Translation of the Original Operating Manual

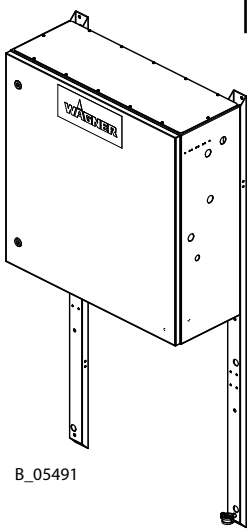
For professional use.
Always follow the information in this manual, particularly the safety instructions and the warning instructions. Store the manual in a safe place.

Version 05/2017

2K COMFORT

Electronically Controlled Multi-component System for Lacquers

Software version 4.0x / 4.0x K
3.2x / 3.2x K
3.1x / 3.1x K
3.0x



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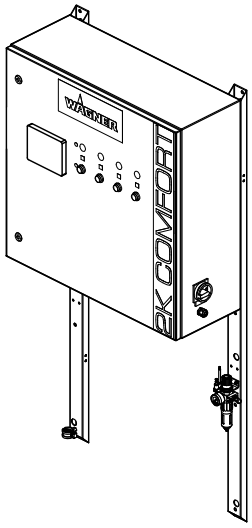

CE

CE Ex II 2 G c IIB X

CE Ex II (2) G

Table of Contents

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 operating 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 risk. Non-observance may result in death or serious injury.
⚠ **CAUTION**	Potentially hazardous situation. Non-observance may result in minor injury.
ⓘ **NOTICE**	Potentially hazardous situation. Non-observance may result in damage to property.
Note	Provides information about particular characteristics and how to proceed.

Explanation of warning:

⚠ **LEVEL OF DANGER**

This notice warns you of a hazard!
Possible consequences of not observing the warning instructions.
→ The measures for preventing the hazard and its consequences.

1.3 LANGUAGES

The **2K COMFORT Operating Manual** is available in the following languages:

Language	Order No.
German	2357060
French	2357062
Dutch	2357063
Polish	2357075

Language	Order No.
English	2357061
Italian	2357064
Swedish	2357067
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Language	Order No.
Spanish	2357065
Chinese	2357078
Japanese	2367166
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2K COMFORT Software Documentation

Language	Order No.
German	2357082
English	2357084

2K COMFORT Spare Parts Catalog

Language	Order No.
German	2357085
English	2357086

2K COMFORT XL Spare Parts Catalog

Language	Order No.
German	2363593
English	2363595

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

1.3.1 OPERATING DOCUMENTS FOR INDIVIDUAL COMPONENTS

Paint valves (PV) and dosing valves (DV), GA (DN 2.6) operating manual

Language	Order No.
German	2343270
French	2343276

Language	Order No.
English	2343275
Italian	2343277

Language	Order No.
Spanish	2343278
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Paint valves (PV) and dosing valves (DV), GA (DN 4) operating manual

Language	Order No.
German	2336797
French	2336799

Language	Order No.
English	2336798
Italian	2336800

Language	Order No.
Spanish	2336801
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ADC-0301 / MPX-0403 operating manual (for stroke measurement)

Language	Order No.
German	2382346
French	2382350

Language	Order No.
English	2382349
Italian	2382351

Language	Order No.
Spanish	2382352
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User information for **Coriolis Compact**

Language	Order No.
German	2359722
French	2359727

Language	Order No.
English	2359725
Italian	2359728

Language	Order No.
Spanish	2359730
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T0170.00BI pressure regulators operating manual

Language	Order No.
German	ZZB019GER
French	ZZB019FRE

Language	Order No.
English	ZZB019ENG
Italian	ZZB019ITA

Language	Order No.
Spanish	ZZB019SPA
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2K Data

2K Data software documentation	
Language	**Order No.**
German	2382353
English	2382354
The 2K Data software is contained on the 2K SMART USB stick (see Chapter 1.4). Purpose: Transfer system settings, names, paint and flushing recipes and the I/O configuration via USB stick to the PC. View or change data on the PC.	

2K Archive

2K Archive software documentation	
Language	**Order No.**
German	2361954
English	2361978
The 2K Archive software is available as an accessory. Purpose: Log and archive consumption data and error messages on the PC.	

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

1.4 USB STICK 2K COMFORT

All operating documents specified above, as well as the accessory set's assembly manuals (with the description of the accessory's function) are also available as pdf files on a USB stick. The USB stick is included in the system's scope of delivery.

The **Order No.** is: 2359808 (specify additionally the Serial No. of the system)

1.5 ABBREVIATIONS

Stk	Number of pieces
Pos	Position
K	Marking in the spare parts lists
Order No.	Order number
ET	Spare part
1K	One component
2K	Two components
3K	Three components
4K	Four components
DH	Double stroke
DN	Nominal diameter
HP	High pressure
HVLP	High Volume Low Pressure
AIS	Adaptive Injection System
AIS-B	AIS for component B
AIS-C	AIS for component C
AIS-D	AIS for component D

P1	Spray gun 1
P2	Spray gun 2
P3	Spray gun 3
P4	Spray gun 4
Q	Flow
cc	Cubic centimeters (cm^3)
/K1	Fluid circuit 1 (in 2-circuit system)
/K2	Fluid circuit 2 (in 2-circuit system)

Materials

SSt	Stainless steel
PE	Polyethylene
UHMWPE	Ultra-high molecular weight polyethylene
PTFE	Polytetrafluorethylene
TC	Carbide

1.6 TERMINOLOGY FOR THE PURPOSE OF THIS MANUAL

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

Staff 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 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.

1.6.1 LOW PRESSURE / HIGH PRESSURE / XL

These operating manual differentiates for purposes of illustration between 2K COMFORT low-pressure, high-pressure and XL version:

	Maximum product pressure	**Maximum flow rate**	**Fluid cabinet**
	Fluid section type plate	Fluid section type plate	Width x height
Low-pressure version	up to 2.5 MPa; 25 bar; 362 psi	up to 7,000 cc/min	800 x 800 mm
High-pressure version	up to 32.5 MPa; 325 bar; 4,714 psi		
XL version	up to 53 MPa; 530 bar; 7,687 psi	up to 25,000 cc/min	800 x 1,200 mm

2 CORRECT USE

2.1 DEVICE TYPES

a) 2K COMFORT
b) 2K COMFORT (with Ex identification)

The 2K COMFORT system is also available as a 2-circuit system (1 control cabinet, 2 fluid circuits).

2.2 TYPE OF USE

The device is suitable for mixing 2K, 3K and 4K 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.
→ Only operate the device as a whole.
→ 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 FIELD OF APPLICATION

2.3.1 WITHOUT EX IDENTIFICATION

The control cabinet and the fluid section may **not** be used in potentially explosive areas.

Remote control: The remote control (accessory) may always be used in potentially explosive areas (zone 1 and zone 2).

→ See chapter 6.5.

2.3.2 WITH EX IDENTIFICATION

Control cabinet CE Ex II (2) G

The control cabinet may **not** be used in potentially explosive areas.

Fluid section CE Ex II 2 G c IIB X

The 2K COMFORT fluid section (with Ex identification) is suitable for use in potentially explosive areas (zone 1 and zone 2)

→ See chapter 6.5.

2.3.3 ACCESSORIES

Remote control CE 0102 Ex II 2 G Ex d IIB T6 Gb
CML 13 ATEX 1008X

The remote control may be used in potentially explosive areas (zone 1 and 2).
→ See chapter 6.5.

Alarm horn
The alarm horn may be used in potentially explosive areas (zone 1 and 2).

2.4 PROCESSIBLE WORKING MATERIALS

Low-viscosity to high-viscosity 2K/3K/4K 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
- 3K and 4K combinations of above products

→ Solvent and water-based 2K products should not be processed using the same system.

NOTICE

Abrasive working materials and pigments!
Greater wear of parts carrying the product.
→ Do not use any grainy and abrasive working materials with large, sharp-edged pigments.
→ Use application-oriented pumps (flow rate/cycle, product, valves, etc.).
→ Check if the fluids and solvents used are compatible with the pump construction materials.
→ For explanations of the models and construction materials, consult the technical data in Chapters 5.5.4 as well as the operating manuals for the pumps and valves or contact a WAGNER service technician.

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

Materials in direct contact with the products			
Stainless steel	Carbide	PTFE	PE (UHMWPE)

2.5 MISUSE

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 NON-EX SYSTEM

The 2K COMFORT system is **not** suitable for use in potentially explosive areas.

CE

3.2 EX SYSTEM

As defined in Directive 2014/34/EU the 2K COMFORT system (with Ex identification) is suitable for use in potentially explosive areas.

3.2.1 CONTROL CABINET

CE  II (2) G

The control cabinet may **not** be used in potentially explosive areas.

CE	CE mark (European Communities)
	Explosion-proof equipment

II	Device class II (not mining)
( )	effective in zone ...
(2)	effective in zone 1
G	Ex-atmosphere gas

3.2.2 FLUID SECTION

CE  II 2 G c IIB X

The 2K COMFORT system's fluid section (with Ex identification) is suitable for use in potentially explosive areas (zone 1 and zone 2).

CE	CE mark (European Communities)
	Explosion-proof equipment
II	Device class II (not mining)
2	Category 2 device (suitable for zone 1)
G	Ex-atmosphere gas

c	Protection provided by constructional safety
IIB	Device class (Gas) IIB
X	Special instructions exist for safe operation. → See the following Chapter "Identification X".

3.2.2.1 IDENTIFICATION X

Ignition temperature

→ Ensure that the ignition temperature of the coating product is above the maximum surface temperature of the work piece.

Ambient temperature

→ Permissible ambient temperature: +5 °C to +40 °C; +41 °F to +104 °F.

Medium supporting atomizing

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

Surface spraying, electrostatics

→ 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.

→ Remove deposits from the surfaces to maintain conductivity.

→ Use only a damp cloth to clean the device.

3.2.3 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:

→ Do not knock or push the device or components against steel or rusty iron.

→ Do not drop the device or components.

→ Use only tools that are made of a permitted material.

National regulations

→ Ensure that the national explosion prevention rules and regulations are observed when setting up the device.

3.3 REMOTE CONTROL (OPTION)

CE 0102 Ex II 2 G Ex d IIB T6 Gb

CML 13 ATEX 1008X

The remote control (Order No. 2341153) may be used in potentially explosive areas (zone 1 and 2).

CE	CE mark (European Communities)
0102	Number of the notified body which is used by WAGNER in the production monitoring phase (PTB in this case)
Ex	Explosion-proof equipment
II	Device class II (not mining)
2	Category 2 device (suitable for zone 1)
G	Ex-atmosphere gas

Ex	Electrical device corresponds to ignition protection type
d	Ignition protection class "Flame-proof enclosure" EN 60079-1
IIB	Device class (Gas) IIB
T6	Temperature class T6: maximum surface temperature 85 °C; 185 °F
Gb	Device protection level (EPL), suitable for use in Zone 1
CML 13 ATEX 1008X	
	ATEX certificate number

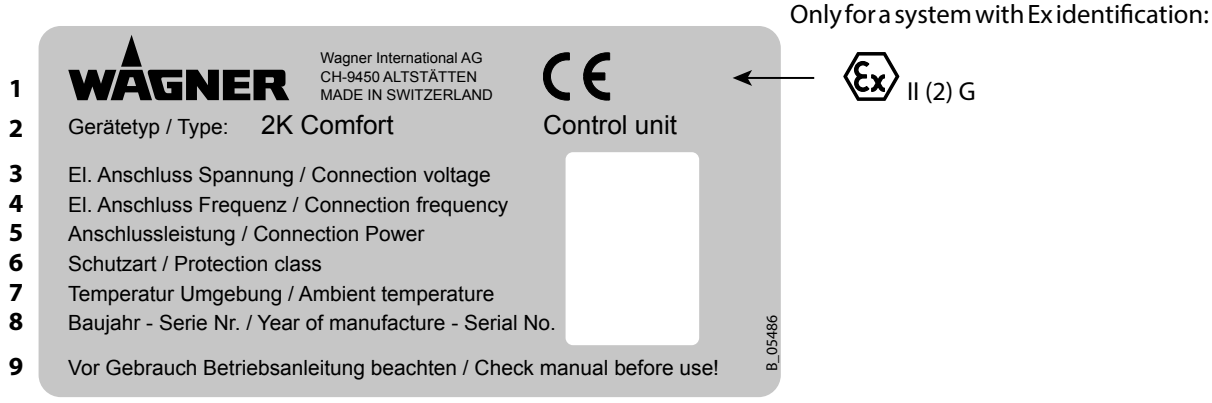
Safety instructions

→ For safe operation, observe the safety data in Chapter 13.5.2.

3.4 TYPE PLATES

3.4.1 CONTROL CABINET

Only for a system with Ex identification:

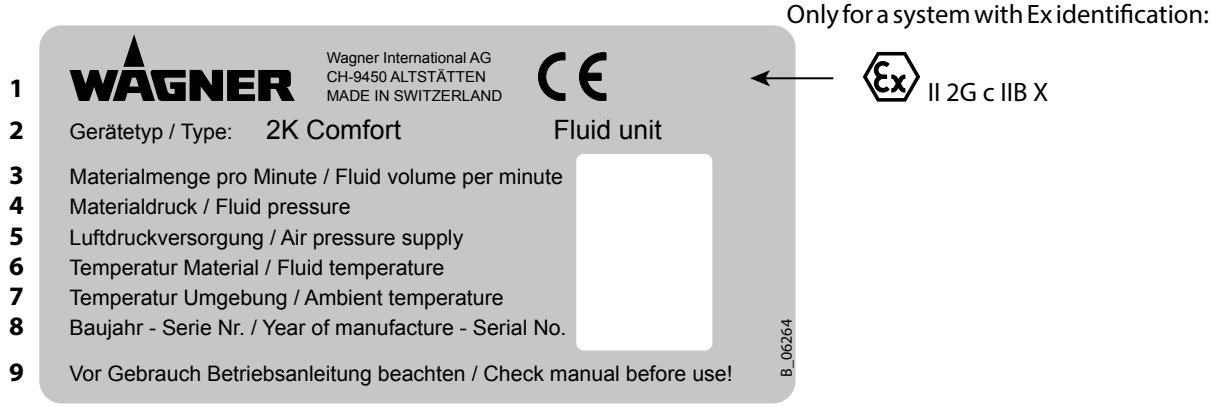


Pos	Designation
1	Manufacturer and CE Identification
2	Device type: 2K COMFORT control cabinet
3	Electrical connection: voltage
4	Electrical connection: frequency
5	Connection power

Pos	Designation
6	Protection class
7	Ambient temperature
8	Manufacturing year and serial number
9	Read operating manual before use!

3.4.2 FLUID SECTION

Only for a system with Ex identification:



Pos	Designation
1	Manufacturer and CE Identification
2	Device type: 2K COMFORT fluid section
3	Flow rate per minute
4	Product pressure
5	Air pressure supply

Pos	Designation
6	Product temperature
7	Ambient temperature
8	Manufacturing year and serial number
9	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.

4.1.1 ELECTRICAL DEVICES AND EQUIPMENT

Electric shock hazard!
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, there is a danger from line voltage.
→ Operate device in accordance with the safety regulations and electrotechnical regulations.
→ Must be repaired immediately in the event of problems.
→ Decommission if it poses a hazard or is damaged.
→ Must be de-energized before work is commenced. Inform staff 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

Hazard due to dangerous fluids or steam!
Severe or fatal injuries due to explosion hazard or inhalation, swallowing or contact with the skin or eyes.
→ Ensure that the floor in the working are is static dissipative in accordance withEN 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 / air hoses adapted to the working pressure are used.

→ Ensure that personal protective equipment (see section 4.2.1) 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 electrically conductive gloves. The grounding takes place via the spray gun handle or the 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 and 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.
→ 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

Hazard 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 STAFF

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

→ In electrostatics application: anyone fitted with a pacemaker must not enter the high-voltage area!

4.2.1 USE PERSONAL SAFETY EQUIPMENT

Hazard due to dangerous fluids or steam!
Serious or fatal injuries due to inhalation, swallowing or contact with the skin or eyes.

- → When preparing or working with paint and when cleaning the device, follow the working instructions of the manufacturer of the lacquers, solvents, and cleaning agents being used.
- → Take the specified protective measures. In particular wear safety goggles, protective clothing and gloves, as well as hand protection cream if necessary.
- → 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

Hazard 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 paint or flushing agents:

- → Never point the spray gun at people.
- → Never reach into the spray jet.
- → 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.
  - – Secure 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" section.
- → 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.
- → Carry out the work steps as described in the "Pressure relief" section:
  - – If pressure relief is required.
  - – If the spraying work is interrupted or stopped.
  - – Before the device is cleaned on the outside, checked, or serviced.
  - – Before the spray nozzle is installed or cleaned.

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 causes strong recoil forces. Thereby the user can lose his balance and injure himself during falling.
Avoid risk of injury from recoil forces:

- → Ensure that you have firm footing when operating the spray gun.
- → Only hold the spray gun briefly in a position.

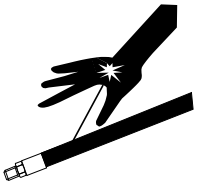
4.2.3 GROUND THE UNIT

Hazard due to electrostatic charge!
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 handle or the trigger.
→ The spray substance supply (spray substance tank, pump, etc.) must be grounded.

4.2.4 PRODUCT HOSES



Hazard 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 hose 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 or
– 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 equipment.
→ 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. Thus 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 is a multiplication of the inlet air pressure.

4.2.5 CLEANING AND FLUSHING

Hazard due to cleaning and flushing

Explosion hazard and damage to the device.

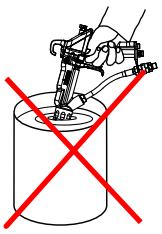
- → Preference should be given to non-flammable cleaning and flushing agents.
- → When carrying out cleaning work with flammable cleaning agents, make sure that all equipment and resources (e.g., collection tank, funnel, transport cart) are conductive or static dissipative and grounded.
- → Observe the 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.

- → Explosive gases are produced when aluminum comes into contact with halogenated hydrocarbons. To clean aluminum, do not use liquids containing halogenated hydrocarbons.
- → Take measures for workplace safety (see section 4.1.2).
- → When commissioning or emptying the device, please note that an explosive mixture may temporarily exist inside the lines and components of equipment:
  – Depending upon used coating product,
  – Depending on the flushing agent (solvent) used,
  an explosive mixture may temporarily exist inside the lines and items of equipment.
- → Only electrically conductive tanks may be used 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.

4.2.6 TOUCHING HOT SURFACES

Hazard 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 °C; 109 °F:
  - – Identify the device with a warning label, "Warning – Hot surface".
    Instruction label: Order No. 9998910
    Protection label: Order No. 9998911
    Note: Order the two stickers together

4.2.7 MAINTENANCE AND REPAIR

Hazard 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.
- → Do not change or modify the device; if change is necessary, contact WAGNER.
- → Only repair and replace parts that are listed in the 13"Spare parts" section and 14 that are assigned to the unit.
- → Do not use any defective components.
- → Exclusively use accessories listed in Chapter 13 and that are assigned to the unit.
- → Before all work on the device and in the event of work interruptions:
  - – Switch off the energy and compressed air supply.
  - – Relieve the pressure from the spray gun and device.
  - – Secure the spray gun against actuation.
- → Observe the operating and service manual for all work.

4.2.8 PROTECTIVE AND MONITORING EQUIPMENT

Hazard 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

The 2K system is clearly structured. It can be controlled using easy-to-understand and easily accessible operating elements.

Control cabinet
All electrical components are installed in the control cabinet. The system can be controlled via the four push-buttons and the operating panel (touch screen). Information can be displayed or be entered via the operating panel.

Fluid section
The fluid section contains all parts which come into contact with the 2K products.

5.2 MODE OF OPERATION

The system is suitable for measuring (dosing) and for mixing two or multi-component products.

- → An electronic controller monitors and regulates the predetermined ratio of components. The controller regularly adds in the necessary quantity of hardener -in short intervals (and by way of pulses)- via a valve to the flow of base lacquer.
- → The flow of the base lacquer and hardener is measured with flow meters. In the case of piston pumps, stroke sensors can be used if desired.
- → The components and flushing agents are made available by supplying pumps or pressure tanks (not supplied with the system).

Paint selection
The mixing ratio, pot life etc. are stored in the recipe. By means of a simple recipe change, the paint can be changed.

Further characteristics and areas of application

- → For low to medium pressure (32.5 MPa; 325 bar; 4714 psi).
  2K COMFORT XL for high-pressure (53 MPa; 530 bar; 7687 psi).
- → Modular structure - can be combined as required by the customer.
- → Electronic dosing precision guarantees consistent quality.
- → Processing even water-based 2K products, since all parts carrying the product are suitable to do so - made, for example, of stainless steel.
- → The fluid section of the Ex version is suitable for use in potentially explosive areas (zone 1 and zone 2).
- → Many functions are displayed in a language-independent way with icons which are easy to understand. Texts are displayed in the selected language.
- → The overview of consumption of each component and flushing agent, VOC documentation.
- → Storage of the last 700 error messages indicating date and time.
- → Security by permanently checking the system parameters, operator information, in case of the slightest trouble, and if necessary, automatic interruption of the production.
- → Protection of the parameters by security code. Settings can be saved on a USB stick.

→ Electronic adjustment of the mixing ratio between 0.1:1 and 50:1.
→ Up to 100 paint recipes. (Also with robot communication or Profibus.)
→ Possibility of two separate fluid circuits::
  – for simultaneous operation,
  – for quick paint changes,
  – or to separate incompatible 2K products (e.g., PUR and epoxy lacquers).
→ Programmable flushing recipes to economize up to 60% of flushing agent compared with previous systems.
→ Fully automatic control and monitoring of 1 to 4 guns.
→ The compatibility with solvent-based products and water-based products and selective automatic cleaning with water and/ or solvent.
→ Use of hand or automatic spray guns.
→ Enabling of automatic booth, automatic gun flush box, etc.
→ Possibility of robot communication.

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 INCLUDED ITEMS

2K COMFORT scope of delivery	**Ex**	**Non-Ex**
Designation	**Order No.**	**Order No.**
Basic device	- Control cabinet - Fluid section - Connection set	- Control cabinet - Fluid section (Connection set only if control cabinet and fluid section are separately)

The scope of delivery of a basic device includes:

Declaration of Conformity. For details, see Chapter 15	2359625	2359623
Operating manual, German	2357060	
Operating manual in the local language	see Chapter 1.3	

The delivery note shows the exact scope of delivery.

5.5 DATA

5.5.1 TECHNICAL DATA

Electrical	
Voltage and frequency range	100–240 VAC / 120–350 VDC / 50–60 Hz + PE
Power consumption	60 W / 0.3 A

See electrical circuit diagram (delivered together with the system).

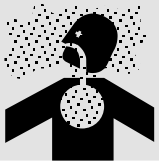
Pneumatic	
Compressed air Inlet	0.7–0.8 MPa; 7–8 bar; 101–116 psi
Air pressure quality: free from oil and water	Quality standard 7.5.4 according to ISO 8573.1, 2010 7: Particle concentration 5 – 10 mg/m³ 5: Humidity: pressure dew point ≤ +7 °C 4: Oil content ≤ 5 mg/m³

⚠ WARNING

Exhaust air containing oil!

Risk of poisoning if inhaled.

→ Provide compressed air free from oil and water.



	Low-pressure version	High-pressure version	XL version		
			without Coriolis		with Coriolis
			Product valves		
			DN 4	DN 2.6 DN 10	
Flushing agent: Maximal inlet pressure	0.8 MPa 8 bar 116 psi	32.5 MPa * 325 bar * 4,714 psi *	53 MPa * 530 bar * 7,687 psi *	40 MPa * 400 bar * 5,800 psi *	34.5 MPa * 345 bar * 5,000 psi *
Compressed air flushing: Maximal inlet pressure	0.8 MPa 8 bar 116 psi				
Maximum inlet pressure of components A/B/C/D. The maximum pressure of the pumps used may not exceed this value.	2.5 MPa ** 25 bar ** 362 psi **	32.5 MPa * 325 bar * 4,714 psi *	53 MPa * 530 bar * 7,687 psi *	40 MPa * 400 bar * 5,800 psi *	34.5 MPa * 345 bar * 5,000 psi *
Mixer product outlet	0.05–2.5 MPa *** 0.5–25 bar *** 7–362 psi ***	0.1–32.5 MPa 1–325 bar 14.5–4,714 psi	0.1–53 MPa 1–530 bar 14.5–7,687 psi	0.1–40 MPa 1–400 bar 14.5–5,800 psi	0.1–34.5 MPa 1–345 bar 14.5–5,000 psi
Application rate (depending on the flow meters used, see Chapters 5.5.3 and 5.5.4)	100–7,000 cc/min		50–25,000 cc/min		75–10,000 gr/min
Product inlet (outside)	G1/4"		G3/8"		
Product outlet (outside)	G1/4"		G3/8"		
Viscosity of components A/B/C/D (dependent on flow, flow meters, hoses and mixers)	see Chapters 5.5.3 and 5.5.4				
Viscosity of mixed products (depending on flow, flow meters, hoses and mixers) → Chapter 5.5.4	5–10000 mPa·s				
Maximum particle size	see Chapter 5.5.4				

* Maximal inlet pressure depends on:
- Measurement method (see Chapter 5.5.4)
- Mixing tube: Mixing elements made of stainless steel in mixing tube set 6-32: max. 28.2 MPa; 282 bar; 4,090 psi
  Mixing elements made of stainless steel in mixing tube set 8-32: max. 22.6 MPa; 226 bar; 3,278 psi
  XL: Mixing elements made of stainless steel in mixing tube set 10-32: max. 40 MPa; 400 bar; 5,800 psi
- XL version with product pressure regulator:
  Input pressure max. 4 MPa; 40 bar; 580 psi
  Product outlet max. 0.8 MPa; 8 bar; 116 psi
- XL version with -air flushing: Input pressure max. 2.5 MPa; 25 bar; 362 psi

** When air bubbles monitoring max. 0.8 MPa; 8 bar; 116 psi

*** When air bubbles monitoring or product pressure regulator max. 0.8 MPa; 8 bar; 116 psi

		Low-pressure version	High-pressure version	XL version	XL version + Coriolis
Product pH value		3.5–9			
Product temperature		+5 °C … +60 °C +41 °F … +140 °F			
Ambient temperature	Operation	+5 °C … +40 °C +41 °F … +104 °F			
	Assembly	0 °C … +40 °C +32 °F … +104 °F			
	Suspension	-20 °C … +60 °C -4 °F … +140 °F			
Relative humidity		10–95% (without condensation)			
Mixing ratio, volumetric A/B or (A+B)/C or (A+B+C)/D		0.1:1 … 50:1 0.00:1 (1K)			
Dosing precision	System with flow meters (for all components)	± 1% precision in mixing ratio *			
	System with stroke sensors (min. one component)	± 2% precision in mixing ratio *			

* The target mixing ratio at a precision level of ± 1% or ± 2%, is achieved after each completed cycle (injection of hardener into base lacquer).
Precision of ± 1% or ± 2% is achieved under the following conditions:
- Proper use of the system in compliance with the operating manuals.
- Correct calibration and function of the flow meters or stroke sensors in accordance with Chapter 7.12.
- Correct adjustment of the compression ratio between the base lacquer and hardener.
  → see Chapter 8.5.2
- Correct adjustment of the hardener metering 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, permitted viscosity and flow rate.
- Regular maintenance has to be carried out by a qualified person (e.g., WAGNER Service Technician) in accordance with Chapter 9.

