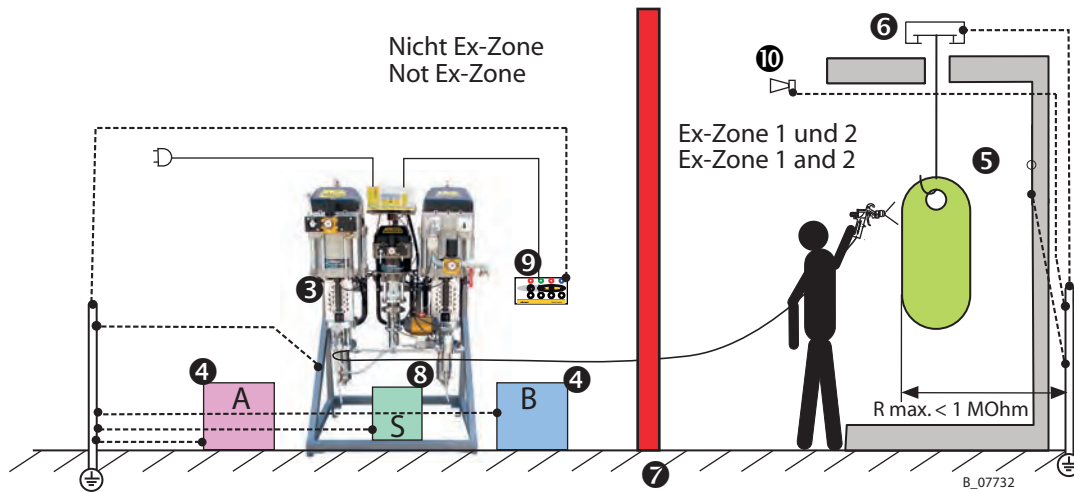
Cable cross-sections	
TwinControl frame	4 mm ² ; AWG 12
Paint tank / collection tank	6 mm ² ; AWG 10
Conveyor	16 mm ² ; AWG 6
Spray booth	16 mm ² ; AWG 6
Spraying stand	16 mm ² ; AWG 6

6.5.2 Grounding Scheme example for TwinControl with Turbine



3	TwinControl frame	4	Paint tank
5	Work piece	6	Conveyor
7	Floor, static dissipative	8	Flushing agent tank
9	Remote Control (Option)	10	Horn (option)

6.5.3 Example of Grounding Scheme for TwinControl with Mains Power Connection (Cable)



3	TwinControl frame	4	Paint tank
5	Work piece	6	Conveyor
7	Floor, static dissipative	8	Flushing agent tank
9	Remote Control (Option)	10	Horn (option)

6.6 COMMISSIONING

6.6.1 Preparation Before Commissioning

1. Make sure that the device and all other conductive parts within the work area are grounded.

2. Connect spray gun without nozzle with high-pressure hose to the mixing unit and secure with safety clip.
3. Check hoses for damage.
4. Check that all product-conveying connections are correctly connected.
5. Check all connections for leaks.
6. Check that all connections carrying air are connected correctly according to the pneumatic diagrams in Chapter Pneumatic Diagram [▶▶ 39].
7. Visually check the permissible pressures for all the system components.
8. Check level of separating agent in the pumps and top up separating agent if necessary.
9. Provide and ground a product tank for A and B components, a tank for flushing agent and an empty tank for return flow.
10. Connect the system to the air supply.

! NOTICE

Magnetic fields

Danger of damage to electronic devices and magnetic data carriers.

- ▶ Ensure that electronic devices and magnetic data carriers are removed from the danger area.

6.6.2 Basic Flushing and Pressure Tightness Test

The devices are tested in the factory with emulsifying oil, pure oil or solvent. Possible residues must be flushed out of the circuits with a solvent (flushing agent) before commissioning.

! WARNING

Incompatibility of cleaning agent and working medium!

Risk of explosion and danger of poisoning by toxic gases.

- ▶ Examine the compatibility of the cleaning agents and working media on the basis of the safety data sheets.



Always carry out basic flushing and the pressure tightness test:

- before putting the new system into operation for the first time (pumps are empty);
- before using the system again after prolonged storage;
- before servicing the system.

! WARNING

Overpressure!

Risk of injury from bursting components.

- ▶ The operating pressure must not exceed the value shown on the type plate.




Please note:

- Do not insert the nozzle into the gun yet. Gun secured.
- Keep the pump pressure as low as possible during flushing.
- Operating manuals for the affected components must be read and understood.

Process

1. Visual check: personal safety equipment, grounding and all devices ready to use.


2. Connect compressed air supply. Switch the system on.
3. Place the suction hoses of the three pumps in a grounded metal tank with flushing agent. Use a separate, grounded, metal tank for each pump. Provide and ground an additional, empty metal tank.
4. Place grounded metal tanks for return product under the return tube of each of the pumps.
5. Close the pressure regulator of all of the pumps (0 MPa; 0 bar; 0 psi).
6. Select "Work" in main menu.
7. **Flushing and pressure tightness test for pump A:**
 - Open return valve of pump A.
 - Slowly open ball valve of pump A.
 - Slowly turn up the air pressure on the pressure regulator of pump A. Only turn up the air pressure until the pump is running normally (approx. 0–0.05 MPa; 0–0.5 bar; 0–7.25 psi). Be prepared to switch from air to flushing agent and prevent back spray.
 - Close the ball valve of pump A again as soon as clean flushing agent comes out.
 - Close the return valve of pump A again.
 - In sub-menu, select component [A]  and press [Start].
 - Point the spray gun (preferably without nozzle) into the grounded metal tank for return product and open carefully.
 - Slowly open ball valve of pump A. Be ready to switch from air to flushing agent and prevent back spray.
 - Flush until the hose content has been emptied and clean flushing agent comes out.
 - Close and secure the spray gun.
 - Gradually increase pressure in pump A with the pressure regulator until maximum pressure is reached. Maintain the pressure for 3 minutes and check all connection points of the A-product circuit for leaks.
 - Relieve pressure of A-product-circuit:

Relieve air pressure in accordance with the operating manual for pump A.

Slowly open the return valve of pump A. When no further overpressure is detected, close the return valve again.



Point the spray gun into the grounded metal tank for return product.

Release and open spray gun to relieve the pressure. Avoid splashback.

When no further overpressure is detected, close and secure the spray gun.
 - Close product valve by pressing [Stop].
8. **Flushing and pressure tightness test for pump B:**
 - Open return valve of pump B.
 - Slowly open ball valve of pump B.
 - Slowly turn up the air pressure on the pressure regulator of pump B. Only turn up the air pressure until the pump is running normally (approx. 0–0.05 MPa; 0–0.5 bar; 0–7.25 psi). Be prepared to switch from air to flushing agent and prevent back spray.
 - Close the ball valve of pump B again as soon as clean flushing agent comes out.
 - Close the return valve of pump B again.
 - Select component [B] in sub-menu  and press [Start].
 - Point the spray gun (preferably without nozzle) into the grounded metal tank for return product and open carefully.
 - Slowly open ball valve of pump B. Be ready to switch from air to flushing agent and prevent back spray.

- Flush until the hose content has been emptied and clean flushing agent comes out.
- Close and secure the spray gun.
- Gradually increase pressure in pump B with the pressure regulator until maximum pressure is reached. Maintain the pressure for 3 minutes and check all connection points of the B-product circuit for leaks.
- Relieve pressure of B-product circuit:
Relieve air pressure in accordance with the operating manual for pump B.
Slowly open the return valve of pump B. When no further overpressure is detected, close the return valve again.
Point the spray gun into the grounded metal tank for return product.
Release and open spray gun to relieve the pressure. Avoid splashback.
When no further overpressure is detected, close and secure the spray gun.
- Close product valve by pressing [Stop].

9. Flushing and pressure tightness test for flushing pump:

- Open return valve of flushing pump.
- Slowly open the ball valve of the flushing pump.
- Slowly turn the air pressure up on the pressure regulator of the flushing pump. Only turn up the air pressure until the pump is running normally (approx. 0–0.05 MPa; 0–0.5 bar; 0–7.25 psi). Be prepared to switch from air to flushing agent and prevent back spray.
- Close the ball valve of the flushing pump again as soon as clean flushing agent comes out.
- Close return valve of flushing pump again.
- In sub-menu, select flushing valve [AS]:  and press [Start].
- Point the spray gun (preferably without nozzle) into the grounded metal tank for return product and open carefully.
- Slowly open the ball valve of the flushing pump. Be ready to switch from air to flushing agent and prevent back spray.
- Flush until the hose content has been emptied and clean flushing agent comes out.
- Close and secure the spray gun.
- Gradually increase pressure in the flushing pump with the pressure regulator until maximum pressure is reached. Maintain the pressure for 3 minutes and check all connection points for leaks.
- Relieve pressure of flushing agent circuit:
Relieve air pressure in accordance with the operating manual for flushing pump.
Slowly open return valve of flushing pump. When no further overpressure is detected, close the return valve again.
Point the spray gun into the grounded metal tank for return product.
Release and open spray gun to relieve the pressure. Avoid splashback.
When no further overpressure is detected, close and secure the spray gun.
- Close flushing valve by pressing [Stop].
- If there is a separate B flushing valve (controller 2 or 3): Select flushing valve [BS]  in the sub-menu and then repeat steps 9.7 to 9.13.

6.6.3 Replacing Flushing Agent with Working Media

! NOTICE

Interchange of the two components A and B!


Device damage due to hardened product.

- ▶ Label device components and paint tank so that the components A and B are not mixed up.

Prerequisites

- At the start, all pumps should be filled with flushing agent just as after basic flushing Basic Flushing and Pressure Tightness Test [▶▶ 57]).
- Do not insert the nozzle into the gun yet. Gun secured.
- Operating manuals for the affected components must be read and understood.

Process

1. Visual check: personal safety equipment, grounding and all devices ready to use.
2. Connect compressed air supply. Switch the system on.
3. Place the suction hoses of the three pumps in the respective grounded metal tanks:
 - flushing agent for the flushing pumps
 - master product for pump A
 - hardener product for pump B
4. Place grounded metal tanks for return product under the return tubes of pumps A and B.
5. Set a low pressure (approx. 0.05 MPa; 0.5 bar; 7 psi) on the pressure regulators for the three pumps.
6. Select "Work" in main menu.
7. **Filling pump A:**
 - Open return valve of pump A.
 - Slowly open ball valve of pump A.
 - Close the ball valve of pump A again as soon as pure working product comes out.
 - Close the return valve of pump A again.
 - In sub-menu, select component [A]  and press [Start].
 - Point the spray gun (preferably without nozzle) into the grounded metal tank for return product and open carefully.
 - Slowly open ball valve of pump A.
 - Close the ball valve of pump A again as soon as pure working product without air inclusions comes out.
 - Close and secure the spray gun.
 - Relieve pressure of A-product-circuit:

Relieve air pressure in accordance with the operating manual for pump A.

Slowly open the return valve of pump A. When no further overpressure is detected, close the return valve again.

Point the spray gun into the grounded metal tank for return product.

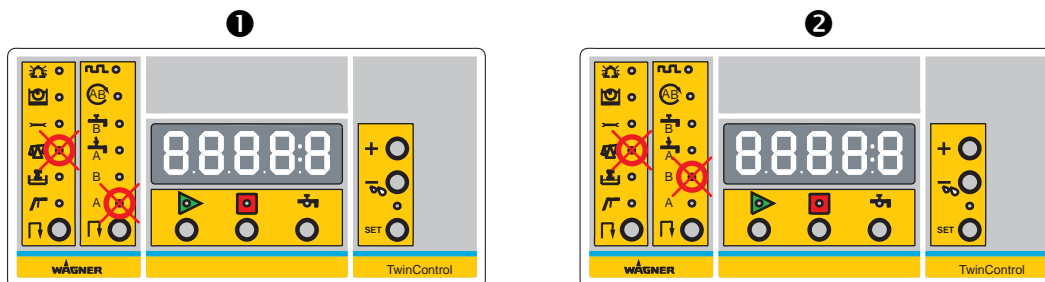
Release and open spray gun to relieve the pressure. Avoid splashback.

When no further overpressure is detected, close and secure the spray gun.
 - Close product valve by pressing [Stop].

8. **Filling pump B:**

- Open return valve of pump B. As soon as pure working product comes out, close return valve again.
 - Select component [B] in sub-menu **B** and press [Start].
 - Point the spray gun (preferably without nozzle) into the grounded metal tank.
Release the spray gun safety and open carefully. Flush until the hose content is emptied and pure working product, without air inclusions, comes out. Close and secure the spray gun.
 - Relieve pressure of B-product circuit:
Relieve air pressure in accordance with the operating manual for pump B.
Slowly open the return valve of pump B. When no further overpressure is detected, close the return valve again.
Point the spray gun into the grounded metal tank for return product.
Release and open spray gun to relieve the pressure. Avoid splashback.
When no further overpressure is detected, close and secure the spray gun.
 - Close product valve by pressing [Stop].
9. Dispose of the contents of the waste tanks according to the local regulations.
10. The system is ready to start. Continue with calibration (Chapter Calibrating the System [▶▶ 61]) or spraying (Chapter Spraying mode [▶▶ 83]). If not continuing with work right away, flush the system (Chapter Flushing [▶▶ 85]).

6.6.4 Calibrating the System



B_07737

1	Calibrating A-component	2	Calibrating B-component
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- ▶ The system is volumetrically calibrated in the factory, therefore it does not have to be calibrated with the product. However, if a calibration is required, proceed as follows:
 1. The product to be calibrated is first conveyed manually as far as the gun.
 2. Set the pump pressure to 0.5 MPa; 5 bar; 73 psi and select the nozzle so that the product flow rate corresponds to the subsequent production process.
 3. Start the calibration process for the A-side with the [Start] button.
 4. A minimum of 5 pump double strokes are discharged into a measuring cup via the gun (use tubing to protect against overspray if necessary). The flow rate measured by the controller is shown on the display.
 5. Press the [STOP] button.
 6. The quantity discharged into the measuring cup in cm³ is entered by pressing [SET] and [+] [-] and confirmed by pressing [SET].
Interrupting the process: The calibration process can be interrupted without saving by pressing the [Stop] button.
 7. The controller has now calculated and saved the new K-factor and displays it.

8. Repeat the calibration in order to check it.
Large deviations may be due to the following error causes:
 - Air in the lines. Fill the lines with product and check the suction system.
 - Large proportion of air bubbles in product in measuring cup. Determine product weight with scale and calculate the volume based on the density.
9. Calibrate the B-component in the same way as the A-component.
10. The K factor can be entered directly for the flushing pump (in cm³ per double stroke).
11. Flush system.

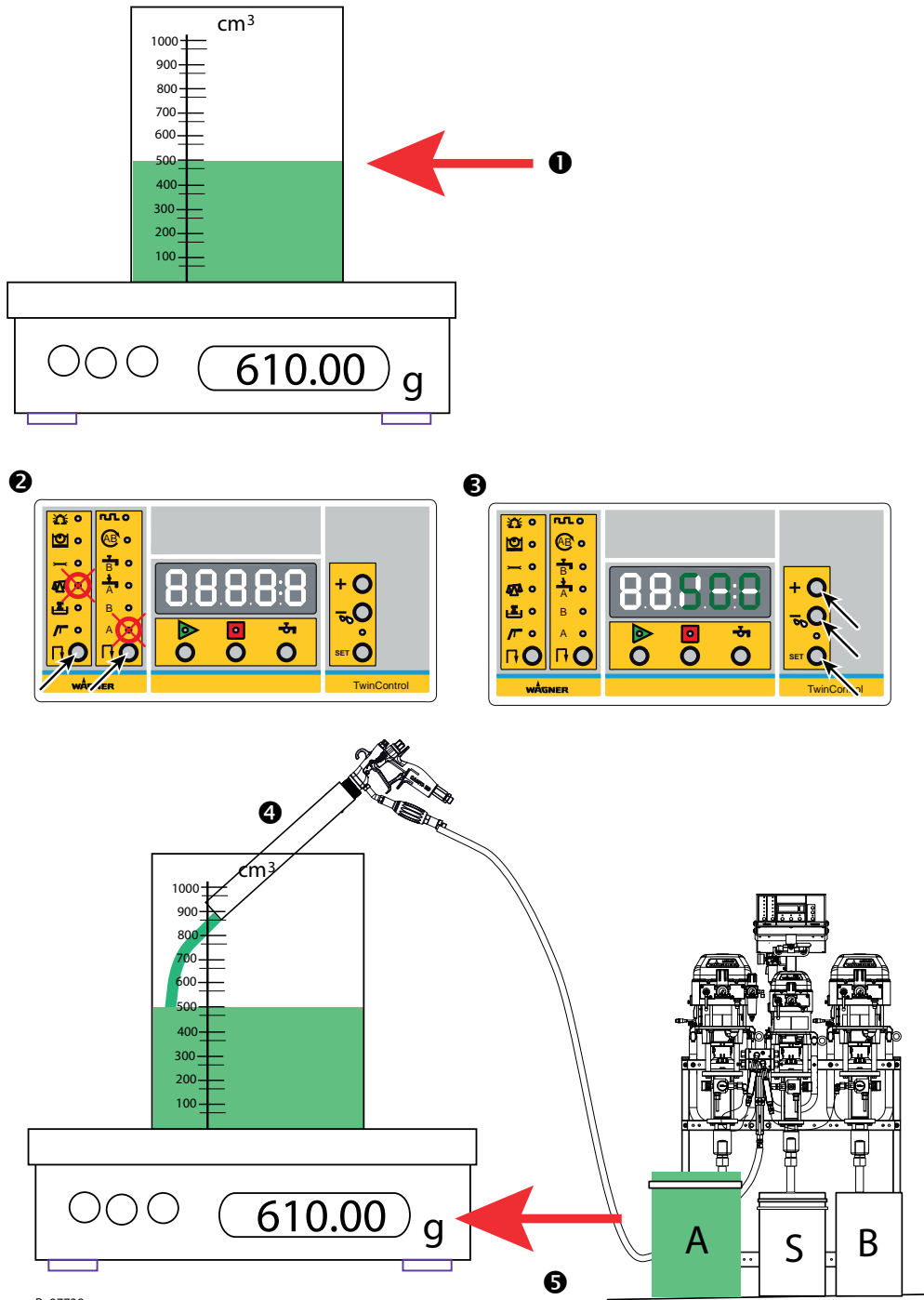
6.6.4.1 Method of Calibration (Simple Practical Variant)

1. Manually measure precisely e.g., 500 cm³ of A-product into a measuring cup and determine the product weight in "g" grams.
Note: For pumps with more than 150 cm³/DH, a greater product reference quantity must be specified. Rule of thumb: At least 3 double strokes of the pump.
2. The product to be calibrated is first conveyed manually as far as the gun.
3. Set the pump pressure to 0.5 MPa; 5 bar; 73 psi and select the nozzle so that the product flow rate corresponds to the subsequent production process.
4. Set calibration from A-side on control unit.
5. Start the calibration process for the A-side with the [Start] button.
6. Use the gun to add the weight in "g" indicated above for 500 cm³ of A-product into a measuring cup (use tubing to protect against overspray if necessary).
The flow rate measured by the controller is shown on the display.
7. Press the [STOP] button.
8. Enter the preselected reference amount in "cm³" (500 = example) by pressing [SET] and [+] [-] and confirm by pressing [SET].

Interrupting process:

The calibration process can be interrupted without saving by pressing the [Stop] button.

