



EcoAUC

Control System

Operation manual

MCU00001EN, V06

F30310001V

Information about the document

This document describes the correct handling of the product.

- Read the document prior to every activity.
- Prepare the document for the application.
- Pass on the product only together with the complete documentation.
- Always follow safety instructions, handling instructions and specifications of every kind.
- Illustrations can deviate from the technical construction.

Validity range of the document

This document describes the following material number:

F30310001V
EcoAUC



Applicable documents

- Operating instructions of the plugged key components
 - For versions with high tension EC, DC: Observe operating instructions for high tension generator and high tension controller
- Circuit diagram
- Process schematics
- Process Description for Actuation of the Application

Hotline and Contact

If you have queries or would like technical information, please contact your dealer or sales partner.

TABLE OF CONTENTS

1	Product overview	5	6.3.1	General notes	26
	1.1 Overview	5	6.3.2	Setting operating parameters	27
	1.2 Short description	5	7	Operation	27
2	Safety	5	7.1	Safety recommendations	27
	2.1 Presentation of Notes	5	7.2	Switching on	28
	2.2 Intended Use	5	7.3	Switching off	28
	2.3 Safety devices	6	7.4	Operating mode	29
	2.4 Safety signs	6	8	Visualizer	30
	2.5 Residual risks	8	8.1	Operator Interface	30
	2.6 Conduct in the event of a hazardous situation	9	8.1.1	Overview	30
	2.7 Staff qualification	9	8.1.2	Header row	30
	2.8 Personal protective equipment	10	8.1.3	Work area	31
3	Design and Function	10	8.1.4	Menu bar	31
	3.1 Exterior view	10	8.2	System settings	31
	3.2 Interior view	11	8.2.1	Overview	31
	3.3 Interfaces	12	8.2.2	Screen cleaning	32
	3.4 Operator panel	13	8.2.3	Lamp test	32
	3.5 User management	13	8.2.4	Station settings	32
4	Transport, scope of supply and storage ..	14	8.2.5	IP address and port number	34
	4.1 Unpacking	14	8.2.6	Change password	35
	4.2 Scope of delivery	14	8.2.7	Reset password	35
	4.3 Handling of packaging material	14	8.2.8	Log on and Log off	35
	4.4 Storage	14	8.2.9	Setting Date and Clock Time	36
	4.5 Transport	14	8.2.10	Set language	36
5	Assembly	16	8.2.11	USB functions	36
	5.1 Safety recommendations	16	8.3	Atomizer	37
	5.2 General notes	17	8.3.1	Overview	37
	5.3 Requirements for the installation point	17	8.3.2	Valves	37
	5.4 Assembly	17	8.3.3	Process components	39
	5.4.1 Assembling high voltage power cable	17	8.3.4	Color changer	41
	5.5 Connecting	21	8.3.5	Shaft detent	41
	5.5.1 Overview of the connections	21	8.4	Brush	42
	5.5.2 Connect components	23	8.4.1	Overview	42
	5.5.3 Connect application devices	24	8.4.2	Select brush record	43
	5.5.4 Grounding the Control Cabinet	24	8.4.3	Manage brush parameters	43
	5.5.5 Connect compressed air supply	25	8.4.4	Interface for external control	44
	5.5.6 Connecting Infeed	25	8.5	Timer programs	44
	5.5.7 External communication	25	8.5.1	Overview	44
6	Commissioning	26	8.5.2	Switching on and canceling timer program	44
	6.1 Safety notes	26	8.5.3	Start color change	45
	6.2 General notes	26	8.5.4	Volumetric measurement	46
	6.3 Commissioning	26	8.6	Alarms	47
			8.6.1	Overview	47
			8.6.2	Error codes	47
			8.7	High voltage	63
			8.7.1	Overview	63