Maximum number of A/B/C/D paint and dosing valves **	25/10/10/10	DN 10: 4/–/–/– *** DN 4: 10/5/5/5 *** DN 2.6: –/5/5/5 ***
Maximum number of A/B/C/D flushing valves **	10/5/5/5	DN 4: 1/1/1/1 *** DN 2.6: –/1/1/1 ***
Maximum number of guns **	4	
Sound pressure level during alarm	110 dB(A)	
(A-rated sound pressure level measured at 1 m distance, LpA1m, according to DIN EN 14462: 2005.)		
Distance control cabinet - fluid section	up to 10 m; 32.8 ft / 15 m; 49.2 ft / special versions available	
Weight (approx.)	80–250 kg	120–300 kg

** for 2-circuit system, see Chapter 5.5.1.1.

*** More valves for XL version available on request.

5.5.1.1 LIMITATIONS FOR 2-CIRCUIT SYSTEMS

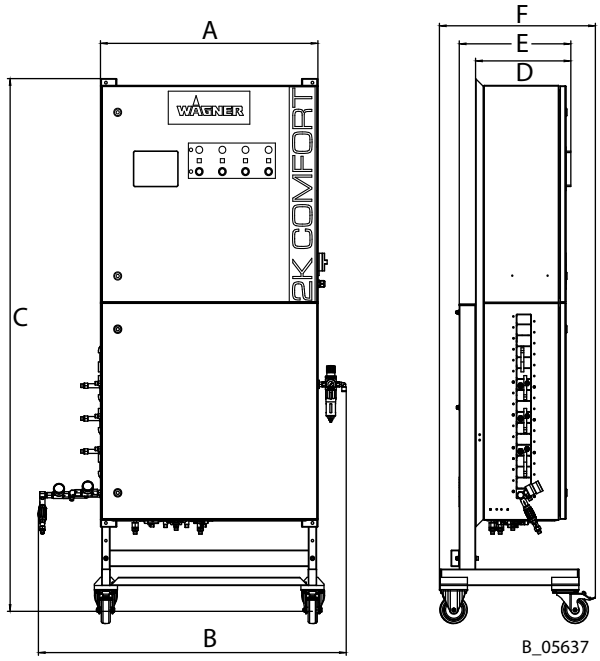
Limitations for 2-circuit systems opposite the data in Chapter 5.5.1:

	Standard system	2-circuit system	2-circuit system XL
		per circuit	per circuit
2K / 3K / 4K system	2K / 3K / 4K	2K / 3K	
Maximum number of A/B/C/D paint and dosing valves	25/10/10/10	10/5/5/–	DN 10: 4/–/–/– * DN 4: 10/5/5/– * DN 2.6: –/5/5/– *
Maximum number of A/B/C/D flushing valves	10/5/5/5	5/2/2/–	DN 4: 1/1/1/– * DN 2.6: –/1/1/– *
Maximum number of guns	4	2	
Dump valve for waste separation	✓ (option)	--	
External flushing agent: - Flushing over a period of time	✓ (option)	✓ (option)	
- Flushing with flow monitor	✓ (option)	✓ (option)	
- Flushing with flow meter	✓ (option)	--	
Booster pump	✓ (option)	--	

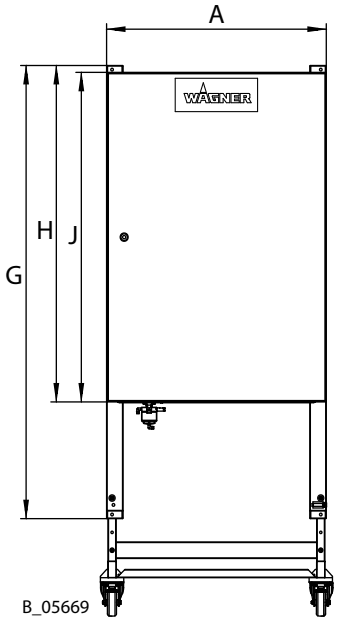
* More valves for XL version available on request.

5.5.2 DIMENSIONS

Control cabinet and/or fluid cabinet
– Standard system
– Ex system
– 2-circuit system
– XL system (control cabinet)



XL system (fluid cabinet)

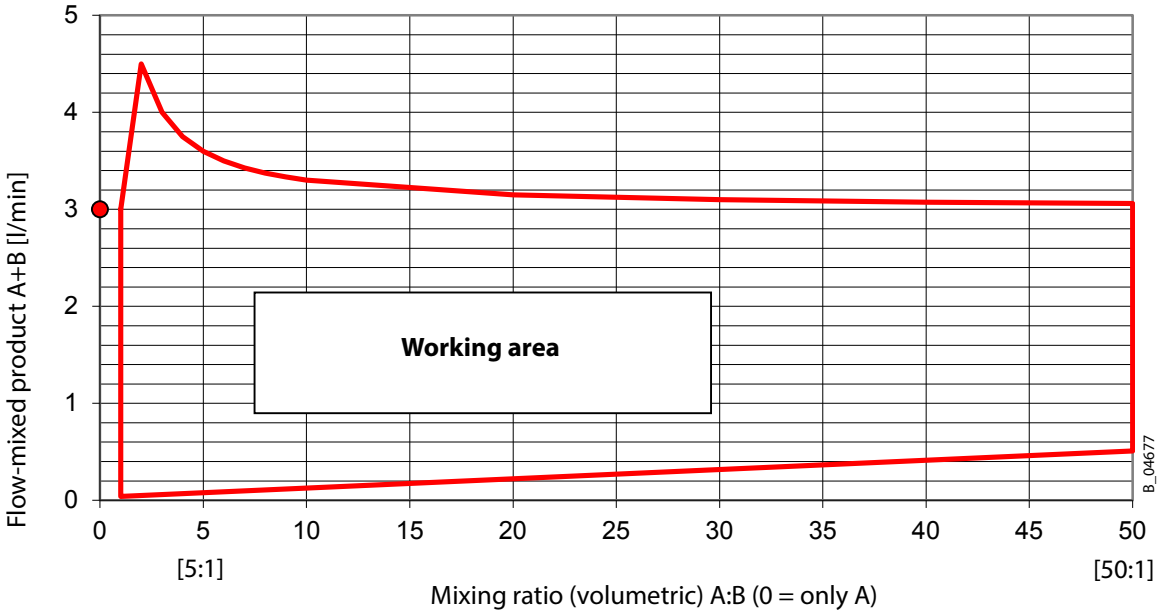


Dimensions		
Measurement	**mm**	**inch**
A	800	31.50
B	1,133	44.61
C	1,960	77.17
D	350.5	13.80
E	410.5	16.16
f	573.8	22.59
G	1,650	64.96
H	1,225	48.23
J	1,200	47.24

5.5.3 WORKING AREAS OF FLOW METERS

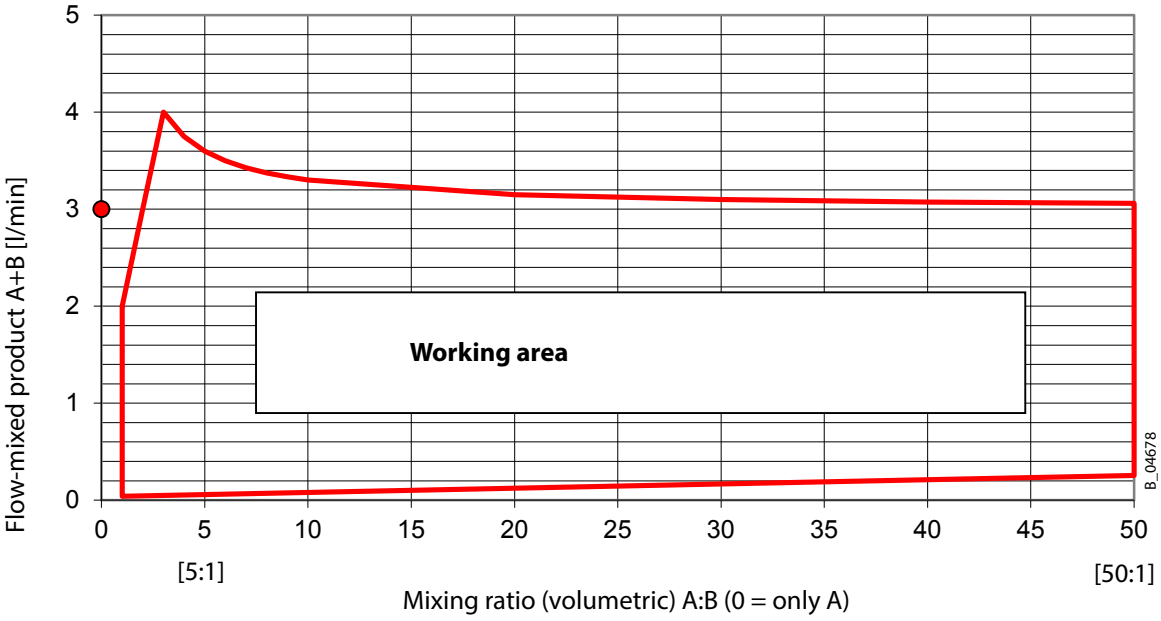
Flow meters: A/B: 0.02 – 3 l/min

Viscosity: A: min. 5 mPa·s
B: min. 5 mPa·s



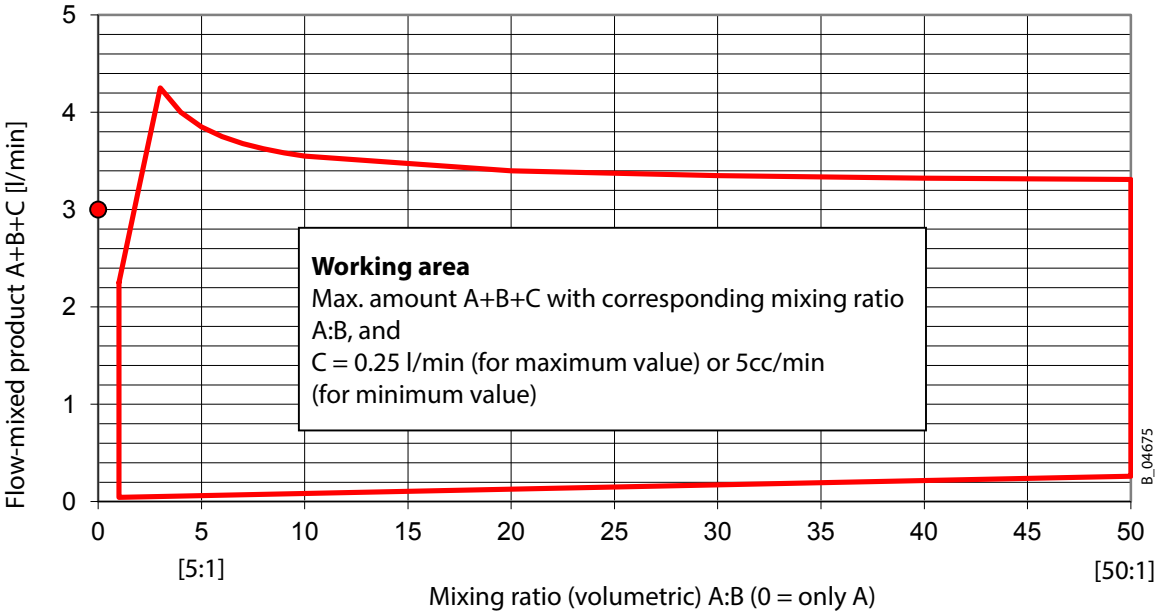
Flow meters: A: 0.02 – 3 l/min
B: 0.005 – 2 l/min

Viscosity: A: min. 5 mPa·s
B: min. 5 mPa·s



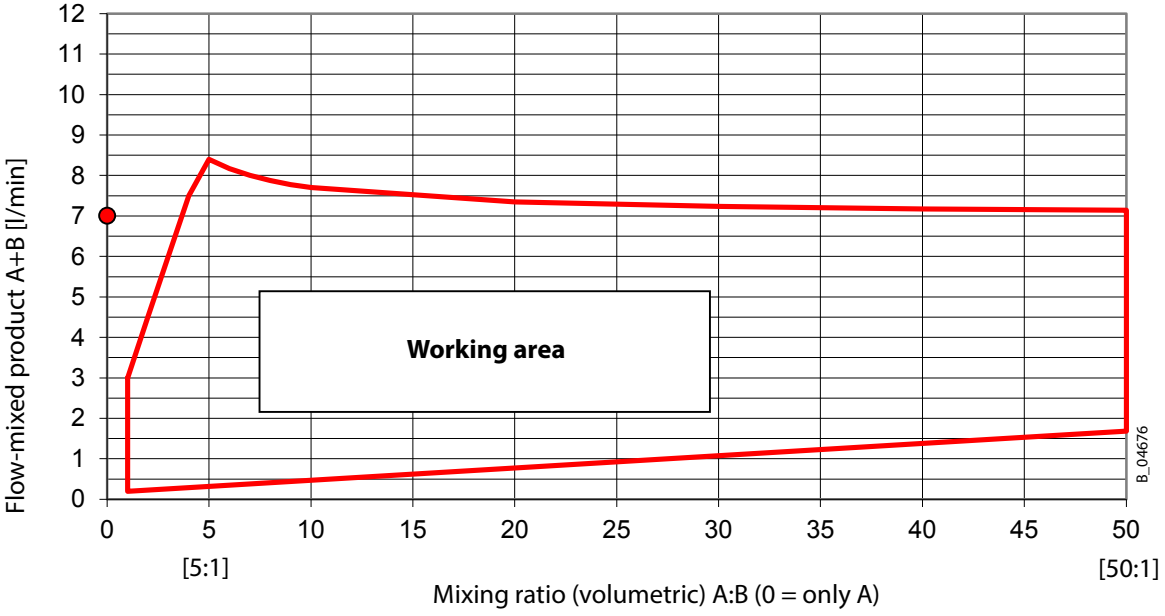
Flow meters: A: 0.02 – 3 l/min
B: 0.005 – 2 l/min
c: 0.005 – 0.5 l/min

Viscosity: A: min. 5 mPa·s
B: min. 5 mPa·s
c: 1-100 mPa·s



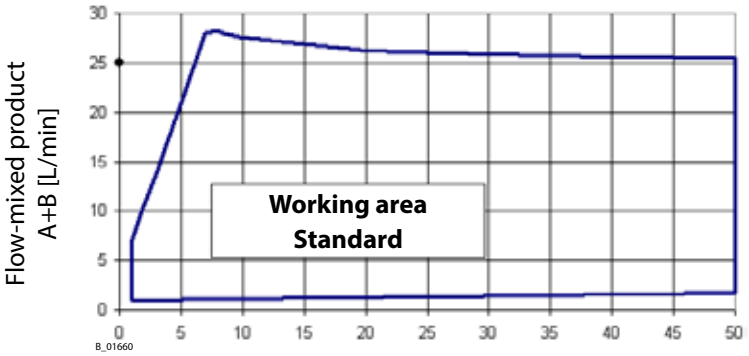
Flow meters: A: 0.1 – 7 l/min
B: 0.02 – 3 l/min

Viscosity:
Maximum viscosity depending on flow rate



Flow meters: A: 0.5 – 25 l/min
B: 0.1 – 7 l/min

Viscosity:
Maximum viscosity depending on flow rate



Mixing ratio volumetric A:B [A:1] (0= only A)

5.5.4 APPLICATION LIMITS OF FLOW METERS

Viscosity

All viscosity information in this chapter are approximate values. The viscosities are recommended limit values for commercial operation.

Particle size

	Gear flow meters		**Micro flow meter** 0.005-0.25 Ex
	Measuring range from 0.02 l/min	Measuring range from 0.005 l/min	
Maximum particle size	120 µm 0.12 mm 0.0047 inch	60 µm 0.06 mm 0.0024 inch	40 µm 0.04 mm 0.0016 inch
Product filtration required	min. 100 mesh/inches	min. 200 mesh/inches	min. 300 mesh/inches

Flow meter type	WAGNER Order No. (without Pickup)	Note	Max. pressure * bar	Flow rate measuring range l/min	Application	Low pressure / High pressure / XL
Gear flow meter, 0.02-3 GL Ex	2343971	Standard slide bearing	400	0.02–3	Standard	✓ / ✓ / ✓
Gear flow meter, 0.02-3 KL Ex	2343972	Standard ball bearing	400	0.02–3	Water-based lacquers	✓ / ✓ / ✓
Gear flow meter, 0.005-2 GL Ex	2343973	Small quantity slide bearing	400	0.005–2	Small quantities	✓ / ✓ / --
Gear flow meter, 0.005-2 KL Ex	2334770	Small quantity ball bearing	400	0.005–2	better starting performance with small quantities	✓ / ✓ / --
Gear flow meter, 0.005 – 0.5 KL Ex	2343974	Ball bearing	250	0.005–0.5	suitable for demineralised water	✓ / ✓ / --
Gear flow meter, 0.005–1 GL Dual Pickup Ex **	9955686 (with Pickup)	Slide bearing Dual Pickup flow meter	530	0.005–1	for high-precision dosing	✓ / ✓ / --
Gear flow meter, 0.5-25 GL Ex	2311958	25 l/min slide bearing	530	0.5–25	extremely viscous media	-- / -- / ✓
Gear flow meter, 0.1-7 GL Ex	2311948	7 l/min slide bearing	530	0.1–7	highly viscous media	✓ / ✓ / ✓
Coriolis compact, 0.075–5 Ex	2359845	Coriolis DN 4	345	0.075–5 kg/min	high percentage of solid objects	✓ / ✓ / ✓
Coriolis compact, 0.15–10 Ex	2359846	Coriolis DN 6	345	0.15–10 kg/min	high percentage of solid objects, highly viscous media	-- / -- / ✓
Micro flow meter 0.005–0.25 Ex	2311618	Micro quantity	100	0.005–0.25	thin media without solid objects	✓ / ✓ / --

Maximum viscosities for economical operation of the flowmeters

Flow meter type	WAGNER Order No. (without Pickup)	Max. pressure * bar	Flow rate measuring range l/min	Viscosity limit values*** for 1 l/min mPa s	2 l/min mPa s	3 l/min mPa s	Product filtration Mesh/inches
Gear flow meter, 0.02-3 GL Ex	2343971	400	0.02–3	5–1200	5–700	5–500	≥ 100
Gear flow meter, 0.02-3 KL Ex	2343972	400	0.02–3	5–1200	5–700	5–500	≥ 100
Gear flow meter, 0.005-2 GL Ex	2343973	400	0.005–2	5–500	5–200	--	≥ 200
Gear flow meter, 0.005-2 KL Ex	2334770	400	0.005–2	5–500	5–200	--	≥ 200
Gear flow meter, 0.005 – 0.5 KL Ex	2343974	250	0.005–0.5	1–100 (at 0.005–0.5 l/min)			≥ 200
Gear flow meter, 0.005–1 GL Dual Pickup Ex **	9955686 (with Pickup)	530	0.005–1	5–400	--	--	≥ 200
Gear flow meter, 0.5-25 GL Ex	2311958	530	0.5–25	up to 8,000	up to 4,200	up to 3,200	≥ 100
Gear flow meter, 0.1-7 GL Ex	2311948	530	0.1–7	5–4,000	5–2,100	5–1,600****	≥ 100
Coriolis compact, 0.075–5 Ex	2359845	345	0.075–5 kg/min	up to 600	up to 350	up to 250	--
Coriolis compact, 0.15–10 Ex	2359846	345	0.15–10 kg/min	up to 1200	up to 700	up to 500	--
Micro flow meter, 0.005-0.25 Ex	2311618	100	0.005–0.25	0.5–6 (at 0.005–0.25 l/min)			≥ 300

* The maximum pressure of the flow meter must be greater than the maximum product pressure of the system (Fluid section type plate).
** Can not be combined with stroke measurement
*** All viscosity information are approximate values. The viscosities are recommended limit values for commercial operation.
**** at 7 l/min: 5–1000 mPa·s

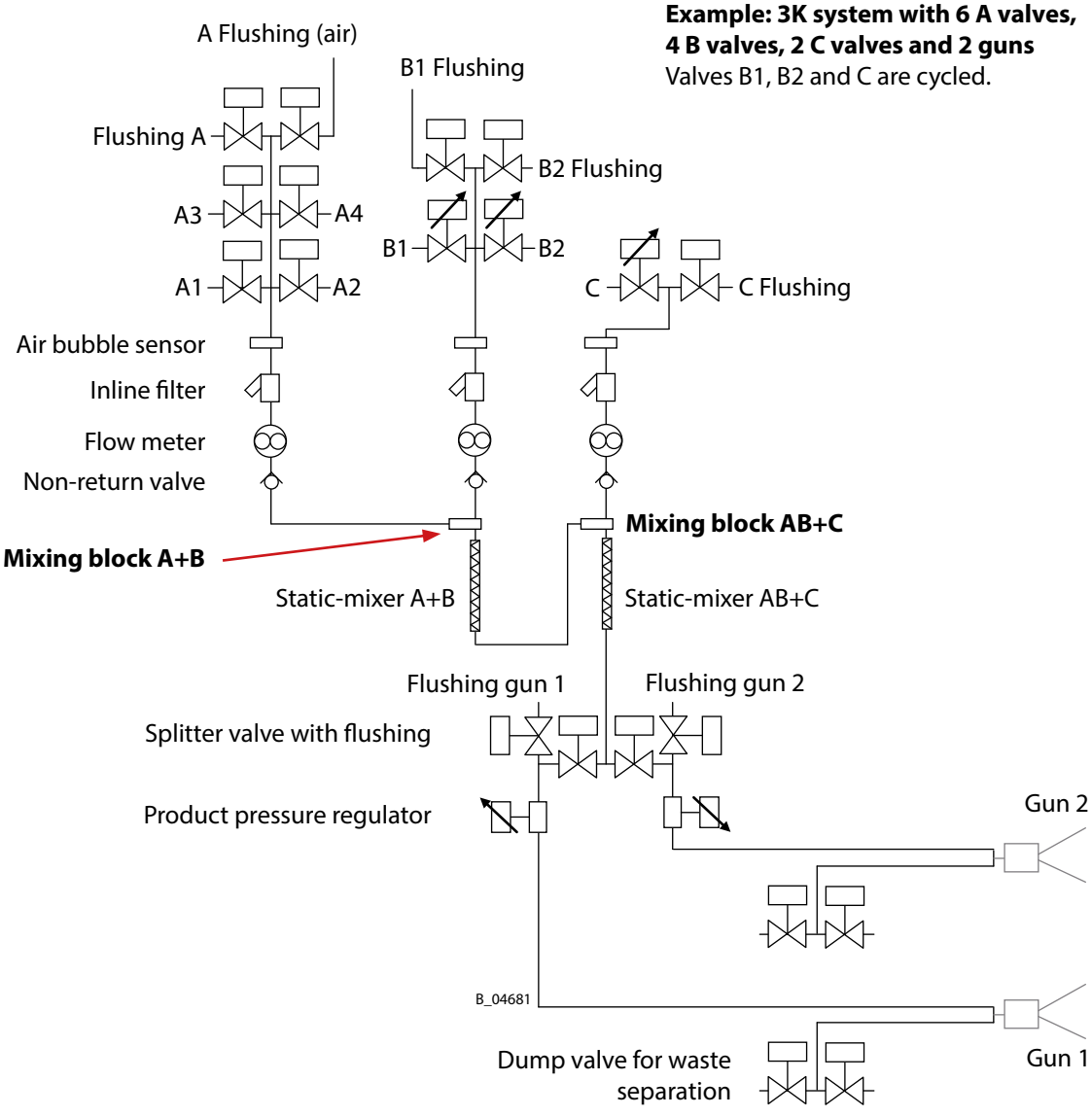
5.6 MIXING TYPES

For mixing components A, B, C and D, three versions are available:

A) With mixing block (standard) B) With mixing head valve C) With external mixer

A) Mixing block (standard)

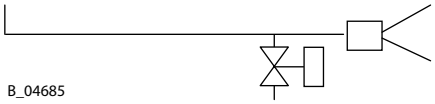
Example: 3K system with 6 A valves, 4 B valves, 2 C valves and 2 guns
Valves B1, B2 and C are cycled.



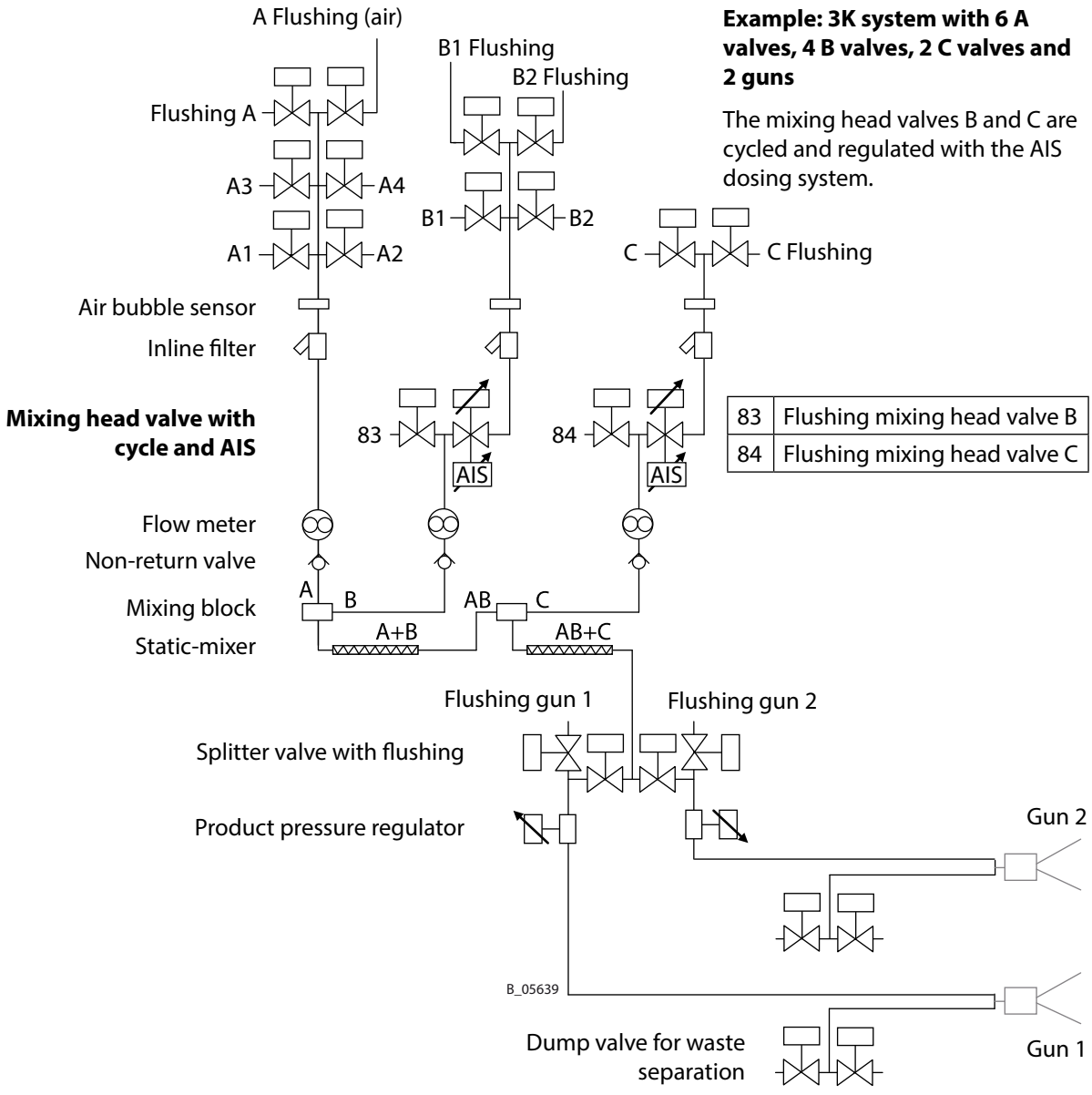
Dump valve

The dump valve can also be installed before the gun in the gun hose.

Example with simple dump valve:



B) Mixing head valve



Example: 3K system with 6 A valves, 4 B valves, 2 C valves and 2 guns

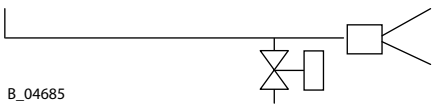
The mixing head valves B and C are cycled and regulated with the AIS dosing system.