9. The controller has now calculated and saved the new K-factor and displays it.



B_07738

1	e.g., weigh out 500 cm ³ (= 0.5 liter) of A-product.	2	Set calibration A on the control unit.
3	Once 610 g has been discharged, enter 500 on the control unit and confirm with [SET].	4	Tubing to protect against overspray
5	Use gun to convey the 610 g of A-product measured above into tank.		

7 CONTROLLER

7.1 TRAINING THE OPERATING PERSONNEL

1. The operating personnel must be qualified to operate the entire system.
2. The operating staff must be familiar with the potential risks associated with improper behavior as well as the necessary protective devices and measures.
3. Before work commences, the operating personnel must receive appropriate system training.

7.2 SAFETY INSTRUCTIONS

Before carrying out any work, ensure that commissioning is carried out in accordance with Chapter Commissioning [>> 56].

WARNING

Incorrect operation!

Risk of injury and damage to the device.

- ▶ If contact with lacquers or cleaning agents causes skin irritation, appropriate precautionary measures must be taken, e.g., wearing protective clothing.
- ▶ The footwear worn by operating staff must comply with EN ISO 20344. The measured insulation resistance must not exceed 100 megohms.
- ▶ The protective clothing, including gloves, must comply with EN ISO 1149-5. The measured insulation resistance must not exceed 100 megohms.



WARNING

Unintentional putting into operation!

Risk of injury.

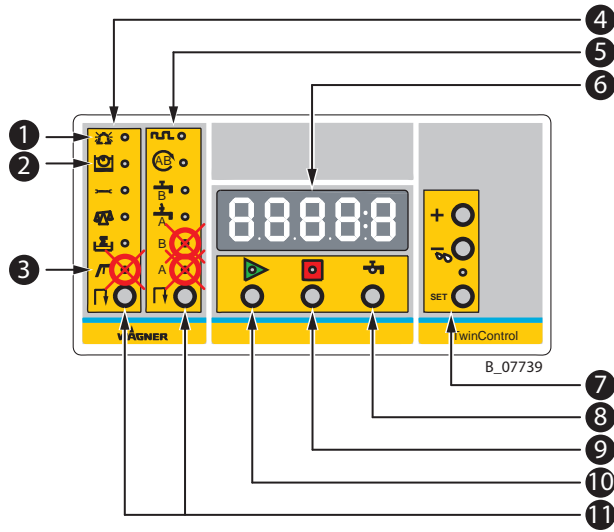
Before performing any work on the device, in the event of work interruptions and malfunctions:

- ▶ Switch off the energy and compressed air supply.
- ▶ Relieve pressure from spray guns, high-pressure hoses and all devices.
- ▶ Secure spray guns against actuation.
- ▶ Disconnect the control unit from the mains.
- ▶ In the event of functional faults: remedy the fault as described in the "Troubleshooting" chapter.



7.3 OPERATING THE CONTROL UNIT

For the meaning of all symbols/illuminated displays: see Chapter Operating Elements and Control Unit Connections [>> 36]



1	Alarm	2	Pot life
3	Tasks	4	Main menu
5	Sub-menu	6	Display
7	Setting buttons	8	[Flush] button
9	[Stop] button	10	[Start] button
11	Menu selection buttons		

Base position

When switched on, the control unit is in its base position. The three lamps "Work", "A" and "B" are illuminated in the base position. Depending on system status, other lamps might light up or flash.

Returning to base position

- ▶ Press the [Stop] button once or twice.

Triggering action

1. Main menu selection (depending on personal authorization)
2. Sub-menu selection
3. [Start] or [Flush]

[Start] button

Main menu	Sub-menu	Function of the [Start] button
Tasks	A + B	Start of work cycle
	A	A-valve opens
	B	B-valve opens
	Flushing agent A	A-flushing-valve opens
	Flushing agent B	For separate A and B flushing hoses. B flushing valve opens If only one flush hose is connected directly to mixer, [Start] button has no function
	Circulation operating mode (option)	Circulation of A and B product

[Stop] button

Device status	Function of [Stop] button
Program running	Terminates active program. Resets all valves to original status.
Program not running	Returns to base position
Setting input [SET]	Terminates input without saving
Alarm	Acknowledges alarm. Fault rectification (Chapter Troubleshooting [▶▶ 109])

Alarm

If there is a malfunction, the systems stops and the alarm display lights up. An error code appears on the display.

1. Acknowledge with [Stop] button
2. Fault rectification in accordance with Chapter Troubleshooting [▶▶ 109]

Pot life

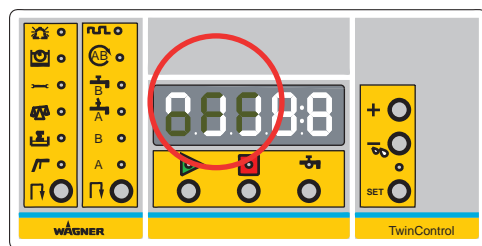
- Pot life display lights up. Pot life running.
- Pot life display flashing. Display shows the remaining pot life.

Display in the display unit

- When working in accordance with system parameter P120 (see Chapter List of Service Functions [▶▶ 44]).
- After pressing the [Stop] button in accordance with system parameter P121 (see Chapter List of Service Functions [▶▶ 44]).

7.3.1 Entering Numbers [SET]

Changing and saving numbers	
To change numbers [SET], [+] (higher) or [-] (lower)	Cancel input [Stop] button
Store numbers [SET]	Into the main menu 2x [Stop] button



B_07740

If the indication [OFF], appears after making an entry in the display, then the input authorization must be enabled.

7.4 PASSWORD PROTECTION AND USER FUNCTIONS

Level 0 Painter

Functions:

Start, stop, flush, (option - circulate)

Press [+] and [-] at the same time ->[SET] ->Password level 1 ->[SET]

Level 1 Painter with control tasks

Password = xxxx **Functions:**

Job quantities, total quantities, mixed product in hose, filling quantity A, B, flushing quantity A, B, calibration value, alarms, mixing ratio, pot life.

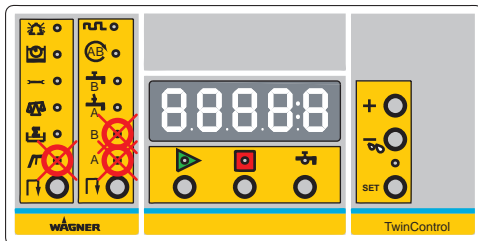
View and change parameters from P0 to P309.

Exceptions: Parameters P107, P108, P109, P110, P111, P112, P308 and P309 can be viewed only.

The passwords, which are set by WAGNER at the time of the device delivery, are not contained in the operating manual for safety reasons. The valid passwords are communicated to the customer separately.

7.5 BASIC FUNCTIONS FOR THE PAINTER

Base position

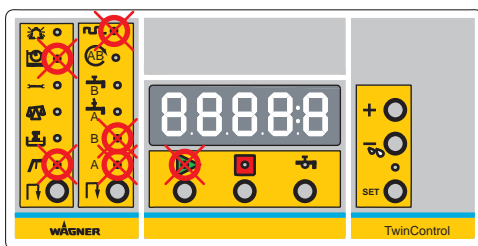


B_07741

System is ready to start

[Start] button -> System starts mixing

System is mixing



B_07742

Pot life LED flashing -> pot life running

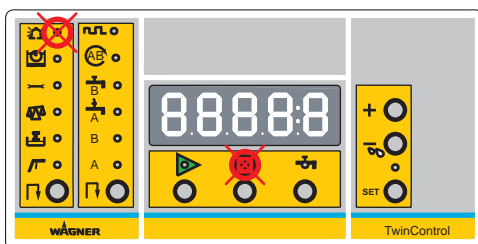
Work LED flashing -> filling

Work LED illuminated -> system ready to spray

B-valve cycle display -> flashes in B-valve cycle

Display -> See Chapter 5.10 -> P120

Automatic stop in case of error



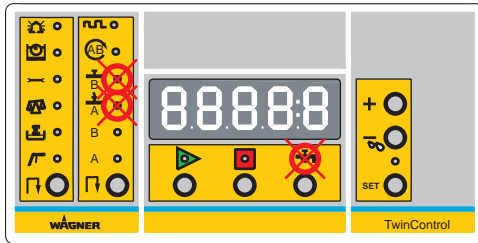
B_07743

Alarm illuminated display on

Stop illuminated display on

Error code is displayed

Flushing



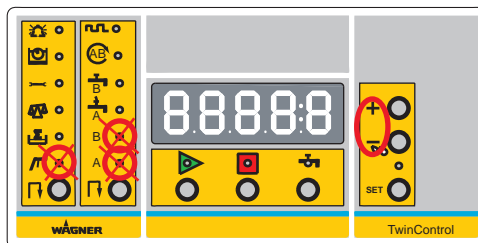
B_07744

The flushing program runs automatically. The flushing program needs to have been defined in advance under service level 3 (with password protection). Also refer to flushing stages F1 to F33 in the service functions list in Chapter 5.10 and how to define the flushing program in Chapter 7.6.2.

Emergency flushing

If the flush button is pressed for 3 seconds or more, only the stages involving flushing agent are undertaken (actions 3 or 4).

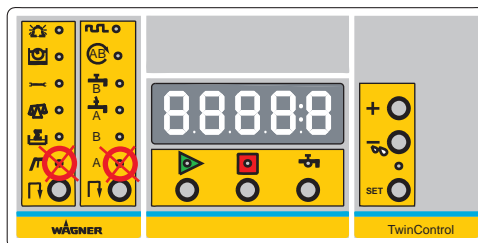
7.6 EXTENDED FUNCTIONS WITH PASSWORD PROTECTION



B_07778

Adjusting the mixing ratio

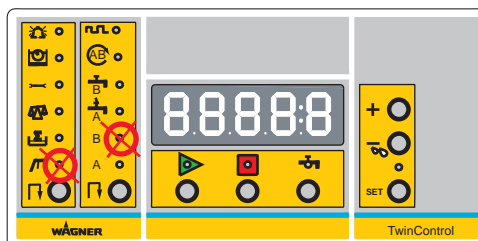
Press [SET] -> change value with + - push button. Press [SET] again to confirm new value (cancel with the STOP push button).



B_07783

Manual operation / job quantities

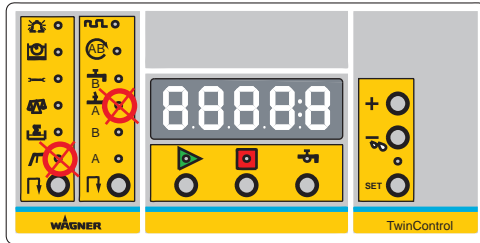
- **Only convey A component** (START / STOP).
Displays job total A in cm³.



B_07784

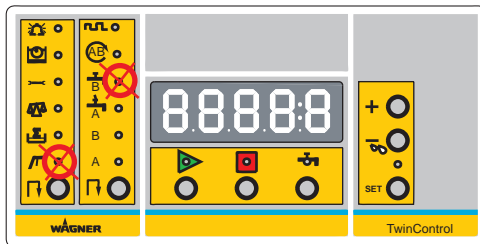
- **Only convey B component** (START / STOP).

Displays job total B in cm^3 .



B_07785

- **Only convey flushing agent A** (START / STOP)
Displays job total for flushing agent A in cm^3 .



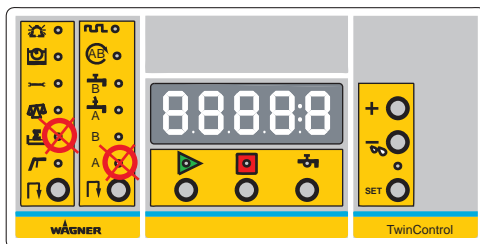
B_07786

- **Only convey flushing agent B** (START / STOP)
Displays job total flushing agent B in cm^3 .

Valid for:

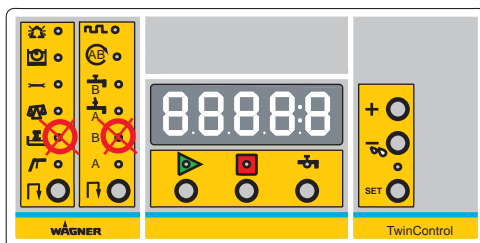
- types 48-110, 95-150, 72-300, 72-200, 38-300, 8-300, 3-600, 18-300, 8-600
- or if a separate flushing agent B is available.

Total quantities



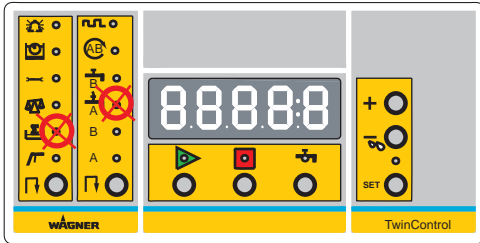
B_07787

- **Total amount A**
Set to "0": Press [SET] push button > 2 seconds.
Display in liters.



B_07788

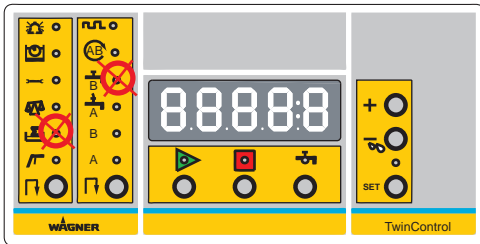
- **Total amount B**
Set to "0": Press [SET] push button > 2 seconds.
Display in liters.



B_07789

– **Total amount flushing A**

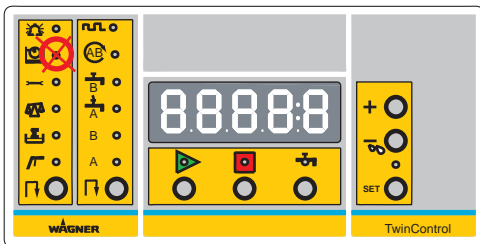
Set to "0": Press [SET] push button > 2 seconds.
Display in liters.



B_07790

– **Total amount flushing B**

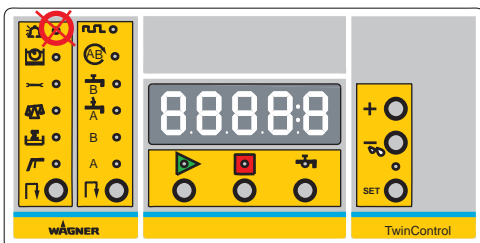
Set to "0": Press [SET] push button > 2 seconds.
Display in liters.



B_07791

– **Pot life**

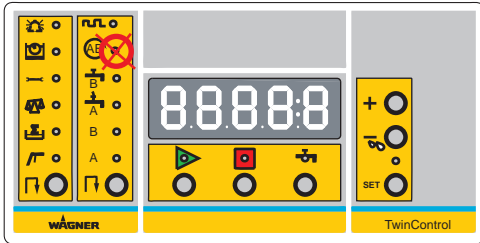
Setting the pot life.
set [SET] with [+] [-], [SET].



B_07792

– **Error messages**

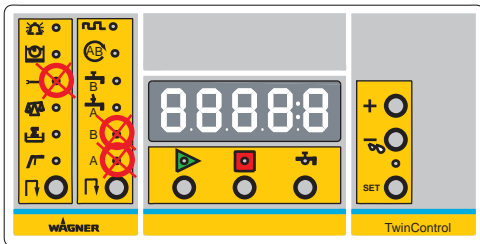
Display of last 28 error messages.
View with ±.



B_07793

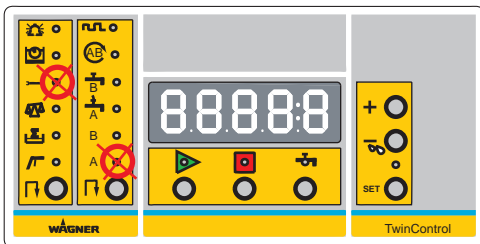
- **Circulation of A and B components**
(only possible if option available)

Service (password entry required for P100)



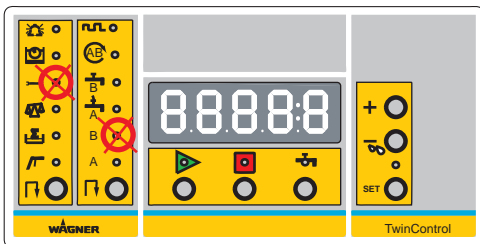
B_07794

- Content of spray hose with mixed material [cm³]



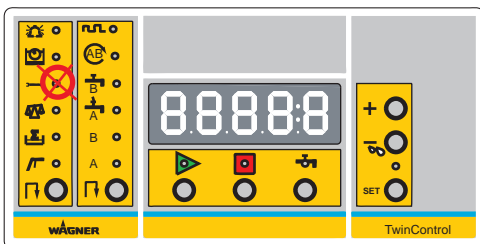
B_07795

- Quantity from product valve A to mixing block [cm³]



B_07796

- Quantity from product valve B to mixing block [cm³]



B_07797

- **Parameter**
Service parameters P0 - P7
Configuration parameters P100 - P154

Totals P200 - P213

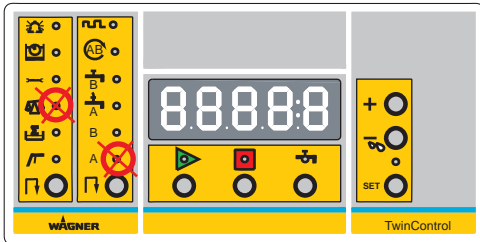
(Also see Chapter 5.10)

- Change from P0 to P1...P2, ... with [+] button.

Return with [-] button.

7.6.1 Calibration

(Password entry required for P100)

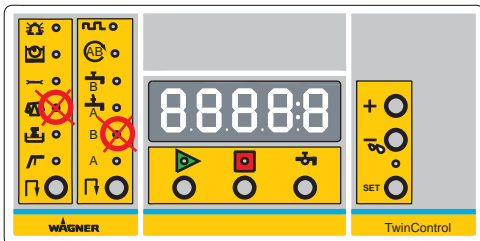


B_07429

Calibrate A

[Start] -> Open gun -> With spray pressure, pump out around 5 double strokes into measuring cup -> Gun closed -> [SET] -> Enter measurement in measuring cup in cm³ -> [SET]

(Cancel with [Stop] button)

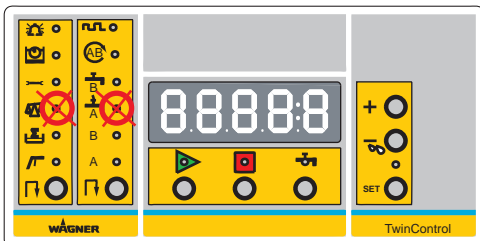


B_07430

Calibrate B

[Start] -> Open gun -> With spray pressure, pump out around 5 double strokes into measuring cup -> Gun closed -> [SET] -> Enter measurement in measuring cup in cm³ -> [SET]

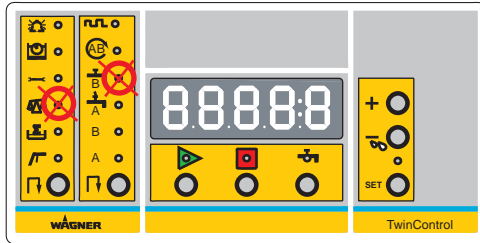
(Cancel with [Stop] button)



B_07431

Calibration Flushing A

Direct input in cm³/DH of the flushing pump



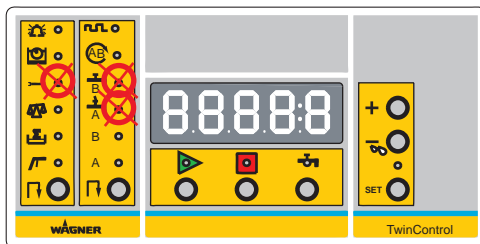
B_07432

Calibrate flushing B

Direct input in cm³/DH of the flushing pump

7.6.2 Flushing Programs

Flushing program mode



B_07433

The flushing steps can be defined in the mode shown under parameters F1 to F20.