8.7.2	High voltage On/ Off	64
8.7.3	Set nominal value of the high voltage generator	64
8.7.4	High voltage self-test	65
8.8	2K color configuration	65
8.9	Application	66
9	Cleaning	68
9.1	Safety recommendations	68
9.2	General notes	68
9.3	Cleaning	68
10	Maintenance	69
10.1	Safety notes	69
10.2	General notes	70
10.3	Maintenance schedule	70
10.4	Maintenance work	70
10.4.1	Replace compressed air hoses.	70
10.4.2	Replace filter of the maintenance unit.	71
10.4.3	Replacing illuminated push button ..	71
11	Decommissioning and Disposal	72
11.1	Safety recommendations	72
11.2	General notes	72
11.3	Decommissioning	72
11.4	Disposal	73
12	Technical data	73
12.1	Dimensions and weight	73
12.2	Connections	74
12.3	Operating conditions	74
12.4	Operating values	74
12.5	Compressed air quality	74
12.6	Type plate	75
12.7	Operating and auxiliary materials	75
13	Spare parts, tools and accessories	75
13.1	Spare parts	75
13.2	Tools	100
13.3	Accessories	100
13.4	Order	100
14	Index.....	101
	Appendix.....	105
A	Interfaces - Binary	106
B	Interfaces - ASCII	112
C	Flow chart of the external interface	120
D	Variants of the control cabinet	125

1 Product overview

1.1 Overview



Fig. 1: Overview

- 1 Door rear side (pneumatic components and high voltage generator)
- 2 Door front side (electrical components)
- 3 Fan cover with fan
- 4 Operator panel

1.2 Short description

The **EcoAUC** (hereafter called “Control cabinet”) is a serially produced control system with electrical, electro-pneumatic and pneumatic components. The integrated control software actuates application products.

For further information, refer to [2.2 “Intended Use”](#)

2 Safety

2.1 Presentation of Notes

The following notes can appear in this instruction:

DANGER!
High risk situation that can lead to serious injuries or death.

WARNING!
Medium risk situation that can lead to serious injuries or death.

CAUTION!
Low risk situations that can lead to minor injuries.

NOTICE!
Situations that can lead to material damage.

ENVIRONMENT!
Situations that can lead to environmental damage.

Additional information and recommendations.

2.2 Intended Use

Use

The Control cabinet is designed for stationary use in industrial paint systems.

The Control cabinet is only for actuation of the following application components:

- High rotation atomizer (hereafter called “rotary atomizer”) with direct charging, external charging or without charging through high voltage
- Color changer
- Spray guns with air spray, air assisted or airless
- **EcoPaintJet** application device
- Gear wheel pumps
- Paint pressure regulator

The application components can be installed, for example, on columns, hoists, in painting systems or with robots.

The Control cabinet may only be operated with the components that fit with the software configuration.

The selection of the application components determines the possible fluid coating materials:

- Flammable coating materials
- Non-flammable coating materials

The Control cabinet must be operated with additional safety measures [2.3 “Safety devices”](#) .

Use the Control cabinet only within the approved technical data [12 “Technical data”](#) .

Set up and operate Control cabinet exclusively outside potentially explosive areas.

Misuse

Not using as intended entails danger to life.

Examples of wrong use are:

- Use in explosive areas
- Use of powder coating
- Making conversions or changes on your own
- Movement during operation
- Setting up near lines carrying material
- Lay
- Storage of electrostatically chargeable objects on the housing
- Exceeding maximum hose lengths and cable lengths ↪ 12.2 “Connections”
- Commissioning with missing or bridged safety devices
- Commissioning by unqualified personnel ↪ 2.7 “Staff qualification”

2.3 Safety devices

The operator must put the Control cabinet in operation with additional safety devices.

The operator must implement the following safety devices for the control cabinet depending on the version:

- Closed booth
 - Protection against mechanical dangers due to bell disk with 70,000 RPM for rotating atomizer
 - Limitation of the Ex zone
- Parent control system with additional signals from safety-relevant parts of controls
- Integrate entry protection in the emergency stop circuit of Control cabinet.
- Emergency stop concept according to Performance Level D (2 channel)
- Fire safety with extinguisher device and fire detection system for performance level d
 - Fire safety valve with delayed switch off

To prevent damage, ensure turbine bearing air for the turbine to run down.

- Mechanical ventilation according to EN 16985 or country-specific operating specifications for thinning of Ex atmosphere
- Mode selector switch for different safety configurations
- Warning light “High voltage on/off” (only for versions with high voltage) according to EN 50176
- High voltage cable with grounded shield ↪ 5.4.1 “Assembling high voltage power cable”
- Delayed release for access doors (min. 15 seconds) based on run down of the rotary bell (only for versions with rotary atomizer)
- Delayed release for access doors based on discharge of residual energy with high voltage (only for versions with high voltage), see:
 - Operating instructions of the high voltage supply **EcoHT2**
 - Circuit diagram ↪ “Applicable documents”

With performance level d according to ISO 13849-1 and -2.