83	Flushing mixing head valve B
84	Flushing mixing head valve C

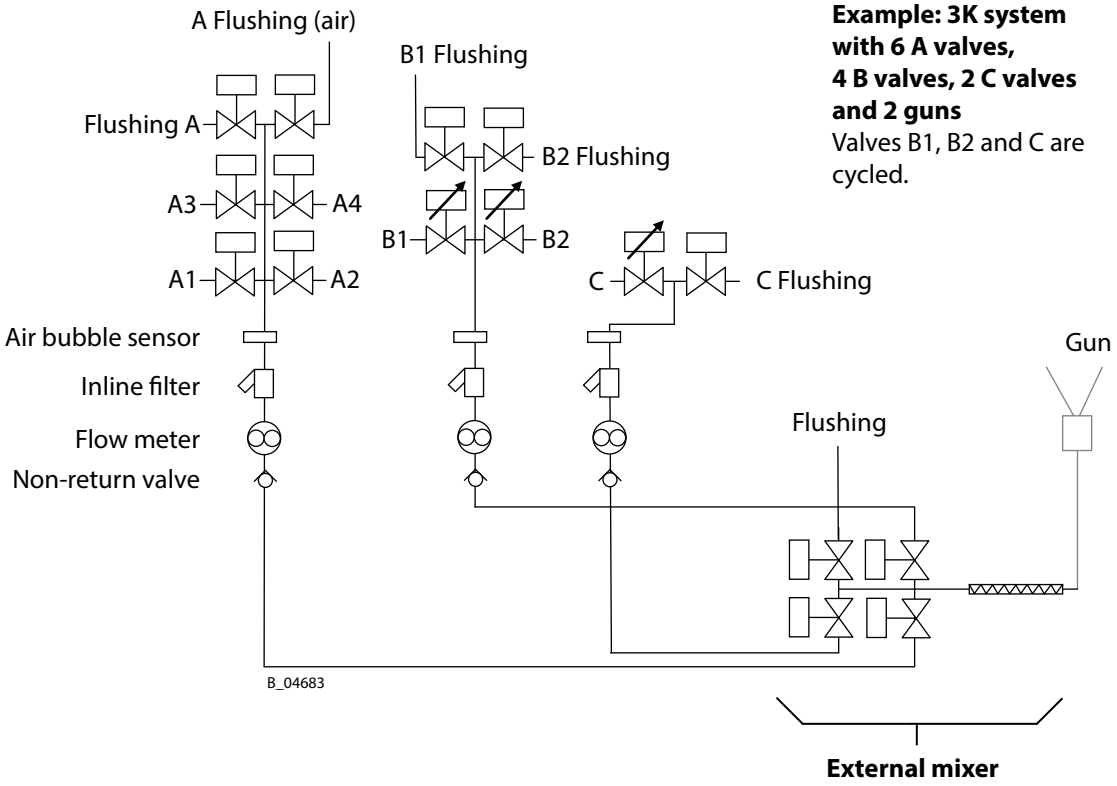
Dump valve

The dump valve can also be installed before the gun in the gun hose.

Example with simple dump valve:



C) External mixer



Example: 3K system with 6 A valves, 4 B valves, 2 C valves and 2 guns
Valves B1, B2 and C are cycled.

5.7 DUMP VALVE FOR WASTE SEPARATION (OPTION)

In addition to the simple dump valve, there is also a dump valve for waste separation. When filling and when flushing, the system separates the flushing agent from the remaining product. For this purpose, a double valve is used: one output for flushing agent, another for waste (mixed product).

With an average number of paint changes and pot lives which are not too short, the dump valve can be an alternative to a gun flush box for waste separation.

Not available for 2-circuit systems.

5.8 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.

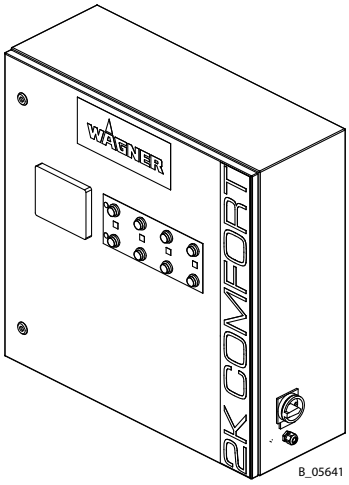
5.9 2-CIRCUIT SYSTEM

The 2-circuit system consists of:

- 2 fluid circuits
- 1 control cabinet with:
  - 4 mechanical push-buttons per fluid circuit
  - 1 operating panel for both fluid circuits

The control cabinet controls both fluid circuits. It is possible to work with two fluid circuits simultaneously.

Limitations for 2-circuit systems: see Chapter 5.5.1.1.



5.10 FLOW MEASUREMENT

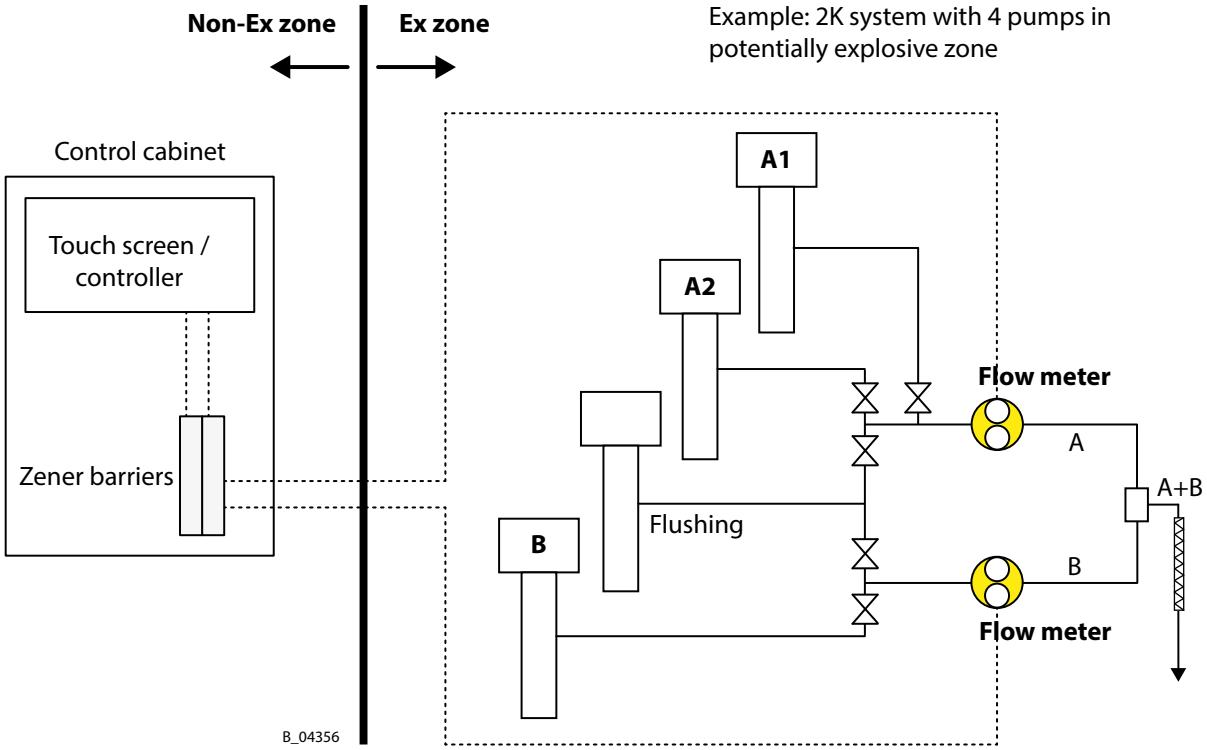
The flow of components A, B, C and D can be measured as follows:

- with flow meters
  - Gear flow meters
  - Coriolis flow meters (contact-free)
- with stroke sensors (contact-free, from software version 4.0x / 4.0x K)

Only one measuring method can be used within a component. It is however possible, for example, to use stroke sensors for component A and flow meters for component B.

5.10.1 FLOW METERS

For every component, there is a flow meter installed upstream of the mixing block (gear or Coriolis flow meter).



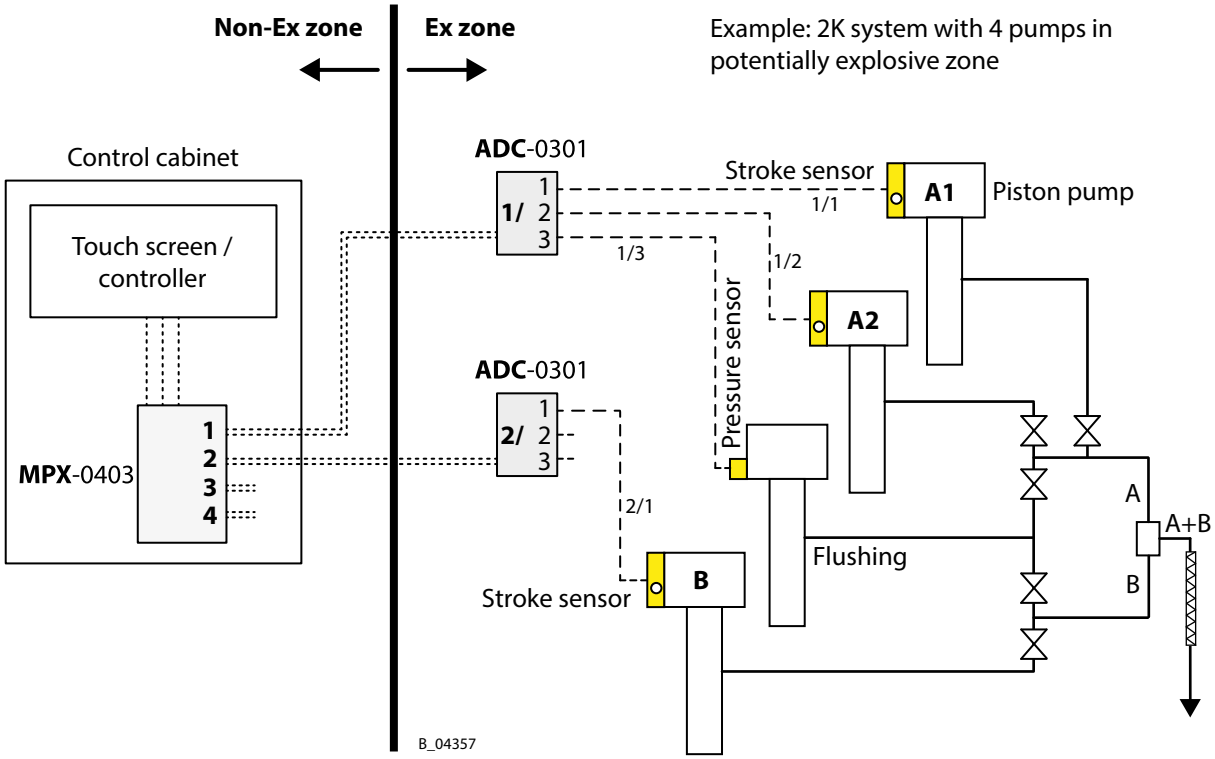
For operating ranges and technical data of the flow meters, see Chapters 5.5.3 and 5.5.4.

5.10.2 STROKE MEASURING

For piston pumps, the flow can be measured contact-free with stroke sensors (from software version 4.0x / 4.0x K). For this, each pump must be equipped with a stroke sensor.

There are three types of stroke sensors:

Stroke sensor type	Field of application	Working method
Stroke sensor short	e.g., IceBreaker pumps up to 70 cm^3/DH	Detects the exact position of the piston.
Stroke sensor long	e.g., IceBreaker pumps up to 100 cm^3/DH	
Pressure sensor	Flushing pump	Detects the piston's upper and lower reversal points.



A/D Converter (ADC)

The analog stroke sensor signals are evaluated in an A/D converter (ADC) and converted into digital signals. Up to four A/D converters, with three inputs each, can be used. The ADC automatically recognizes, whether a stroke sensor or a pressure sensor is connected to its inputs (1, 2, 3).

Multiplexer (MPX)

In the control cabinet, a multiplexer processes the A/D converter's digital signals and transmits the signals, of the currently active pumps, to the controller.

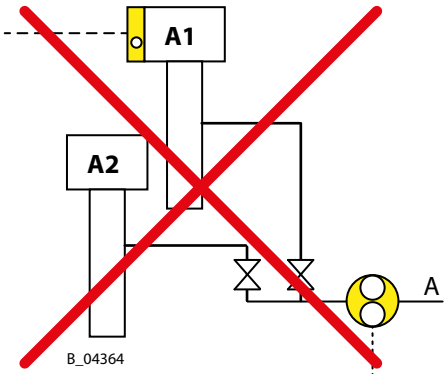
5.10.3 FLOW METERS AND STROKE SENSORS

Flow meters and stroke sensor can be used simultaneously.

The following should be noted:

→ Only one measuring method can be used within a component.

→ As soon as stroke sensors are used, the flushing pump must be equipped with a pressure sensor.

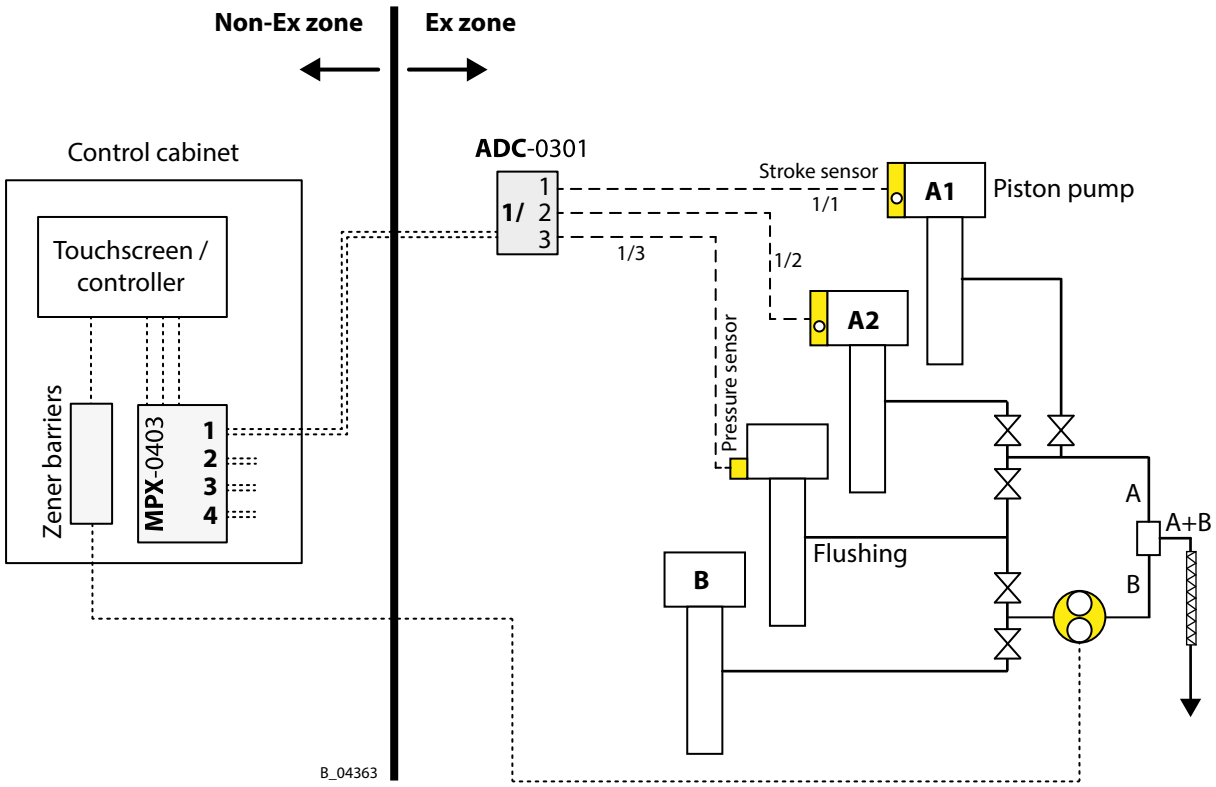


Incorrect

Correct

Example: 2K system with 4 pumps in potentially explosive zone.

– Stroke sensors for component A.
– Flow meter for component B.



6 ASSEMBLY AND COMMISSIONING

6.1 TRAINING OF ASSEMBLY/COMMISSIONING STAFF

→ The assembly and commissioning staff must have the technical skills to safely commission the device.

→ 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 installed 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 5.5.1.

Long-term storage

→ See chapter 9.1.6.

→ For recommissioning, proceed according to following chapters.

6.3 TRANSPORTATION

The system can be transported in the specially designed transportation box.

System	Unit	Length	Width	Height
Non-Ex System	mm; inch	1,800; 70.9	1,178; 46.4	400; 15.75
Ex System	mm; inch	1,800; 70.9	1,178; 46.4	800; 31.5
2-circuit (1 separate fluid section)	mm; inch	1,800; 70.9	1,178; 46.4	800; 31.5
2-circuit (2 separate fluid sections)	mm; inch	1,800; 70.9	1,178; 46.4	1,200; 47.25
XL	mm; inch	1,800; 70.9	1,178; 46.4	800; 31.5

6.4 ASSEMBLY AND INSTALLATION

The mixing units are normally installed by WAGNER technicians directly or by their agents. If this is not the case, the material has to be checked for damage on receipt of the system.

⚠ WARNING

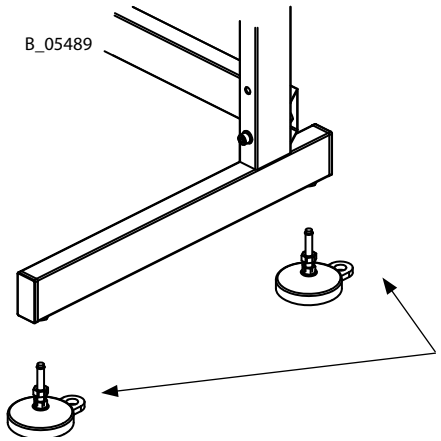
Inclined ground!

Risk of accidents if the device rolls away/falls.

→ Place the device on horizontal floor.

→ Rollers should be locked in position or replaced by leveling feet and secured.

→ Do not tilt the device during shifting / transporting.



Ensure a sufficient secure stance.

Fix the fixing attachments of leveling feets on the floor.

⚠ WARNING

Electric shock hazard 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 commented on active parts.

⚠ DANGER

Incorrect installation of the device!

Explosion hazard and damage to the device.

- → Set up the system outside the spray booth / spray zone.
- → The control cabinet should not be set up within the Ex zone.
- → Protect the control cabinet from extreme temperature and moisture changes as well as dirt.
- → The fluid section (non-Ex version) must not be installed in the explosion zone in the 2K COMFORT.
- → Lay and fix the connecting cable correctly and protect it against tripping, dirt and traffic.

- → Use only feed pumps and components which are suitable for 2K products.
- → Use hardener pump with PE/T packing (T = PTFE).
- → No contact of 2K products with non-ferrous metals.
- → With water based lacquers: pumps and product-wetted parts of stainless steel.
- → Use product filters at the feed pumps.

6.4.1 ELECTRICAL CONNECTIONS

An electric connection cable with plug is standardly provided.

When exchanging the connection cable, please observe the following:

→ Carry out the electrical connections and the grounding inside the control unit using a 3-wire cable of 1.5 mm^2; AWG16 in accordance with the enclosed circuit diagram.

6.4.2 PNEUMATIC CONNECTIONS

→ Check whether the line pressure is sufficient. It has to be between 0.7 and 0.8 MPa; 7 to 8 bar; 101-116 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. For compressed air quality, see Chapter 5.5.1.

→ Every day, discharge all contamination and the condensate (if any) which has accumulated in the equipment air filter.

⚠ WARNING

Brittle filter pressure regulator!

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

→ Do not clean the tank on the filter pressure regulator with solvents.

6.4.3 PRODUCT CONNECTIONS

Carry out the following connections:

→ Product hose from the mixing tube or splitter valve to the gun.

– Electrostatic guns must be used **without** electrostatics during commissioning. First commission the electrostatic system after all steps are carried out up to Chapter 6.6.6.

→ The product hoses from the feeding pumps to the system's product inlets may not be connected until the preliminary flushing of the hoses (see Chapter 6.6.1) has been done (contamination of the unit)!

Circular pipeline

→ If the unit is connected to a circular pipeline, suitable shut-off devices must be installed

– to prevent the products from mixing in case of leakage in the 2K system.

– These shut-off devices must always be closed at the end of work.

6.4.4 FLOW METER MONITORING

For safe operation it is necessary for the 2K system to receive a signal, when the gun is open and there is 2K product flow. Otherwise for example no B product is added when the A flow meter is blocked, although A product continues flowing through the leakage in the flow meter (possibly not visible).

The signal (product flow yes/no) can be made available on ways that follow:

- → for AirSpray- or AirCoat manual spray guns: AirSpray + AirCoat gun monitoring (atomizing air-flow switch);
- → for Airless- or HVLP manual spray guns: flow monitor (lacquer-flow switch in the lines to the guns);
- → for automatic spray guns: automatic gun monitoring (pressure switch);
- → for digital robot communication: robot signal ("gun signal 1/2/3/4");
- → for bus communication (e.g., CAN Profibus Gateway): signal by superordinate control ("gun monitoring 1/2/3/4").

Gun monitoring for each gun

If possible, each gun should be monitored separately.

NOTICE

Caution with only one gun monitoring for multiple guns!

If for several spray guns only one gun monitoring is installed, the controller does not know which gun in each case is in operation.

- → Then the product flow is divided to all guns.
- → The pot lives in the gun hoses and guns can be exceeded without a pot life alarm.

WARNING

Incorrect installation of the device!

Explosion hazard and damage to the device.

- → The flow monitor is non-Ex-proof and has to be installed outside the explosion zone.
- → Lay and fix the connection pipes correctly and protect them against tripping, dirt and damage.

- → No air consuming equipment, other than the feed pumps for a 2K system, may be installed after the flow monitor (e.g., pumps circular pipeline and stirrer).

6.4.5 LACK-OF-PRODUCT PROTECTION

Make sure that product without air bubbles is supplied to the mixing and dosing system.

- → The flow meters can not detect whether product or air is delivered.
- → This may lead to mixing errors. (An air bubbles monitoring system is optionally available for the low-pressure model).

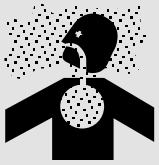
A lack-of-product protection can be achieved by installing a level probe in the A-product tank or by always having the coater make sure that sufficient product is in the tanks. Otherwise false coating may occur.

If, e.g., the A-tank's level probe indicates the minimum level, a signal can stop the 2K system (STOP) or electronic consumption measuring equipment warns of a lack of product.

The lack-of-product protection with level probe is not supplied with the 2K system and has to be realized on-site.

6.4.6 VENTILATION OF THE SPRAY BOOTH

⚠ WARNING



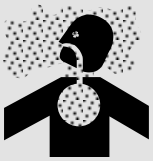
Toxic and/or flammable vapor mixtures!
Risk of poisoning and burns.
- → Operate the device in a spray booth approved for the working materials.
  -or-
- → Operate the device on an appropriate spraying wall with the ventilation (extraction) switched on.
- → Observe national and local regulations for the exhaust air speed.

6.5 GROUNDING

⚠ WARNING

Fire, explosion and electric shock hazard
Danger to life by electric shock and explosion.
- → The device must be electrically connected to the equipotential bonding (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

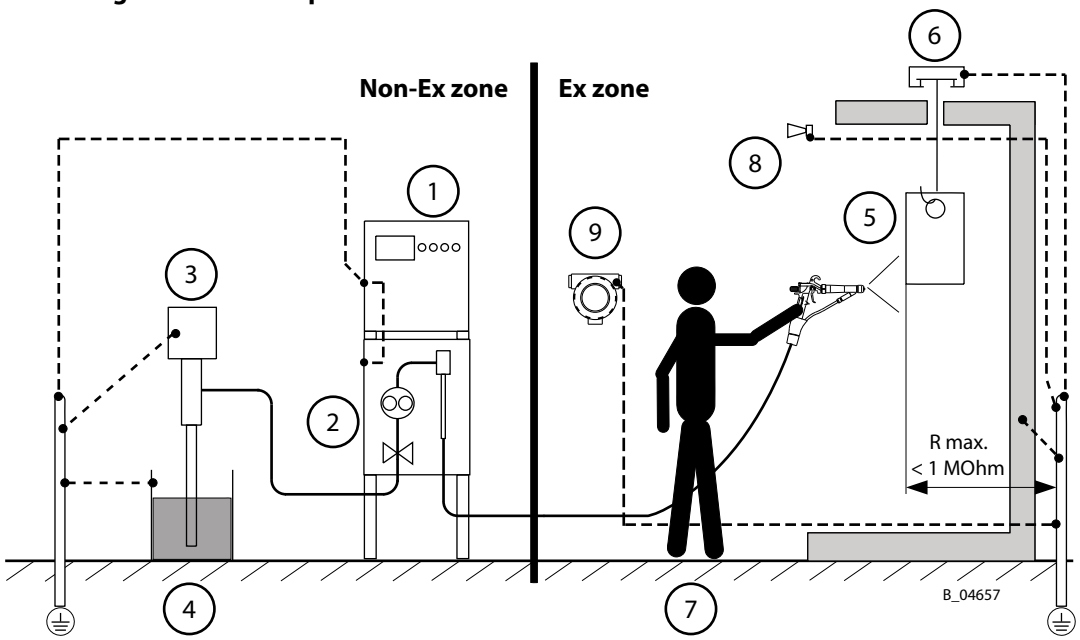


Heavy paint mist if grounding is insufficient!
Danger of poisoning.
Insufficient paint application quality.
- → Ground all device components.
- → Ground the work pieces to be coated.

Make sure to include the control cabinet and the fluid cabinet in the local equipotential bonding.

The 2K system, the pumps, all accessories and all parts that come into contact with the sprayer have to be grounded non-Ex or Ex according to the following grounding scheme.

Grounding scheme - example for 2K COMFORT non-Ex



Pos	Designation
1	Controller
2	Fluid section (non-Ex)
3	Pump
4	Paint tank
5	Work piece

Pos	Designation
6	Conveyor
7	Floor, static dissipative
8	Pneumatic alarm horn (option)
9	Remote control Ex (option)

- - - - Grounding cables

——— Fluid hoses

Cable cross sections	
2K system, pump	4 mm²; AWG 12
Paint tank / collection tank	6 mm²; AWG 10
Conveyor	16 mm²; AWG 6
Spray booth	16 mm²; AWG 6
Spraying stand	16 mm²; AWG 6

Connect all ground cables using a short and direct route.

Ex zone

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

Tank

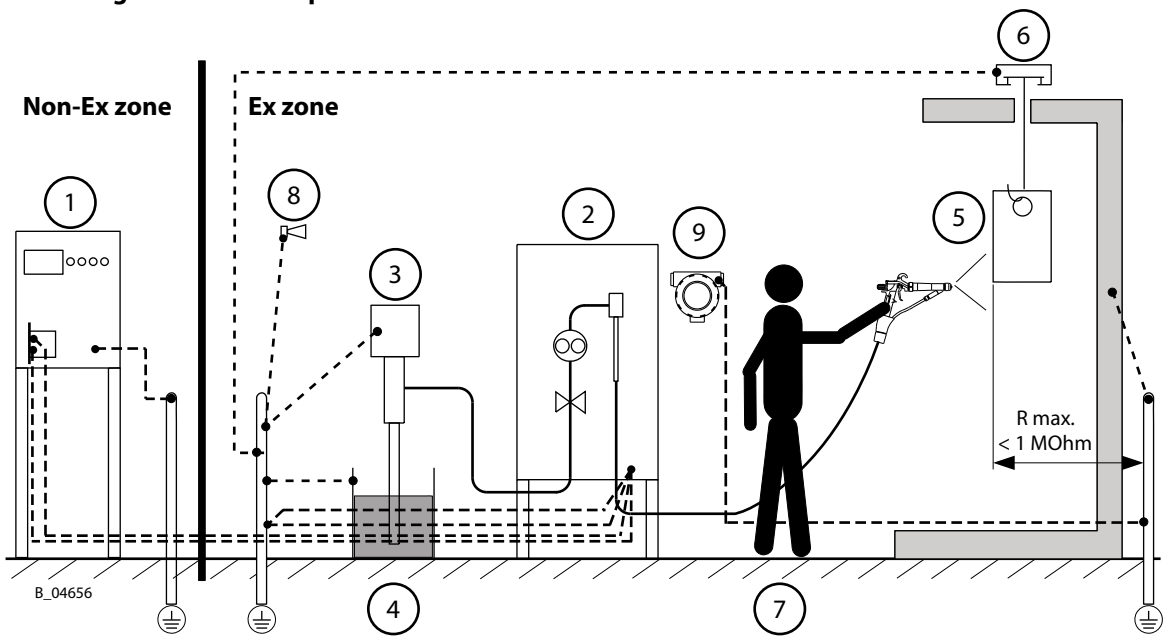
→ All paints, flushing agents and waste tanks have to be electrically conductive.