Enter flushing program

- ▶ Press [**SET**] during program step F1 (to F20). A appears on the left to enter the action. Use [+] or [-] button to select the value. For input values, see description of action in Table 2.
- ▶ Press [**SET**].
- ▶ Enter the amount using the [+] or [-] button.
- ▶ Press [**SET**].
- ▶ Enter the measuring unit cc (= ml) or sec using the [+] or [-] button.
- ▶ Press [**SET**] (the measuring unit displayed is saved).
- ▶ The [+] or [-] button takes you to the next program step (F2 or Fx).

Table 1: flushing steps

Step F	Actions	Quantity	Unit
F1*	0-2	0.0-9999.9	cc/sec
F2*	0-2	0.0-9999.9	cc/sec
F3	0-5	0.0-9999.9	cc/sec
F4	0-5	0.0-9999.9	cc/sec
F5	0-5	0.0-9999.9	cc/sec
F6	0-5	0.0-9999.9	cc/sec
F7	0-5	0.0-9999.9	cc/sec
F8	0-5	0.0-9999.9	cc/sec
F9	0-5	0.0-9999.9	cc/sec
F10	0-5	0.0-9999.9	cc/sec

Step F	Actions	Quantity	Unit
F11	0-5	0.0-9999.9	cc/sec
F12	0-5	0.0-9999.9	cc/sec
F13	0-5	0.0-9999.9	cc/sec
F14	0-5	0.0-9999.9	cc/sec
F15	0-5	0.0-9999.9	cc/sec
F16	0-5	0.0-9999.9	cc/sec
F17	0-5	0.0-9999.9	cc/sec
F18	0-5	0.0-9999.9	cc/sec
F19	0-5	0.0-9999.9	cc/sec
F20	0-5	0.0-9999.9	cc/sec

** With repeated flushing (2 instances of flushing one after another), flushing steps "F1" and "F2" are only performed the first time. During the second flushing cycle, the flushing program starts from step "F3".

Table 2: actions

Action	Description of action
0	No activity
1	Product A
2	Product B
3	Flushing A
4	Flushing B
5	Wait time

Table 3: repetitions

Step F	Step	Description
F31**	3-20	Start repetition
F32**	3-20	End repetition
F33	1-200	Number of repetitions

** F31 must be less than F32.

Display in the display unit

When the programmed flushing program is called up by pressing the [Flush] push button on the control unit and is running, each of the individual steps is shown briefly on the display.

Examples of flushing programs

for EvoMotion 5-60

Step F	Action	Value	Unit	Remarks
F1	1	10	cc	Product A (press 10cc of A-product into spray hose)
F2	2	10	cc	Material B (press 10cc of B-product into spray hose)
F3	3	200	cc	Flushing A (press mixed product out of the spray hose)
F4	3	1	sec	Flushing A (solvent for solvent-air flushing)
F5	4	2	sec	Flushing B (air for solvent-air flushing)
F6	3	200	cc	Flushing A (fill spray hose with flushing agent again)

Step F	Action	Value	Unit	Remarks
F31	4	-	-	Start of repetition from step 4
F32	5	-	-	End of repetition at step 5
F33	10	-	-	Number of repetitions from step 4 to 5 = 10x

for Puma 28-40

Step F	Action	Value	Unit	Remarks
F1	1	10	cc	Product A (press 10cc of A-product into spray hose)
F2	2	10	cc	Material B (press 10cc of B-product into spray hose)
F3	3	200	cc	Flushing A (flush product hose with 200 cc)

for Leopard 48-110

Step F	Action	Value	Unit	Remarks
F1	1	10	cc	Product A
F2	2	10	cc	Product B
F3	3	200	cc	Flushing B (flush 200 cc on B-side)
F4	3	200	cc	Flushing A (flush 200 cc on A-side)

7.6.3 AIS

Prerequisite: AIS system

The AIS (Adaptive Injection System) automatically regulates the dosing valve stroke. A stepping motor increases or decreases the stroke in steps.

AIS settings (password level 4)				
Parameter	Explanation	Unit	Values	Default value
P300	Number of dosing valve cycles after the AIS has performed a calculation. Note: When starting the mixing mode, the AIS must wait for these cycles before the adjustment can begin.	Cycles	3-100	3
P301	Warning limit: Minimum injection quality (opening time of the dosing valve in percent). If the value falls below this, a warning is triggered (code 97).	%	0-100	10
P302	Lower injection quality limit (opening time of dosing valve as a percentage). If the value falls below this, the AIS optimizes the injection quality.	%	0-100	50
P303	Upper injection quality limit (opening time of dosing valve as a percentage). If the value falls below this, the AIS limits the injection quality. Thereby smooth operation is ensured.	%	0-100	60
P304	If the dosing valve is continuously opened for longer than the stated time, then too little product flows through. The AIS allows more product through.	sec	0.5-25.0	1.5

AIS settings (password level 4)				
Parameter	Explanation	Unit	Values	Default value
P305	Repetition interval: For the above function (P304), the AIS undertakes a step every x seconds until the valve cycles again.	sec	0.5-25.0	1.5
P306	Number of steps which the AIS is to open when mixing operation is ended.	Steps	0-20	5
P307	Minimum flow of all components for AIS to undertake regulation.	cc/min	5-1000	100

AIS settings (view only, password level 4)	
Parameter	Explanation
P308	Current opening time of the dosing valve in percent (0–100%)
P309	Current AIS position. The start value (after pressing the START push button) is 1000. Each step of the stepping motor changes the value by 1. A number greater than 1000 increases the flow rate. A number less than 1000 decreases the flow rate.

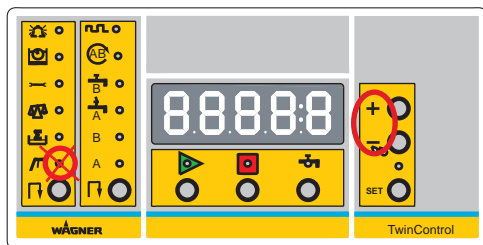
Presetting dosing valve stroke (from password level 2)

Depending on the starting position, some time may be needed to reach the optimum stroke (AIS position). This alignment time can be reduced with an appropriate manual presetting.

The dosing valve stroke can be manually preset, if product B flows (not flushing agent B):

- ▶ Main menu "Work", submenu "A+B", START
- ▶ Main menu "Work", submenu "B", START
- ▶ Main menu "Work", submenu "Circulation operating mode", START
- ▶ Main menu "Calibration", submenu "B", START
- ▶ During a flushing step with product B

Procedure



B_07434

Preset dosing valve stroke when product B flows:

1. Main menu "Work" (see figure)
2. Press the push button [-] or [+] several times until the material flow is approximately correct.
+ increases the flow, while
- decreases the flow

Note: Do not press the SET button.

In the event of mixing problems:

Checking AIS function

Observe for 3 minutes in spray mode with gun open: If the AIS position (P309) is continually counting up or down in the same direction without the opening time of the dosing valve (P308) changing, the AIS is not working. Contact the WAGNER service department.

Check AIS stepping motor

Check whether the AIS stepping motor works:

1. Main menu "Work", submenu "B", START
2. Press push button [-] until the product flow stops.

If the stepping motor does not react:

- ▶ Check connections.
- ▶ Contact the WAGNER service department.

AIS error messages

Error code 97: see Chapter Alarm messages and fault rectification [▶▶ 110].

7.6.4 Check for Leaks in A and B Fluid Section

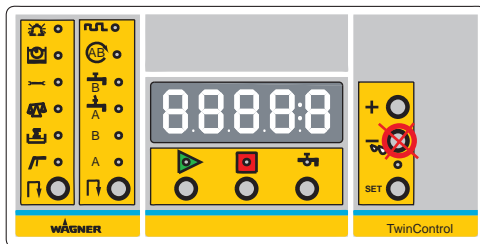
Leak testing setting

Via password level 4 where pos. "P115" P115 = 1.

Sensitivity settings

- | | |
|------|-------------------------------|
| P116 | Leak warning limit A (mm/min) |
| P117 | Leak error limit A (mm/min) |
| P118 | Leak warning limit B (mm/min) |
| P119 | Leak error limit B (mm/min) |

Leak testing for one stroke direction



B_07435

1. [Stop]. Secure the gun. Close all return valves.
2. Pumps A and B: Set pressure regulator to working pressure.
3. Press push button [-] for three seconds.
A-pump and B-pump (including circulation valves) are checked for leaks for 10 seconds. During the check, the display counts from 10 to 0 and the LED displays for A and B flash. Any leakage is indicated by an error message.

Changing stroke direction

1. Pumps A and B: Set pressure regulator to zero.
2. Place grounded metal tanks for return product under the return tubes of pumps A and B.
3. Pumps A and B: Briefly open each return valve. As soon as the stroke direction audibly switches over, close valve.

Leak testing for the other stroke direction

1. Pumps A and B: Set pressure regulator to working pressure.

2. Press [-] push button for three seconds.

Leakage error messages

See Chapter Alarm messages and fault rectification [▶▶ 110].

7.6.5 "Batch Mode" filling mode

The Batch Mode setting allows a recurring and pre-defined flow rate to be discharged via the gun or via an external valve.

Batch Mode setting

Via password level 4 where pos. "P137" P137 = 1.

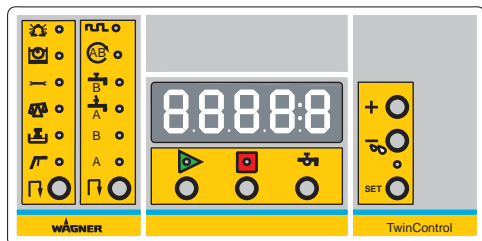
Other settings for the Batch quantity to be displayed:

Parameter pos. "P120" and "P121" must be set to one of the following values:

- P120; P121 = 2 (job sum) or
- P120; P121 = 4 (MR and JS in turn) or
- P120; P121 = 5 (P and JS in turn) or
- P120; P121 = 6 (MR and JS and P in turn).

Access for changing the Batch quantity

1. Via password level 2 or
2. Via parameter pos. "P142" P142 = 1 (no password protection for MR and batch quantity).



B_02744

Changing the Batch quantity

"Total" illuminated display must be flashing.

Press [Set] -> the current set value is displayed.

Use the [+] or [-] button to select the set value.

Use [SET] to save the new set value.

Operation

Press [Start].

Note:

If filling has not yet taken place, it is undertaken automatically. Filling complete -> System at Stop.

Press [Start] again. The system is running and shifts to Stop when the target quantity is reached.

The operating cycle can be repeated any number of times.

8 OPERATION

Below, operation with manual guns is described. For automatic guns, the same workflow applies correspondingly.

8.1 TRAINING THE OPERATING PERSONNEL

- ▶ The operating personnel must be qualified to operate the entire system.
- ▶ The operating staff must be familiar with the potential risks associated with improper behavior as well as the necessary protective devices and measures.
- ▶ Before work commences, the operating personnel must receive appropriate system training.

8.2 SAFETY INSTRUCTIONS

The operating documents for the pneumatic pumps and other system components should be read through carefully. The appropriate operating manuals are available on the WAGNER CD as PDF files.

Also observe the operating manuals for the components mounted on site.

Automatic electrostatic system

When using the built-in automatic electrostatic system for the GM 5000 electrostatic gun, the electrostatic may only be released in spraying mode. Always follow the instructions in the operating manual.

WARNING

Gas mixtures can explode if there is an incompletely filled device!

Danger to life from flying parts.

- ▶ Ensure that the device is always completely filled with flushing agent or working media.
- ▶ Do not spray the device empty after cleaning.



8.2.1 General rules for making adjustments to the spray gun

WARNING

High-pressure spray jet!

Danger to life from injecting paint or solvent.

- ▶ Never reach into the spray jet.
- ▶ Never point the spray gun at people.
- ▶ Consult a doctor immediately in the event of skin injuries caused by paint or solvent. Inform the doctor about the paint or solvent used.
- ▶ Never seal defective high-pressure parts, instead relieve the pressure from them and replace them immediately.
- ▶ Wear the appropriate protective clothing, gloves, eyewear, and respirator.



8.3 MALFUNCTION

If a fault occurs, it is indicated by the following:

- ▶ The system stops and the alarm horn sounds

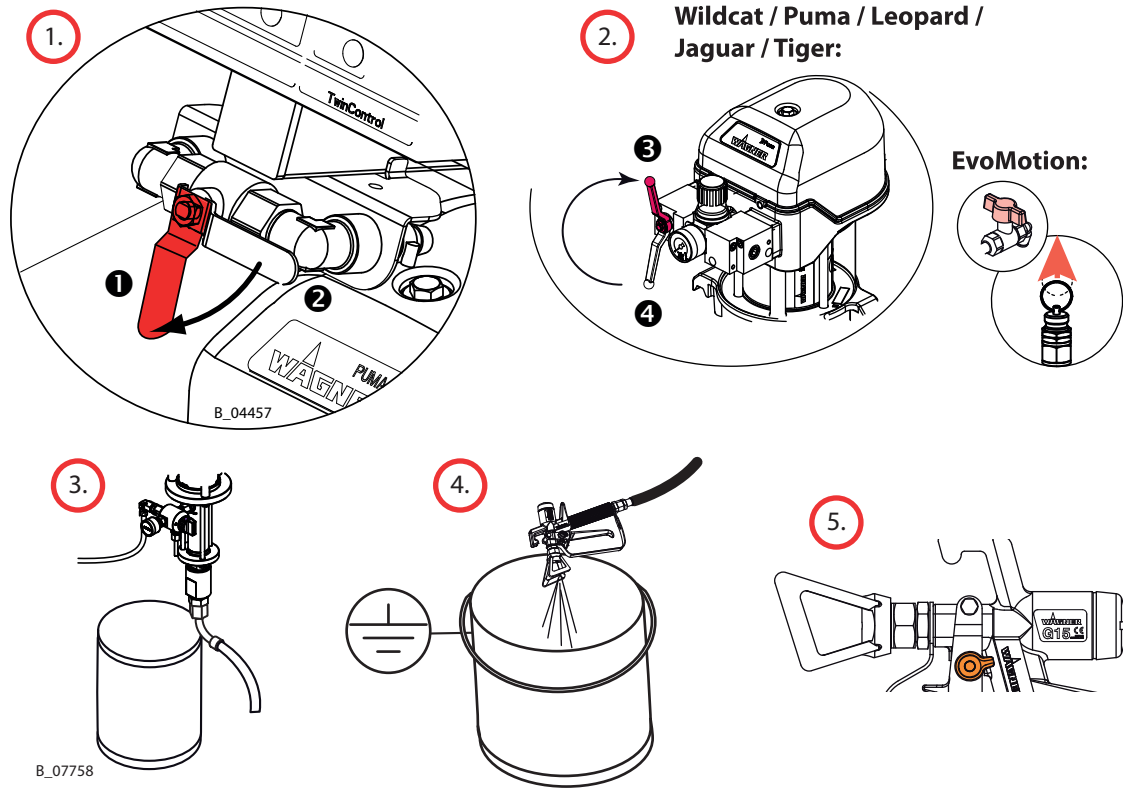
- ▶ The alarm display lights up (control unit and remote control).
- ▶ A fault is indicated on the display.

Acknowledge fault

- ▶ With the [Stop] button.

Alarm messages and fault rectification see Chapter Alarm messages and fault rectification [▶▶ 110].

8.4 EMERGENCY DEACTIVATION

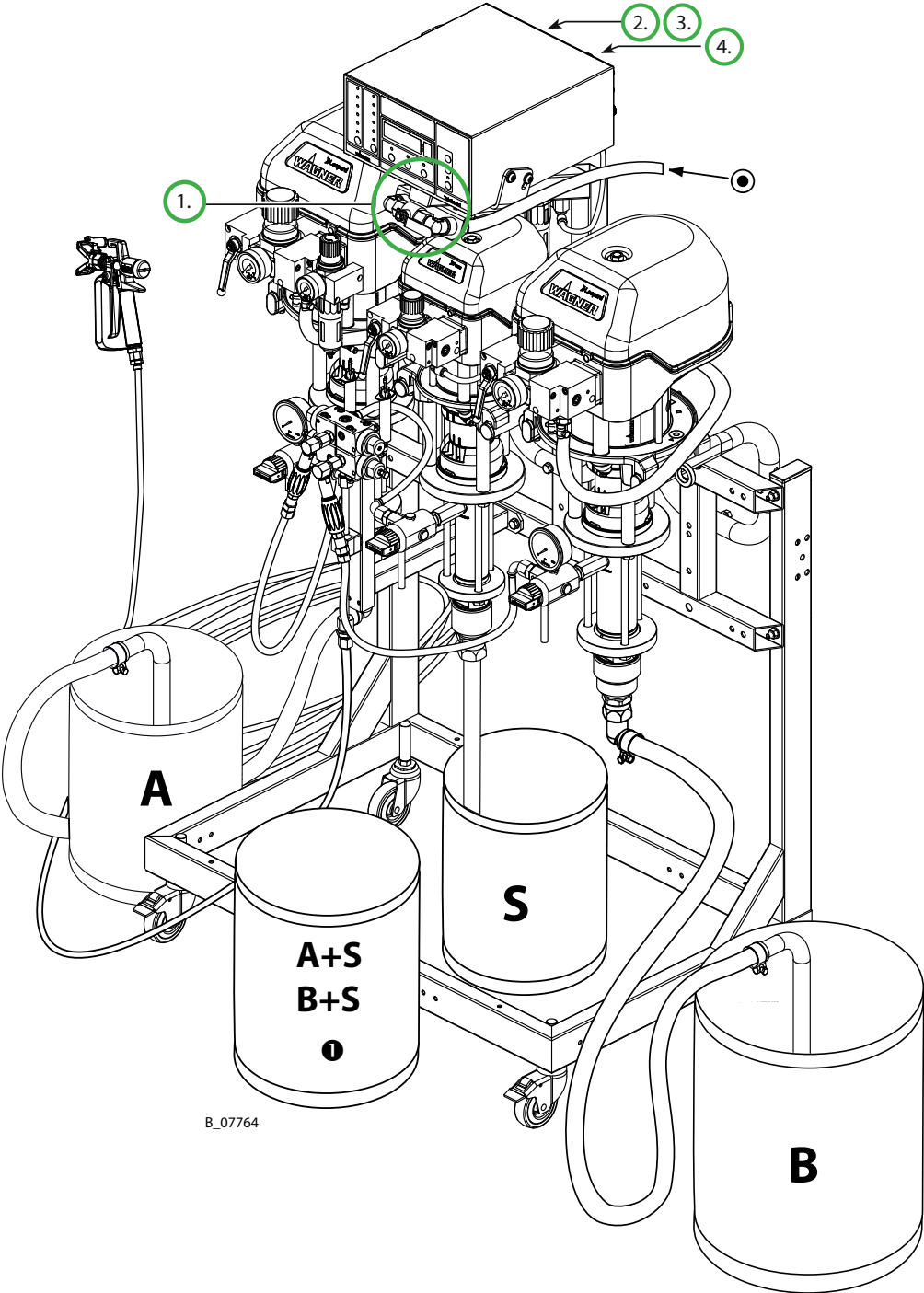


1	Off	2	On
3	Closed	4	Open

In the case of unforeseen occurrences, immediately:

1. Switch off air supply.
2. Vent air motors for all pumps.
3. Provide grounded metal tanks for return product. Relieve pressure from all the pumps via the return valves.
4. Point the spray gun into the grounded metal tank for return product. Release and open spray gun to relieve the pressure. Avoid splashback.
5. When no further overpressure is detected, close and secure the spray gun.