2.4 Safety signs

There is a risk of death due to high voltage and tension in the Control cabinet housing.

The danger due to high voltage and laser radiation depends on the version.

The following signs are placed on Control cabinet.

- Do not remove sign from Control cabinet. Replace illegible signs.

Safety Signs	Code	Meaning
	W012	Warning of electrical voltage
	W004	Warning of laser beams
	-	Observe the operating instructions

Safety sign - Housing outside rear



Fig. 2: Warning of electrical voltage

Only for versions with high voltage (rotating atomizer EC and DC)

Safety sign - Housing inside rear

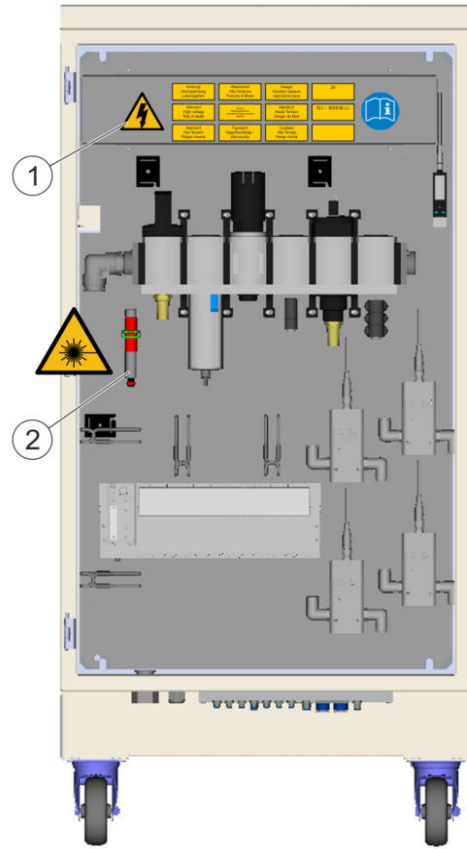


Fig. 3: Risk of death due to high voltage and warning of laser beams

- 1 High voltage generator* cover
- 2 R/O converter speed measurement*

An asterisk (*) marks an optional component.

Safety sign - Housing inside front

Electrical components must be installed to be safe for fingers and back of the hand.

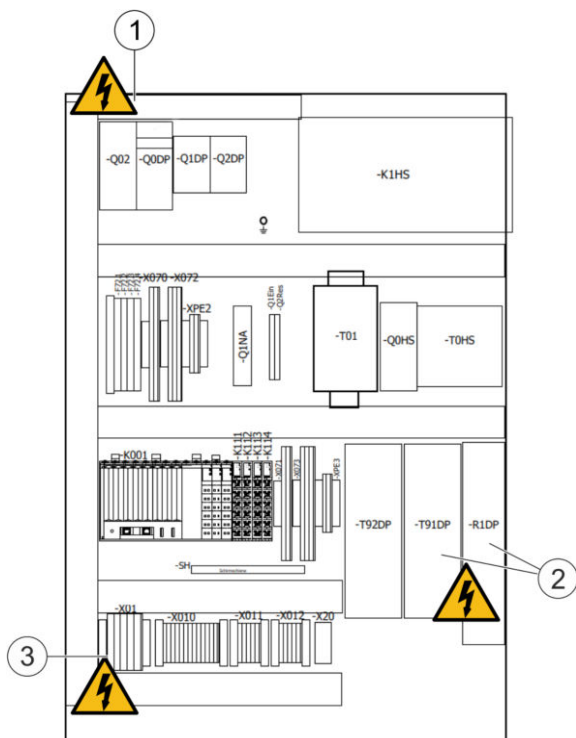


Fig. 4: Warning of electrical voltage

- 1 Clamping of the mains disconnecting device Q01
- 2 Frequency converter T91DP/T92DP and line filter R1DP
- 3 Feed X01

2.5 Residual risks

Electric current

Live components are under high voltage and/or tension. This can result in death or serious injuries.

- Prior to starting work, switch off the electrical supply from the mains disconnecting device and secure against restarting.
- The danger of electric shocks persists even after shutting down the power supply due to stored residual charges.
 - Discharge all connected application components using a grounding rod.
 - Capacity measurement is to be carried out according to the documentation of the respective high voltage supply (only for rotary atomizer EC and DC).
 - Note the discharge rate for high voltage (only for rotary atomizer EC and DC).
 - Note the discharge rate of the frequency converter T91DP/T92DP and line filter R1DP.
- Clamp ground connector to potential equalization of the Control cabinet ↪ 5.5.4 “Grounding the Control Cabinet” .