→ All tanks must be grounded.

Stroke measuring

→ Grounding ADC-0301: see "ADC-0301 / MPX-0403" operating manual (for Order No., see Chapter 1.3.1)

Grounding scheme - example for 2K COMFORT Ex



Pos	Designation
1	Controller
2	Fluid section (Ex)
3	Pump (Ex)
4	Paint tank
5	Work piece

Pos	Designation
6	Conveyor
7	Floor, static dissipative
8	Pneumatic alarm horn (option)
9	Remote control Ex (option)

- - - - Grounding cables

——— Fluid hoses

Cable cross sections	
2K system, pump	4 mm²; AWG 12
Paint tank / collection tank	6 mm²; AWG 10
Conveyor	16 mm²; AWG 6
Spray booth	16 mm²; AWG 6
Spraying stand	16 mm²; AWG 6

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Stroke measuring

→ Grounding ADC-0301: see "ADC-0301 / MPX-0403" operating manual (for Order No., see Chapter 1.3.1)

6.6 COMMISSIONING

⚠ WARNING

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

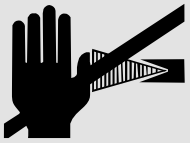
Danger to life from flying parts.

→ Ensure that the device is always completely filled with flushing agent or working medium.

→ Do not spray the device empty after cleaning.

⚠ 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

ⓘ 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 supplying pressure should be constant.

Electrostatic gun

→ Electrostatic guns must be used **without** electrostatics during commissioning. First commission the electrostatic system after all steps are carried out up to Chapter 6.6.6.

6.6.1 PRE-CLEANING

The devices are tested at the factory using emulsified oil, plain oil or solvent, according to the kind of fluid being pumped.

→ Before commissioning the pump with a product, it is recommended to flush both circuits and supply pumps with an appropriate flushing agent.

⚠ WARNING

Incompatibility of flushing agent and working medium!

Risk of explosion and danger of poisoning by toxic gases.

→ Examine the compatibility of the flushing agents and working medium on the basis of the safety data sheets.

Pre-cleaning
Before the product hoses are connected to the system, they should be flushed, together with the corresponding pumps, with the flushing agent to be used.

→ Unless this preliminary flushing is executed, the flow meters can already be clogged due to contamination during the first flow through!
→ For preliminary cleaning of the pumps, carefully follow the corresponding pump instructions.
→ After all pumps and product hoses to the device have been flushed, the product hoses can be connected to the system.
→ The flushing agent still remains in the pumps.

Note:
The flushing agent used for the first cleaning may not be used again since it might contain oil residues.

6.6.2 INITIALIZING THE CONTROLLER

The controller is already individually pre-configured upon delivery. Additional settings must be entered on-site.

→ Switch on the system with the main switch.
→ The initialization programs starts when the system is switched on for the very first time. It allows quick input of the most important settings, which must still be entered. The initialization program can also be called up later (with password level 3, setting "Reset initialization").
→ Define one after the other on the operating panel:
  – Language (touch desired language, then proceed with the arrow key [→]);
  – Volumes measuring unit (liters or US gallons, touch field to change);
  – Lengths measuring unit (meter or inch);
  – Hose lengths and diameters;
  – Number of paint recipes (maximum 100) and number of flushing recipes (maximum 10);
  – Mixing ratio input type (A:B or percentage).
→ At the end, a note appears, explaining what should be done next. Perform one after the other (password level 1):
  – Enter names of valves, flushing recipes and paint recipes (see Chapter 7.9.2);
  – Enter flushing recipes (see Chapter 7.10);
  – Enter paint recipes (see Chapter 7.11), still without calibration.
→ If necessary, implement further settings.

6.6.3 VENTING THE SYSTEM

First bleed the system via the gun with little product pressure:

→ Prepare a grounded metal bucket, that is suitable to collect all products to be disposed of.

Menu →  →  (see Chapter 7.8)

→ Select each A side valve, one after the other and perform the following steps:
- Open the valve with the large valve icon.
- Bleed, via the gun, with low product pressure until clean flushing agent flows out of the gun.
- Close the valve icon again.

→ Do the same for the B side (and C/D, if available) and for the flushing valves.

6.6.4 PRESSURE TIGHTNESS TEST

⚠ WARNING

Overpressure!
Risk of injury from bursting components.

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

For pressure tightness control of the entire installation, the flushing agent pressure is slowly increased, step by step, until the maximum pressure of the individual pumps is achieved.

Menu →  →  (see Chapter 7.8)

→ One after the other and in each component (A, B, flush, ...) for each product valve (A1, A2, ...):
- Select valve and open it with the large valve button.
- Slowly increase the pressure at the respective pumps, step-by-step, until the maximum pressure specified on the type plate has been reached.
- Hold the maximum pressure for at least 2 minutes.
- If there is a leak, mend it.

→ After the test, relieve pressure from the entire system according to Chapter 8.8.

6.6.5 FILLING THE SYSTEM

NOTICE

Interchange of the two components A and B!

Device damage by hardened product.

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

(see Chapter 7.8)

Example for a hardener valve with the name B1:

1. Prepare the hardener components' tank and put the suction pipe in the respective pump.
2. Select [B] components, then select valve B1.
   Open the valve with the large valve button.
3. Set the hardener pump slightly under pressure. Open the hardener valve with the large valve button.
4. Point the guns into the grounded metal bucket and open it step by step. Avoid splashback.
5. After the hardener is filled, calibrate the hardener straight away, if necessary, according to Chapter 7.12.
6. Close the valve via the [Valve] field or close the STOP button again.

→ Then, in the same way, fill the system with the other components.

Note:
The solvent used for the first cleaning may not be used again since it might contain oil residues.

Calibration

Components with flow meter:

– In all paint recipes, calibrate the components as well as the flushing agent.
  If the components were already calibrated during filling, the K factors must be entered in the different recipes.
  → In accordance with Chapter 7.12.

Components with Coriolis measuring system:

– K factor = Enter 60 ,000 Imp/l according to Chapter 7.12.
  Perform zero point adjustment in accordance with "Coriolis Compact" user information (Order No., see Chapter 1.3.1)

6.6.6 ELECTROSTATICS

With an electrostatic gun:

→ Commissioning the electrostatics according to the corresponding assembly manual.

7 CONTROLLER

7.1 TRAINING THE OPERATING STAFF

→ The operating staff 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 staff must receive appropriate system training.

7.2 SAFETY INSTRUCTIONS

Before carrying out any work, ensure that commissioning is carried out in accordance with Chapter 6.6.

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

→ Relieve the pressure from the spray gun and unit.
→ Secure the spray gun against actuation.
→ Switch off the energy/compressed air supply.
→ Disconnect the control unit from the mains.
→ In the event of functional faults: remedy the fault as described in the "Troubleshooting" chapter.

7.3 CONTROL CABINET

There are four push-buttons and an operating panel (touch screen) for the system controller in the control cabinet. The touchscreen and the push-buttons can be used to communicate with the controller.

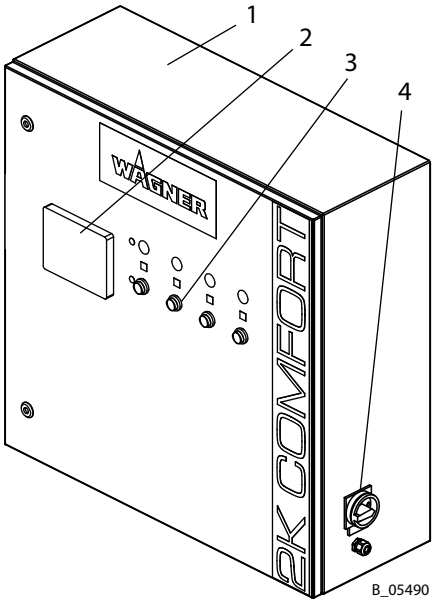
→ Initialization program for commissioning: see Chapter 6.6.2
→ Basic operating principles: see Chapter 7
→ Workflow: see Chapter 8

Detailed software documentation is separately available (see Chapter 1.3).

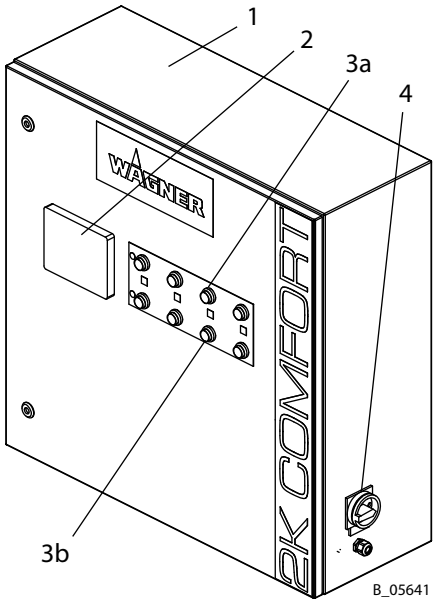
USB connection

The USB port is located at the control panel on the inside of the control cabinet.

Standard system of the control cabinet



2-circuit system of the control cabinet



Pos	Designation
1	Control cabinet
2	Operating panel (touchscreen)
3	Mechanical push-buttons
3a	Mechanical push-buttons, Circuit 1
3b	Mechanical push-buttons, Circuit 2
4	Main switch

2-circuit system

It is possible to work with two fluid circuits simultaneously. The operation of both fluid circuits is at any time immediately possible with mechanical push-buttons (3a or 3b).

The operating panel can be switched at any time quickly from one fluid circuit to the other.

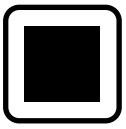
7.3.1 MAIN SWITCH

The main switch, on the right side of the control cabinet, switches the controller on and off. When switched off, all valves close automatically.

→ **Switching the system on and off:** see Chapter 8.3.

7.4 MECHANICAL PUSH-BUTTONS

The system's basic functions are controlled by four mechanical push-buttons:

START	STOP	Flushing	RECIPE CHANGE
			
Starts spraying mode. **Flashes green** during filling. **Lights up green** as soon as the system is ready for spraying. The AirCoat air is activated (option).	Ends the spraying or flushing process. (Depending on setting, it may not be possible to end the flushing process early.) **Alarm** → Lights up red. **Warning** → Flashes red.	Starts end flushing of the last paint recipe used. (With external mixer if necessary mixer flushing.) **Lights up blue** during flushing process.	Switches to next paint recipe. STOP + recipe change → jumps 10 steps.

Display of filling progress: 

Display of flushing progress: 

 **Gun symbol flashes** → Open gun.

7.5 OPERATING PANEL BASICS

  highlighted (yellow)	Some buttons are highlighted by a yellow background color. The highlighted buttons indicate our current location.
	All fields with frames can be touched. For example, to trigger an action, select a different recipe, or enter a number.

Recurring operating elements

[↑] Scroll up screen
[↓] Scroll down screen
[✓] Confirm selection
[✕] Cancel selection
[🖫] Saves the data

Differences in screen displays

The controller's functions differ depending on system, accessories installed, and user settings. The screens shown in the following chapters may therefore contain additional input options, or some of the buttons and fields shown may not be present in your version.

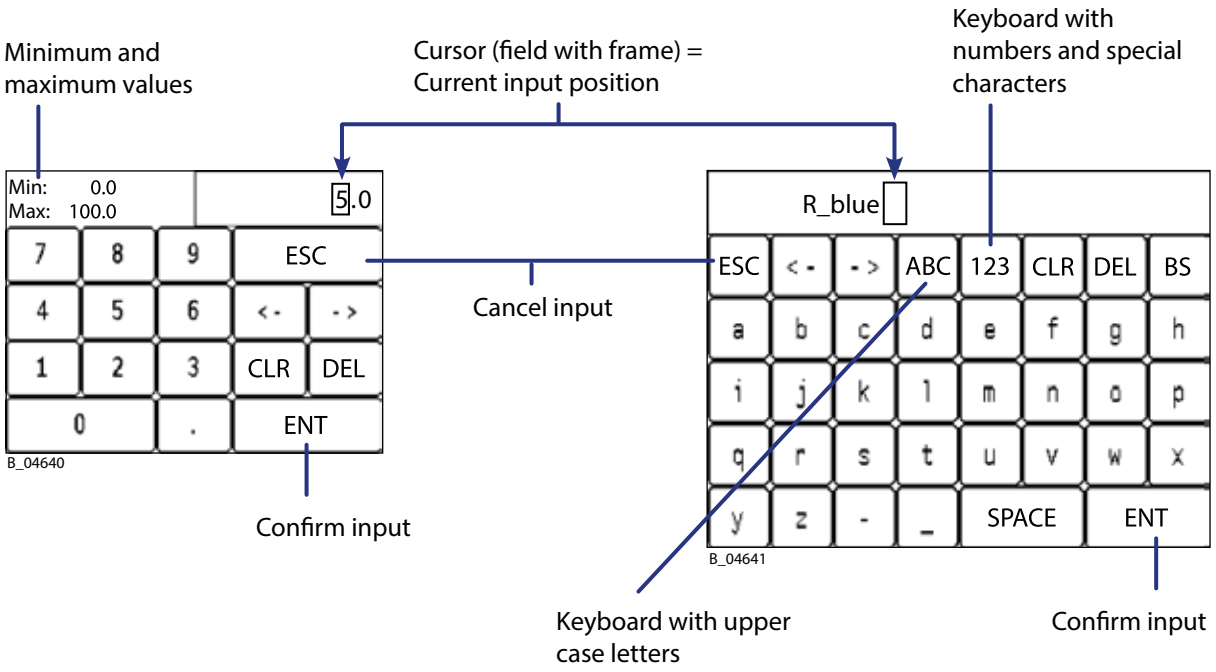
→ The screen will only ever show what is actually installed.

7.5.1 SELECT LANGUAGE

1. [Menu] button (second button in bottom row)
2. 
3. Touch language: [English]

7.5.2 KEYBOARD INPUT

A keyboard with numbers or letters appears as necessary when fields with frames are touched. The input is confirmed with [ENT] or canceled with [ESC].



Keyboard Controls	
[ESC]	Escape / Cancel
[→]	Move cursor to right
[←]	Move cursor to left
[ENT]	Enter / Confirm input
[CLR]	Clear / Delete all
[DEL]	Delete / Delete character
[BS]	BackSpace / Delete character to left of cursor (backspace)
[SPACE]	Space / Spaces

Changing over keyboard with letters	
[ABC]	Switch to keyboard with upper case letters
[abc]	Switch to keyboard with lower case letters
[123]	Switch to keyboard with numbers and special characters

7.5.3 PASSWORDS

Some functions and input options are protected by passwords. The following password levels exist:

Password level	Responsibility	Functions
0	Painter	Spraying mode
1	Painter with control jobs	Plus enter flushing and paint recipes, diagnosis, calibration
2	Foreman	Plus system settings
3	Service customer	Plus basic system settings
4	WAGNER Service Department	–

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

Password input

1. [Menu] button
2. If [Log Out] button appears: [Log Out] (The button switches to [Log In].)
3. [Log In]
4. Touch password input field.
   A numerical keyboard appears.
5. Enter the password.
6. [ENT]
   The password level is displayed briefly, for example: "Level 1".
   The menu buttons for the corresponding password level then appear.

7.6 HOME PAGE

NOTICE

Wrong mixing ratio!

Poor quality of paint application.

→ Before changing the lacquer, check the mixing ratio on the display and modify it if necessary, if individual components have different mixing ratios.

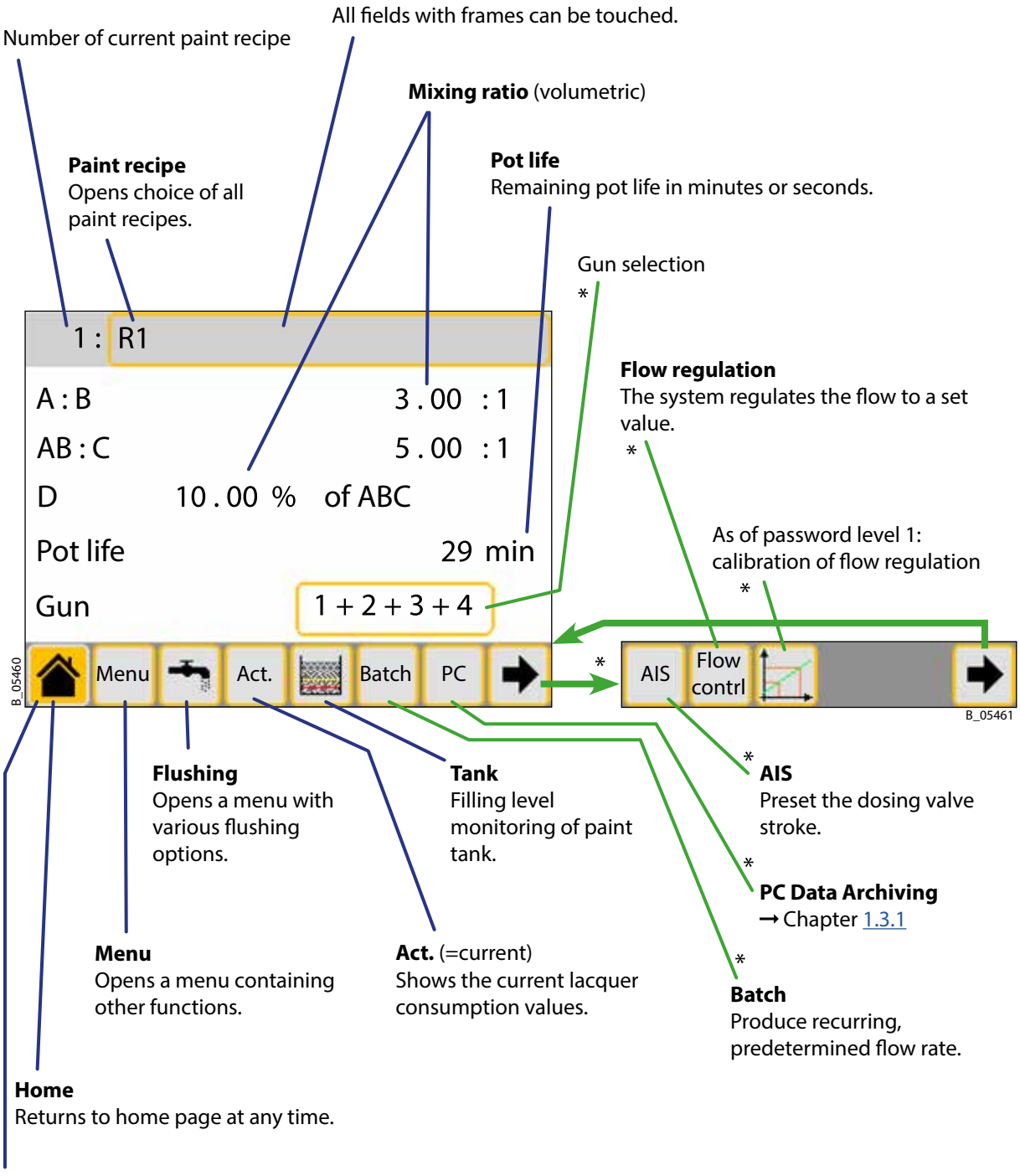
7.6.1 CHANGING THE PAINT RECIPE

Press RECIPE CHANGE push button
→ Switches to next paint recipe.

Or:

1. Touch paint recipe field (see above).
2. Select desired paint recipe from the list.

7.6.2 HOME PAGE OPERATION



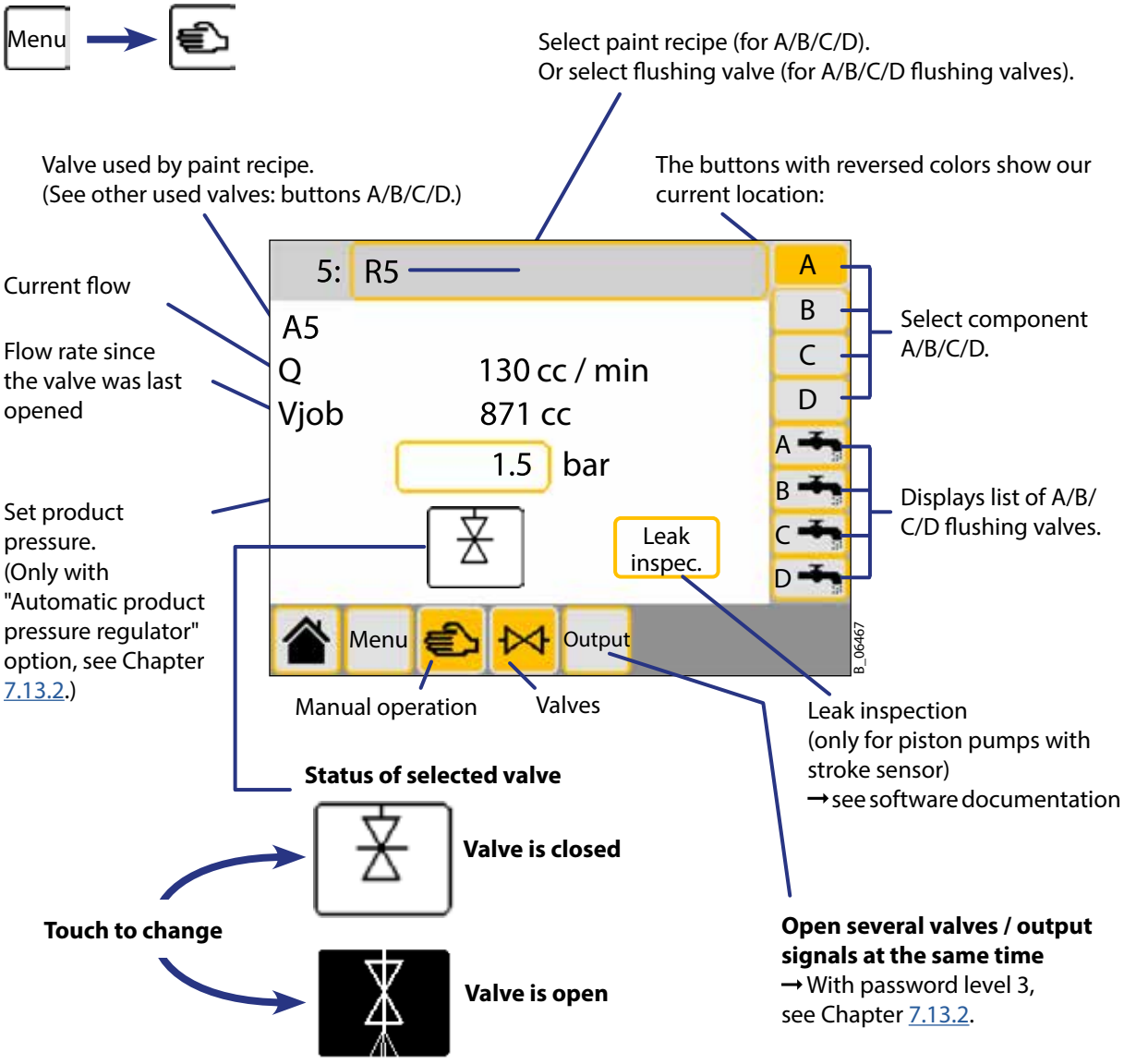
The 'Home' button is emphasized using reversed colors – on screen with light background. This shows us our current location: on the home page.

* Only present with corresponding setting (with password level 3, see Chapter 7.13.2).

7.7 MENU

Button	Function
	**Alarm** Calls up list of the last 700 warning messages.
	**Manual operation** Specific opening and closing of product or flushing valves. → Chapter 7.8
	**Tank** → Software Documentation
	**Change name** (password level 1) → Chapter 7.9.2
	**Flushing recipes** (password level 1) → Chapter 7.10
	**Paint recipes** (password level 1) → Chapter 7.11
	**Diagnosis** (password level 1) Mixing amount, e.g., **QB**: As soon as the mixture has the correct mixing ratio, the mixing amount is reset to zero. The system stops when the maximum is exceeded (=QB-control, see Chapter 7.13.1). **Btkt** = The dosing valve's cycle length **% open per cycle** = dosing valve's opening time. If too short: slowly reduce the difference in pressure between A and B. **Output** → Display the output signal status. **Input** → Display the input signal status.
	**Totals** (password levels 1 / 2) View / zero product consumption and working times.
	**VOC quantities** (password levels 1 / 2) View / zero VOC quantities, enter VOC factors. → Chapter 7.11
	**Info** (password level 1) View software version number, set date and time.
	**Calibration** (password level 1) → Chapter 7.12
	**Settings** (password levels 2 / 3) → Chapter 7.13
USB	**USB** (password levels 2 / 3) Back up alarms, totals, and configuration data on USB stick.
	**Service** (password level 2) Service intervals for dosing valves and flow meters.
I/O Config	**Input / Output configuration** (password level 3) Assign inputs and outputs. → see software documentation
Stroke sensor	**Stroke sensor configuration** (password level 3), from software version 4.0x / 4.0x K. → see software documentation

7.8 MANUAL MODE: OPEN VALVES



Manual mode is used for troubleshooting or to fill a pump, for example.

Only one valve can be opened at any one time. If another valve is touched, the controller closes all valves.

With a gun flush box, the valve for the gun is also opened: either for gun 1 (if gun 1 or 1+x is selected on the home page), or for gun 2 (if gun 2 is selected on the home page).

Ext. flushing agent

The valve for the external flushing agent can not be opened on this page. If necessary, the calibration function can be used for this, without saving the measured value (password level 2, Chapter 7.12).

7.9 RECIPES

7.9.1 ADD NEW RECIPES

Create a **new flushing recipe:**

1. Increase the "Number of flushing recipes" in the settings by one (see Chapter 7.13.1).
2. Change the flushing recipe's automatically assigned name (see Chapter 7.9.2).
3. Enter the flushing recipe (see Chapter 7.10).

Create a **new paint recipe:**

1. Increase the "Number of paint recipes" in the settings by one (see Chapter 7.13.1).
2. Change the paint recipe name automatically assigned (see Chapter 7.9.2).
3. Enter paint recipe (see Chapter 7.11).