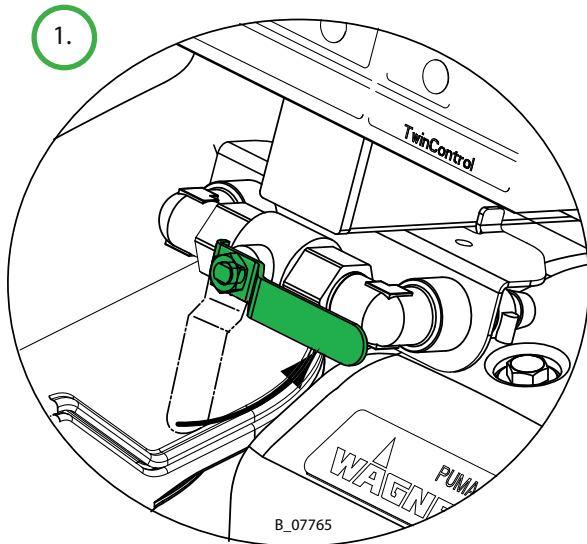
8.5 SWITCHING ON THE SYSTEM



B_07764

1	Return line
---	-------------

Example of **TwinControl** system ready for spraying

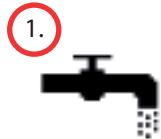


1. Switch on the main air supply.
Switch on control air.

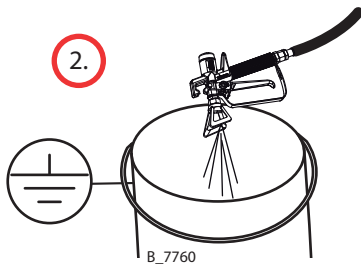
Note:

For control units with turbines, the turbines are powered by control air which switches on the electronics.
For a system with a product pressure regulator: switch on the work air.
For a TwinControl cable variant:
Turn on main switch on the control unit.

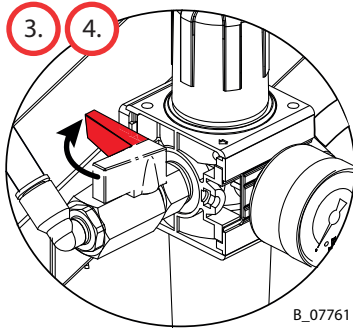
8.6 SWITCHING OFF THE SYSTEM



1. Carry out flushing in accordance with Chapter Flushing [>> 85].



2. Relieve pressure according to Chapter Pressure Relief / Work Interruption [>> 86].

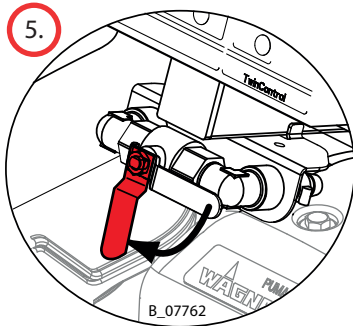


3. Switch off the control air.

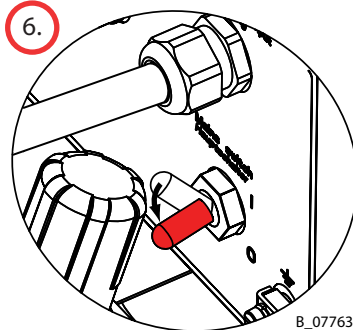
Note:

For control units with turbines, the turbines are powered by control air.

4. For a system with a product pressure regulator: Switch off the work air.



5. Switch off air supply.



6. For the TwinControl cable variant:
Switch off the main switch at the control unit.
7. Relieve compressed air pressure between main switch and pumps:
 - Flushing pump A: Open air ball valve
 - Flushing pump A: Open and close relief valve
 - Flushing pump A: Close air ball valve

8.7 SPRAYING MODE

Optimum painting results are obtained if:

- the system parameters are set correctly;
- product data such as the mixing ratio and pot life correspond to the working product;
- the flushing program is defined;
- the supply pressures are constant;
- the pressure regulators for the A-pump and B-pump are set correctly. A is always approx. 10% lower than B.

- AIS is used.
Or without AIS: If the dosing valve (B-side) is set using the valve stroke such that as many cycles are undertaken as possible (depending on flow rate and mixing ratio every 0.5–2 seconds). See the operating manual for the valves (order no. in Chapter Operating Manuals for the Individual Components [▶▶ 8]);
- The product pumps A and B can draw in the product perfectly and no cavitation occurs (pump breaking through during down stroke). If necessary, the product must be fed with a feed pump.


Optimum operation is fulfilled under the following conditions:

- The flushing agent pressure for A and B is always present on the device, and the product pressure for the A and B pumps.
- When filling the mixed product in the product hose, ensure that the nozzle is inserted in the gun.
- The flushing process is performed without the nozzle in the gun.
- The level in the A and B product tanks and in the flushing product tank is checked visually, in order to prevent unintended interruptions in the spray process.

Prerequisites

- At the start, all pumps must be filled with working product and the system must be ready to start, as described in Chapter Replacing Flushing Agent with Working Media [▶▶ 60].
- The nozzle is inserted into the gun. Gun secured.
- Operating manuals for the affected components must be read and understood.

Process

1. Visual check: personal safety equipment, grounding and all devices ready to use.
2.  If necessary, use [Stop] to move control unit into base position.
3. Press [Start] button on control unit.
4. **Filling process:** Pull the trigger on the gun with nozzle and spray into waste bucket. The green start lamp on the control unit flashes during filling.
5. Fill until the green start lamp is lit up continuously and no more flushing agent or unmixed product comes out (Only mixed product should come out).
6. Start the coating process right away and perform without interruption if possible. Bear in mind the pot life of product at all times.
7. If necessary, adjust air pressure levels of high-pressure pumps. The hardener pressure should be slightly higher than that of the A-component.
8. Once spraying work is complete, carry out flushing (Chapter Flushing [▶▶ 85]) and / or pressure relief (Chapter Pressure Relief / Work Interruption [▶▶ 86]).

⚠ NOTICE

Fluctuating supply pressures!

Poor coating result.

- ▶ The supply pressure of component B should be adjusted to a higher value (approx. 5-10%) than that of component A.
- ▶ The supply pressures should be constant.

8.8 FLUSHING

The system's flushing program flushes the hoses between the mixer and gun and removes any mixed product present.

Flushing must always be carried out:

- before prolonged work interruptions and before the end of work;
- before expiry of the pot life;
- before a product change.

⚠ WARNING

Incompatibility of cleaning/flushing agent and working medium!

Risk of explosion and danger of poisoning by toxic gases.

- ▶ Examine the compatibility of the flushing and cleaning agents and working media on the basis of the safety data sheets.
- ▶ If a high-pressure gun is used, remove the spray nozzle before flushing.
 - ⇒ The pressure has to be relieved before removing the spray nozzle (see Chapter Pressure Relief / Work Interruption [▶▶ 86]).
- ▶ Wear protective goggles.
- ▶ Set the flushing agent pressure as low as possible for flushing.



Process

1. Press [Stop] on the control unit.
2. Press]Flush] on the control unit.
3. Point the spray gun (preferably without nozzle) into the grounded metal tank for return product.
4. Release the spray gun safety and open carefully.
5. Flush until clean flushing agent comes out and the flushing program is complete.
6. Close and secure the spray gun.

Display in the display unit

While the flushing program is underway, the individual steps and entered data are shown on the display.

Insufficient flushing affect

- ▶ If necessary adjust the flushing pressure on the flushing pump.
- ▶ If necessary, adapt the flushing program. See "Defining Flushing Program" in Chapter Flushing Programs [▶▶ 73].
- ▶ Check suitability of flushing agent for the master and hardener materials used. Note manufacturer's recommendations for use.

Cleaning the system see Chapter Cleaning the system [▶▶ 99]

8.9 PRESSURE RELIEF / WORK INTERRUPTION

The pressure must always be relieved:

- after the spraying tasks are finished,
- before servicing or repairing the spraying system,
- before carrying out cleaning tasks on the spraying system,
- before moving the spraying system to another location,
- before something must be checked on the spraying system,
- before the nozzle or the filter is removed from the spray gun.

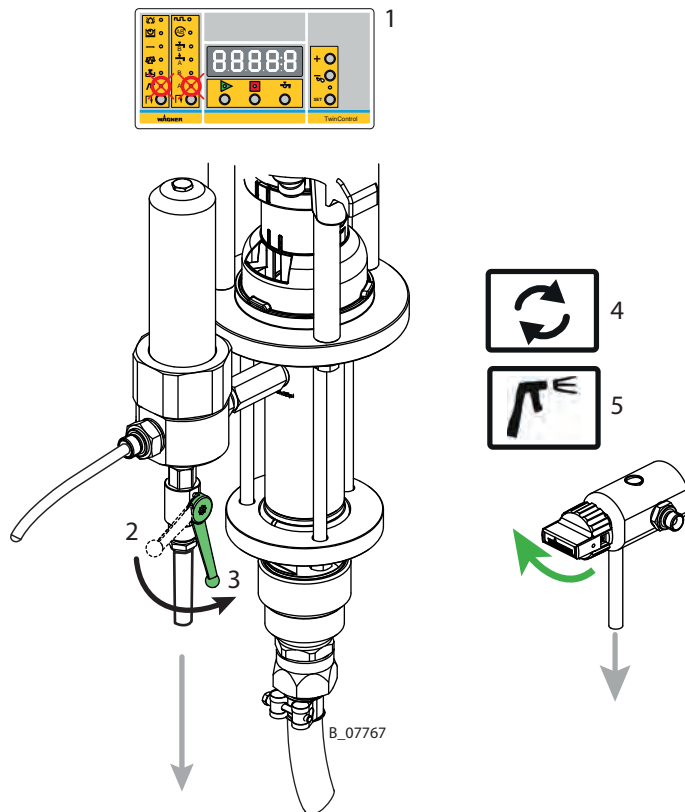
Procedure (password level 1 is required)

Wildcat / Puma / Leopard / Jaguar / Tiger:

EvoMotion:

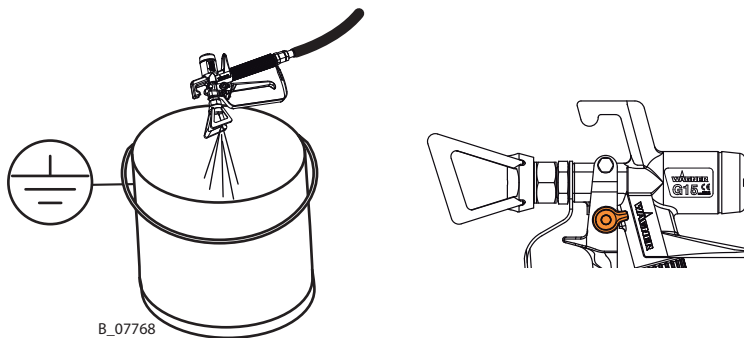
1	Closed	2	Open
---	--------	---	------

1. Close and secure the spray gun.
2. Press [Stop].
3. Relieve all A and B pumps of pressure:
 - ⇒ Relieve air pressure in accordance with the respective operating manual.
 - ⇒ With product pressure regulator (option): Ensure that the product pressure regulator is open.



1	(Example for A-components)	2	Closed
3	Open	4	Open (return flow)
5	Closed (spraying)		

- ⇒ With password level 1:
Only convey A component or only convey B component.
- ⇒ Press [Start].
- ⇒ Place grounded metal tank for return product under the return tube of the respective pump.
- ⇒ Open the return valve slowly.
- ⇒ When no further overpressure is detected, close the return valve.



- ⇒ Point the spray gun into the grounded metal tank for return product.
- ⇒ Release and open spray gun to relieve the pressure. Avoid splashback.
- ⇒ When no further overpressure is detected, close and secure the spray gun.
- ⇒ Press [Stop].

- ⇒ Repeat step 3 for all A and B pumps.
- 4. Flush mixed product from step 3.

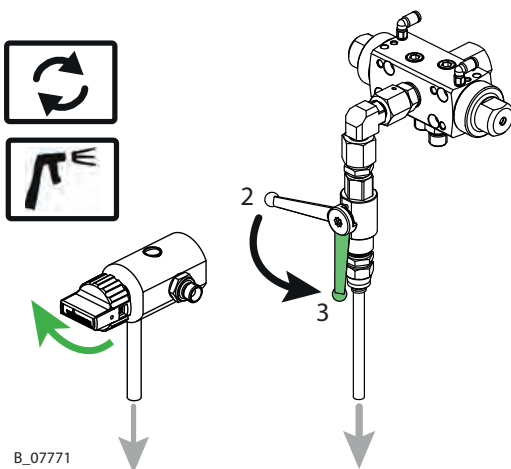
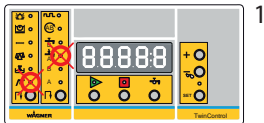


- ⇒ Press [Flush], B_07769
- ⇒ Point the spray gun (preferably without nozzle) into the grounded metal tank for return product.
- ⇒ Release the spray gun safety and open carefully.
- ⇒ Flush until clean flushing agent comes out and the flushing program is complete.
- ⇒ Close and secure the spray gun.



1	Splitter valve
---	----------------

- ⇒ With splitter valve: Switch splitter valve over and repeat step 4 for the second gun.
- 5. Relieve all flushing pumps of pressure:
 - ⇒ Relieve air pressure in accordance with the respective operating manual.
 - ⇒ With product pressure regulator (option): Ensure that the product pressure regulator is open.



1	(Example for flushing agent A)	2	Closed
3	Open		

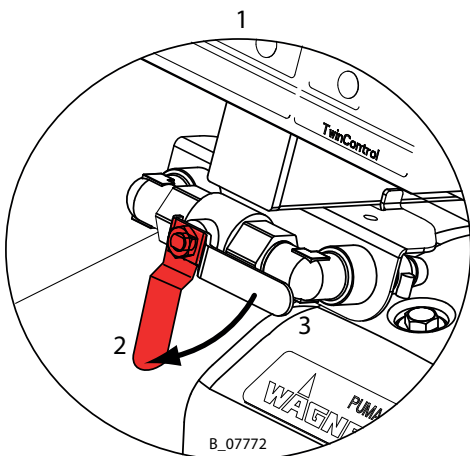
- ⇒ With password level 1:
 - Only convey flushing agent A or only convey flushing agent B.
- ⇒ Press [Start].
- ⇒ Place grounded metal tank for return product under the return tube of the respective pump.
- ⇒ Open the return valve slowly.
- ⇒ When no further overpressure is detected, close the return valve.

- ⇒ Point the spray gun into the grounded metal tank for return product.
- ⇒ Release and open spray gun to relieve the pressure. Avoid splashback.
- ⇒ When no further overpressure is detected, close and secure the spray gun.



1	Splitter valve
---	----------------

- ⇒ With splitter valve: Switch splitter valve over and relieve the pressure from the second gun as well.
- ⇒ Press [Stop].
- ⇒ With two flushing pumps: Repeat step 5 for flushing pump B.



1	Mains air	2	Off
3	On		

6. Switch off air supply.
7. Relieve air pressure between main cock and pump:
 - ⇒ Open the air ball valve of flushing pump A.
 - ⇒ Place grounded metal tank for return product under the return tube of flushing pump A.
 - ⇒ Open the return valve slowly.
 - ⇒ When no further overpressure is detected, close the return valve.
 - ⇒ Close air ball valve of flushing pump A again.
8. **Note:**
Control air pressure is still present.

8.10 AUTOMATIC ELECTROSTATIC SYSTEM SET FOR ELECTROSTATIC GUN GM 5000 (OPTION)

The TC VM 5000 automatic electrostatic system set serves as an additional safety device for the safe use of the TwinControl 2K system with a GM 5000 electrostatic gun. However, it is the responsibility of the operator to proceed in compliance with the following instructions. Four possible operating states of the TwinControl system:

1. Paint filling ▶ Switch off the electrostatic system.
2. Spraying mode ▶ The electrostatic system is enabled.
3. Work Interruption (Stop) ▶ Switch off the electrostatic system.
4. Flushing ▶ Switch off the electrostatic system.

8.10.1 Commissioning and Settings

Perform commissioning and parameter settings as described in the operating manuals for the electrostatic guns and control units.

Settings on the pressure switch

The pressure sensor is set to the lower switching point of 2 bar at the factory. If the switching point setting needs to be adjusted, proceed as described in the assembly manual for the automatic electrostatic system set (order no. 2334831).

Settings on the VM5000 control unit

Device configuration settings must be made on the VM 5000 control unit. Please follow the safety instructions and instructions in the VM 5000 operating manual.

Adjust the device configuration settings in the VM 5000:

C11: Set the remote enable to **on**.

Function test

After commissioning, a function test is required in accordance with the assembly manual for the automatic electrostatic system set, order no. 2334831.

8.10.2 Paint filling

Safety precautions:

Before product can be filled with the TwinControl system, the electrostatic system on the VM 5000 control unit must be switched off manually. This ensures that under no circumstances will solvent be sprayed if the electrostatic system is switched on. The electrostatic system can cause ignitable solvent-air mixtures to explode.

1. Switch off the electrostatics on the VM 5000 control unit manually as described in the VM 5000 operating manuals.
2. Perform product filling as described in this operating manual (TwinControl). The "Work" illuminated display flashes during filling.
3. When the filling process is complete, the illuminated display "Work" is lit up continuously.

Attention:

It must be ensured that the filling quantity is set correctly on the system. At the end of the filling process, the product hose must be filled with product that can be sprayed up to the end of the gun nozzle. In other words, product that can be sprayed (without solvent) must come out of the gun nozzle.

8.10.3 Spraying mode

Safety precautions:

Before spraying mode with electrostatic system can be started, it must be checked whether product, that can be sprayed (without solvent), is coming out of the gun nozzle.

1. Press and release the trigger of the spray gun and check that product, that can be sprayed (without solvent), is coming out of the gun nozzle. Perform the paint filling procedure, if necessary, and set the correct filling quantity.

2. Switch on the electrostatics on the VM 5000 control unit manually as described in the VM 5000 operating manual.
3. Perform spraying mode as described in this operating manual (TwinControl). Ensure that the electrostatics has been set correctly on the GM 5000 gun as described in the GM 5000 and VM 5000 operating instructions.

8.10.4 Work interruption (STOP)

1. Switch off the electrostatics on the VM 5000 control unit manually as described in the VM 5000 operating manuals.
2. Relieve pressure according to Chapter Pressure Relief / Work Interruption [▶▶ 86].

8.10.5 Flushing

Safety precautions

Before the TwinControl system is flushed, the electrostatics on the VM 5000 control unit must be switched off manually. This ensures that under no circumstances will solvent be sprayed if the electrostatic system is switched on. The electrostatic system can cause ignitable solvent-air mixtures to explode.

1. Switch off the electrostatics on the VM 5000 control unit manually as described in the VM 5000 operating manuals.
2. Briefly press and release the trigger of the GM 5000 spray gun and check that the electrostatics has been switched off.
3. Carry out flushing in accordance with Chapter Flushing [▶▶ 85]. The "Flushing" illuminated display lights up during flushing.