Explosions

If the control cabinet is erected in explosive areas, there is a danger of explosion. Serious injuries and death can be the consequence.

- Set up control cabinet exclusively outside potentially explosive areas.

Incomplete or missing safety devices

Incomplete or missing safety devices can lead to serious injuries or death.

- Integrate the control cabinet in a safety concept according to the chapter ↪ 2.3 “Safety devices” .

Fire

Flammable coating materials and their detergents and cleaning agents can cause a fire. Serious injuries and death can be the consequence.

- Do not operate control cabinet near lines carrying material.
- Integrate control cabinet in a total system with fire report system and extinguishing device.

Compressed air

If compressed air escapes with high pressure, it can cause death or serious injury.

Before working on the control cabinet:

- Switch off mains disconnecting device on maintenance unit.
The cables of the control cabinet are vented.
- Secure against reconnection.

Laser radiation

Only for versions with R/O-converter

Marked components emit a visible laser beam of the Class 2. Incidental brief exposure is not dangerous. Long exposure of the eye to laser beam can damage the eyes.

- Do not look into the laser beam.
- If the laser beam does hit your eye, close your eye immediately and avert your gaze.
- Pay attention to safety markings.

Rolling Away and Tipping Over

If the control cabinet rolls away or tips over, it can cause serious injuries and material damage.

- When moving, ensure that there are no obstacles on the floor, such as hoses.
- Slide it by maximum 1 meter only for assembly and maintenance work.
- Have only two persons sliding it.
- Ensure, both before and after work on the control cabinet, that the brakes are engaged.

2.6 Conduct in the event of a hazardous situation

Conduct in case of danger depends on the operator's installation situation. In case of danger In case of danger, press the emergency stop.

Emergency shutdown



Fig. 5: Emergency stop button

1. Press emergency stop function (1).
 - ⇒ The drives of the metering unit switch off. The pressure remains in the material lines.
 - ⇒ The main air valve switches off. There can still remain a residual pressure in the compressed air lines.
 - ⇒ High voltage (*) switches off.

An asterisk (*) marks an optional component.

2. Pay attention to the company's internal emergency regulation.

For operations with rotary atomizers (EC, DC and HRZ)

! NOTICE!

Air supply interruption

If the external air supply system of the control cabinet switches off immediately, that can ruin the turbine of the rotating atomizer.

- The operator must ensure that the air supply system switches off after a delay.

2.7 Staff qualification

! WARNING!

Inadequate qualification

Wrong estimation of dangers can cause serious injury or death.

- Only sufficiently qualified persons may execute all work.
- Some work requires additional qualification. Additional qualifications of specialized personnel are marked with a "+".

This document is intended for qualified personnel in industry and craftsmanship.

The following describes the different qualifications required for the work in this document. The required qualification is presented prior to the individual tasks in the appropriate chapters.

Cleaning staff

The cleaning staff receives regular instructions from the operator about the following contents:

- Using the product
- Handling cleaning tools
- Handling cleaning agents
- Technical Measures for occupational safety and health

Electrician

Electricians assemble, install, service and repair electrical systems in a professional manner.

Furthermore, electrical engineers have the following knowledge:

- Directives, Standards and Rules of Engineering
- Local conditions
- Electrical Systems and Their Loading Limits
- Technical Measures for occupational safety and health

Mechanic

The mechanic is trained specifically for the field of work in which he works.

Furthermore, he has the following knowledge:

- Directives, Standards and Rules of Engineering
- Local conditions
- Technical Measures for occupational safety and health

The mechanic is responsible for the following activities on equipment and components:

- Assembly
- Waiting
- Maintenance
- Disassembly

System operator

The system operator is trained specifically for the field of work in which he works.

The system operator has knowledge in the following specialized areas:

- System-specific process engineering
- Knowledge of the application processes regarding the application medium used
- Local technical measures for occupational safety and health

The system operator is responsible for the following tasks on equipment and components:

- Operate and monitor the system.
- Introduce measures in the event of faults.
- Clean the system.