7.9.2 CHANGING RECIPE AND VALVE NAMES

Menu → **ABC** (with password level 1 or higher)

Change **valve names** (for example: red, yellow, hardener_1, flushing agent_1).
→ First select components (A, B, flushing A, ...), then touch the valve names.

others

Other valve names

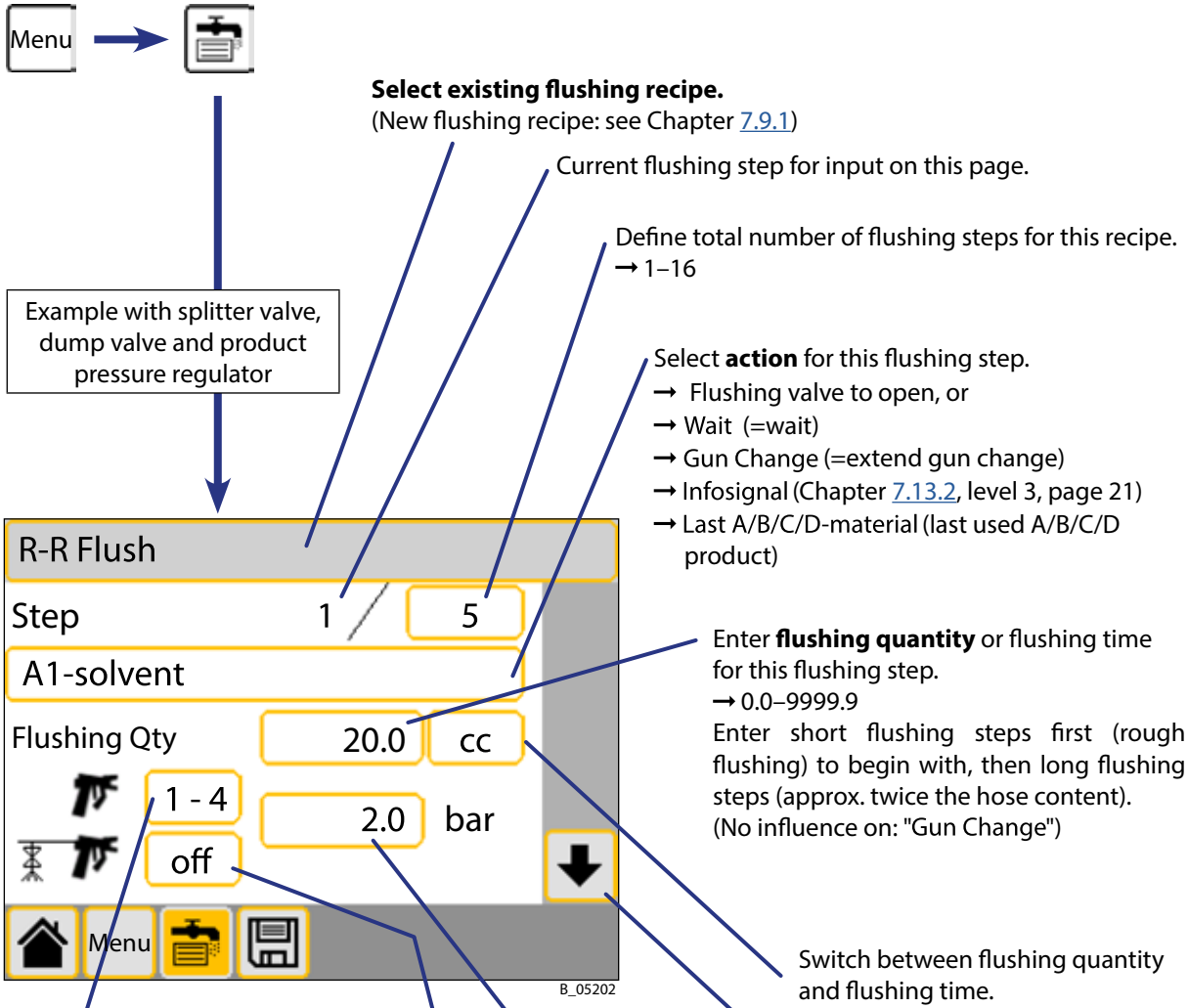
----------	No valve open
Ext. Mixer Flush	Flushing from external mixer (option)
Mix Head Flush B/C/D	Flushing starting from mixing head valve (option)
Flush P1	Flushing starting from splitter valve for gun 1 or gun 2
Flush P2	
Infosignal *	Generates an information signal
101: Wait	Wait
102: Gun Change	Demand gun change. (With 2-4 guns and only one gun flush box.)
Last A/B/C/D material	Last used A/B/C/D product

* from version 3.2x / 3.2x K

Change **flushing recipe name**.
For example: R-R flushing (= recipe change flushing), end flushing, gun flushing.

Change **paint recipe name**.
For example: red-90, red-95, yellow_customer-1, yellow_customer-2.

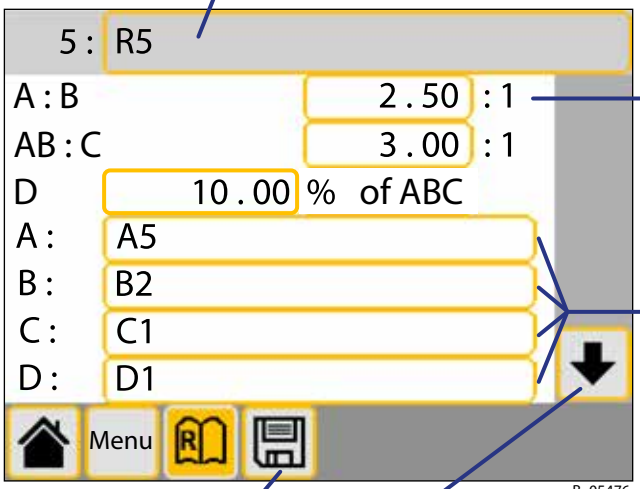
7.10 ENTER FLUSHING RECIPE



7.11 ENTER PAINT RECIPE

Menu → (with password level 1 or higher)

Select existing paint recipe.
New recipe: see Chapter 7.9.1



Enter **mixing ratio (volume)** for the selected recipe
→ 0.1:1–50.00:1
→ 0.02% – 1,000.00%

If one or several components are not required: enter 0.00:1 or 0.00%.

1K application: Enter 0.00:1 or 0.00% for all components except for one.

The flow is measured by volume and the mixing ratio is entered and controlled volumetrically by default.

Select **product valves** for available components.

If one or several components are not required: B valve = "---------"

1K application: Enter "---------" for all components except for one.

Save paint recipe.

Go to next page

Page 2

– Enter **pot life**.
– Select **flushing recipes** to be used:

	Is carried out, ...
End:	... **after** this paint recipe has been used when end flushing is being carried out.
R-R:	... **after** this paint recipe has been used when the recipe is changed.
Mix: *	... when flushing just from the external mixer to the gun.
Pre: *	... **before** using this paint recipe. (For whether a recipe change and / or end flushing comes first: see Chapter 7.13.2, "Pre-flushing after paint change flush" or "Pre-flushing after end flushing").

* May also be missing, depending on configuration.
Select empty field if no flushing recipe is to be active.

Page 3 (option)

– **Product pressure when filling and working.**
Prerequisite: low-pressure system with automatic product pressure regulator.

Page 4 (option)

– **Flow regulation**: pre-define flow set value for this paint recipe.
Settings: "Flow regulation" → see Chapter 7.13.2 (password level 3, page 19)

↓

Page 5 (option)

– **Flow monitoring**: enter minimum and maximum flow in cc/min. (For example, with robot applications to monitor nozzle wear and nozzle blockages.)
Prerequisite: gun monitoring or flow monitor.
Settings:
  – Activate "Flow monitoring" → see Chapter 7.13.2 (password level 3, page 2)
  – "Alarm delay for flow monitoring" → see Chapter 7.13.1 (password level 2, page 2)

If flow falls below or exceeds the limits, the system stops with alarm A121 or A122.

↓

Page 6 (option)

– **Batch Mode**: pre-define the Batch quantity for this paint recipe.
Prerequisite: accessories set for automatic filling + external signal transmitter (e.g., foot-operated switch)

↓

– [🖫] Save recipe.
– **VOC** = Volatile Organic Compounds
If the local specifications require a VOC measurement, then the corresponding VOC factor must be entered in every paint recipe for each component.

1. Select newly entered paint recipe.
2. One after the other, touch components A / B / C / D and flushing A / B / C / D and for each:
   – Enter the corresponding VOC factor in percent or g/L or g/G. The VOC measuring unit is defined in the settings (see Chapter 7.13.1).
   – Only if the corresponding factor is to be saved for all paint recipes: [🖫]

↓

– **Calibration** for the newly entered paint recipe:
→ According to Chapter 7.12.

7.12 CALIBRATION

Coriolis measuring system: K factor = 60,000 Imp/L

1. Enter "60,000" in the Kn field in all paint recipes for components with Coriolis measuring system and then save.
2. Perform zero point adjustment in accordance with "Coriolis Compact" user information (Order No., see Chapter 1.3.1)

Flow meters and stroke sensors

Flow meters or stroke sensors must be calibrated. This produces a K factor for every component. The K factors may vary depending on the lacquer (A1, A2, A3, ...). Therefore, the K factors for each paint recipe are saved separately.

→ **Flow meter:** The default is the average from the calibration report. The default is accurate and is a good match for most products. A calibration is therefore, not usually necessary.

→ **Stroke sensor**: Calibration must be carried out.

→ When a calibration is performed, it should always be a precise process. Particular care must be taken, to measure the volume in the measuring cup exactly and without air bubbles.

Menu →  (with password level 1 or higher)

Example: K factor for paint recipe R1 and for component B with flow meter.

1. Select paint recipe: R1.
2. Select component: B.
3. The system is under spraying pressure and the selected component is already in the spray gun. Select the spray nozzle, so that pressure and product flow approximately meet subsequent work processes.
   [Start] → [Stop] → Wait until no more product flows.
4. Start the measurement: [Start].
5. Use the gun to fill a certain quantity of the corresponding lacquer (e.g., 500 ml) into a measuring cup. Use a protective tube against overspray if necessary.
   The flow measured by the system is displayed on the screen.
6. Close the gun and push the [STOP] button. Wait until no more product flows.
7. Exactly measure the quantity filled into the measuring cup by weight, with one of the following versions.
8. Enter the determined volume in the measuring cup field.
9. The controller calculates and saves the new K factor and displays it in the Kn field.
10. Press the [🖫] icon in order to accept the new K factor.
    → Selection possibility: If the different lacquers of the same components have similar characteristics, then the K factor can immediately be saved for all recipes. Otherwise, only for the current recipe.
11. Carry out the calibration several times in order to check the values.
    In case of large deviations, eliminate the cause:
    – Air in the lines → fill the lines with product and check the suction system.
    – Air mixture in the measuring cup → gauge the calibration and use the density to calculate the volume.
    – The flow is not measured properly. → Dismount the flow meter or stroke sensor, clean it and check it for any damage.

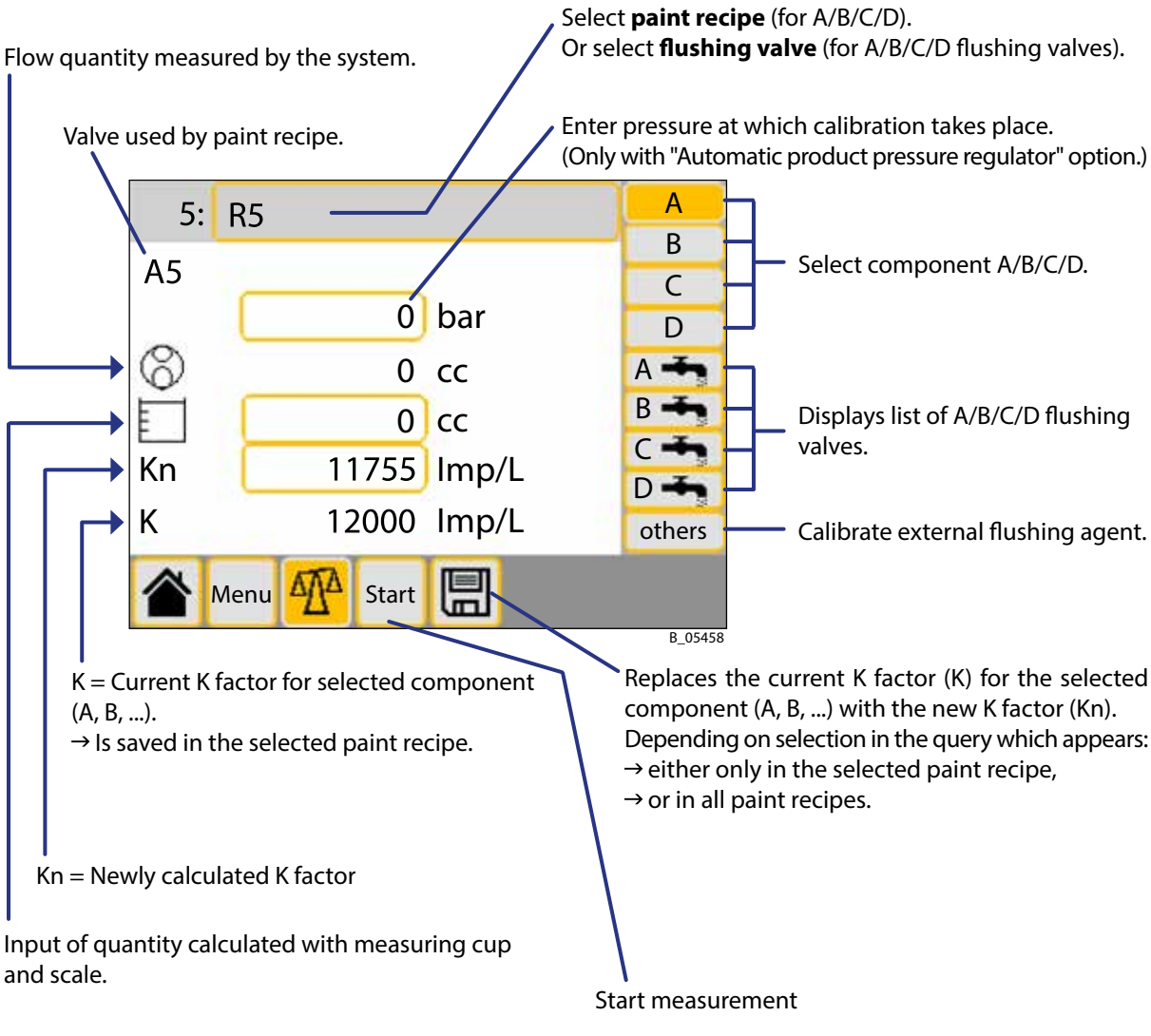
12. In all paint recipes, calibrate all components.
    → With identical flow meters (identical components) and identical lacquers or lacquers with similar characteristics, the K factor can be taken over: Enter the value directly in the Kn field and then save.

Exact calibration, version 1 (Lacquer density is known)

– Weigh the quantity filled into the cup.
– Divide the weight in grams (g) by the lacquer's density. This directly equals the volume in cc, that is entered in the measuring cup field.

Exact calibration, version 2 (Lacquer density is unknown)

– First, manually measure precisely e.g., 500 cc of product into a measuring cup and establish the product weight in "g" grams.
– Set empty measuring cup on the scale. When calibrating, use the gun to fill the cup with the exact weight measure above.
– The initial volume (e.g., 500 cc) is entered in the measuring cup field.



7.13 SETTINGS

7.13.1 PASSWORD LEVEL 2 SETTINGS

There are 24 pages of settings. Depending on configuration, pages may be jumped. The page numbers with a gray background always appear, the others are optional. (Detailed descriptions of these pages can be found in the 2K COMFORT Software Documentation.)

1 Number of **paint recipes** and number of **flushing recipes**.

QB, QC, QD Control → See the software documentation, "Diagnosis" chapter.

Gun Delay → Delay time for alarms A106 to A113 (set "Minimum flow" and "Maximum flow" → Chapter 7.13.2, level 3, page 4)

2 **Post-alarm for pot life** → Once the pot life + post-alarm times have passed, the system stops (alarms A132–A144). The alarm is repeated until the system is flushed. If "Automatic flushing at pot life alarm" is activated, and the guns are in the gun flush box, flushing is started automatically.

Alarm delay Flow monitoring → Delay time for alarms A121 and A122. (Activate "Flow monitoring", → Chapter 7.13.2, level 3, page 2. Enter the limits in the paint recipe → see Chapter 7.11)

Atomizing air at alarm stop → So that coating can be completed without dripping.

Atomizing air at end of flushing → To blow the air cap free.

VOC measuring unit → Percent or gram per Liter.

Password for password level 1.

3 Hose dimensions from product valves A and B to mixer.

4 For 3K system: hose dimensions from product valve C to mixer.

5 For 4K system: hose dimensions from product valves C/D to mixer.

6 Hose dimensions from mixer to splitter valve.

7+8 – Page 7: Hose dimensions from mixer to gun 1.

– Page 8: Hose dimensions from splitter valve to gun 1.

Gun content of gun 1

Gun 1: **Filling via the dump valve** → Quantity (as a percentage), which should be discharged via the dump valve. (The remainder passes via the gun.)

Gun 1: **Flush atomizing air % hose content** → When flushing: What percentage of the hose content from the mixer to the gun, can still be used for coating. The atomizing air (and electrostatics) for gun remains activated for this period when flushing. See also "Flushing pause" (level 2, page 16).

Gun 1: **dump valve flushing time** after filling. (Only with flushable dump valve.)

9 Hose dimensions from gun 1 to the dump valve. (Only with "Dump valve as return flow".)

10+11 Like pages 8 + 9, but for gun 2.

12+13 Like pages 8 + 9, but for gun 3.

14+15 Like pages 8 + 9, but for gun 4.

16 The **flushing pause** indicates that with "Atom.air on flush % of hose volume" the remainder must be sprayed into the waste tank. The atomizing air remains on during the flushing pause.

Pot life alarm → **Flushing** → "On" = Flushing is mandatory after a pot life alarm. Additional spraying is also possible with "Off".

Mixing alarm → **Flushing** → "On" = Flushing is mandatory after a mixing error alarm (A100–A118, A128–A131, A145–A148). Additional spraying is also possible with "Off".

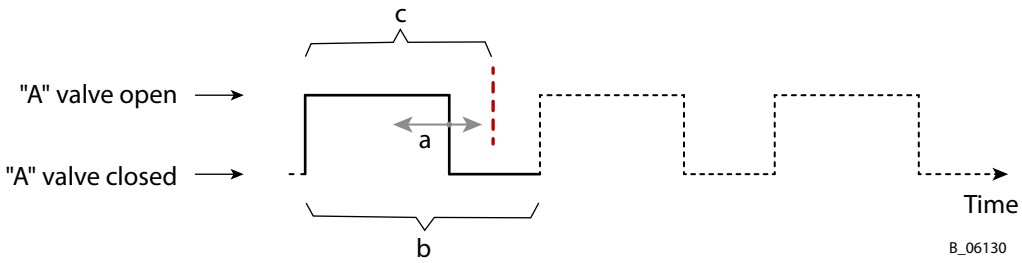
Mixing alarm → **Filling** → "On" = Filling is mandatory after a mixing error alarm (A100–A118, A128–A131, A145–A148). Additional spraying is also possible with "Off".

17 **Filling greater than hose content** → What percentage of the total hose content is also to be filled between product valve and gun to ensure that there is no flushing agent left in the hose.

Flow monitoring during filling → "On" = The flow is limited when filling to optimize the dosing quality. Set limits with "Max. filling flow" or "Min. filling flow". If necessary, the A valve cycles (see figure).

Reset pot life → Pot life is reset manually.

Flow monitoring during filling



(a) During filling, the flow is regulated by a longer or shorter opening of the A valve.

(b) "Filling time period" (in seconds)

(c) "Maximum time period open" (in percent of (b))

18 **Save Start/Stop totals USB stick** → "On": Start/Stop totals are written continuously to a USB stick (USB stick must be plugged in).

PC data archiving → "On": Data are archived continuously on PC. (Operating manual for PC data archiving, see Chapter 1.3.1)

19 For AIS-B:

AIS warning limit → Minimum injection quality (opening time of hardener dosing valve as a percentage). If the value falls below this, a warning is triggered (W123 - W125).

AIS lower limit → If the value falls below this, the AIS optimizes the injection quality. (Default value = 50%)

AIS upper limit → If the value exceeds this, the AIS limits the injection quality. Thereby smooth operation is ensured. (Default value = 80%)

Valve > open AIS open → If the B valve is continuously opened for longer than the stated time, too little product can flow through. The AIS allows more product through. (Default value 1.0 sec.) Repetition after each **repetition interval AIS open**. (Default value 0.5 sec.)

AIS open when stopped → Number of steps which the AIS is to open when mixing operation is ended. (Default value 3)

AIS min. flow → Minimum flow of all components for AIS to undertake regulation. (Default value 20 cc/min)

20 For AIS-B:

AIS hysteresis → Number of steps which do not yet have impact when AIS switches (e.g., close → open) and are therefore inserted at the switchover points. (Default value 1)

AIS Number of cycles with X guns → Number of steps which the AIS is to open or close when an additional gun is switched on or off.

21+22 Like pages 19 + 20, but for AIS-C.

23+24 Like pages 19 + 20, but for AIS-D.

7.13.2 PASSWORD LEVEL 3 SETTINGS

There are 23 pages of settings. (Detailed descriptions of these pages can be found in the 2K COMFORT Software Documentation.)

1 **2K-, 3K-** or **4K** system (with 2-circuit system maximally 3K)

Measuring units for volume (liters / US gallons) and lengths (meter / inch)

Gun closed → **Valves closed** → "On": When the gun is closed, all product valves are also closed automatically. Beneficial for low-pressure applications. Prerequisite: gun monitoring (not flow monitor).

External release → "On" = External releasing (e.g. locking with spray booth's exhaust air)

Number of installed Universal CAN I/O modules

2 **Number of guns** (1–4, with 2-circuit system 1–2)

Gun monitoring for all available guns.

Splitter valve (Prerequisite: minimum 2 guns)

Flush guns separately → "On" = splitter valve with flushing (separate gun flushing valves). Prerequisite: maximum 2 guns, splitter valve = On.

Number of **gun flush boxes (GFB)**

Automatic flushing at pot life alarm (Prerequisite: GFB)

Flow monitoring (On/Off). Prerequisite: gun monitoring or flow monitor. Sets off Alarms A121 and A122. ("Alarm delay for flow monitoring" → Chapter 7.13.1, level 2, page 2. Enter the limits in the paint recipe → see Chapter 7.11)

3 **Dump valve** → "On" = There is a dump valve installed for every gun. **Or a dump valve flushable.** If a dump hose is present between gun and dump valve (not flushable), the option **dump valve as return line** is activated. **Dump valve for waste separation** is possible with double valves (not flushable) (not for 2-circuit system). **Precision of waste separation**: 0 = exact, each additional number = 25% of the dump hose safety margin (default value 2).

Dump valve outputs can be inverted → "Off" = Compressed air opens dump valve with non-flushable dump valves without waste separation.
"On" = Compressed air closes dump valve.

4 For component A:

Number of **valves** and **flushing valves.**

Minimum and maximum **flow**. Sets off Alarms A106 to A113. (Delay time "Gun Delay" → see Chapter 7.13.1, level 2, page 1)

Air bubbles monitoring (On/Off)

Coriolis flow meter

Flow measurement with **stroke sensors** (On/Off), from software version 4.0x / 4.0x K. To configure stroke sensors: see 2K COMFORT software documentation.

5 Only for Coriolis:

Density area lower and upper value. The **actual density** must correspond to the density display of the C-flow measuring transducer (with liquid in the system). Correct the value here if necessary.

Temperature range lower and upper value. The **actual temperature** must correspond to the temperature display of the C-flow measuring transducer (with liquid in the system). Correct the value here if necessary.

6 Like page 4, but for component B.

7 For component B:

AIS (On/Off)

Mixing head valve with cycles → If a mixing head valve is fitted: "On" = Mixing head valve cycles. "Off" = B valve cycles.

Mixing head valve flushing → "On" = A flushing valve is attached to the mixing head valve.

Input type for mixing ratio (A:B oder %B)

8 Like page 5, but for component B.

9–11 Like pages 6–8, but for component C.

12–14 Like pages 6–8, but for component D.

15 **Alarm delay for air bubbles monitoring** → How long can an air bubble be present before the system stops (→ alarms A114–A117).

Alarm delay no flow during filling → How long can filling be interrupted before an alarm occurs (alarm A124). If set to 0.0 seconds, the function is deactivated.

Alarm delay no flow during flushing → How long can flushing be interrupted before an alarm occurs (alarm A125)? When flushing, this alarm takes the place of the pot life alarm. If the setting is "0.0 seconds", the function is deactivated, the pot life continues and a pot life alarm occurs.

Alarm delay for Coriolis error (alarms A128–A131).

Remote control (On/Off)

Robot (no/digital/bus): "Digital" = Robot is digitally connected. "Bus" = Robot is connected via gateway.

Timeout for automatic logout → If the touch panel is not activated during the defined time, then the password level is automatically reset to level 0. ("0 sec" = no automatic logout.)

16 **Batch Mode** → Allows a recurring and pre-defined flow rate to be discharged (see software documentation).

Measuring unit for pot life → minutes or seconds. (Change recipes accordingly after changeovers!)

Booster pump (Off / A-side / Mix-side)

A valve selection at start → "On": After starting, a prompt appears asking which A valve is to be used for the selected recipe.

Number of tanks for filling level monitoring.

17 **Pre-flushing after end flushing** → "On" = After an end flushing, a pre-flushing must be undertaken. Prerequisite: pre-flush recipe is defined and selected in the paint recipes.

Pre-flushing after paint change flushing → "On" = A pre-flushing must be undertaken after a recipe change flushing. Prerequisite: pre-flush recipe is defined and selected in the paint recipes.

Flush interruption ok? → "On" = The flushing process can be interrupted and e.g., the new paint filled. "Off" = The entire flushing process must be undertaken first. If flushing is aborted, the process starts again afresh.

Air flushing valve (On/Off) "On" = Air flushing is fitted.

External mixer (On/Off)

Flushing external mixer as standard → "On" = The FLUSHING push button starts mixer flushing ("Mix") of the last paint recipe used. (→ Flushing from external mixer) "Off" = The FLUSHING push button starts end flushing ("End") of the last paint recipe used.

18 **Number of automatic product pressure regulators** (0 / 1 / number of guns). "1" = Automatic product pressure regulator in front of splitter valve. "Number of guns" = An automatic product pressure regulator is fitted for each gun.

Maximum product pressure for automatic product pressure regulator.

Pressure regulator fully open during flushing

→ For manual product pressure regulators: "On" = During flushing, the product pressure regulator is subjected to full air pressure.

→ For automatic product pressure regulators: No function.

Pulse time at flush for prod.press reg.

→ For manual product pressure regulators, if the above function is switched on: pulse time for changes between working pressure and full air pressure.

→ For automatic product pressure regulators: pulse time for changing between flushing pressure (specified in recipe) and 0 bar.

→ "0.0 sec"= no cycling.

19 **Flow regulation** (On/Off).
P- (proportional-)part and **I-** (integral-)part of controller.
Number of flow measurements, which are included in the calculation.
Time period between the flow measurements.

20 **Flow meter in external flushing agent** (On/Off).
Flow switch in external flushing agent (On/Off).
Flushing monitoring in seconds (flushing with paint valves / flushing external mixer / gun flushing / dump flushing):
→ "no" = The flushing time runs, regardless of whether or not flushing agent flows.
→ "Gun monitoring" = The flushing time only runs when there is a gun signal. Prerequisite: gun monitoring signal from flow monitor or robot, **not** from air monitoring.
→ "Flow switch" = The flushing time only runs when there is a signal from the flow switch. Prerequisite: "Flow switch in external flushing agent" is activated (see above).

21 * An **information signal** can be generated:
– As soon as the filling is complete (Setting "Filling complete: -> Information signal").
– As soon as the gun in the gun flush box must be changed (Setting "GFB gun change: -> Information signal").
– During the flushing process (see Chapter 7.10).
Duration of the alarm horn sounds according to "Information signal switch-on time" and "Information signal break time". ("Number of cycles for information signal" = How many information signal cycles should sound as soon as the filling is complete.)

22 * **Warning signal on alarm horn** (On/Off). Duration of sounds according to "Warning signal switch-on time“ and "Warning signal break time".