8.11 CONNECTION KIT FOR GUN FLUSH BOX (OPTION)

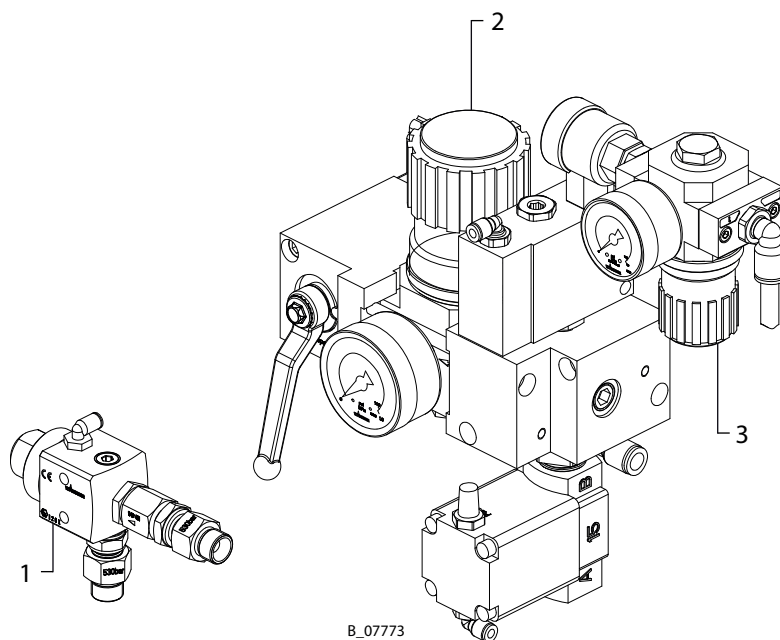
Software settings and tests

1. Attach the compressed air and increase slowly to the desired value. Switch on the voltage supply. Watch out for compressed air leaks!
2. Set parameter P114 in accordance with Chapter Extended Functions with Password Protection [▶▶ 68] (GFB = 1, yes). For system parameters, see Chapter List of Service Functions [▶▶ 44].
3. Insert a gun into the gun flush box and lock the cover.
4. The trigger mechanism of the gun flush box may not be operated now, i.e., is depressurized at connection no. 3 and at no. 3- is pressurized (see Chapter Operating Elements and Control Unit Connections [▶▶ 36] and Pneumatic Diagram [▶▶ 39]).
5. Press the "flushing" button or allow the TwinControl to undercut the pot life. As soon as the pot life alarm is triggered, electro-pneumatic valve no. 3 is actuated. The trigger mechanism of the gun flush box is now operated, i.e., is pressurized at connection no. 3 and is depressurized at no. 3-.

8.12 SOFT CIRCULATION (OPTION)

Systems with soft circulation can let operating pressure automatically circulate the A and/or B component. During circulation, the pumps run at the preset, reduced circulation pressure.

Example, soft circulation Leopard



1	Circulation valve GA 400	2	Working pressure
3	Circulation pressure		

Soft circulation setting

Via password level 4 where pos. "P154" P154 = 1.

0 = no circulation, 1 = soft circulation, 2 = circulation at operating pressure

Separate settings for A and B components


P155 = 1 A-component circulating (product valve A opens when circulating)

P155 = 0 A-component not circulating (product valve A remains closed)

P156 = 1 B-component circulating (product valve B opens when circulating)

P156 = 0 B-component not circulating (product valve B remains closed)

Starting circulation

1. Press the [STOP] button.
2. If necessary, place return hoses in the corresponding product tanks.
3. Select circulation mode: 
4. [Start]

Ending circulation

[Stop] - Circulation stops and the pressure returns to operating pressure.

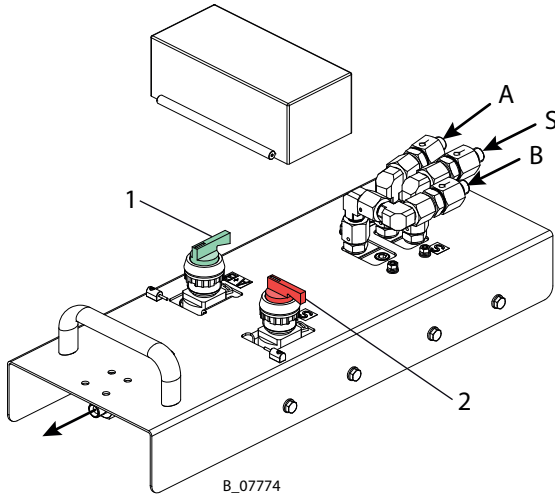
Maintenance

Check valves regularly for leaks (leakage testing in Chapter Check for Leaks in A and B Fluid Section [▶▶ 77]). If the valves are leaking, some of the product will flow back to the product tank and the mixing ratio will no longer be right.

8.13 EXTERNAL MIXERS (OPTION)

8.13.1 Manual External Mixers DN2.6 and DN4

For A-pumps:	5-60, 10-70, 28-40, 15-70, 15-150, 21-110, 35-70, 35-150
Inputs:	A, B and S components
Switches A+B:	Spray on/off
Switch S:	Flushing on/off



1	A+B (open position)	2	S (closed position)
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Spraying mode

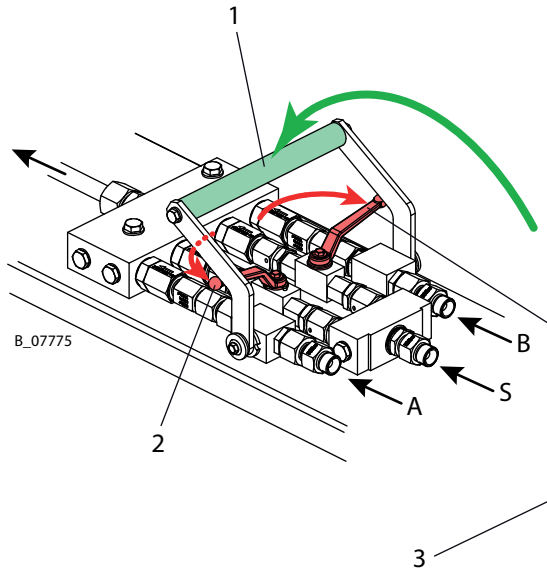
Switches A+B open, switch S closed.

Flushing mode

1. Close switches A+B
2. Open switch S
3. Perform flushing in accordance with Chapter Flushing [▶▶ 85]
4. Close switch S

8.13.2 Manual External Mixer DN8

For A-pumps:	48-110, 3-600, 18-300, 8-600, 55-150
Inputs:	A, B and S components
Handle A+B:	Spray on/off
Ball valve AS:	Flushing on/off for A-side
Ball valve BS:	Flushing on/off for B-side



1	A+B (open position)	2	AS (closed position)
3	BS (closed position)		

Spraying mode

Handle A+B open, ball valves AS and BS closed.

Flushing mode

1. Close handle A+B
2. Carry out flushing process in accordance with Chapter Flushing [▶▶ 85]
Note:
 - ⇒ first flush B-side for 5 seconds (ball valve BS open, AS closed),
 - ⇒ then flush A-side until the flushing process is complete (ball valve AS open, BS closed).
3. Close ball valves AS and BS

8.14 REMOTE CONTROL AND ESTA REMOTE CONTROL (OPTION)

If the control unit cannot be accessed directly from the workplace, the remote control is used for the basic functions: start, stop, flush and circulate. The ESTA remote control is used with electrostatically charged systems.

8.14.1 Explosion protection

The remote control may **not** be used along with a system with a mains power supply (cable) in potentially explosive areas.

The TwinControl remote control may be used along with a system with a turbine in potentially explosive areas (zone 1, zone 2) (see Chapter For Use in Potentially Explosive Areas [▶▶ 11]).

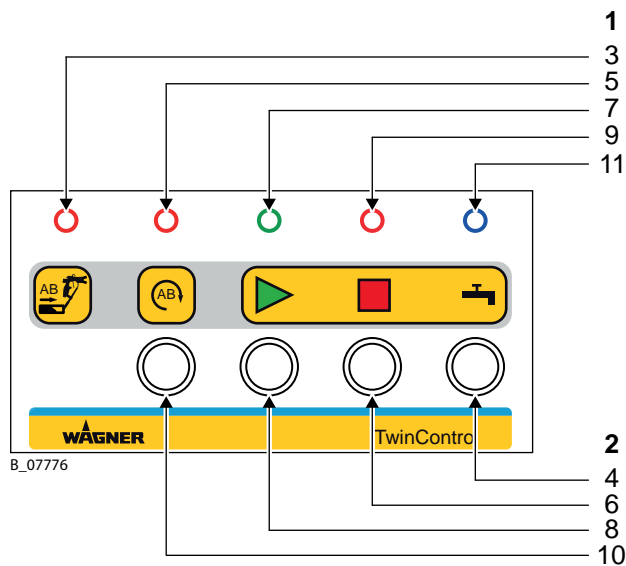
8.14.2 TwinControl Remote Control

Installation

Connect the remote control to the control unit: Insert the cable into the RC connection (remote control, see Chapter Operating Elements and Control Unit Connections [▶▶ 36]). Several cables can be connected together up to a maximum length of 75 m; 246 ft. The cable must be installed permanently and protected from mechanical damage. The first fixing point must be no more than 20 cm from the cable gland.

Operation

[Start], [Stop] and [Flush AB] buttons: Same as the corresponding buttons on the control unit. [Circulation] button: Circulation valves A and B are opened.



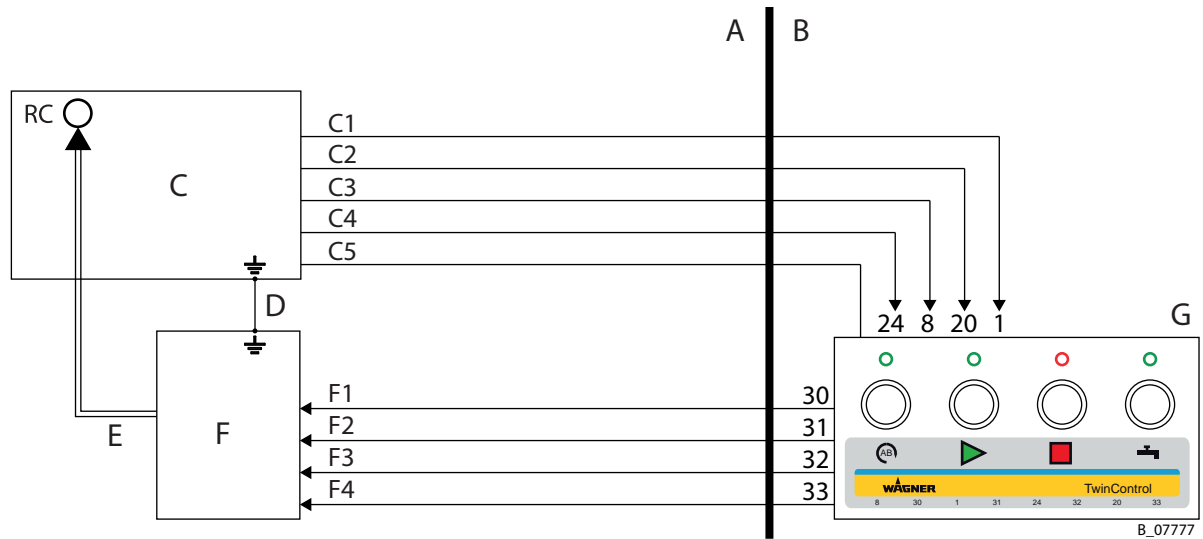
1	Illuminated displays:	2	Buttons:
3	[Filling]	4	[Flushing]
5	[Circulation]	6	[Stop]
7	[Ready]	8	[Start]
9	[Alarm]	10	[Circulation]
11	[Flush AB]		

8.14.3 ESTA remote control

Installation

Pneumatic lines: Connect remote control with control unit and reversing box as shown.

Electric cable: Connect reversing box to control unit (for RC connection, see Chapter Operating Elements and Control Unit Connections [▶▶ 36]).



B_07777

A	ESTA area completely electrostatically charged	B	Outside ESTA area
C	TwinControl control unit	D	Functional potential equalization
E	Electrical cable	F	Reversing box
G	ESTA remote control	C1	(1) Product valve A
C2	(3) Gun flush box (option)	C3	(5) Circulation (option)
C4	(6) Alarm	C5	Air supply
F1	(30) Circulation (option)	F2	(31) Start
F3	(32) Stop	F4	(33) Flush

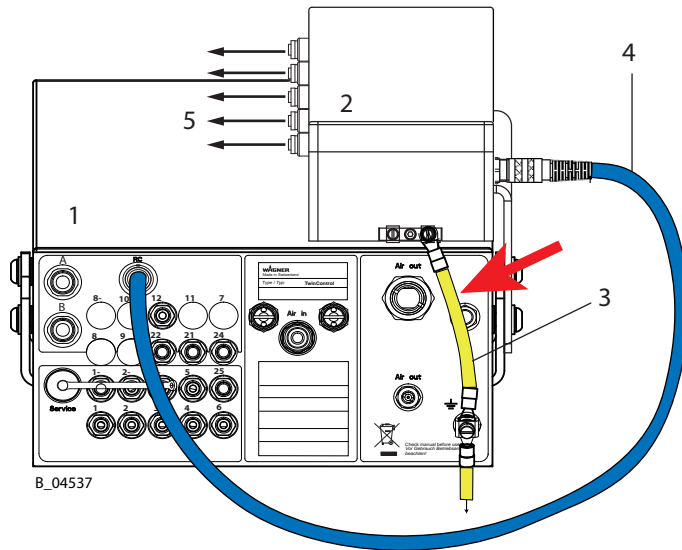
Operation

[Start], [Stop] and [Flush AB] buttons: Same as the corresponding buttons on the control unit.

[Circulation] button: Circulation valves A and B are opened.

Functional potential equalization

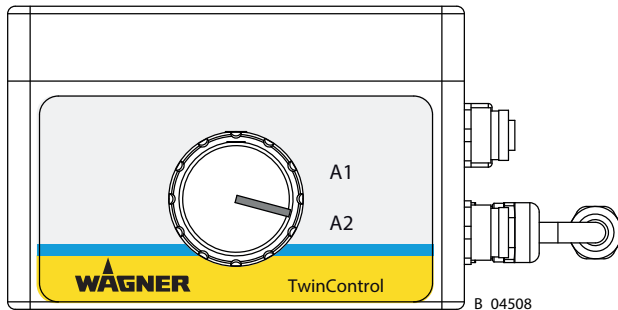
The functional potential equalization connection must have little induction and be short (see diagram).



View from the rear of system

1	Control unit	2	Reversing box
3	Functional potential equalization	4	Electrical cable
5	Hose connections to ESTA remote control		

8.15 2A SWITCHBOX FOR SECOND A-PUMP (OPTION)



If two different colors are to be used in turn, a second A-pump can be installed. A 2A switchbox is used to switch between pumps A1 and A2. The switchbox switches the following pump signals over and forwards them to the control unit:

- Product valve A (pneumatic)
- Changeover signal pump A (pneumatic)
- Stroke measurement A / Sensor A (electric)

Prerequisites

- Pumps A1 and A2 must be the same (model and size).
- Hose from product valve A1 or A2 to mixing block: same diameter and length.
- Same hardener and same mixing ratio for components A1 and A2.
- Soft circulation is not possible.
- External mixer on request.

Grounding

The switchbox must be grounded. The stroke measurement cables may be extended by 5 meters.

Explosion protection

Explosion protection is retained for systems with turbines, even with the 2A switchbox.

Switching over pump

1. [Stop].
2. [Flush] --> Hold gun in a grounded tank, carefully open and hold until clean flushing agent comes out.
3. Turn switchbox switch up to stop.
4. Filling and spraying according to Chapter Spraying mode [▶▶ 83].

Always turn switch up to stop. The center position will result in a fault message (code 20: sensor A at bottom).

9 CLEANING AND MAINTENANCE

9.1 CLEANING

9.1.1 Cleaning Personnel

Cleaning work should be undertaken regularly and carefully by qualified and trained personnel. They should be informed of specific hazards during their training.

The following hazards may arise during cleaning work:

- risk to health from inhaling solvent vapors,
- use of unsuitable cleaning tools and aids.

9.1.2 Safety instructions

Before all work on the device and in the event of work interruptions:

- Switch off the energy and compressed air supply.
- Relieve pressure from spray guns, high-pressure hoses and all devices.
- Secure spray guns against actuation.
- Disconnect the control unit from the mains.

9.1.3 Filter cleaning

- ▶ For information on cleaning the product filter see Chapter Cleaning or replacing the product filter [▶▶ 104].

9.1.3.1 Condensate Drainage from the Filter Pressure Regulator

- ▶ Frequently drain the condensate that may accumulate in the pneumatic filter.
 - ⇒ Make sure the water level in the filter cup never reaches the max. level marked on the cup.

WARNING

Brittle pressure regulator with filter!

The tank on the pressure regulator with filter becomes brittle through contact with solvents and can burst. Flying parts can cause injury.

- ▶ Do not clean the tank on the pressure regulator with filter using solvent.



9.1.4 Cleaning the system

The system must be cleaned to change products and for maintenance purposes. Ensure that no remaining product dries on and sticks to the device.

- ▶ A cleaned system allows leaks to be found easily and measures to be taken quickly.

Procedure

1. Carry out the basic flushing: Chapter Basic Flushing and Pressure Tightness Test [▶▶ 57].
2. Carry out work interruption: Chapter Pressure Relief / Work Interruption [▶▶ 86].
3. Empty system in a controlled manner: Chapter Emptying the system [▶▶ 103].
4. Service spray gun in accordance to its operating manual.
5. Clean and check the suction systems including the suction filter.
6. Remove product filter. Clean and check the filter inserts and filter housing. See Chapter Cleaning or replacing the product filter [▶▶ 104].

7. Product change: If necessary, remove, clean and check the pump inlet housing. If necessary, also remove, clean and check the fluid section.
8. Clean the outside of the system.
9. Fully assemble the system.
10. Check the level of the separating agent: see pump operating manuals.
11. Always carry out basic flushing and the pressure tightness test: Chapter Basic Flushing and Pressure Tightness Test [▶▶ 57].

 **WARNING**

Gas mixtures can explode if there is an incompletely filled pump!

Danger to life from flying parts.

- ▶ Ensure that the pump and suction system are always completely filled with flushing agent or working medium.
- ▶ Do not spray the device empty after cleaning.



9.1.5 Decommissioning

1. Clean the system according to Chapter Cleaning the system [▶▶ 99].
2. Fill the entire system with flushing agent. As laid down in Chapter Replacing Flushing Agent with Working Media [▶▶ 60], but with flushing agent.

9.1.6 Long-term Storage

If storing the system for a prolonged period of time, thorough cleaning and corrosion protection are necessary. For the last rinse, replace the water or solvent in the product pumps with a suitable preservative. Fill separating agent cup with separating agent. Store pump vertically.

Procedure

1. Clean the system according to Chapter Cleaning the system [▶▶ 99].
2. Fill the entire system with flushing agent. As laid down in Chapter Replacing Flushing Agent with Working Media [▶▶ 60], but with flushing agent.
3. Fill the entire system with preservative according to Chapter Replacing Flushing Agent with Working Media [▶▶ 60] and the lacquer supplier's instructions.
4. If the discharge duct is to be removed, seal product output with plug.
5. If the suction system is to be removed, seal product input with plug.
6. Storage according to Chapter Storage and installation conditions [▶▶ 51].

9.2 MAINTENANCE

9.2.1 Maintenance Personnel

Maintenance work should be undertaken regularly and carefully by qualified and trained personnel. They should be informed of specific hazards during their training.

The following hazards may arise during maintenance work:

- risk to health from inhaling solvent vapors,
- use of unsuitable tools and aids.

A skilled person must ensure that the device is checked for being in a reliable state after maintenance work is completed.