23 ** **Password level 2 / 3** → Password input for password level 2 / 3.
Reset initialization → "OK" = When the system is switched on the next time, the initialization program starts (e.g., for training purposes). The current settings are preset, nothing is lost.
Start software update → "OK" = A software update is executed. Special knowledge is required for this purpose (observe separate manual).

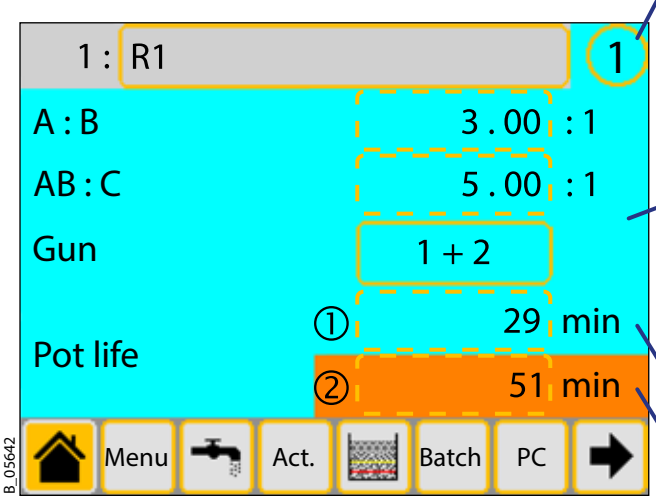
* from version 3.2x / 3.2x K

** Page **21** until version 3.1x / 3.1x K

7.14 OPERATING PANEL FOR 2-CIRCUIT SYSTEM

The operating panel controls either the fluid circuit 1 or the fluid circuit 2.

Example: **Home page for circuit 1**



Current fluid circuit:
① = Fluid circuit 1
② = Fluid circuit 2
1/2 = affects both fluid circuits
Touch = Go to the other fluid circuit

Background color of page:
Turquoise = Fluid circuit 1
Orange = Fluid circuit 2
White = both fluid circuits

On the home page are always both pot lives, each with the appropriate background color:

Pot life Circuit 1

Pot life Circuit 2

7.14.1 CHANGE FLUID CIRCUIT

→ Touch the current upper right fluid circuit, for example: ①

Thereafter, the controller switches to the other fluid circuit. The page remains the same. Example: the controller changes from the menu page for circuit 1 to the menu page for circuit 2.

Change not possible

This error message appears if the current page is not available in the other fluid circuit:

Change to circuit X is not possible.

→ Go to another page (for example to the home page). Then change the fluid circuit.

On some pages, the current fluid circuit is framed in gray. Then a change to another circuit is also not possible. Remedy is the same:

→ Go to another page. Then change the fluid circuit.

7.14.2 /K1 AND /K2

Names and alarm messages, which refer to a specific fluid circuit, are marked with "/K1" or "/K2".

	Name / Alarm message	**Meaning**
	…/K1	… Circuit 1
	…/K2	… Circuit 2
	…	affects the total system
Gun name (example)	Gun P2/K1	Gun P2 of circuit 1
Signal name (example)	A1 valve/K2	A1 valve for circuit 2
Alarm message (example)	A123 flushing first/K1	Circuit 1 has to be flushed

Software version identification

2-circuit systems software versions are marked after the version number with the letter "K":
"x.xx K"

7.14.3 ACKNOWLEDGE ALARMS

	STOP button	**Acknowledge alarm**
Alarm Fluid circuit 1	STOP button Circuit 1 lights up	Press the STOP button Circuit 1. *
Alarm Fluid circuit 2	STOP button Circuit 2 lights up	Press the STOP button Circuit 2. *
Alarm System	Both STOP buttons light up	Press one of both STOP buttons. *

* Or touch the [Reset] button on the screen.

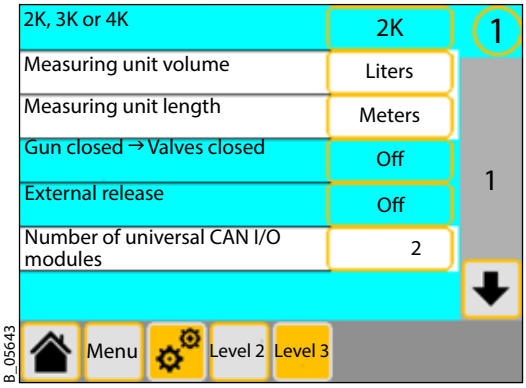
7.14.4 WHITE BACKGROUND: AFFECTS BOTH FLUID CIRCUITS

Everything relates to both circuits has a white background.

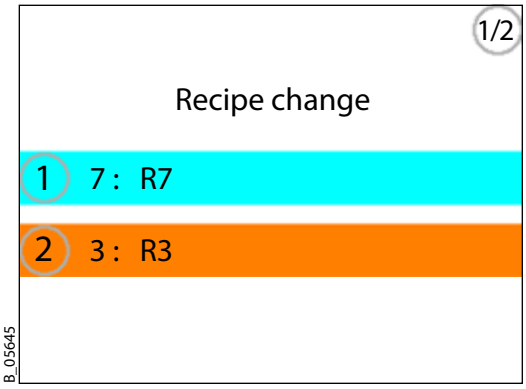
	Fluid circuit 1	Fluid circuit 2	Valid for both fluid circuits
Fluid circuit display (upper right)	①	②	1/2
Background color	Turquoise	Orange	White

Example: Settings

Turquoise = Circuit 1. White = both circuits.



Recipe change



8 OPERATION

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

8.1 TRAINING THE OPERATING STAFF

→ The operating staff 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 staff must receive appropriate system training.

8.2 SAFETY INSTRUCTIONS

Before carrying out any work, ensure that commissioning is carried out in accordance with Chapter 6.6.

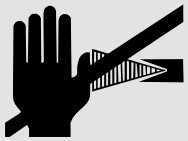
8.2.1 EMERGENCY DEACTIVATION

In the case of unforeseen occurrences:
– Switch off main switch.
– Switch off air supply of system and pumps.
– Point the manual gun into a grounded metal bucket. Open the gun's trigger mechanism step by step in order to relieve the pressure. Avoid splashback.
– Secure the gun.
– Provide appropriate return tanks and relieve pressure from the pumps via the return valves.
– Inform the security personnel / foreman / superiors.

8.2.2 GENERAL RULES FOR MAKING ADJUSTMENTS TO THE SPRAY GUN

→ Observe the operating manual of 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.
→ Use personal protective equipment (protective clothing, gloves, eyewear and respiratory protection).

8.3 SWITCHES THE SYSTEM ON AND OFF

→ Switching the system on

1. Turn red-yellow main switch on the right side of the control cabinet to ON. The software is started.
2. Turn on the air supply of the system and of all feed pumps. Prepare feed pumps, lacquer tank etc. for operation. Provide grounded metal bucket to collect the products to be disposed of.

→ Switching off the system

1. Press the STOP push button.
2. Flush system if necessary (see Chapter 8.6).
3. Make sure that the system has been flushed and that the pot life has been increased.
4. Relieve pressure from the system and from all feed pumps (see Chapter 8.8).
5. Switch off main switch (OFF).
6. Switch off air supply of system and pumps.

8.4 MALFUNCTION

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

→ The system stops and the alarm horn sounds
→ The red STOP push button lights up (control cabinet and remote control).
→ The fault is indicated on the screen.

Acknowledge fault

→ By means of the STOP push button or, on the screen, with the [Reset] button.

Alarm messages + fault rectification → see Chapter 10.

8.5 SPRAYING MODE

8.5.1 PREREQUISITES

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 material.
- The flushing program is defined.
- The supply pressures are constant.
- The A/B/C/D pressure ratio is set correctly (see Chapter 8.5.2).
- 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 1.3.1).
- The product pumps can draw in the product perfectly and no cavitation occurs with piston pumps (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:

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

Prerequisites

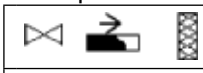
- At the start, all pumps must be filled with working material and the system must be ready to start, as described in Chapter 6.6.5.
- The nozzle is inserted into the gun. Gun secured.
- Operating manuals for the affected components must be known.
- With an electrostatic gun:
  → Commissioning the electrostatics according to corresponding operating manual.

8.5.2 A/B/C/D PRESSURE RATIO

- Set the pressure ratio between base lacquer and hardener correctly. With a mixer: B must be approx. 5–10% higher than A. C approx. 2–5% higher than B, D approx. 2–5% higher than C.
- The pressure drop between pressure gauge and mixer can be differently for A/B/C/D. For longer distances, different flow rates and viscosities that may be relevant (e.g., for external mixer or if the pressure gauges are at the pumps).

8.5.3 SPRAYING WITHOUT GUN FLUSH BOX

→ Provide grounded metal bucket to collect the products to be disposed of.
→ Insert spray nozzle into manual gun.
→ The product pressure of the components is set depending on the required product flow rate. Thereby, keep in mind that the the B-component pressure must be higher (5 to 10%) than that of the A-component.
→ Select the requested paint recipe on the screen (home page). In case of two spray guns, select the requested gun(s).
→ ▶ Start the coating process by means of the START push button.
→ **Filling**
→ For electrostatic spray guns: switch off electrostatics.
Point the manual gun with inserted spray nozzle into the grounded metal bucket. Open the trigger mechanism of the spray gun step by step. Avoid splashback.
→ The 2K product starts to flow and the B-component is dosed proportionally to the A-component. During filling, three screens in turn inform you of filling progress:

 B_04637	From product valves to mixer.
 B_04638	From mixer to splitter valve.
 B_04639	From splitter valve to gun.

→ As soon as the complete high-pressure hose is filled with 2K product, the following will happen:
– "Filling" screen switches to the home page.
– The green START push button begins to light up.
– Remote control (Option): The green lamp begins to light up.
– Atomizing air is added (option).
Correctly mixed product is not transported from the gun until after filling.
→ **Coating**
→ For electrostatic spray guns: safety precautions according to corresponding the operating manual.
→ Start coating of an object.
→ The flushing agent pressure for A and B must always be applied at the device.
→ The flow rate of the system depends on:
– the product pressure,
– the hose lengths and cross-sections,
– the nozzle and
– the viscosity of the products.
→ Without AIS, the B pulse valve should operate every 0.5 to 3 seconds, according to the flow rate. The switching frequency can be optimized by adjusting the pressure of the hardener pump or through the stroke length of the hardener dosing valve. The higher the pulse rate is, the more homogeneous is the mixing of the two components.

8.5.4 SPRAYING WITH GUN FLUSH BOX

Same procedure as in Chapter 8.5.3, however:

→ before actuating the START push button, insert the spray gun into the gun flush box.

→ Remove the spray gun after filling.

8.5.5 INTERRUPTING WORK

→ ■ The STOP push button stops the coating process. All product valves are closed.

→ For electrostatic spray guns: switch off electrostatics.

8.5.6 CHANGING THE PAINT RECIPE

The recipe change flush is executed on all spray guns while the spray nozzle is inserted.

→ Actuate the STOP push botton.

→ Select the new paint recipe on the screen (home page).

→

Without gun flush box	With gun flush box
– Press START push button. – Point the spray gun into the metal bucket. Open the gun step by step. Avoid splashback.	– Insert spray gun(s) in gun flush box. The spray gun is automatically opened as necessary. – Press START push button.

→ The system is flushed (recipe change flushing "R-R Flush").

→ Subsequently the new lacquer is filled.

→ As soon as the green START push button lights up and the home page appears on the screen, the system is ready for spraying.

8.5.7 A VALVE SELECTION AT START

→ Possibly, a list of the A valves appears for selection at the start. Touch desired valve.

→ The option is set with the setting "Select A valve during start" (see Chapter 7.13.2).

8.5.8 CIRCULATION (OPTION)

→ If necessary, the A, B or C components not in use have to be circulated.

8.6 FLUSHING

⚠ DANGER

Exploding gas / air mixture!

Danger to life from flying parts and burns.

→ Never spray into a closed tank.

→ Ground the tank.

→ If a high-pressure gun is used, remove the spray nozzle before flushing.

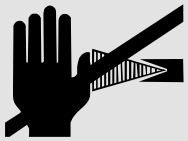
– The pressure has to be relieved before removing the spray nozzle (see Chapter 8.8).

→ Wear protective goggles.

→ Apply the lowest possible product pressure for flushing so that the maximum flow rate of the flow meter is not exceeded.

⚠ 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.

→ Use personal protective equipment (protective clothing, gloves, eyewear and respiratory protection).

The system has to be flushed:

→ in case of recipe change (recipe change flushing, system flushes automatically);

→ in case of extended interruption of work or end of work (end flushing);

→ if pot life has been exceeded (end flushing).

⚠ WARNING

Discharge of the electrostatics in atmospheres containing solvents!

Fire and explosion hazard.

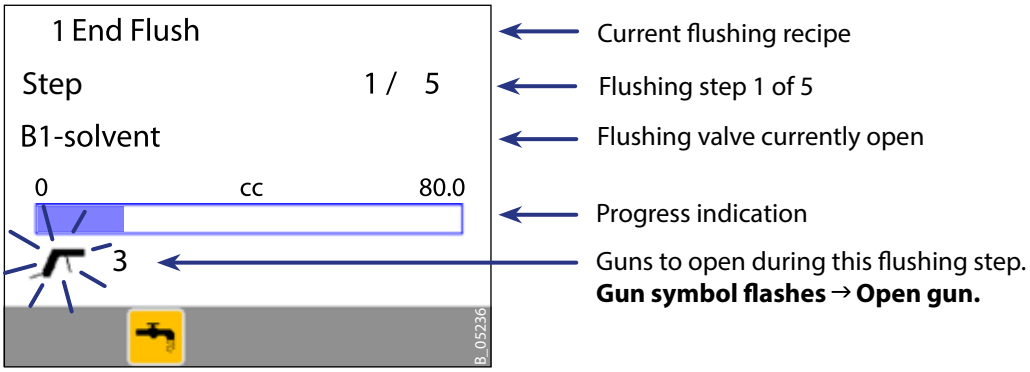
→ Turn off the electrostatics before flushing the gun or before placing the gun in the gun flush box.

End flushing

The FLUSHING push button normally starts the end flushing of the last paint recipe used.

1. Stopping the system.
2. For electrostatic spray guns: switch off electrostatics.
3. Actuate FLUSHING push button.
4. Point the opened gun(s), with or without nozzle, into a waste tank until the flushing process has been terminated.

During flushing, the blue FLUSHING push button lights up. The screen gives step by step information about the individual flushing steps.



Finally, all valves are closed.

If cleaning is insufficient, flushing can be repeated. The flushing recipe can be corrected subsequently.

Flush with external mixer

Setting "Flushing ext. mixer is standard" *	**FLUSHING push button**
On	Starts the mixer flushing ("Mix") of last paint recipe used. → Flushing from external mixer.
Off	Starts the end flushing ("End") of the last paint recipe used.

* see Chapter 7.13.2

Atomizing air flushing

The system can be set such that the atomizing air remains switched on for flushing during a certain time. Thus, the mixed product in the hose can be sprayed. A short flushing pause indicates that the remainder has to be sprayed into the waste tank. (Settings, see Chapter 7.13.1.)

Start other flushing recipes

→ For electrostatic spray guns: switch off electrostatics.

 On the screen's home page.

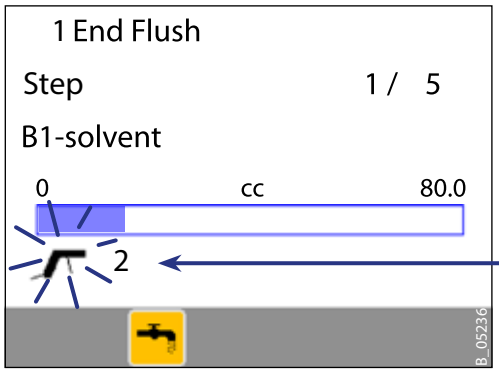
Depending on the configuration, various selection possibilities appear:

- **Manual flushing:** select a recipe from the list of all recipes.
- **Start end flushing**: starts end flushing of the last paint recipe used.
- **Start flushing external mixer**: flushing from external mixer. The product hoses between valves and mixer are not flushed.
- **Flushing spray guns**: flushing from splitter valve. The product hoses between valves and splitter valve are not flushed.

Flushing with dump valve (option)

Flushing via a dump valve is quicker than via the gun. However, the gun has also to be flushed briefly.

→ When the flushing process stops and the spray gun symbol on the screen flashes, the corresponding guns have to be opened. Point opened gun(s) with or without nozzle in a waste tank.



As long as the gun symbol flashes, open the corresponding spray gun (here gun 2).

→ As soon as the gun symbol stops flashing, close gun again.

Flushing with gun flush box

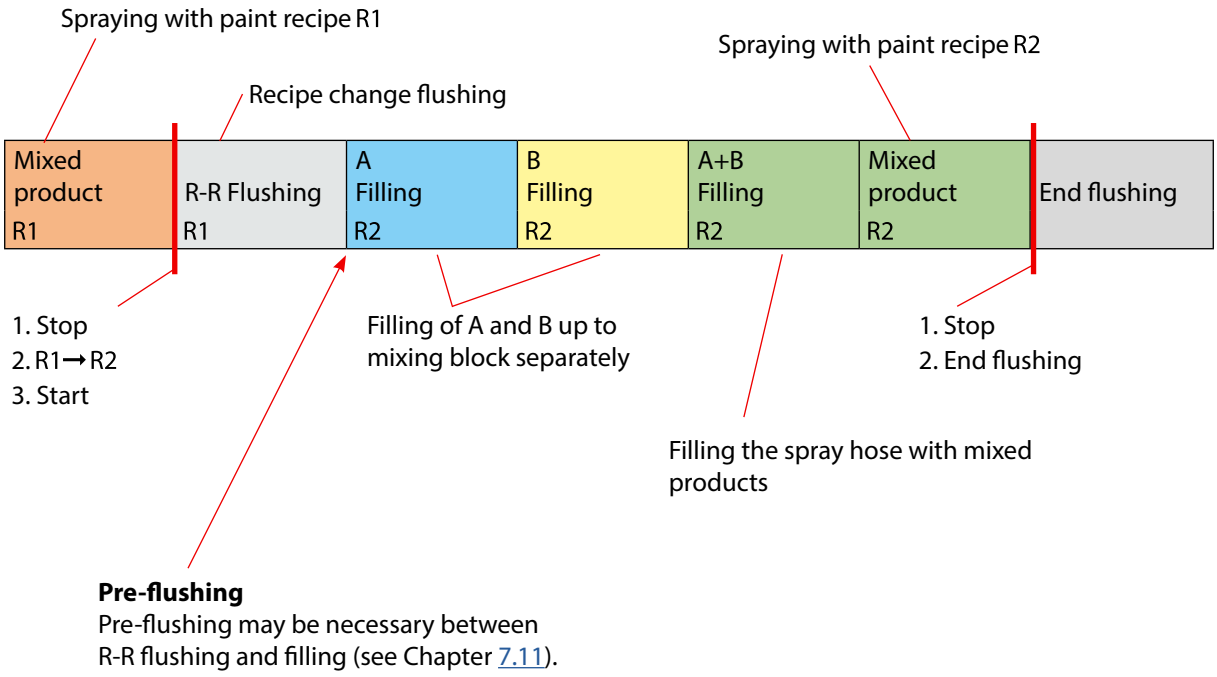
Same procedure as without gun flush box, but:

→ Before flushing, insert the spray gun into the gun flush box.
  - Atomizing air flushing: the flushing pause indicates when the gun is to be inserted into the gun flush box.

→ Remove the spray gun after flushing.

8.7 FLOW CHART WITH PAINT RECIPE CHANGE

Example for 2K system:



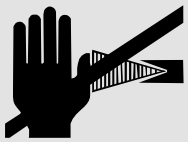
8.8 PRESSURE RELIEF PROCEDURE

The system pressure must be manually relieved to prevent the system from starting or spraying accidentally.

To reduce the risk of an injury from injection, splashing fluid or moving parts, follow the steps in this chapter whenever:

→ you are instructed to relieve the pressure;
→ spraying is stopped;
→ part of the system is checked or maintained;
→ the nozzle is installed or cleaned.

⚠ 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.
→ Use personal protective equipment (protective clothing, gloves, eyewear and respiratory protection).

Pressure relief procedure for the whole system

1. Press the STOP push button.
2. Relieve the product pressure and air pressure in all pumps or pressure tanks. Use return / circulation, according to the instructions in the corresponding operating manuals.
3. For electrostatic spray guns: switch off electrostatics.
4. Menu →  →  (see Chapter 7.8)

   One after the other and in each component (A, B, flush, ...) for each product valve (A1, A2, ...):
   – Select valve and open it with the large valve button.
   – Point the manual gun into a grounded metal bucket. Open the gun's trigger mechanism step by step in order to relieve the pressure. Avoid splashback.
   – Close and secure gun.
5. Press the [STOP] button.

9 CLEANING AND MAINTENANCE

9.1 CLEANING

9.1.1 CLEANING STAFF

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

The following hazards may arise during cleaning work:

- Health hazard 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:

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

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

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

9.1.3 FILTER CLEANING

→ Product filter: check and clean filter insert and filter body. When opening the filter, ensure that no product drips on the flow meter's electronics.
→ The filters of the piston pumps and guns should be cleaned in accordance with the corresponding operating manuals.

9.1.3.1 CONDENSATE DRAINAGE FROM THE FILTER PRESSURE REGULATOR

→ Frequently drain the condensate that may accumulate in the air filter.
  – Make sure the water level in the filter cup never reaches the max. level marked on the cup itself.

⚠ WARNING

Brittle filter pressure regulator!

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

→ Do not clean the tank on the filter pressure regulator with solvents.

9.1.4 CLEANING THE SYSTEM

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

→ A cleaned system allows an easy localization of any leakage and quick repair.

Procedure:

1. Relieve the pressure according to Chapter 8.8.
2. Service guns and pumps according to their operating manuals.
3. Clean and check the suction systems and suction filter.
4. Product filter: check and clean filter insert and filter body.
5. Put the whole system back together.
6. Clean the outside of the system.

9.1.5 DECOMMISSIONING

1. Clean the system according to Chapter 9.1.4.
2. Fill the entire system with flushing agent. → As laid down in Chapter 6.6.5, but with flushing agent.

⚠ WARNING

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

Danger to life from flying parts.

→ Ensure that the device is always completely filled with flushing agent or working medium.

→ Do not spray the device empty after cleaning.

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 9.1.4.
2. Fill the entire system with flushing agent. → As laid down in Chapter 6.6.5, but with flushing agent.
3. Fill the entire system with preservative according to Chapter 6.6.5 and the lacquer supplier's instructions.
4. If the discharge duct is to be removed, seal product outlet with plug.
5. If the suction system is to be removed, seal product inlet with plug.
6. Storage according to Chapter 6.2.

9.2 MAINTENANCE

9.2.1 MAINTENANCE STAFF

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

The following hazards may arise during maintenance work:

- Health hazard from inhaling solvent vapors
- Use of unsuitable tools and aids

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

9.2.2 SAFETY INSTRUCTIONS

Prior to maintenance

- Cleaning and flushing the device. → Chapters 8.6 and 9.1.4.

⚠ 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.

→ Only repair and replace parts that are listed in the "Spare parts" chapter and that are assigned to the unit.

→ Before all work on the device and in the event of work interruptions:
- Relieve pressure from spray guns, high-pressure hoses and all devices.
- Secure spray guns 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.

⚠ DANGER

Incorrect maintenance/repair!

Danger to life and equipment damage.

→ Repair or replacement of devices or parts of devices are only allowed to be performed outside the hazard area by qualified personnel.

After maintenance

- Put the system into operation and check for leaks. → Section 6.6

→ In accordance with DGUV regulation 100-500 Chapter 2.29 and Chapter 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.

9.2.3 GEAR FLOW METER

→ The gear flow meters (A/B/C/D) are cleaned by flushing.

→ If individual parts have to be cleaned, the flow meter should be disassembled. Care should be taken that these parts are installed again in their original positions.

1. Remove the electronic sensor (1) from the flow meter.
   – The electric sensor can be removed by loosening the two screws (10) from the holes without removing the cover (11).
2. Unscrew the screws (2) - two opposite screws should be left, temporarily screwed in by two turns.
3. Carefully take the lid (3) off the flow meter parallelly.
   – If necessary, softly knock on the lid with a plastic hammer so that it loosens.
   – The lid must be removed parallelly so that the internal bearings are not stressed and the shaft (5) does not break.
   – For this reason do not use screwdrivers as levers.

4. Remove the screws which had previously been left screwed in.
5. Remove the lid, the gears (7) and the shafts (5).
   – In most cases a dirt particle in the flow meter causes the problem.
   – If the parts cannot be disassembled easily, put the flow meter into a suitable solvent and then disassemble the parts.
   – Do not disassemble the parts by force!
   – It is important that the gears turn on the shaft, if they don't, the flow meter is not suitable for the lacquer.
   → Contact WAGNER Service Department for further information.

Assembly

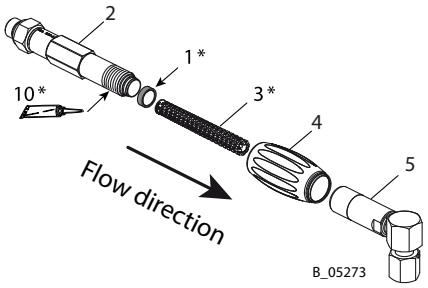
After cleaning the gear flow meter and assembling the shafts and gears into the housing, check whether they turn easily, without any obstruction. This has to be the case even when a finger slightly presses against the shafts laterally.

1. Mount the lid again in parallel position and adjust it in the correct position by means of both dowel pins (12).
   → These pins must never be removed from the flow meter housing.
2. Tighten the screws with 15 Nm; 11.06 lb/ft.
3. Check if the gears turn by using a short pulse of compressed air, maximum 0.1 MPa; 1 bar; 14.5 psi.
4. Mount the electronic sensor again. Do not interchange A/B/C flow meters.

9.2.4 CLEANING AND REPLACING THE PRODUCT FILTER

1. Flush the pump and inline filter in accordance 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 pump's operating manual.
3. Place the grounded collection tank under the inline filter.
4. Unscrew the filter by turning the handle (4).
5. Remove the filter insert (3).
6. If the inline filter has any leaks, replace the seal (1).
7. Insert the new filter insert (3). Note the installation position: Closed end in direction of flow.
8. If necessary, coat the thread with anti-seize paste (10).
9. Assemble the turning handle (4), inlet housing (2) and outlet housing (5) and tighten by turning the handle.
10. Fill the pump in accordance with pump's operating manual.

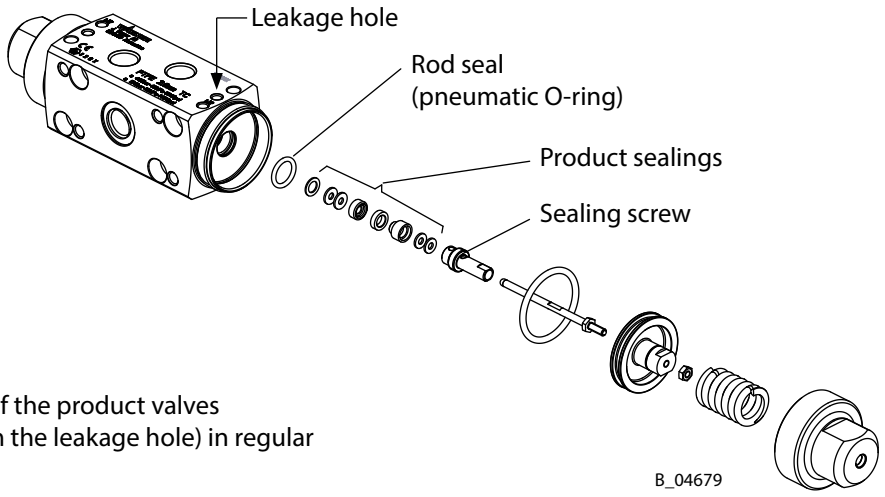
53 MPa; 530 bar; 7,687 psi



* For Order No., see spare parts catalog

9.2.5 PRODUCT VALVES

Example 2.6 mm valve



Check the leakage behavior of the product valves (air or product discharge from the leakage hole) in regular intervals (once per week).

→ In case of air leakage: change rod sealing.
→ In case of product discharge:
  – 2.6 mm valve: re-tighten sealing screw or change the seals.
  – 4 mm valve: change the seals.
→ Check the leakage behavior of the valve seats at regular intervals, by executing a pressure retention test in accordance with Chapter 6.6.4.
→ Disassembly and assembly, see valve operating manual (Order No. in Chapter 1.3.1).

9.2.6 PRODUCT HOSES, TUBES 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.

→ Undamaged complete hoses are to be replaced when 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 (if present)	**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

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

→ The system stops.
→ The alarm horn sounds.
→ Control cabinet: The red STOP push button lights up.
→ The fault is indicated on the screen.
→ Remote control (option): The red LED STOP lights up.

Acknowledge fault

→ Stop with the STOP push button.
→ Or by means of the [Reset] push button on the screen.

List of alarm messages and warning messages: see Chapter 10

Fault rectification

See the following table and Chapters 10.1.1 and 10.2.1.
For troubleshooting, it is important which work steps were last carried out.

→ The troubleshooting within the electric cabinet should be carried out by qualified persons (e.g., industrial electrician)!

⚠ WARNING

Electric shock hazard 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	– Check air supply line connection. – Check the pressure value on the system's pressure gauge for the air supply to the valves. – Check the voltage supply (does the control panel light up?) – Check the selected valves. – Check the fuses.
System is in operation (a pump is running), but there is no product flow	– Check the supply lines of the components as well as filters (clogging) and suction tubes (leakage). – Check the component level in the supply tanks. – Check the viscosity of the components or the pressure loss.
System does not supply any product, pumps do not run	– Check the mixing tube and feed hoses. – Check the guns and the gun filter. – Clean the lines by flushing or cleaning manually.

Malfunction	Remedy
The 2K product does not react correctly	– Check the mixing ratio value. – Check the suction lines (leakage). – Check the flow meter with a calibration process. – Check pressure differences. → see Chapter 8.5.2 – Check AIS function (see software documentation, "Diagnosis" chapter). – Without AIS: Optimize the switching behavior of the hardener dosing valve in spraying mode (0.5 - 3 seconds) via the differential pressure of B to A or via the stroke setting of the valve. – Check the lacquer specifications.
Flow rate is too low	– Check the mixing tube and feed hoses. – Check the guns and the gun filter. – Clean the lines by flushing or cleaning manually. – Increase the pressure of the supply pumps.
Product valves: – Product- or air emission from leakage hole – No product transportation – Contamination	– See product valve's operating manual.
Interruption of circuit over a longer period of time	– With external compressed air, manually open the flushing valve and distributor valve (option).
A fuse is defective. LED lights up	– Check on the basis of the control cabinet diagram whether a cable is damaged. – Replace the fuse.
The system supplies product, but the spray pattern is inadequate	– Ensure that the supply pressures are constant. – Adjust the A/B/C/D pressure ratio. → see Chapter 8.5.2 – Increase the pressure of the supply pumps. – AirCoat: Set the atomizing air correctly. – Check product filter on pumps, 2K systems and guns. – Replace gun nozzle with a more suitable nozzle (Airless and AirCoat). – Check the viscosity of the product and dilute it in accordance with the lacquer manufacturer's instructions. If necessary correct the mixing ratio. – AirCoat: Ensure that only dry, clean atomizing air is used in the spray gun.
Flow rate is too high	– Replace gun nozzle (Airless and AirCoat). – Check the lines for leakage. – Set the opening of the gun needle correctly (air guns only). – Decrease the pressure of the supply pumps.

10.1 ALARM MESSAGES

In the case of an alarm message, the system stops. The alarm horn sounds.
The red STOP push button lights up (control cabinet and remote control).
The fault is indicated on the screen.

Alarm No.	Alarm message in the display	Meaning
A100 A101 A102	B+ tol. alarm C+ tol. alarm D+ tol. alarm	Mixing ratio outside of tolerance range. B+/C+/D+: too much B/C/D.
A103 A104 A105	B– tol. alarm C– tol. alarm D– tol. alarm	Mixing ratio outside of tolerance range. B–/C–/D–: too little B/C/D.
A106 A107 A108 A109	A+ flow rate B+ flow rate C+ flow rate D+ flow rate	Maximum flow of components A/B/C/D exceeded.
A110 A111 A112 A113	A– flow rate B– flow rate C– flow rate D+ flow rate	Falls below minimum flow of components A/B/C/D.
A114 A115 A116 A117	Air bubble A Air bubble B Air bubble C Air bubble D	Air bubble in the line (only with low-pressure).
A118	Flow meter A	Flow meter A is blocked.
A119	Gun monitoring	No gun signal, although product is flowing.
A120	No enabling signal	External release missing.
A121	Flow fault –	The flow rate is below the limit entered in the paint recipe.
A122	Flow fault +	The flow rate is above the limit entered in the paint recipe.
A123	Flushing first	The system has to be flushed.
A124	No flow during filling	The filling procedure is interrupted for too long.
A125	No flow during flushing	The flushing procedure is interrupted for too long.
A126	Gun monitoring disabled	Function is selected, which requires gun monitoring. However, the gun monitoring is deactivated.
A127	K factor is 0!	A K factor for the current paint recipe is zero. Calibrate.

Acknowledge alarm: By means of the STOP push button or on the screen with the [Reset] button.

Fault rectification: see Chapter 10.1.1

Alarm No.	Alarm message in the display	Meaning
A128 A129 A130 A131	Coriolis A Coriolis B Coriolis C Coriolis D	For Coriolis error, see operating manual of Coriolis flow meter.
A132 A133 A134 A135	Pot life gun 1 Pot life gun 2 Pot life gun 3 Pot life gun 4	Pot life + post-alarm time of guns 1/2/3/4 have expired.
A136 A137 A138 A139	Pot life gun hose 1 Pot life gun hose 2 Pot life gun hose 3 Pot life gun hose 4	Pot life + post-alarm time of gun hoses 1/2/3/4 have expired.
A140	Pot life to spl. valve	The pot life + post-alarm time from mixer to splitter valve have expired.
A141 A142 A143 A144	Pot life dump hose 1 Pot life dump hose 2 Pot life dump hose 3 Pot life dump hose 4	Pot life + post-alarm time of dump hoses 1/2/3/4 have expired.
A145 A146 A147 A148	Tank A is empty Tank B is empty Tank C is empty Tank D is empty	Tank for component A/B/C/D is empty.
A149	Tank flushing agent is empty	Flushing agent tank is empty.
A150	Flow is too low	The setpoint flow is not reached with the flow regulation.
A151	Flow is too high	

Acknowledge alarm: By means of the STOP push button or on the screen with the [Reset] button.

Fault rectification: see Chapter 10.1.1

Alarm messages with stroke measurement

Alarm No.	Alarm message in the display	Meaning / Fault rectification
A200	Unknown error	Error number unknown.
A201–A204	Sensor A/B/C/D signal is lost	Stroke sensor cable breakage or sensor signal lost (sensor is in lower idle position).
A205–A208	SensorA/B/C/D LowerReversePoint	Lower stroke sensor reversal point not detected.
A209–A212	SensorA/B/C/D UpperReversePoint	Upper stroke sensor reversal point not detected.
A213–A216	Sensor A/B/C/D dry run down	Pump sags in downward stroke, pump cavitating.
A217–A220	A/B/C/D sensor dry run up	Pump sags in upward stroke, pump cavitating.
A221–A224	Sensor A/B/C/D initialization	Stroke sensor initialization error.
A225–A228	Sensor A/B/C/D unknown. error	Error number unknown.
A229–A232	Sensor A/B/C/D wrong type	Stroke sensor type does not match the setting.
A237–A240	ADC1/2/3/4 no response	Communication error
A241 A242 A243 A244 A245 A246 A247 A248 A249 A250	Unknown operating mode SensorA unknownSelection SensorB unknownSelection SensorC unknownSelection SensorD unknownSelection Sending: unknown SensorNo. Sending: unknown Parameter Wrong data value Reading: unknown SensorNo. Reading: unknown Parameter	Communication error
A254 A255 A256	MPX sends in operation MPX unknown message MPX transfer error	Communication error
A257	Data conflict	Different settings data on MPX / ADC and touch panel.
A258 A259	MPX is not sending data MPX is not responding	Communication error
A260	Sending to MPX interrupted	The sending of settings data to the MPX and ADC was not terminated.
A261	Data from wrong sensor	Communication error

Acknowledge alarm: By means of the STOP push button or on the screen with the [Reset] button.

Fault rectification: see Chapter 10.1.1

CAN I/O modules alarm messages

Alarm No.	Alarm message in the display	Meaning
A500	Initialisation error	Internal error when starting up the touch panel.
A501	CAN master error	The touch panel CAN master process not possible.
A502	CAN master alone	The touch panel CAN master found no connected slaves on the CAN bus.
A503 A504	SDO sending error SDO receiving error	Error while sending or receiving SDO telegrams.
A505	Saving interrupted	Error while saving on the PC.
A600 A601 A602 A603 A604	Module D2 no communication Module D3 no communication Module D4 no communication Module D5 no communication Gateway D6 no communication	No communication to the corresponding module.
A606 A607 A608 A609 A610	Module D2 CAN emergency Module D3 CAN emergency Module D4 CAN emergency Module D5 CAN emergency Gateway D6 CAN emergency	Module sends an emergency telegram.
A612 A613 A614 A615	Module D2 CAN error Module D3 CAN error Module D4 CAN error Module D5 CAN error	Slave reports communication problems.

Acknowledge alarm: By means of the STOP push button or on the screen with the [Reset] button.

Fault rectification: see Chapter 10.1.1

Alarm No.	Alarm message in the display	Meaning
A616	Module D2 hardware error EEPROM	Hardware error in I/O module.
A617	Module D3 hardware error EEPROM	
A618	Module D4 hardware error EEPROM	
A619	Module D5 hardware error EEPROM	
A620	Module D2 hardware error ADC	
A621	Module D3 hardware error ADC	
A622	Module D4 hardware error ADC	
A623	Module D5 hardware error ADC	
A624	Module D2 hardware errror TIMER	
A625	Module D3 hardware errror TIMER	
A626	Module D4 hardware errror TIMER	
A627	Module D5 hardware errror TIMER	
A628	Module D2 unknown hardware error	
A629	Module D3 unknown hardware error	
A630	Module D4 unknown hardware error	
A631	Module D5 unknown hardware error	
A632	Module D2 hardware error counter	
A633	Module D3 hardware error counter	
A634	Module D4 hardware error counter	
A635	Module D5 hardware error counter	
A640	Module D2 DO group1	Voltage supply error.
A641	Module D2 DO group2	
A642	Module D2 DO group3	
A643	Module D2 DO group4	
A644	Module D3 DO group1	
A645	Module D3 DO group2	
A646	Module D3 DO group3	
A647	Module D3 DO group4	
A648	Module D4 DO group1	
A649	Module D4 DO group2	
A650	Module D4 DO group3	
A651	Module D4 DO group4	
A652	Module D5 DO group1	
A653	Module D5 DO group2	
A654	Module D5 DO group3	
A655	Module D5 DO group4	

Acknowledge alarm: By means of the STOP push button or on the screen with the [Reset] button.

Fault rectification: see Chapter 10.1.1

10.1.1 FAULT RECTIFICATION

A100/A101/A102	B+/C+/D+ tol. alarm

The mixing ratio within a specific control quantity (QB/QC/QD control) was not reached: too much B, C or D.

- Reduce pressure of B/C/D: → see Chapter 8.5.2
- Without AIS:
  - The stroke at the B/C/D valve is too long. Close the regulating screw a little.
  - Check the cycle length of the hardener dosing valve (menu → diagnosis). 0.5 to 3 seconds are optimal. If the cycle length is too long, then the difference in pressure is still too great or the stroke is too long.
- With AIS:
  - If the stroke of the B/C/D valve is far from its ideal position, the adjustment can take a long time under some circumstances. → Home page: [AIS], then reduce the AIS position a bit.
- Check whether valve closes. Clean valve.
- The flow meter A is blocked by soiling. The LED at the flow meter has to light up during product flow, otherwise it is clogged (cleaning, see Chapter 9.2.3).
- Check whether nozzles, mixer or filter are clogged.
- Check the level of the paint tank, condition of the feed pumps, etc.
- The QB/QC/QD control quantity may be set too low (standard 150 cc). If the quantity is increased, the control algorithm becomes more stable because more time is available in order to achieve the mixing ratio.

A103/A104/A105	B–/C–/D– tol. alarm

The mixing ratio within a specific control quantity (QB/QC/QD control) was not reached: too little B, C or D.

- Increase the pressure of B/C/D: → see Chapter 8.5.2
- Without AIS:
  - The stroke at the B/C/D valve is too short. Open the regulating screw a little.
  - Check the cycle length of the hardener dosing valve (menu → diagnosis). 0.5 to 3 seconds are optimal. If the valve is always open (cycle check display is almost continuously lit), then the difference in pressure is still too small or the stroke is too short.
- With AIS:
  - If the stroke of the B/C/D valve is far from its ideal position, the adjustment can take a long time under some circumstances. → Home page: [AIS], then enlarge the AIS position a bit.
- Check whether the valve opens. Clean valve.
- The flow meter B or C or D is blocked by soiling. The LED at the flow meter has to light up during product flow, otherwise it is clogged (cleaning, see Chapter 9.2.3).
- Check whether nozzles, mixer or filter are clogged.
- Check the level of the paint tank, condition of the feed pumps, etc.
- The QB/QC/QD control quantity may be set too low (standard 150 cc). If the quantity is increased, the control algorithm becomes more stable because more time is available in order to achieve the mixing ratio.

A106/A107/A108/A109	A+/B+/C+/D+ flow rate

The flow is greater than the upper limit of the flow meter "Maximum flow" (see Chapter 7.13.2, level 3, page 4).

- The flow rate has to be reduced.
- Insert nozzle.
- Possibly worn nozzle, leaking hose or other leaking parts.

A110/A111/A112/A113	A–/B–/C–/D– flow rate

Gun monitoring signal is present, even though no product is flowing (gun closed).

- Check the atomizing air for leaks.
- Check whether the gun monitoring operates correctly.
- Possibly, the "Gun delay" is set too short (see Chapter 7.13.1).
- The alarm can occur if the atomizing air continues to flow from the gun during short spray breaks. → Release the gun trigger completely or increase the gun delay time.
- The A/B/C/D-component flow is less than the lower limit **"Minimum flow"** (see Chapter 7.13.2, level 3, page 4).
- Clean flow meters.
- Possible further causes such as for alarm A100…A105.

A114/A115/A116/A117	Air bubble A/B/C/D

Air bubble in the line (only with low-pressure). Fill product tank.

A118	Flow meter A

The flow meter A is blocked by soiling. The LED at the flow meter has to light up during product flow, otherwise it is clogged (cleaning, see Chapter 9.2.3).

A119	Gun monitoring

Product flows through the A flow meter and for 50 seconds, there is no signal indicating that the gun is open.

- This means that the gun monitoring is defective or that there is no contact.
- Repair or replace the gun monitoring.

A120	No enabling signal

External release missing (booth ventilation etc.)

A121	Flow fault –

The flow rate is below the limit entered in the paint recipe (see Chapter 7.11).

- Check the mixing tube and feed hoses.
- Check the guns and the gun filter.
- Clean the lines by flushing or cleaning manually.
- Increase the pressure of the supply pumps.

A122	Flow fault +

The flow rate is above the limit entered in the paint recipe (see Chapter 7.11).

- Replace gun nozzle (Airless and AirCoat).
- Check the lines for leakage.
- Set the opening of the gun needle correctly (air guns only).
- Decrease the pressure of the supply pumps.

A123	Flushing first

The system has to be flushed.
The "Mixing alarm → flushing" or "Pot life alarm → flushing" is activated and a mixing or pot life alarm has occurred.

A124	No flow during filling

The filling procedure is interrupted for too long (longer than the "Alarm delay no flow during filling" setting).

- Possibly, the filling procedure is waiting for the gun to be opened:
  - With gun flush box: check whether the gun is inserted correctly.
  - Without gun flush box: point spray gun into waste tank and open it.
- Check dump valve: clogging, function.

A125	No flow during flushing

The flushing procedure is interrupted for too long (longer than the "Alarm delay no flow during flushing" setting).

- Possibly, the flushing procedure is waiting for the gun to be opened:
  - With gun flush box: check whether the gun is inserted correctly.
  - Without gun flush box: point spray gun into waste tank and open it.
- Check dump valve: clogging, function.

A126	Gun monitoring deactivated

Function is selected, which requires gun monitoring. However, the gun monitoring is deactivated. Activate the gun monitoring or deactivate the relevant function.

Functions which require gun monitoring:

- Flow monitoring (settings password level 3).
- Spray gun closed → valves closed (settings password level 3).
- Dump valve as return line (settings password level 3).

A127	K factor is 0!

The new K factor "Kn" is 0 and can therefore not be saved.

A128/A129/A130/A131	Coriolis A/B/C/D

For Coriolis error, see operating manual of Coriolis flow meter.

A132/A133/A134/A135	Pot life gun 1/2/3/4

Pot life + post-alarm time have expired. Continue working immediately or flush.

A136/A137/A138/A139	Pot life gun hose 1/2/3/4

Pot life + post-alarm time have expired. Continue working immediately or flush.

A140	Pot life up to splitter valve

Pot life + post-alarm time have expired. Continue working immediately or flush.

A141/A142/A143/A144	Pot life dump hose 1/2/3/4

Pot life + post-alarm time in dump hose have expired. Close the gun until the dump hose is filled with freshly mixed product. Or, flush the system.

A145/A146/A147/A148	Tank A/B/C/D is empty
A149	Tank flushing agent is empty

Flow rate drops below the alarm limit. Fill up tank.

A150	Flow is too low

Even though the product pressure regulator is fully open, the setpoint flow is not reached.

- Check air pressure.
- Check product pressure.
- Check product pressure regulator.
- Check the control of the product pressure regulator (Electric/Pneumatic converter).

A151	Flow is too high

Even though the product pressure regulator is fully closed, the actual flow exceeds the setpoint flow.

- Check product pressure regulator.
- Check the control of the product pressure regulator (Electric/Pneumatic converter).

Fault rectification for stroke measurement

A200	Unknown error

Check compatibilities (software versions touch panel / MPX / ADC).

A201/A202/A203/A204	Sensor A/B/C/D signal lost

Stroke sensor cable breakage

- Check plug connection for sensor.
- Sensor signal lost (sensor is in lower idle position).
- Intake problem: pump is cavitating, improve supply of product.
- Switch pump to circulation and pass lower reversal point.

A205/A206/A207/A208	**Sensor A/B/C/D lower reversal point**
A209/A210/A211/A212	**Sensor A/B/C/D upper reversal point**

Stroke sensor reversal point not detected.

– Check pump.
– Check stroke sensor settings in the touch panel and send again.
– Check stroke sensor.
– Replace stroke sensor if necessary.

A213/A214/A215/A216	**Sensor A/B/C/D dry run down**

Pump sags in downward stroke, pump cavitating.

– Check product supply.
– Leak check, check piston valve.

A217/A218/A219/A220	**Sensor A/B/C/D dry run up**

Pump sags in upward stroke, pump cavitating.

– Check product supply.
– Leak check, check piston valve.

A221/A222/A223/A224	**Sensor A/B/C/D initialization**

Stroke sensor initialization error.

– Switch system off and turn back on.

A225/A226/A227/A228	**Sensor A/B/C/D unknown error**

Error number unknown.

– Check compatibilities (software versions touch panel / MPX / ADC).

A229/A230/A231/A232	**Sensor A/B/C/D wrong type**

Stroke sensor type does not match the setting.

– Check stroke sensor.
– Check stroke sensor settings in the touch panel and send again.

A237/A238/A239/A240	**ADC 1/2/3/4 no response**
A241	**Unknown operating mode**
A242/A243/A244/A245	**Sensor A/B/C/D unknown selection**
A246	**Sending: unknown sensor no.**
A247	**Sending: unknown parameter**
A248	**Wrong data value**
A249	**Reading: unknown sensor no.**
A250	**Reading: unknown parameter**
A254	**MPX sends in operation**
A255	**MPX unknown message**
A256	**MPX transfer error**

Communication errors between the touch panel, MPX multiplexer and A/D converter ADC.

– Check cable with plug.
– Check compatibilities (software versions touch panel / MPX / ADC).
– If this occurs repeatedly, contact the WAGNER Service Department.

A257	Data conflict

Different settings data on MPX / ADC and touch panel.

– Check stroke sensor settings in the touch panel and send again.

A258	MPX is not sending data
A259	MPX is not responding

Communication errors between the touch panel, MPX multiplexer and A/D converter ADC.

– Check cable with plug.
– Check compatibilities (software versions touch panel / MPX / ADC).
– If this occurs repeatedly, contact the WAGNER Service Department.

A260	Sending to MPX interrupted

The sending of settings data to the MPX and ADC was not terminated. Data must be sent again. (See software documentation.)

A261	Data from wrong sensor

Communication errors between the touch panel, MPX multiplexer and A/D converter ADC.

– Check cable with plug.
– Check compatibilities (software versions touch panel / MPX / ADC).
– If this occurs repeatedly, contact the WAGNER Service Department.

CAN bus fault rectification

A500	Initialisation error

Internal error when starting up the touch panel.

– Switch off the system and back on via the main switch.
– Contact the Service Team.

A501	CAN master error

The touch panel CAN master process not possible.

– Switch off the system and back on via the main switch.
– Contact the Service Team.

A502	CAN master alone

The touch panel CAN master found no connected slaves on the CAN bus.

– Check the connected modules: voltage supply, CAN cable, address, baud rate and terminating resistor. See spare parts catalog (Order No., see Chapter 1.3).
– Switch off the system and back on via the main switch.
– Contact the Service Team.

A503	**SDO sending error**
A504	**SDO receiving error**

Error while sending or receiving SDO telegrams.

– Switch off the system and back on via the main switch.
– Contact the Service Team.

A505	**Saving interrupted**

An error occured while saving on the PC.

– Check the archiving software on the PC.

A600/A601/A602/A603	**Module** D2/D3/D4/D5 **no communication**
A604	**Gateway D6 no communication**

Slave is not responding.

– Check corresponding module: voltage supply, CAN cable, address, baud rate and terminating resistor.
– Switch off the system and back on via the main switch.
– Contact the Service Team.

A606/A607/A608/A609	**Module** D2/D3/D4/D5 **CAN emergency**
A610	**Gateway D6 CAN emergency**

Corresponding module sends an emergency telegram.

– Switch off the system and back on via the main switch.
– Contact the Service Team.

A612/A613/A614/A615	**Module** D2/D3/D4/D5 **CAN error**

Corresponding slave reports communication problems.

– Switch off the system and back on via the main switch.
– Contact the Service Team.

A616/A617/A618/A619	**Module** D2/D3/D4/D5 **hardware error EEPROM**
A620/A621/A622/A623	**Module** D2/D3/D4/D5 **hardware error ADC**
A624/A625/A626/A627	**Module** D2/D3/D4/D5 **hardware error TIMER**
A628/A629/A630/A631	**Module** D2/D3/D4/D5 **unknown hardware error**
A632/A633/A634/A635	**Module** D2/D3/D4/D5 **hardware error counter**

Corresponding module reports a hardware error.

– Switch off the system and back on via the main switch.
– Contact the Service Team.

A640–A655	**Module** D2/D3/D4/D5 **DO group** 1/2/3/4

I/O module reports insufficient voltage supply at the respective output group.
(DO = Digital Output)

– Check the voltage supply of the respective output group.
– Check the fuse of the respective output group.

See spare parts catalog, "I/O modules" chapter.

10.2 WARNING MESSAGES

In the case of warning messages, the system does not stop, work can be continued.
The red STOP push button blinks (control cabinet and remote control).
The fault is indicated on the screen.

Alarm No.	Warning message on the display	Meaning
W100	1st pot life gun 1	Pre-alarm for the pot life of gun 1/2/3/4
W101	1st pot life gun 2	
W102	1st pot life gun 3	
W103	1st pot life gun 4	
W104	1st pot life gun hose 1	Pre-alarm for the pot life of gun hose 1/2/3/4
W105	1st pot life gun hose 2	
W106	1st pot life gun hose 3	
W107	1st pot life gun hose 4	
W108	1st pot life to spl.valve	Pre-alarm for pot life from mixer to splitter valve
W109	1st pot life dump hose 1	Pre-alarm for the pot life of dump hose 1/2/3/4
W110	1st pot life dump hose 2	
W111	1st pot life dump hose 3	
W112	1st pot life dump hose 4	
W113	A flow meter service	Carry out service for flow meter A/B/C/D
W114	B flow meter service	
W115	C flow meter service	
W116	D flow meter service	
W117	B valve service	Carry out service for dosing valve B/C/D
W118	C valve service	
W119	D valve service	
W120	Mix head B service	Carry out service for mixing head valve B/C/D
W121	Mix head C service	
W122	Mix head D service	
W123	AIS-B	AIS-B/C/D Fell short of warning limit (injection quality in %)
W124	AIS-C	
W125	AIS-D	
W126	Tank A limit	
W127	Tank B limit	
W128	Tank C limit	
W129	Tank D limit	
W130	Tank flushing agent Limit	
W500	USB memory	No USB stick used or too little memory
W501	USB storage	Automatic job total saving: saving did not work

Fault rectification → see Chapter 10.2.1

10.2.1 FAULT RECTIFICATION

W100/W101/W102/W103	**Pre-alarm for the pot life of gun 1/2/3/4**

Pot life has expired. Continue working immediately or flush.

W104/W105/W106/W107	**Pre-alarm for pot life gun hose 1/2/3/4**

Pot life has expired. Continue working immediately or flush.

W108	**Pre-alarm for pot life from mixer to splitter valve**

Pot life has expired. Continue working immediately or flush.

W109/W110/W111/W112	**Pre-alarm for pot life dump hose 1/2/3/4**

The pot life in the dump hose has expired. Close the gun until the dump hose is filled with freshly mixed product. Or, flush the system.

W113/W114/W115/W116	**A/B/C/D flow meter service**

The maximum flow rate indicated in the [service] → [menu] was reached. The corresponding flow meter needs servicing.

W117/W118/W119	**B/C/D valve service**

The maximum switching cycle indicated in the [service] → [menu] was reached.
The corresponding dosing valve needs servicing.

W120/W121/W122	**Mix head B/C/D service**

The maximum switching cycle indicated in the [service] → [menu] was reached.
The corresponding mixing head valve needs servicing.

W123/W124/W125	**AIS-B / AIS-C / AIS-D**

AIS below the warning limit (minimum opening time of the dosing valve in percent).

- If the stroke of the dosing valve is far from its ideal position, the adjustment can take a long time under some circumstances. → Home page: [AIS], then reduce the "AIS position" a bit.
- Reduce pressure of B/C/D: → see Chapter 8.5.2
- Check whether valve closes. Clean valve.
- The flow meter A is blocked by soiling. The LED at the flow meter has to light up during product flow, otherwise it is clogged (cleaning, see Chapter 9.2.3).
- Check whether nozzles, mixer or filter are clogged.
- Check the level of the paint tank, condition of the feed pumps, etc.

W126/W127/W128/W129	**Tank A/B/C/D limit**
W130	**Tank flushing agent limit**

Flow rate drops below the warning limit. Fill up tank.

W500	**USB memory**

No USB stick used or too little memory. Try removing the USB stick and plugging it back in or plug in another USB stick.

W501	**USB storage**

Automatic job total saving: saving did not work.

11 REPAIRS

11.1 REPAIR STAFF

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:

- Health hazard 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.