9.2.2 Maintenance instructions

DANGER

Incorrect maintenance/repair!

Danger to life and equipment damage.

- ▶ Only a WAGNER service center or a suitably trained person may carry out repairs and replace parts.
- ▶ Use only WAGNER original spare parts and accessories.
- ▶ Only repair and replace parts that are listed in the spare parts chapter and that are assigned to the device.
- ▶ Before all work on the device and in the event of work interruptions:
 - ▶ Relieve the pressure from the spray gun, product hoses and all devices.
 - ▶ Secure the spray gun against actuation.
 - ▶ Switch off the energy and compressed air supply.
 - ▶ Disconnect the control unit from the mains.
- ▶ Observe the operating and service manual for all work.



Prior to maintenance

- Flush and clean the system in accordance with Chapter Cleaning the system [▶▶ 99].
- Switch off the system, see Chapter Switching off the system [▶▶ 82].

After maintenance

- Carry out safety checks in accordance with Chapter Safety Checks and Maintenance Intervals [▶▶ 101].
- Put the system into operation and check for leaks as described in Chapter Commissioning [▶▶ 56].
- Have the system checked for safe condition by a skilled person.

DANGER

Incorrect maintenance/repair!

Danger to life and equipment damage.

- ▶ WAGNER devices, protective systems and safety, monitoring and control equipment may only be serviced/repared as defined in Directive 2014/34/EC (ATEX) by trained WAGNER service personnel or skilled persons in accordance with TRBS 1203! Note national regulations!
- ▶ Service, repair or replacement of devices or parts of devices may only be performed outside the hazard area!



9.2.3 Safety Checks and Maintenance Intervals

Every day

- ▶ Check grounding: see Chapter Grounding [▶▶ 54]
- ▶ Check hoses, tubes and couplings: see Chapter Product Hoses, Pipes and Couplings [▶▶ 107]
- ▶ Check the level of separating agent in the separating agent cup and top up if necessary.
- ▶ Check and clean the product filter or replace it as required: Chapter Cleaning or replacing the product filter [▶▶ 104]

Weekly

- ▶ Check system for damage.
- ▶ Check non-return valves: Chapter Non-return valves [▶▶ 102]
- ▶ Clean product filter: Chapter Cleaning or replacing the product filter [▶▶ 104]
- ▶ Clean pneumatic filter: Chapter Filter cleaning [▶▶ 99]
- ▶ Product valves: Check air or product emission from the leakage holes according to the respective operating manual.
- ▶ Check the function of the safety fixtures (see Chapter Protective and Monitoring Equipment [▶▶ 24]):
 - ⇒ External release
 - ⇒ Pumps and accessories: Check protective and monitoring equipment in accordance with the respective operating manuals.

Yearly or as required

- ▶ In accordance with DGUV regulation 100-500, Chapters 2.29 and 2.36:
 - ⇒ The liquid ejection devices should be checked by an expert (e.g., WAGNER service technician) for their safe working conditions as required and at least every 12 months.
 - ⇒ For shut down devices, the examination can be suspended until the next start-up.

9.2.4 Service Plug

WARNING

Service plug!

Explosion hazard.

- ▶ Do not connect the service plug if a potentially explosive gas atmosphere could be present.



9.2.5 Connections for Stroke Measurement

Plug connectors A and B on the rear side of the device are used to connect the potentiometers and may be inserted and removed, even during operation (lines are intrinsically safe).

9.2.6 Turbine

- ▶ When replacing the turbine, attention should be paid to the "TC Turbine Set" assembly manual with order no. 2320883.
- ▶ When replacing the generator, attention should be paid to the "TC Generator Conversion Set" assembly manual with order no. 2336796.

9.2.7 Non-return valves





- ▶ Regularly check the function of the non-return valves.

Pressure relief valve for protecting the feed pump (see Chapter Feed Pump (Option) [▶▶ 48])





- ▶ Regularly check the function of the pressure relief valve.

- ▶ The pressure-relief valve must be cleaned regularly and after each activation: Flush with solvent.

9.2.8 Emptying the system

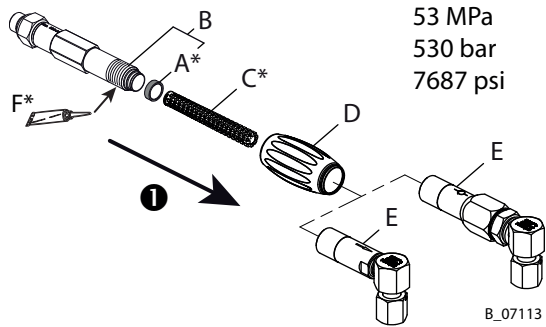
1. Visual check: personal safety equipment, grounding and all devices ready to use.
2. Close the pressure regulator of the three pumps (0 MPa; 0 bar; 0 psi).
3. Select "Work" in main menu.
4. **Emptying pump A:**
 - ⇒ In sub-menu, select component "A"  and press [Start].
 - ⇒ Empty pump A in accordance with pump A's operating manual.
 - ⇒ Close product valve by pressing [Stop].
5. **Emptying pump B:**
 - ⇒ Select component "B" in sub-menu  and press [Start].
 - ⇒ Empty pump B in accordance with pump B's operating manual.
 - ⇒ Close product valve by pressing [Stop].
6. **Emptying flushing pump:**
 - ⇒ In sub-menu, select flushing valve AS:  and press [Start].
 - ⇒ Empty flushing pump in accordance with flushing pump's operating manual.
 - ⇒ Close product valve by pressing [Stop].
 - ⇒ If there is a separate B flushing valve (controller 2 or 3): Select flushing valve BS in the sub-menu  and then repeat steps 6.2 to 6.3.

9.2.9 Filling Empty System

1. Visual check: personal safety equipment, grounding and all devices ready to use.
2. Close the pressure regulator of the three pumps (0 MPa; 0 bar; 0 psi).
3. Select [Work] in main menu.
4. **Filling pump A:**
 - ⇒ In sub-menu, select component "A"  and press [Start].
 - ⇒ Fill pump A in accordance with pump A's operating manual.
 - ⇒ Close product valve by pressing [Stop].
5. **Filling pump B:**
 - ⇒ Select component "B" in sub-menu  and press [Start].
 - ⇒ Fill pump B in accordance with pump B's operating manual.
 - ⇒ Close product valve by pressing [Stop].
6. **Filling the flushing pump:**
 - ⇒ In sub-menu, select flushing valve AS:  and press [Start].
 - ⇒ Fill flushing pump in accordance with flushing pump's operating manual.
 - ⇒ Close product valve by pressing [Stop].
 - ⇒ If there is a separate B flushing valve: Select flushing valve BS in the sub-menu  and then repeat steps 6.2 to 6.3.

9.2.10 Cleaning or replacing the product filter

9.2.10.1 Angled Inline Filter (530 bar)

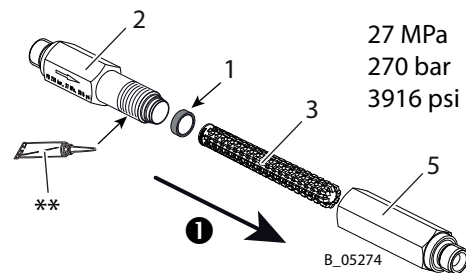


1	Flow direction
---	----------------

* For order no., see spare parts catalog.

1. Flush the pump and inline filter in accordance with Chapter Maintenance Work on the Pumps [▶▶ 50] and with pump's operating manual. Flush using the gun so that the flushing agent flows through the inline filter. Maximize the flow (remove the nozzle, open the dosing valve if necessary).
2. Empty the pump in a controlled manner in accordance with Chapter Maintenance Work on the Pumps [▶▶ 50] and the pump's operating manual.
3. Place the grounded collection tank under the inline filter.
4. Unscrew the filter by turning the handle (D).
5. Remove the filter insert (C).
6. If the inline filter has any leaks: Replace the seal (A).
7. Insert the new filter insert (C). Note the installation position: closed end in direction of flow.
8. If necessary, coat the thread with anti-seize paste (F).
9. Assemble the turning handle (D), inlet housing (B) and outlet housing (E) and tighten by turning the handle.
10. Clean the spray gun's product filter in accordance with the spray gun's operating manual.
11. Fill pump in accordance with Chapter Maintenance Work on the Pumps [▶▶ 50] and the pump's operating manual.

9.2.10.2 Straight Inline Filter (270 bar)



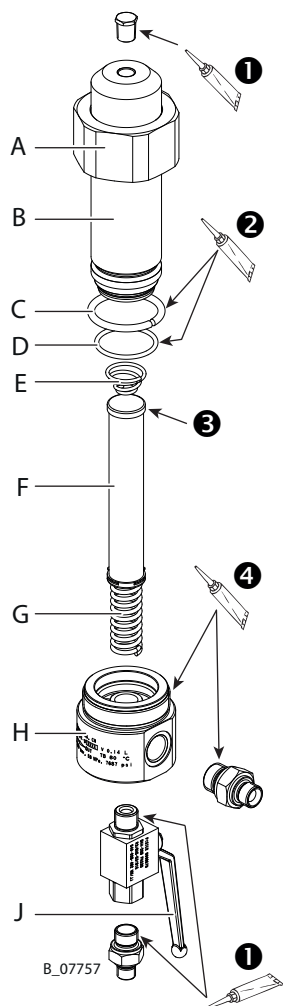
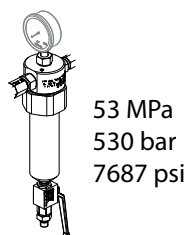
1	Flow direction
---	----------------

* For order no., see spare parts catalog.

1. Flush the pump and inline filter in accordance with Chapter Maintenance Work on the Pumps [▶▶ 50] and with pump's operating manual. Flush using the gun so that the flushing agent flows through the inline filter. Maximize the flow (remove the nozzle, open the dosing valve if necessary).
2. Empty the pump in a controlled manner in accordance with Chapter Maintenance Work on the Pumps [▶▶ 50] and the pump's operating manual.
3. Place the grounded collection tank under the inline filter.
4. Unscrew the inlet housing (B) and outlet housing (E) with two size 19 wrenches.
5. Remove the filter insert (C).
6. If the inline filter has any leaks: Replace the seal (A).
7. Insert the new filter insert (C). Note the installation position: closed end in direction of flow.
8. If necessary, coat the thread with anti-seize paste (F).
9. Screw together the inlet housing (B) and outlet housing (E) with two size 19 wrenches.
10. Clean the spray gun's product filter in accordance with the spray gun's operating manual.
11. Fill pump in accordance with Chapter Maintenance Work on the Pumps [▶▶ 50] and the pump's operating manual.

9.2.10.3 High-pressure Filter, 530 Bar

Filter installation position is reversed



1	Loctite® 542 *	2	Mobilux® EP2 *
3	Filter identification	4	Anti-seize paste *

* For order no., see spare parts catalog.

1. Flush the pump and high-pressure filter in accordance with Chapter Maintenance Work on the Pumps [▶▶ 50] and with pump's operating manual. Flush using the gun so that the flushing agent flows through the filter cartridge (F). Maximize the flow (remove the nozzle, open the dosing valve if necessary).
2. Empty the pump in a controlled manner in accordance with Chapter Maintenance Work on the Pumps [▶▶ 50] and the pump's operating manual.
3. Place the grounded collection tank under the high-pressure filter.
4. Open ball valve (J).
5. Loosen union nut (A) with a size 70 wrench.

6. Unscrew the union nut (A) and lift slightly so that it does not get dirty in the next step.
7. Remove the filter housing (B) with the union nut (A). The cone spring (E) remains in the filter housing (B). If the O-ring (D) is not damaged, it remains on the filter housing (B).
8. Remove the filter cartridge (F) and filter socket (G) from the filter housing (B).
9. Clean all parts:
 - ⇒ Place the filter cartridge (F) and filter socket (G) in solvent. Clean using brush.
 - ⇒ Fill the filter housing (B) approx. 1/3 full with solvent. Close, wearing gloves, and shake well.
 - ⇒ Clean the distribution housing (H) using a brush.
10. If necessary, replace the O-ring (D) and/or filter cartridge (F). For order no., see spare parts catalog.
11. Assemble all parts in reverse order. While doing so:
 - ⇒ Coat the thread of the distribution housing (H) with anti-seize paste.*
 - ⇒ Coat O-ring (D) and pressure ring (C) with Mobilux® EP2*.
 - ⇒ Observe the installation position of the filter cartridge (F): Push the closed end with the filter identification ahead into the filter housing (B).
 - ⇒ Make sure that the cone spring (E) is in the filter housing (note the installation position). Press on the cone spring after inserting the filter cartridge (F) and filter socket (G); the spring action must be noticeable.
 - ⇒ Tighten the union nut (A) by hand.
12. Close ball valve (J).
13. Clean the spray gun's product filter in accordance with the spray gun's operating manual.
14. Fill pump in accordance with Chapter Maintenance Work on the Pumps [▶▶ 50] and the pump's operating manual.

* For order no., see spare parts catalog.

9.2.11 Product Hoses, Pipes and Couplings

The service life of the complete hoses between product pressure generator and application device is reduced due to environmental influences even when handled correctly.

- ▶ Check hoses, pipes, and couplings every day and replace if necessary.
- ▶ Additionally, the operator must regularly check the complete hoses for wear and tear as well as for damage at intervals that he/she has set. Records of these checks must be kept.
- ▶ The complete hose is to be replaced as soon as one of the two following intervals has been exceeded:
 - ⇒ 6 years from the date of the hose crimping (see fitting embossing).
 - ⇒ 10 years from the date of the hose imprinting.

Fitting embossing	Meaning
xxx bar	Pressure
yymm	Crimping date (year/month)
XX	Internal code

Hose imprinting	Meaning
WAGNER	Name/manufacturer
yymm	Date of manufacture (year/month)
xxx bar (xx MPa) e.g., 270 bar (27 MPa)	Pressure
XX	Internal code
DNxx (e.g., DN10)	Nominal diameter

10 TROUBLESHOOTING

Fault display

If a fault occurs, it is indicated by the following:

1. The horn sounds and the system stops.
2. The alarm display lights up (control unit and remote control).
3. A fault is indicated on the display.

Acknowledge fault

- ▶ With the [Stop] button.

Fault rectification

If the alarm signal sounds, it is advantageous to be able to determine which operating situation has caused the error. Fault rectification can be carried out in accordance with the list in Chapter Alarm messages and fault rectification [▶▶ 110].

Incorrect product in spray hose

After a fault, the spray hose is filled with incorrectly mixed product. This incorrect product must be discharged or removed with intermediate flushing.

Defect in control unit

- ▶ Faults caused by a defect in the control unit may only be remedied by a trained expert (e.g., workshop electrician)!

WARNING

Danger of electric shock inside the control unit!

Danger to life from electric shock.

- ▶ May only be installed/maintained by skilled electricians or under their supervision.
- ▶ Operation according to the safety regulations, fire protection and electrotechnical rules.
- ▶ Must be de-energized before work is commenced on active parts.



Malfunction	Remedy
System does not start up	<ol style="list-style-type: none"> 1. Check air supply line connection. 2. Check the pressure value on the system's pressure gauge for the air supply to the valves. 3. Check the voltage supply (Does the control panel light up?). 4. Check the selected valves. 5. Check the fuses.
System is in operation (a pump is running), but there is no product flow	<ol style="list-style-type: none"> 1. Check the supply lines of the components as well as filters (clogging) and suction tubes (leakage). 2. Check the component level in the supply tanks. 3. Check the viscosity of the components or the pressure loss.
System does not supply any product, pumps do not run	<ol style="list-style-type: none"> 1. Check the mixing tube and feed hoses. 2. Check the guns and the gun filter. 3. Clean the lines by flushing or cleaning manually.

Malfunction	Remedy
The 2K product does not react correctly	<ol style="list-style-type: none"> 1. Check the mixing ratio value. 2. Check the suction lines (leakage). 3. Check the stroke sensors by carrying out a calibration. 4. Check the differential pressure between B and A (B approx. 5-10% higher than A). 5. Check AIS function and stepping motor according to Chapter AIS [▶▶ 75]. 6. Without AIS: Optimize the switching behavior of the hardener dosing valve in spraying mode (0.5-2 seconds) via the differential pressure of B to A or via the stroke setting of the valve. 7. Check the lacquer specifications.
Flow rate is too low	<ol style="list-style-type: none"> 1. Check the mixing tube and feed hoses. 2. Check the guns and the gun filter. 3. Clean the lines by flushing or cleaning manually. 4. Increase the pressure of the supply pumps.
Lacquer loss from the bleed bore of a product valve	<p>▶ Replace the valve needle seal, check the valve needle and housing for damage and if necessary, replace the entire valve.</p>
Power failure over a longer period of time	<p>▶ With external compressed air, manually open the flushing valve and distributor valve (option).</p>
The system delivers product, but the spray pattern is insufficient	<ol style="list-style-type: none"> 1. Ensure that the supply pressures are constant. 2. The pressure of component B must be 10% higher than that of component A. 3. Increase the pressure of the supply pumps. 4. AirCoat: Set the atomizing air correctly. 5. Check the product filter with pumps and guns. 6. Replace gun nozzle with a more suitable nozzle (Airless and AirCoat). 7. Check the viscosity of the product and dilute it in accordance with the lacquer manufacturer's instructions. If necessary correct the mixing ratio. 8. AirCoat: Ensure that only dry, clean atomizing air is used in the spray gun.
Flow rate is too high	<ol style="list-style-type: none"> 1. Replace gun nozzle (Airless and AirCoat). 2. Check the lines for leakage. 3. Set the opening of the gun needle correctly (air guns only). 4. Decrease the pressure of the supply pumps.

10.1 ALARM MESSAGES AND FAULT RECTIFICATION

Software version V 4.0x / 4.1x / 4.2x

Code	Meaning	Cause	Fault rectification
off	No authorization	Unauthorized input	Release authorization
11	Shortage of the B-component	Too little B-component in the mixture.	Increase air pressure for B pump or reduce for A. Without AIS: Increase length of stroke of timing valve in B-product. With AIS: Check AIS position, manually increase if necessary (see Chapter AIS [▶▶ 75], parameter P309).
12	B Excess	Too much B component in the mixture.	Reduce air pressure for B-pump. Without AIS: Decrease length of stroke of timing valve in B-product. With AIS: Check the AIS position, manually decrease if necessary (see Chapter AIS [▶▶ 75], parameter P309).
15	Pot life	Pot life has expired.	Flush or continue operation.
16	Compressed air supply	Compressed air supply less than 0.4 MPa; 4 bar; 58 psi.	Increase compressed air supply.
17	External release	No external release.	Activate external release. See Chapter Pneumatic Diagram [▶▶ 39].
18	Flushing problem	Flush program is not running.	Open compressed air for A and B product pump. Carefully open gun. Check gun flush box.
19	Pot life	Flushing must be undertaken first.	Flushing
20	Sensor A at bottom	Stroke sensor A cable breakage or Sensor signal lost (sensor is in lower idle position).	Suction problem: A-pump is cavitating, improve supply of product. Switch A-pump to circulation and pass lower reversal point. Check plug connection for sensor A. If second A-pump is present: 2A switchbox switch must be at stop.
21	Sensor B at bottom	Stroke sensor B cable breakage or Sensor signal lost (sensor is in lower idle position).	Suction problem: B-pump is cavitating, improve supply of product. Switch B-pump to circulation and pass lower reversal point. Check plug connection for sensor B.
24	Initializing sensor A	Stroke sensor A initialization error.	Switch system off and turn back on.
25	Initializing sensor B	Stroke sensor A initialization error.	Switch system off and turn back on.
26	Sensor A reversal points	Stroke sensor A problem with reversal points.	Calibrate A. Replace stroke sensor if necessary.
27	Sensor B reversal points	Stroke sensor B problem with reversal points.	Calibrate B. Replace stroke sensor if necessary.
30	Descending speed A	Pump A sags in downward stroke, pump cavitating.	Check product supply.

Code	Meaning	Cause	Fault rectification
31	Descending speed B	Pump B sags in downward stroke, pump cavitating.	Check product supply.
32	Ascending speed A	Pump A sags in upward stroke, pump cavitating.	Check product supply. Leak check, check piston valve.
33	Ascending speed B	Pump B sags in upward stroke, pump cavitating.	Check product supply. Leak check, check piston valve.
40	Alarm password	The software is not enabled.	Enter software password. WAGNER AG password (only possible on PC).
41	Incorrectly adjusted air pressure	Turbine speed too low.	Check turbine. Adjust air pressure (WAGNER technician).
42	Incorrectly adjusted air pressure	Turbine speed too high.	Check turbine. Adjust air pressure (WAGNER technician).
61	Warning leakage A up	The A fluid section has a slight leak in the upward stroke.	Check circulation valve. / Schedule an inspection of the A fluid section.
62	Warning leakage A down	The A fluid section has a slight leak in the downward stroke.	Check circulation valve. / Schedule an inspection of the A fluid section.
63	Alarm leakage A up	The A fluid section has a large leak in the upward stroke.	Check circulation valve. / Schedule inspection of the A fluid section.
64	Alarm leakage A down	The leak in the A-pump in the downward stroke exceeds the error limit.	Check circulation valve. / Schedule inspection of the A fluid section.
65	Alarm leakage B up	The B fluid section has a slight leak in the upward stroke.	Check circulation valve. / Schedule an inspection of the B fluid section.
66	Alarm leakage B down	The B fluid section has a slight leak in the downward stroke.	Check circulation valve. / Schedule an inspection of the B fluid section.
67	Alarm leakage B up	The B fluid section has a large leak in the upward stroke.	Check circulation valve. / Schedule inspection of the B fluid section.
68	Alarm leakage B down	The leak in the B pump in the downward stroke exceeds the error limit.	Check circulation valve. / Schedule inspection of the B fluid section.
70	Stroke rate of the A-pump is too high	A-product-pump is too fast.	Restrict stroke rate.
71	Stroke rate of the B-pump is too high	B product pump is too fast.	Restrict stroke rate.
72	Number of strokes from A-flushing-pump too high	A-flushing-pump is too fast.	Restrict stroke rate.
73	Number of strokes from B flushing pump too high	B flushing pump is too fast.	Restrict stroke rate.
80	A-valve worn out	A-valve has too many cycles.	Inspect A-valve.
81	B-valve worn out	B-valve has too many cycles.	Inspect B-valve.
85	Failure	The factory settings are not saved.	Contact the WAGNER hotline.
86	Failure	The customer settings are not saved.	Contact the WAGNER hotline.

Code	Meaning	Cause	Fault rectification
90	EEPROM alarm	Reading or writing to the EEPROM is not possible.	Contact WAGNER service department.
91	ADC alarm	Reading the potentiometer values is not possible.	Contact WAGNER service department.
92	Alarm K-factor pump A	The current K-factor is outside the valid range.	Recalibrate pump. Check range setting of pump.
93	Alarm K-factor pump B	The current K-factor is outside the valid range.	Recalibrate pump. Check range setting of pump.
94	Flow is too high	The current flow is above the set value.	Check nozzle and pump pressure.
95	Flow is too low	The current flow is below the set value.	Check nozzle and pump pressure.
96	Gun signal missing	The gun signal is not present.	Check gun monitoring.
97	AIS fell short of warning limit	AIS: Falls short of minimum injection quality (opening time of the dosing valve in percent, see Chapter AIS [▶▶ 75], parameter P301).	If the stroke of the dosing valve is far from its ideal position, the adjustment can take a long time under some circumstances. Preset dosing valve stroke (see Chapter AIS [▶▶ 75], parameter P309) Reduce air pressure for B-pump. Check whether valve closes. Clean valve. Check stroke sensor. Check whether nozzles, mixer or filter are clogged. Check the level of the paint tank, condition of the feed pumps, etc.

11 REPAIRS

11.1 REPAIR PERSONNEL

Repair work should be undertaken carefully by qualified and trained personnel. They should be informed of specific hazards during their training.

The following hazards may arise during repair work:

- risk to health from inhaling solvent vapors,
- use of unsuitable tools and aids.

A skilled person must check to ensure that the device is in a reliable state after it is repaired. A function test should be performed.

11.2 REPAIR NOTES

DANGER

Incorrect maintenance/repair!

Danger to life and equipment damage.

- ▶ Only a WAGNER service center or a suitably trained person may carry out repairs and replace parts.
- ▶ Use only WAGNER original spare parts and accessories.
- ▶ Only repair and replace parts that are listed in the spare parts chapter and that are assigned to the device.
- ▶ Before all work on the device and in the event of work interruptions:
 - ▶ Relieve the pressure from the spray gun, product hoses and all devices.
 - ▶ Secure the spray gun against actuation.
 - ▶ Switch off the energy and compressed air supply.
 - ▶ Disconnect the control unit from the mains.
- ▶ Observe the operating and service manual for all work.



Before Repair Work

- Flush and clean the system. ☒ Chapter Cleaning the system [▶▶ 99]
- Switch off the system. ☒ Chapter Switching off the system [▶▶ 82].

After Repair Work

- Carry out safety checks in accordance with Chapter Safety Checks and Maintenance Intervals [▶▶ 101].
- Put the system into operation and check for leaks as described in Chapter Commissioning [▶▶ 56].
- Have the system checked for safe condition by a skilled person.

⚠ DANGER

Incorrect maintenance/repair!

Danger to life and equipment damage.

- ▶ WAGNER devices, protective systems and safety, monitoring and control equipment may only be serviced/repared as defined in Directive 2014/34/EC (ATEX) by trained WAGNER service personnel or skilled persons in accordance with TRBS 1203! Note national regulations!
- ▶ Service, repair or replacement of devices or parts of devices may only be performed outside the hazard area!



11.3 ASSEMBLY AIDS

In the spare parts catalog the order numbers for device spare parts can be found, as well as for wearing parts such as seals.

- ▶ Use torques, greases and glues in accordance with the spare parts catalog.

Assembly Aids

Order no.	Quantity	Designation	Smaller tanks
9992511	1 pc = 50 ml	Loctite® 243	
9992528	1 pc = 150 g	Loctite® 270	
9998157	1 pc = 18 ml	Loctite® 480	
9992831	1 pc = 50 ml	Loctite® 542	
3201587	1 pc = 50 ml	Loctite® 577	
9999042	1 pc = 50 ml	Loctite® 638	
9998808	1 pc = 18 kg!	Mobilux® EP 2 grease	400 g tube = Order no. 2355418
2342273	1 pc = 390 g	Mobil SHC Polyrex™ 222 grease	

Brand notice

The brands specified in this document are property of the respective owners. Loctite®, for example, is a registered brand of Henkel.

12 DISPOSAL

When the devices must be scrapped, please differentiate the disposal of the waste materials.

The following materials have been used:

1. Steel
2. Aluminum
3. Elastomers
4. Plastics
5. Carbide

⚠ NOTICE

Do not dispose of used electrical equipment with household refuse!

In accordance with European Directive 2012/19/EU on the disposal of used electrical equipment and its implementation in national law, this product may not be disposed of with the household refuse, but must be recycled in an environmentally correct manner.

- ▶ WAGNER or one of our dealers will take back your used WAGNER electric or electronic equipment and will dispose of it for you in an environmentally-friendly way.
- ▶ Please contact one of our service points, one of our representatives or us directly.

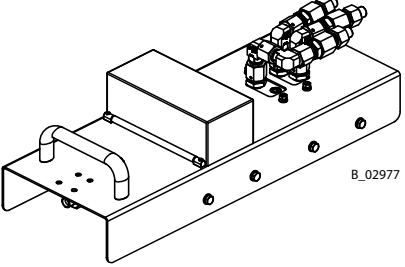
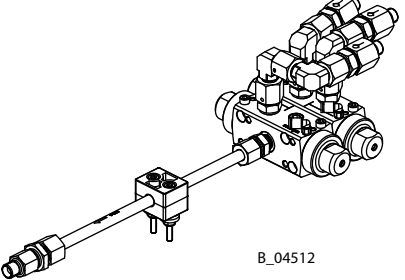
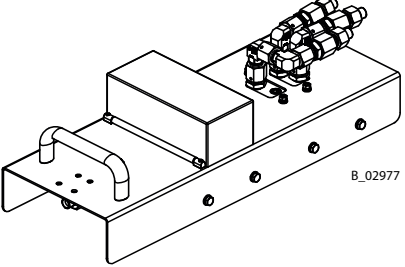
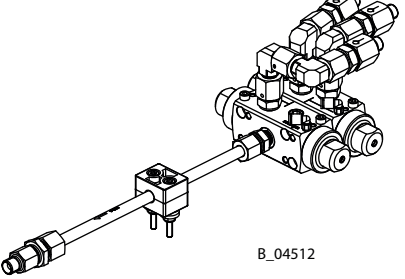
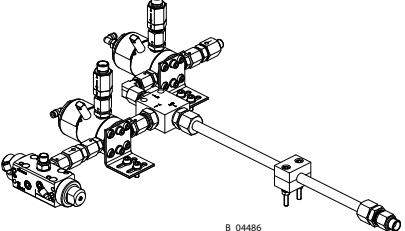


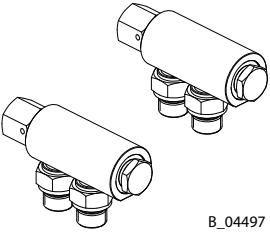
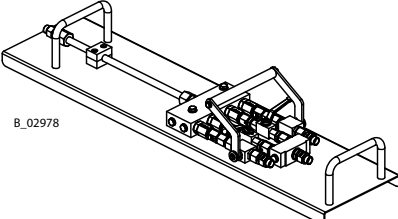
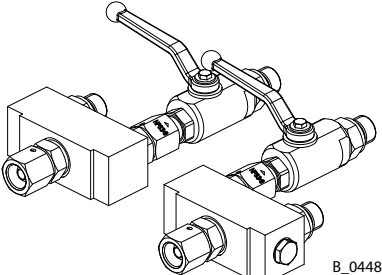
Consumable products

Consumable products (lacquers, adhesives, flushing and cleaning agents) must be disposed of in accordance with all applicable legal requirements.

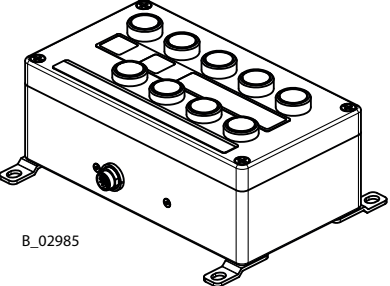

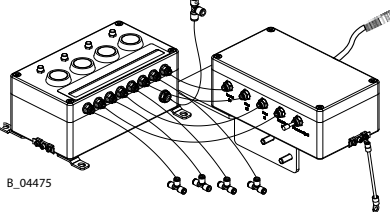
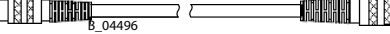
13 ACCESSORIES

13.1 MIXER

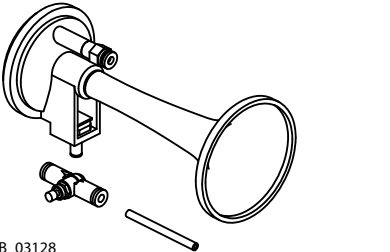
Order no.	Designation	
2338297	Manual, external mixer DN 2.6 For A-pumps 5-60, 10-70, 28-40, 21-110, 35-70, 35-150	 <p>B_02977</p>
2339620	Automatic, external mixer DN 2.6 For A-pumps 5-60, 10-70, 28-40, 21-110, 35-70, 35-150 Prerequisite: Controller 3, 6 or 9	 <p>B_04512</p>
2338298	Manual, external mixer DN 4 For A-pumps 5-60, 10-70, 28-40, 21-110, 35-70, 35-150	 <p>B_02977</p>
2339621	Automatic, external mixer DN 4 For A-pumps 5-60, 10-70, 28-40, 21-110, 35-70, 35-150 Prerequisite: Controller 3, 6 or 9	 <p>B_04512</p>
2339617	Automatic, external mixer DN4 / DN10VA ab 48-110 For A-pumps 48-110, 3-600, 18-300, 8-600, 75-150, 55-200, 60-240 Prerequisite: Controller 3, 6 or 9	 <p>B_04486</p>

Order no.	Designation	
2339628	Circulation G3/8" for automatic, external mixer DN4	 <p data-bbox="1193 464 1257 485">B_04497</p>
2338300	Manual, external mixer DN 8 For A-pumps 48-110, 3-600, 60-240 (270 bar), 8-600, 75-150, 55-200, 60-240	 <p data-bbox="1002 611 1050 632">B_02978</p>
2338301	Circulation for manual, external mixer DN8	 <p data-bbox="1321 989 1385 1010">B_04485</p>

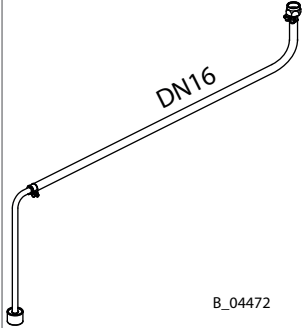
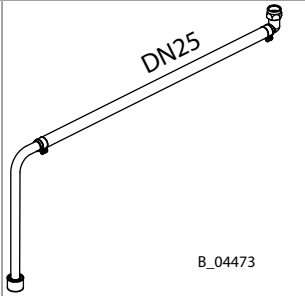
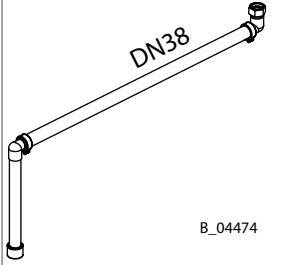
13.2 REMOTE CONTROL

Order no.	Designation	
2308874	<p>TwinControl remote control includes 15 m; 49 ft. cable. Maximum permissible cable length: 75 m; 246 ft.</p> <p>Please note: If used in a system with a mains power supply (cable) -> Can only be used in areas not at risk of explosion. When used in a system with turbine -> Can be used in Ex zones (zone 1 and zone 2).</p>	 <p>B_02985</p>
2308879	<p>Cable 15 m; 49 ft. Extension for TwinControl remote control. Maximum permissible cable length: 75 m; 246 ft.</p>	 <p>B_03757</p>
2313533	<p>ESTA remote control including cable</p>	 <p>B_04475</p>
2311371	<p>Cable for ESTA remote control Length 1 m; 3.3 ft.</p>	 <p>B_04496</p>

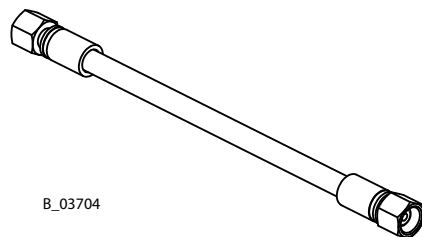
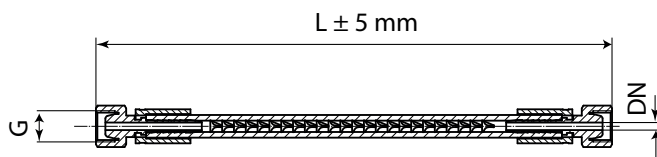
13.3 HORN ALARM

Order no.	Designation	
2312343	<p>External pneumatic horn set</p>	 <p>B_03128</p>

13.4 SUCTION HOSES

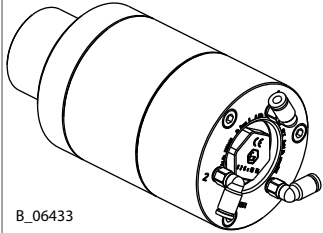
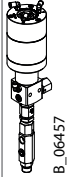
Order no.	Designation	
2324110	Suction hose DN16-SSt complete for: <ul style="list-style-type: none"> - EvoMotion 5-60 - Wildcat 10-70, 18-40 - Puma 28-40, 21-110 - Leopard 35-70 	 <p style="text-align: right;">B_04472</p>
2324116	Suction hose DN25-SSt complete for: <ul style="list-style-type: none"> - all pumps 	 <p style="text-align: right;">B_04473</p>
2329592	Suction hose DN38-SSt complete for: <ul style="list-style-type: none"> - Puma 8-300, 3-600 - Protec 60-240 (270 bar), Leopard 8-600 - Protec 72-200, Protec 60-240 	 <p style="text-align: right;">B_04474</p>

13.5 MIXING HOSES

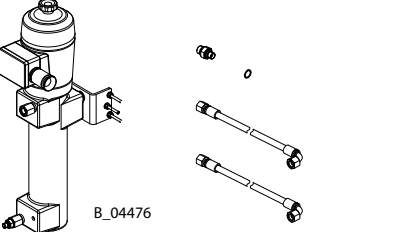
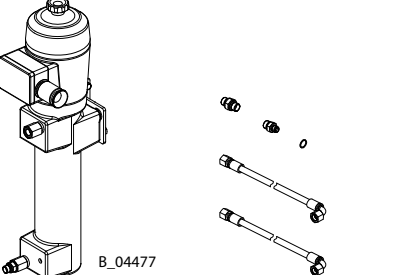
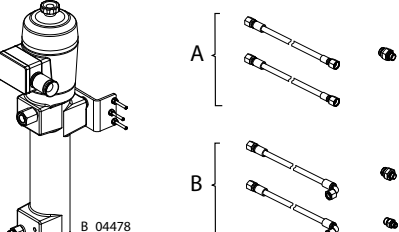
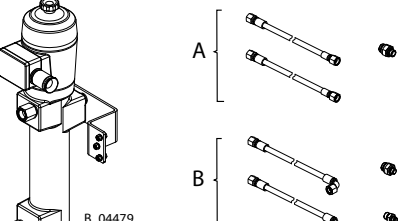


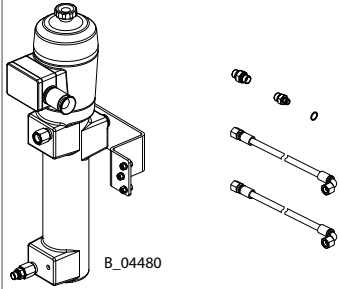
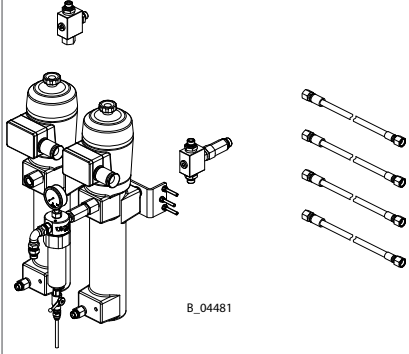
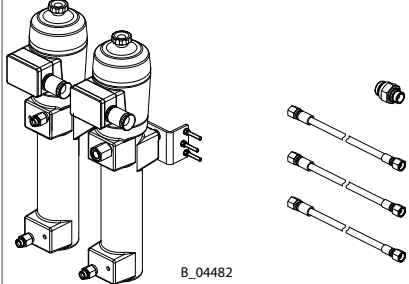
Order no.	Designation	DN	L	G
2312390	Mixing hose 32	4	235	G1/4 "
2312393	Mixing hose 96	4	455	G1/4 "
2312396	Mixing hose 32	6	315	G1/4 "
2312399	Mixing hose 96	6	715	G1/4 "
2312402	Mixing hose 32	10	387	G3/8 "
2312405	Mixing hose 96	10	921	G3/8 "
2317130	Mixing hose 32 GXP	10	460	G3/8 "