11.2 SAFETY INSTRUCTIONS

Before a Repair

- Cleaning and flushing the device. → Chapters 8.6 and 9.1.4.

⚠ 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.

→ Only repair and replace parts that are listed in the "Spare parts" chapter and that are assigned to the unit.

→ Before all work on the device and in the event of work interruptions:
- Relieve pressure from spray guns, high-pressure hoses and all devices.
- Secure spray guns 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.

⚠ DANGER

Incorrect maintenance/repair!

Danger to life and equipment damage.

→ Repair or replacement of devices or parts of devices are only allowed to be performed outside the hazard area by qualified personnel.

After a Repair

- Put the system into operation and check for leaks. → Section 6.6

→ In accordance with DGUV regulation 100-500 Chapter 2.29 and Chapter 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.

11.3 MOUNTING MATERIALS

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.

Mounting materials

Order No.	Quantity	Designation	Smaller tanks
9992590	1 pc ≙ 50 ml	Loctite® 222	
9992511	1 pc ≙ 50 ml	Loctite® 243	
9992528	1 pc ≙ 150 g	Loctite® 270	
9992831	1 pc ≙ 50 ml	Loctite® 542	
9999042	1 pc ≙ 50 ml	Loctite® 638	
9998808	1 pc ≙ 18 kg!	Mobilux® EP 2 grease	400 g tube ≙ Order No. 2355418
9992616	1 pc ≙ 1 kg can	Molykote® DX grease	50 g tube ≙ Order No. 2355419
9992609	1 pc ≙ 100 g	Anti-seize paste	
9992698	1 pc ≙ 200 g can	Vaseline white, PHHV II	

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

The following materials have been used:

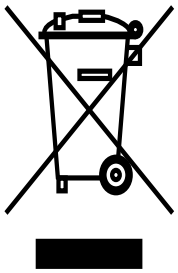
- → Steel
- → Aluminum
- → Elastomerics
- → Plastics
- → Carbide

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

The system is ordered and supplied including all desired accessories.

It is possible for a WAGNER technician to install extensions and accessories later on, e.g., paint extension, gun monitoring, air bubble monitoring etc.

13.1 CONNECTIONS

There are five types of connectors:

Digital outputs	Digital inputs	High-speed counters	Analog outputs	Analog inputs

Before the installation of an accessory set, it must be checked whether enough room in the fluid cabinet and enough connections in the control cabinet are available:

1. Open on the 2K COMFORT USB stick (see Chapter 1.4) the assembly manual of the required set.
2. Check based of the assembly manual, whether enough room is available in the fluid cabinet.
3. For number and type of the required connectors please look into the assembly manual.
4. Check whether sufficient free connections are present in the control cabinet:
   - Either in the 2K COMFORT connection table: each sufficient free lines must be present of the required connection types (see Chapter 13.2).
   - Or in the controller: password level 3 → "Menu" → "I/O Config" (see software documentation).

13.1.1 I/O EXTENSION MODULE

If too few connections are available, the set "CAN I/O extension module" can be installed by a WAGNER technician. This includes:

	CAN I/O extension module: number of connections	
	Serial number 1 – 99	from serial number 100
Digital outputs	16	24
Digital inputs	16	8
High-speed counters	2	
Analog outputs	2	
Analog inputs	4	

A maximum of total 4 I/O modules can be installed in the control cabinet.

13.2 CONNECTION TABLE 2K COMFORT

The "2K COMFORT connection table" is delivered together with the system and must be adapted for each conversion. It is available on the USB stick (see Chapter 1.4).
The table is divided into five sections:

Digital outputs									
		Name	**Connection signal**	**GND connection**	Cable No.	Solenoid valve	Hose No.	**Fluid valve element**	**Stroke sensor**
⋮	Q1	Ready	X3:1C/D	--	10	--	--	L1	--
	…	…	…	…	…	…	…	…	
D2	Q12	*Set 1*	D2:X2_14	D2:X2_4	--	--	--	--	
	…	…	…	…	…	…	…	…	

Digital inputs						
		Name	**Connection signal**	Cable No.	Hose No.	**Fluid valve element**
⋮	I1	Start	X2:1B/C	30;501	--	S2;RC;Robo
	…	…	…	…	…	…

High-speed counters						
		Name		**Connection signal**	Cable No.	**Fluid valve element**
⋮	C1	--		X2:19B/C	--	--
	…	…		…	…	…

Analog outputs							
		Name	**Connection signal**	Cable No.	EP valve	Hose No.	**Fluid valve element**
⋮	AO1	--	D2:X4_17	10	--	--	--
	…	…	…	…	…	…	…

Analog inputs					
		Name	**Connection signal**	Cable No.	**Fluid valve element**
⋮	AI1	--	D2:X4_1	--	--
	…	…	…	…	…

Assignment in the controller (touch panel)

Connection in the control cabinet

Valve name in the circuit diagram

The connection table enables:

- → The recognition of free connections. Example: in the "Name" column of the "Digital outputs" section 3 fields are empty → 3 digital outputs are free.
- → The assignment of the names in the controller (e.g., D2 module, Q12 conneciton) with the I/O modules connections in the control cabinet (e.g., D2:X2_14 connection).

Example

Accesory "Set 1" requires a digital output. The Q12 output in the D2 module is still free and "Set 1" is connected there. The D2:X2_14 connection is assigned to this output.

→ Call up the digital outputs: → "Output" in the controller ("Menu" → "I/O Config"). Then scroll to the "D2" module with the arrow keys . Assign there to the "Q12" output the accessory function "Set 1" (according to the assembly manual).

→ Connect the accessory "Set 1" in the control cabinet to the D2:X2_14 terminal (according to the assembly manual).

13.3 CONTROL CABINET DIAGRAMS

Pneumatic Diagram

A general pneumatic diagram can be found on the USB stick (Order No., see Chapter 1.4). The pneumatic diagram is also available at order no. 2364198.

Circuit diagram

A system specific circuit diagram can be found on the USB stick (Order No., see Chapter 1.4).

A general circuit diagram is available under order no. 2359815. The 2-circuit circuit diagram is available at order no. 2363147.

13.4 EXPANSION AND ACCESSORY SETS

Functional descriptions

The descriptions of the expansion and accessory sets can be found in the corresponding assembly manuals on the USB stick (Order No., see Chapter 1.4).

Assembly

→ Have expansion and accessory sets be installed only by specially trained staff or a WAGNER service center.

→ Carry out each assembly according to the corresponding assembly manual.

→ A skilled person must check to ensure that the device is in a reliable state after it is mounted.

Most accessory sets require conversions in the control cabinet.

⚠ WARNING

Electric shock hazard 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.

13.4.1 INSTALLATION BY CUSTOMER OR BY WAGNER SERVICE DEPARTMENT

Expansion and accessory sets		Non-XL				XL
		Ex	Non-Ex	High pressure	Low pressure	Ex
Order No.	**Name**					
2358991	Paint/flushing valve set, high pressure, DN 2.6 (for 1–2 A components)	x	x	x	--	--
2358992	Paint/flushing valve set, low pressure, DN 4 (for 1–2 A components)	x	x	--	x	--
2362624	Valve set supplement for air flushing (A component, DN 4)	x	x	--	x	x
2358995	Dosing/flushing valve set DN 2.6, 400 bar SSt, non-Ex (For 1–2 B/C/D-components, if component is already present.) Valve seat of stainless steel.	--	x	x	x	--
2358994	Dosing/flushing valve set DN 2.6, 400 bar TC, non-Ex (for 1–2 B/C/D-components, if component is already present.) Valve seat of carbide.	--	x	x	x	--
	Flushing valve set, Ex for 1–2 B/C/D-components: → Use one of the above two sets 2358994 or 2358995. For flushing: these sets are also suitable for use in potentially explosive areas.	x	--	x	x	--
392076	Paint/flushing valve set, DN 10	--	--	--	--	x
2357422 *	Paint/flushing valve set, DN 4 SSt	--	--	--	--	x
2357421 *	Paint/flushing valve set, DN 4 TC	--	--	--	--	x
2357462 *	Dosing/flushing valve set, DN 4 SSt	--	--	--	--	x
2357461 *	Dosing/flushing valve set, DN 4 TC	--	--	--	--	x
2360606 **	Dosing/flushing valve set DN 2.6, PTFE SSt (for 1–2 valves)	--	--	--	--	x
2360605 **	Dosing/flushing valve set DN 2.6, TC (for 1–2 valves)	--	--	--	--	x
2359046	High-pressure splitter valve, DN 2.6	x	x	x	--	x ***
2359052	Low-pressure splitter valve, DN 4	x	x	--	x	--
2359066	High-pressure splitter valve, DN 2.6 with flushing connection	x	x	x	--	x ***
2359054	Low-pressure splitter valve, DN 4 with flushing connection	x	x	--	x	--
2359041	Splitter valve: 2 to 3-4, DN 2.6	x	x	x	--	x
2359042	Splitter valve: 2 to 3-4, DN 4	x	x	--	x	--
2359022	Control of gun flush box	x	x	x	x	x

* For 2., 6. and 7. valve: additional Order No. 392090 (mounting bracket)
For 6. valve: additional Order No. 2334457 & 2330775 (hose & fitting)

** For dosing: per valve additional Order No. 2365901 (dosing connection, Ex), possibly connection plate, EX i
For flushing: per set additional Order No. 9956145 (double 3/2-way valve with base plate)

*** XL version: additional Order No. 2331173 (fitting)

Expansion and accessory sets		Non-XL				XL
Order No.	**Name**	**Ex**	**Non-Ex**	**High pressure**	**Low pressure**	Ex
2359033	Gun monitoring for AirSpray + AirCoat DN 8 in fluid cabinet, non-Ex	--	x	x	x	--
2359035	Gun monitoring for AirSpray + AirCoat DN 8 in fluid cabinet, Ex	x	--	x	x	x
2359031	Gun monitoring for AirSpray + AirCoat DN 8 in spray booth, non-Ex	--	x	x	x	--
2359032	Gun monitoring for AirSpray + AirCoat DN 8 in spray booth, Ex	x	--	x	x	x
2359030	Gun monitoring for automatic gun (pressure switch)	x	x	x	x	x
2359023	Automatic atomizer air system	x	x	x	x	x
2359109	Product pressure regulator 8 bar, manual (Input pressure max. 4 MPa; 40 bar; 580 psi)	x	x	--	x	--
2369322	Product pressure regulator 8 bar, manual, G3/8 XL (Input pressure max. 4 MPa; 40 bar; 580 psi)	--	--	--	--	x
2341153	Remote control with cable 15 m; 49 ft (see Chapter 13.5)	x	x	x	x	x
2343063	Extension cable 15 m; 49 ft for remote control Maximum extension of 2 times 15 m; 49 ft. (Total 45 m; 147 ft.)	x	x	x	x	x
2360731	Dump valve set, not flushable	x	x	x	x	--
2369329	Dump valve set XL, not flushable	--	--	--	--	x
2360732	Dump valve set, flushable	x	x	x	x	--
2369330	Dump valve set XL, flushable	--	--	--	--	x
2343061	Dump valve for waste separation (flushable) *	x	x	x	x	x
2362638	Control for booster pump *	x	x	x	--	x
2360992	External release, pneumatic	x	x	x	x	x
392030	Ex alarm horn, spray booth	x	x	x	x	x
2362637	"Comfort Archive" PC data archiving (for 1 system) **	x	x	x	x	x
2365136	"Comfort Archive" PC data archiving (for 2–5 systems) **	x	x	x	x	x
2359045	Profibus module	x	x	x	x	x
2339620	External mixer automatic, high pressure (DN 2.6)	x	x	x	--	--
2339617	External mixer automatic, high pressure DN4 / DN10VA	--	--	--	--	x
2339621	External mixer automatic, low-pressure (DN 4)	x	x	--	x	--
2360730	CAN I/O output expansion	x	x	x	x	x

* Can not be used for 2-circuit systems.

** Prerequisite for PC data archiving: Network connection of the 2K COMFORT system by WAGNER Service Department

13.4.1.1 STROKE MEASURING

– For overview see Chapter 5.10
– "ADC-0301 / MPX-0403" operating manual: for Order No., see Chapter 1.3.1

Accessory sets for stroke measurement	Ex	Non-Ex
Name	**Order No.**	**Order No.**
MPX-0403	2376552	
ADC-0301 with bus cable 10 m; 32.8 ft	2376553	
ADC-0301 with bus cable 20 m; 65.6 ft	2376554	
ADC-0301 with bus cable 50 m; 164 ft	2376555	
Stroke sensor 1	2305981	
Stroke sensor 2	2305982	
Pressure switch	2351041	

13.4.2 INSTALLATION BY WAGNER SERVICE DEPARTMENT

Expansion and accessory sets		Non-XL				XL
Order No.	**Name**	**Ex**	**Non-Ex**	**High pressure**	**Low pressure**	Ex
2358996	Dosing valve set DN 2.6, 400 bar TC, Ex (For 1–2 B/C/D-valves, if component is already present. Carbide valve seat) → If mixing head cycle install the not explosion-protected version 2358994.	x	--	x	x	--
2362622	Dosing valve set DN 2.6, 400 bar SSt, Ex (For 1–2 B/C/D-valves, if component is already present. Stainless steel valve seat) → If mixing head cycle install the not explosion-protected version 2358995.	x	--	x	x	--
2360926	3K installation material	x	x	x	x	--
2359024	Flow monitor lacquer, non-Ex	--	x	x	x	--
2359025	Flow monitor lacquer, Ex	x	--	x	x	--
2360619	Flow monitor lacquer, Ex XL	--	--	--	--	x
2359110	Product pressure regulator, digital (controllable) (Input pressure max. 4 MPa; 40 bar; 580 psi)	x	x	--	x	--
2369327	Product pressure regulator, digital (controllable) G3/8 XL (Input pressure max. 4 MPa; 40 bar; 580 psi)	--	--	--	--	x
2359111	Air bubbles monitoring, non-Ex (Input pressure max. 0.8 MPa; 8 bar; 116 psi)	--	x	x	x	--
2359112	Air bubbles monitoring, Ex (Input pressure max. 0.8 MPa; 8 bar; 116 psi)	x	--	x	x	--
2362636	Automatic electrostatic system set for GM 5000 manual gun	x	x	x	x	x
2360940	Automatic electrostatic system set for automatic gun	x	x	x	x	x
2360953	Mixing head cycle (for flow meter)	x	x	x	x	x
2360956	Mixing head cycle, flushable (for flow meter)	x	x	x	x	x
2360954	Mixing head cycle (for Coriolis)	x	x	x	x	x

13.4.2.1 AIS

AIS accessories sets

AIS dosing system:

- For description, see Chapter 5.8
- For example, see Chapter 5.6 (diagram B)

Following accessories must be ordered for each B/C/D-component, which is to be equipped with AIS:

Name	Stk	Ex Order No.	Non-Ex Order No.
AIS basic set	1	2359016	
Additionally, if yet no mixing head valve is present: [A] or [B] or [C]			
Added component with flow meter:			
[A] Mixing head cycle (for flow meter)	1	2360953	
[B] Mixing head cycle, flushable (for flow meter)	1	2360956	
Added component with Coriolis:			
[C] Mixing head cycle (for Coriolis)	1	2360954	
Additionally, without connection set:			
Double 3/2-way valve	2	--	9956145
Additionally, if length of connection set ≤15 m:			
Double 3/2-way valve	2	9956145	
Hose, PUR 4/2.7, length = 3* x (length of connection set + 4 m)	m	9982072	
Additionally, if length of connection set ≥ 17 m:			
Dosing connection, EX	3*	2365901	--
Cable to Ex i valve, length = 3* x (length of connection set + 4 m)	m	9956160	--
Connection plate, EX i (for 4 Ex i valves), if not enough free spaces are available:			
– Plate Ex-valve	1	384445	--
– Hexagon socket cylinder head screw	2	9900307	--
– Washer	2	9920101	--
– Hexagon nut	2	9910106	--

* * 3 pieces, if mixing head valve is already present.
Otherwise: 4 pieces minus number of present dosing valves. All present dosing valves must be newly controlled with air hoses.

XL version

Prerequisite: Corresponding B/C/D-component must have DN 2.6 valves.
Order No., see column "Ex".

13.4.3 ACCESSORIES SETS FOR EXTERNAL FLUSHING AGENT

External flushing agent can be used for:

- Mixing head cycle, flushable
- External mixer
- Splitter valve, flushable
- Dump valve, flushable
- Dump valve for waste separation

The external flushing can be done in three ways. Optionally, an accessory set is required (installed by the WAGNER Service Department):

Flushing mode	Detail in the flushing recipe	Meaning	Accessories set	
			Ex	Non-Ex
Flushing over a period of time	Flush. time	Flushing time runs, if the flushing valves are open.	--	--
Flushing with flow monitor	Flush. time	Flushing time runs, if flushing agent flows.	Flow monitor lacquer, Ex, Order No. 2359025	Flow monitor lacquer, non-Ex, Order No. 2359024
			Cable, Order No. 9956160, Length = distance from control cabinet-flow monitor + 2m	
Flushing with flow meter**	Flushing Qty	Precise flushing quantity is used.	Not orderable as a set	

* With XL design: Flow monitor lacquer, Ex XL, Order No. 2360619

** Can not be used for 2-circuit systems.

13.5 REMOTE CONTROL (OPTION)

The remote control can be operated in the EX area, allowing the following functions to be controlled: start; stop; flushing and recipe change. In addition, a signal display for the current recipe and displays for the operating status (Filling, Ready and Alarm) can be installed.

Designation	Order No.
Remote control	2341153
Magnetic pin, complete	2342917
Extension cable 15 m; 49 ft for remote control Maximum extension of 2 times 15 m; 49 ft. (Total 45 m; 147 ft.)	2343063

13.5.1 REMOTE CONTROL ASSEMBLING

13.5.1.1 SOFTWARE SETTINGS

Log in as the administrator (Level 3 password).
Set the remote control option to ON.

Parameter	Setting
Remote control	ON

13.5.1.2 ASSEMBLY ON CONTROL CABINET

→ Observe safety instructions in Chapter 13.5.2.

1. Before connecting the remote control or an extension cable, de-energize the device. In other words, switch off the main switch and unplug the power plug.
2. Plug the plug on the underside of the control cabinet into the socket intended for it.
3. Ground the remote control's ground wire.

13.5.1.3 TESTING AND COMMISSIONING

Make sure that the commands and signals described in Chapter 13.5.3 are being transmitted. To do this, activate and check the various functions on the control cabinet and remote control in turn.

Function	Impact on control cabinet	Impact on remote control
Start	Green push button lights up	START LED lights up
Stop	Red push button lights up	STOP LED lights up
Flushing	Blue push button lights up	FLUSH LED lights up
Recipe change	The recipe is changed on the display. The recipe displayed matches that of the remote control.	The display in the center of the remote control changes the number (counting upward).

The impacts are always the same regardless of whether the function is activated on the remote control or control cabinet. Activate all functions on remote control and control cabinet at least once.

Carry out commissioning and parameter settings according to the operating manual and the 2K COMFORT software manual.

13.5.2 SAFETY INSTRUCTION REMOTE CONTROL

The installation must be carried out in accordance with Chapter 13.5.1. The following safety instructions must be observed:

Safety instruction remote control
→ Do not open housing under voltage.
→ Open housing only in the absence of a potentially explosive atmospheres.
→ The gap distance from cover-housing bottom to fixed obstacles must be at least 3 cm; 1.2 inches.
→ The remote control must be securely assembled, the line must be laid firmly and with protection from mechanical damage. (For example not laid in the area of aisles or walkways, not on driveways from product handling vehicles, not through doors/ gates.)
→ The first attachment point of the cable should be no more than 30 cm; 12 inches away from the housing.
→ Extension cable: lengthen to a maximum of 2 times 15 m; 49 ft. (Total 45 m; 147 ft.)
→ The plug connectors of remote control and extension cable must be located in non-potentially explosive areas.
→ **Grounding**: ground the housing via a separate line (cross-section 4 mm^2; 0.0062 sq in), connect on the local equipotential bonding (see grounding schemas in Chapter 6.5).
→ **Warning**: Any repair by a repair shop according to EN 60079-19 is not possible due to flame path gaps smaller than the maximum permitted by EN 60079-1. Contact the WAGNER service center in Markdorf (Germany) if a repair is necessary.

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 of the magnetic pin.

13.5.3 OPERATION

⚠ DANGER

Magnetic fields!

Danger to life from malfunction of heart pacemakers.

Make sure that persons with pacemakers:

→ Do not use the device.

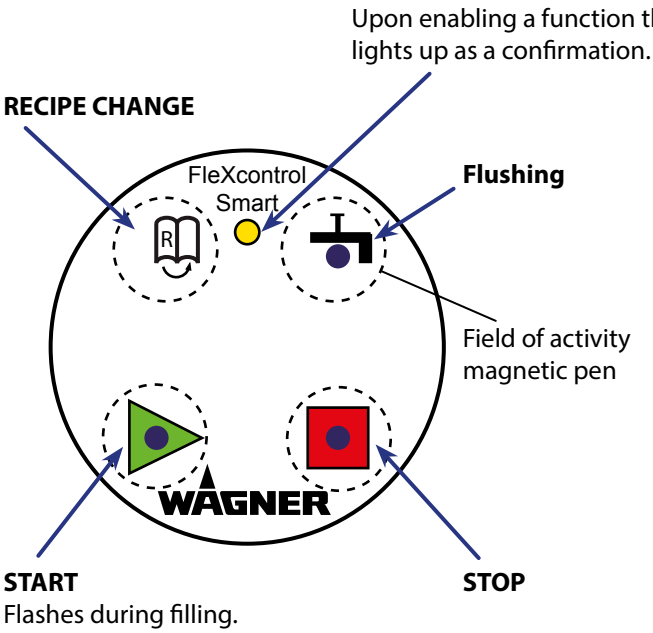
→ Do not enter in the area of the magnetic pin.

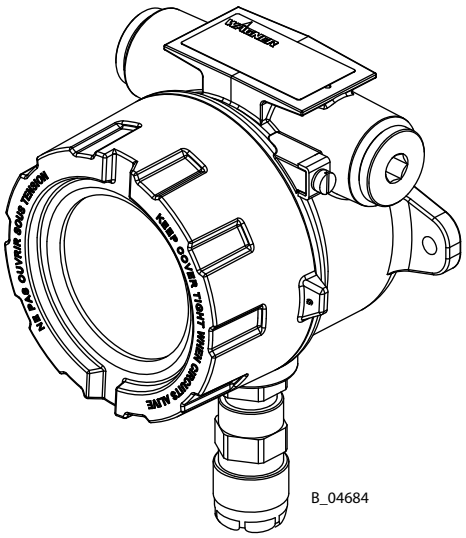
The same four functions as on the control cabinet are on the remote control: START, STOP, FLUSHING and RECIPE CHANGE.

The functions are identical, with the following two exceptions.

On the remote control:

- the functions will be activated with a **magnetic pin**.
- the green START LED flashes during filling.





14 SPARE PARTS

Spare parts catalog → Order No., see Chapter 1.3.

15 DECLARATION OF WARRANTY AND CONFORMITY

15.1 IMPORTANT NOTES ON PRODUCT LIABILITY

As a result of an EC regulation effective from January 1, 1990, the manufacturer shall only be liable for his product if all parts originate from him or are approved by him, and if the devices are properly mounted, operated and maintained.
The manufacturer will not be held liable or will only be held partially liable if third-party accessories or spare parts have been used.
With genuine WAGNER accessories and spare parts, you have the guarantee that all safety regulations are complied with.

15.2 WARRANTY CLAIM

Full warranty is provided for this device:
We will at our discretion repair or replace free of charge all parts which within 24 months in single-shift, 12 months in 2-shift or 6 months in 3-shift operation from date of receipt by the purchaser are found to be wholly or substantially unusable due to causes prior to the sale, in particular faulty design, defective materials or poor workmanship.
The type of warranty provided is such that the device or individual components of the device are either replaced or repaired as we see fit. The resulting costs, in particular shipping charges, road tolls, labour and material costs will be borne by us except where these costs are increased due to the subsequent shipment of the device to a location other than the address of the purchaser.
We do not provide warranty for damage that has been caused or contributed to for the following reasons:
Unsuitable or improper use, faulty assembly or commissioning by the purchaser or a third party, normal wear, negligent handling, defective maintenance, unsuitable coating products, substitute products and the influence of chemical, electrochemical or electrical agents, except when the damage is attributable to us.
Abrasive coating products such as red lead, emulsions, glazes, liquid abrasives, zinc dust paints and so forth reduce the service life of valves, packings, spray guns, nozzles, cylinders, pistons etc. Signs of wear traced back to these products are not covered by this warranty.
Components that have not been manufactured by WAGNER are subject to the original warranty of the manufacturer.
Replacement of a component does not extend the period of warranty of the device.
The device should be inspected immediately upon receipt. To avoid losing the warranty, we or the supplier company are to be informed in writing about obvious faults within 14 days upon receipt of the device.
We reserve the right to have the warranty compliance met by a contracting company.
The services provided by this warranty are dependent on evidence being provided in the form of an invoice or delivery note. If the examination discovers that no warranty claim exists, the costs of repairs are charged to the purchaser.
It is clearly stipulated that this warranty claim does not represent any constraint on statutory regulations or regulations agreed to contractually in our general terms and conditions.

Wagner International AG

15.3 EU DECLARATION OF CONFORMITY FOR 2K COMFORT

Herewith we declare that the supplied version of:

2K COMFORT

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 12621:2006+A1:2010
EN ISO 4413:2010	EN 60204-1:2006+A1:2009+B:2010
EN ISO 4414:2010	EN 61000-6-2:2005+B:2011
EN ISO 13732-1:2008	EN 61000-6-4:2007+A1:2011
EN 14462:2015	EN ISO 9001:2008

Applied national technical standards and specifications, in particular:

DGUV regulation 100-500 Chapter 2.29 and Chapter 2.36

Identification: CE

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: 2359623

15.4 EU DECLARATION OF CONFORMITY FOR 2K COMFORT (WITH EX IDENTIFICATION)

Herewith we declare that the supplied version of:

2K COMFORT (with Ex identification)

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 60079-14:2014
EN ISO 4413:2010	EN 1127-1:2011
EN ISO 4414:2010	EN 13463-1:2009
EN ISO 13732-1:2008	EN 13463-5:2011
EN 14462:2015	EN 61000-6-2:2005+B:2011
EN 12621:2006+A1:2010	EN 61000-6-4:2007+A1:2011
EN 60204-1:2006+A1:2009+B:2010	EN ISO/IEC 80079-34:2011
EN 60079-0:2012+A11:2013	--

Applied national technical standards and specifications, in particular:

DGUV regulation 100-500 Chapter 2.29 and Chapter 2.36
TRGS 727

Identification: CE Ex II (2) G CE Ex II 2 G c IIB X

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: 2359625

15.5 EC DECLARATION OF CONFORMITY FOR REMOTE CONTROL

Herewith we declare that the supplied version of:

FlexControl Smart remote control (is also used for 2K COMFORT)

complies with the following guidelines:

94/9/EC
2004/108/EC
2002/95/EC
2002/96/EC

Applied standards, in particular:

DIN EN 1127-1: 2011	DIN EN 61000-6-2: 2006
DIN EN 60079-0: 2012	DIN EN 61000-6-4: 2007+A1:2011
DIN EN 60079-1: 2007	DIN EN ISO/IEC 80079-34: 2011
DIN EN 60079-14: 2008	--

Applied national technical standards and specifications, in particular:

TRBS 2153

Identification: CE 0102 Ex II 2 G Ex d IIB T6 Gb
CML 13 ATEX 1008X

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: 2343991

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.

→ Some lacquer manufacturers state the mixing ratio by weight, others by volume or ratio.

→ Since the gear flow meter measures volumetrically, we need the specification in volume.

Conversion of mixing proportion 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:

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

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

Mixing ratio:

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

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

Other volumetric mixing ratio specifications:

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

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Version 05/2017

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