13.6 AIS

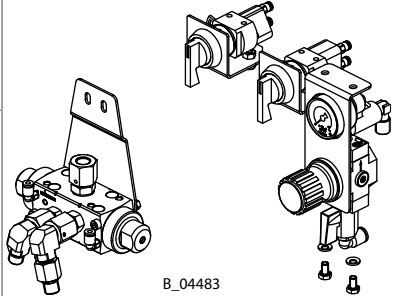
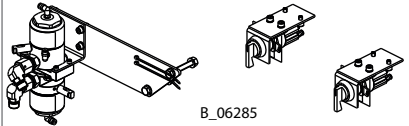
Order no.	Designation	
2371157	<p>AIS set including conversion of control unit 1 to 9 / 10</p> <p>For pumps 5-60, 10-70, 28-40, 21-110, 35-70, 35-150.</p> <ul style="list-style-type: none"> - Control unit 9: no air flushing - Control unit 10: no soft circulation <p>For software version 4.0x and 4.1x, an update to 4.2 is necessary.</p>	 <p>B_06433</p>
2373390	<p>AIS set including conversion of control unit 2 to AIS</p> <p>For pumps 48-110, 8-300, 60-240, 3-600, 8-600, 75-150.</p> <p>For software version 4.0x and 4.1x, an update to 4.2 is necessary.</p>	 <p>B_06457</p>

13.7 HEATER

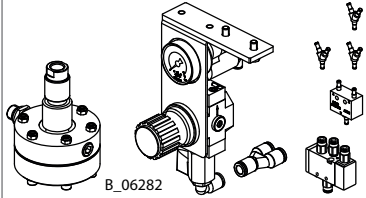
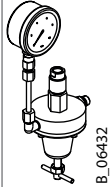
Order no.	Designation	
2338290	Heater set A or B for TwinControl pumps 5-60, 10-70, 28-40, 21-110, 35-70, 35-150	
2338294	Heater set A or B for TwinControl pumps 3-600, 48-110, 60-240, 8-600; and for 95-150 (without trolley)	
2338291	Heater set A for TwinControl pumps 72-200 (without trolley), 72-300 (without trolley) and 60-240 (without trolley)	
2340906	Heater set B for TwinControl pumps 72-200 (without trolley), 60-240 (without trolley)	
2338292	Heater set A trolley for TwinControl pumps 72-200 (with trolley), 60-240 (with trolley)	
2340907	Heater set B trolley for TwinControl pumps 72-200 (with trolley), 60-240 (with trolley)	

Order no.	Designation	
2338293	Heater set A, B trolley for TwinControl pump 95-150 (with trolley)	
2338295	Double parallel heater set for TwinControl pumps 72-200 (without trolley), 60-240 (without trolley)	
2338296	Twin serial heater set for TwinControl pumps 72-200 (without trolley), 60-240 (without trolley)	

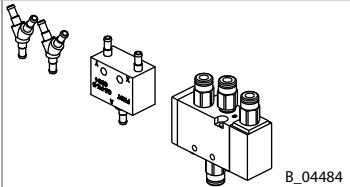
13.8 SPLITTER VALVE

Order no.	Designation	
2338302	Splitter valve DN 2.6 TC, 400 bar For A-pumps 28-40, 21-110, 35-70, 35-150. Not possible with external mixer.	
2338303	Splitter valve DN 4 TC, 100 bar For A-pumps 5-60, 10-70. Not possible with external mixer.	
2371352	Splitter valve PV 530-4 TC, DN 4, 530 bar For A-pumps 48-110, 8-300, 60-240, 3-600, 8-600, 75-150, 55-200*. Note: The mounting bracket fits large frames (protective coating). Not possible with external mixer.	

13.9 PRODUCT PRESSURE REGULATOR

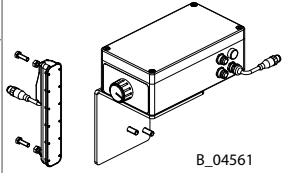
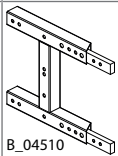
Order no.	Designation	
2315965	Product pressure regulator set 0.8 MPa; 8 bar; 116 psi, pneumatic (including flushing pressure set). For low pressure systems.	
2315994	Product pressure regulator set 0.8 MPa; 8 bar; 116 psi, mechanical For low-pressure systems.	

13.10 FLUSHING PRESSURE SET

Order no.	Designation	
2315985	Flushing pressure set 0.8 MPa; 8 bar; 116 psi. For low pressure systems. Sets flushing pressure to maximum. Is included in product pressure regulator set 2315965.	

13.11 ADDITIONAL PARTS FOR SECOND PAINT (2A)

- ▶ For requirements, see Chapter 2A Switchbox for Second A-Pump (Option) [▶▶ 97].
- ▶ If heaters are used, the second A-pump needs a separate bracket. (Instead of the 2A extension)

Order no.	Designation	
2340959	Switchbox 2A-HM1 (TC) with stroke measurement 1	
2340820	Switchbox 2A-HM2 (TC) with stroke measurement 2 Without pump, Spraypack and additional parts.	
2339639	Extension 2A Lateral extension for small frame for assembling of second A-pump. For systems without a heater.	

Order no.	Designation	
2341205	Expansion set 2A-HM1 (TC) for TwinControl A-pumps 28-40, 35-70, 31-110	
2340707	Expansion set 2A-HM1-ND (TC) for TwinControl A-pumps 5-60, 10-70	
2341006	Expansion set 2A-HM2 (TC) for TwinControl A-pumps 21-110, 35-150 Extension 2A (for systems without a heater), switchbox 2A incl. stroke measurement, inline filter, hoses and fittings. Without pump and Spraypack.	
2344231	Expansion set 2A-HM2 (TC) for TwinControl A-pumps 48-110, 8-300, 60-240, 3-600, 8-600 Extension 2A (for systems without a heater), switchbox 2A incl. stroke measurement, high-pressure filter, hoses and fittings. Without pump and Spraypack.	
2348739	Expansion set 2A-HM2 (TC) for TwinControl A-pumps 95-150 Extension 2A for large frames (for systems without a heater), switchbox 2A incl. stroke measurement, high-pressure filter, hoses and fittings. Without pump and Spraypack.	

13.12 EXTENSION CABLES

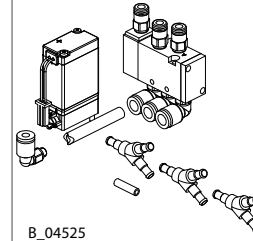
Order no.	Designation	
2320609	Connection set for TwinControl controller, approx. 5 m; 16.4 ft. The extension set allows the control unit to be fitted remotely from the system. The set can be used for type 1 and 2 control units.	
2316481	Connection line with stroke measurement 5 m; 16.4 ft. Can be used to extend the potentiometer for the stroke measurement on TwinControl systems. Maximum extension 5 m; 16.4 ft.	

13.13 TC VM5000 AUTOMATIC ELECTROSTATIC SYSTEM

Order no.	Designation
2334530	<p>Automatic electrostatic system</p> <p>The TC VM5000 automatic electrostatic system set serves as an additional safety device for the safe use of the TwinControl 2K system with a GM5000 electrostatic gun.</p> <p>Prerequisite: Controller 1, 2, 3, 9 or 10</p>

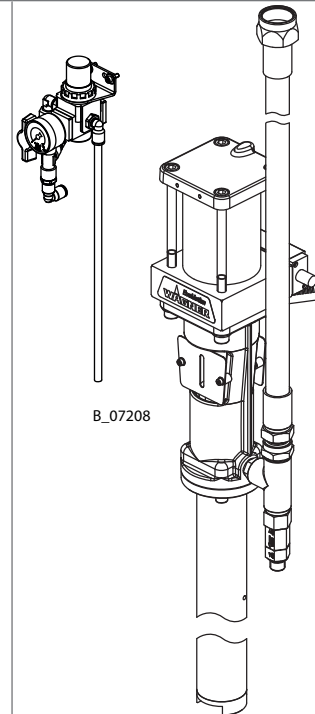
13.14 CONNECTION KIT, GFB

Order no.	Designation
2302563	<p>Connection kit for gun flush box (GFB)</p> <p>Installation in control unit 1, 2, 9 or 10. The kit is already installed in controllers 3 and 8.</p> <p>The GFB connection kit is used as a link between the TwinControl system and a gun flush box.</p>

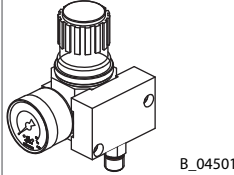
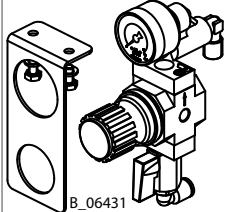


13.15 FEED PUMP

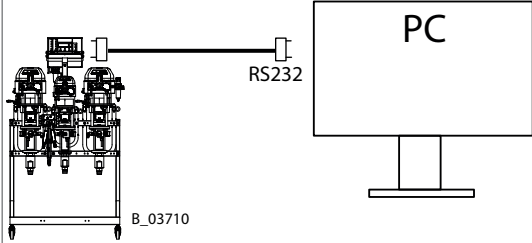
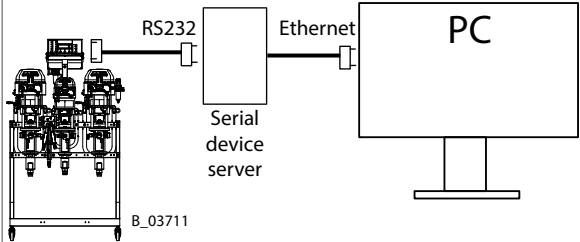
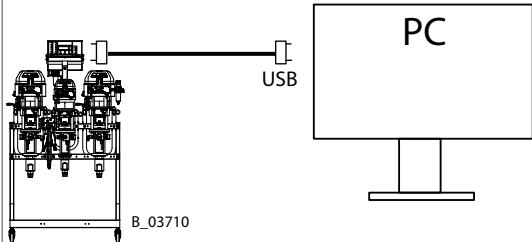
Order no.	Designation
2329966	<p>Feed pump set 5-125 (3/4")</p> <p>For pumps 75-150, 55-200, 60-240</p>



13.16 AIRCOAT REGULATOR

Order no.	Designation	
2328611	AirCoat regulator For A-pumps: Wildcat, Puma, Leopard, Protec	
2336769	AirCoat regulator 5-60 For A-pump EvoMotion 5-60	

13.17 ARCHIVING SOFTWARE

Order no.	Designation	
2317811	TwinData RS-232 archiving software consisting of: – RS-232 cable communication – PC data archiving manual GER – PC data archiving manual ENG – Archiving Software	
	The RS-232 cable of TwinData RS-232 archiving software can also be connected to a network. A factory-provided RS-232 serial device server is required.	
2309015	TwinData USB archiving software consisting of: – USB to TTL cable (service) – PC data archiving manual GER – PC data archiving manual ENG – Archiving Software	

14 SPARE PARTS

DANGER

Incorrect maintenance/repair!

Danger to life and equipment damage.

- ▶ Only a WAGNER service center or a suitably trained person may carry out repairs and replace parts.
- ▶ Use only WAGNER original spare parts and accessories.
- ▶ Only repair and replace parts that are listed in the spare parts chapter and that are assigned to the device.
- ▶ Before all work on the device and in the event of work interruptions:
 - ▶ Relieve the pressure from the spray gun, product hoses and all devices.
 - ▶ Secure the spray gun against actuation.
 - ▶ Switch off the energy and compressed air supply.
 - ▶ Disconnect the control unit from the mains.
- ▶ Observe the operating and service manual for all work.

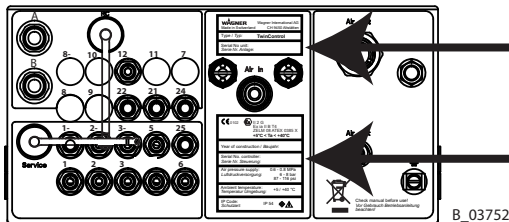


14.1 WHERE CAN SPARE PARTS BE FOUND?

Spare parts for the TwinControl systems and the TwinControl accessories are to be found in the following spare parts catalogs (German and English):

- **Finishing spare parts catalog** for systems with a small frame / small trolley / small wall.
 - **PC spare parts catalog** for systems with a large frame / large trolley.
 - Further spare parts for TwinControl components, which are not contained in the spare parts catalog, can be found on the **compact disk (CD) TwinControl** in the appropriate operating manuals, in all languages available.
- ▶ Order no., see Chapter Languages [▶▶ 7].

14.2 SERIAL NUMBER



The parameters used by WAGNER and the special properties of each 2K TwinControl system are documented upon delivery and stored in the WAGNER archive.

If the customer wishes to modify the 2K TwinControl system or prior to inspections, the technical customer service team must always be provided with the serial number of the system in question. The serial number can be found on the rear side of the control unit.

14.3 TURBINE

1. When replacing the turbine, attention should be paid to the "TC Turbine Set" assembly manual with order no. 2320883.
2. When replacing the generator, observe the TC Generator Conversion Set assembly manual with the order no. 2336796.

15 DECLARATION OF CONFORMITY

15.1 DEVICES WITH TURBINES

Herewith we declare that the supplied version of control units:

TwinControl Version: Turbine

complies with the following guidelines:

2006/42/EC	2014/34/EU	2014/30/EU	2011/65/EU	2012/19/EU
------------	------------	------------	------------	------------

Applied standards, in particular:

EN ISO 12100:2010	EN ISO 4414:2010	EN ISO 13732-1:2008
EN 14462:2015	EN 12621:2006+A1:2010	EN 60079-0:2006
EN 60079-11:2007	EN 1127-1:2011	EN 13463-1:2009
EN 13463-5:2011	EN 61000-6-2:2005+B:2011	EN 61000-6-4:2007+A1:2011
		EN ISO/IEC 80079-34:2011

Applied national technical standards and specifications, in particular:

DGUV regulation 100-500 Chapter 2.29	DGUV regulation 100-500 Chapter 2.36	TRGS 727
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EC type examination certificate:

Zelm 08 Atex 0385 X, Zelm Ex Prüf- und Zertifizierungsstelle, D-38124 Braunschweig, Germany (notified body no. 0820)

EC quality certificate for the quality assurance system:

PTB 03 ATEX Q019

Identification:

  II 2 G Ex ia IIB T4 ZELM 08 ATEX 0385 X +5 °C < Ta +40 °C

EU Declaration of Conformity

The EU Declaration of Conformity is enclosed with this product. If needed, further copies can be ordered through your WAGNER dealer by specifying the product name and serial number.

- ▶ Order number: 393916

15.2 DEVICES WITH CABLE FOR MAINS POWER SUPPLY

Herewith we declare that the supplied version of control units:

TwinControl Version: Cable with mains power supply

complies with the following guidelines:

2006/42/EC	2014/35/EU	2014/30/EU	2011/65/EU	2012/19/EU
------------	------------	------------	------------	------------

Applied standards, in particular:

EN ISO 12100:2010	EN 60204-1:2006+A1:2009+B:2010	EN ISO 4414:2010
EN 14462:2015	EN 12621:2006+A1:2010	EN ISO 13732-1:2008
EN 61000-6-2:2005+B:2011	EN 61000-6-4:2007+A1:2011	EN ISO 9001: 2008

Applied national technical standards and specifications, in particular:

DGUV regulation 100-500 Chapter 2.29	DGUV regulation 100-500 Chapter 2.36
--------------------------------------	--------------------------------------

Identification:



EC Declaration of Conformity

The EC Declaration of Conformity is enclosed with this product. If needed, further copies can be ordered through your WAGNER dealer by specifying the product name and serial number.

- ▶ Order number: 393915

16 APPENDIX

16.1 CONVERSION OF THE MIXING RATIO SPECIFICATIONS

It is very important that the data sheets of the paint supplier are available, so that the correct mixing ratio can be entered.

1. Some lacquer manufacturers state the mixing ratio by weight, others by volume or ratio.
2. Since the 2K system measures volumetrically, we need the specification in volume.

Conversion of mixing ratio from gravimetric to volumetric:

Example:

- 10 Parts of component A by weight and
- 1 Parts of component B by weight
- or
- 10g Component A
- 1g Component B
- or parts by weight 10:1
- or 10:1 per weight (A gravimetric : B gravimetric)

- ▶ The density or specific volume of the components A and B must be known or be determined beforehand.

Density:

$$P_A = \frac{G_A}{V_A} = \frac{0.15 \text{ gr}}{0.1 \text{ cm}^3} = 1.5 \frac{\text{gr}}{\text{cm}^3} = 1.5 \frac{\text{Kg}}{\text{L}}$$

$$P_B = \frac{G_B}{V_B} = \frac{0.1 \text{ gr}}{0.1 \text{ cm}^3} = 1 \frac{\text{gr}}{\text{cm}^3} = 1 \frac{\text{Kg}}{\text{L}}$$

Legend: G = weight
V = volume

Mixing ratio:

$$Mvol = Avol \div Bvol = \frac{Agrav.}{P_A} \div \frac{Bgrav.}{P_B}$$

$$Mvol = \frac{10\text{gr}}{1.5 \frac{\text{gr}}{\text{cm}^3}} \div \frac{1 \text{ gr}}{1 \frac{\text{gr}}{\text{cm}^3}} = 6.67 \div 1$$

Other volumetric mixing ratio specifications:

- 667 Parts of component A by volume
- 1 Parts of component B by volume

16.2 HOSE VOLUME TABLE

Di = inside diameter of hose

L = hose length

Vol = product volume in the hose

Di	L	Vol
[mm]	[m]	[L]
4	5	0.06
4	7.5	0.09
4	10	0.13
4	12.5	0.16
4	15	0.19
4	20	0.25
4	25	0.31
4	30	0.38
4	40	0.5
4	50	0.63
5	5	0.1
5	7.5	0.15
5	10	0.2
5	12.5	0.25
5	15	0.29
5	20	0.39
5	25	0.49
5	30	0.59
5	40	0.79
5	50	0.98
6	5	0.14
6	7.5	0.21
6	10	0.28
6	12.5	0.35
6	15	0.42
6	20	0.57
6	25	0.71
6	30	0.85
6	40	1.13
6	50	1.41
8	5	0.25
8	7.5	0.38
8	10	0.5
8	12.5	0.63
8	15	0.75
8	20	1.01
8	25	1.26
8	30	1.51
8	40	2.01
8	50	2.51

Di	L	Vol
[mm]	[m]	[L]
10	5	0.39
10	7.5	0.59
10	10	0.79
10	12.5	0.98
10	15	1.18
10	20	1.57
10	25	1.96
10	30	2.36
10	40	3.14
10	50	3.93
12	5	0.57
12	7.5	0.85
12	10	1.13
12	12.5	1.41
12	15	1.7
12	20	2.26
12	25	2.83
12	30	3.39
12	40	4.52
12	50	5.65
16	5	1.01
16	7.5	1.51
16	10	2.01
16	12.5	2.51
16	15	3.02
16	20	4.02
16	25	5.03
16	30	6.03
16	40	8.04
16	50	10.05
20	5	1.57
20	7.5	2.36
20	10	3.14
20	12.5	3.93
20	15	4.71
20	20	6.28
20	25	7.85
20	30	9.42
20	40	12.57
20	50	15.71





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www.wagner-group.com

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