+ additional qualification explosion protection

In addition to the knowledge of the various specialist fields, the mechanic has knowledge of regulations and safety measures when working in potentially explosive areas.

+ additional qualification high tension technology

In addition to the knowledge of the various specialist fields, the mechanic has knowledge of the following specialist fields

- Painting process
- High voltage engineering for electrostatic coating

Dürr Systems offers special product training for ☞ "Hotline and Contact" .

2.8 Personal protective equipment

When working in explosive areas, the protective clothing, including gloves, must meet the requirements of EN 1149-5. Footwear must meet the requirements of ISO 20344 and IEC 61340-4-3. The volume resistivity must not exceed 100MΩ.

Wear the specified personal protective equipment when working. Provide the following personal protective equipment:



Eye protection

Protects eyes from dust, paint drops and particles.



Protective gloves

Protect the hands from:

- mechanical forces
- Thermal forces
- Chemical effects



Protective workwear

Tight fitting workwear with low tear strength, tight sleeves and no hanging parts.



Safety boots

Protect feet from crushing, falling items and slipping.



Use ear protection

Protects from auditory damage due to noise.

3 Design and Function

3.1 Exterior view



Fig. 6: Exterior view front

- 1 Operator panel
- 2 Fan cover with fan
- 3 Electrical components in the housing

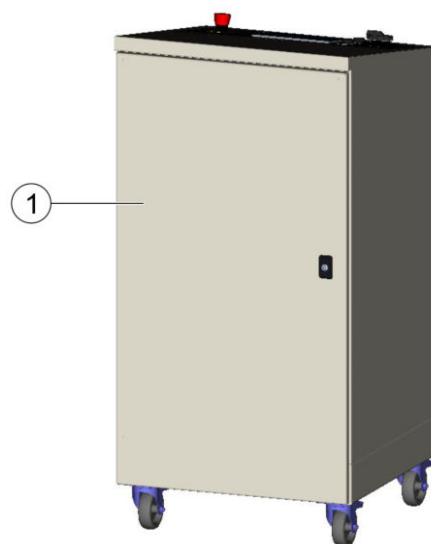


Fig. 7: Exterior view rear

- 1 Pneumatic components and high voltage generator* in the housing

An asterisk (*) marks an optional component.

3.2 Interior view

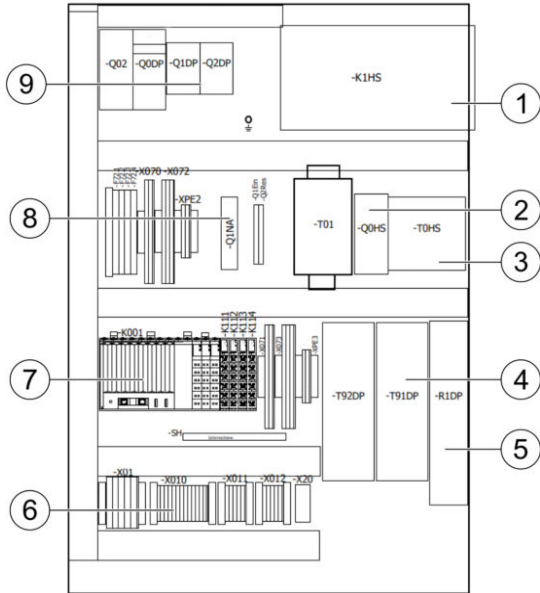


Fig. 8: Interior view front

- 1 High voltage controller G100* / G500*
- 2 Power switch high voltage*
- 3 Supply transformer high voltage*
- 4 Frequency converter for dosing pump*
- 5 Line filter for frequency converter*
- 6 Terminals for signal interchange
- 7 PLC
- 8 Safety switching device
- 9 Grid protections

An asterisk (*) marks an optional component.

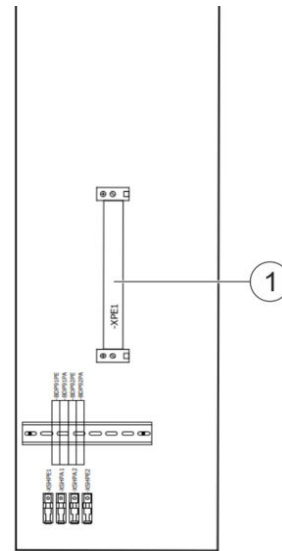


Fig. 9: Interior view front, Side wall left

- 1 Isolating switch amplifier

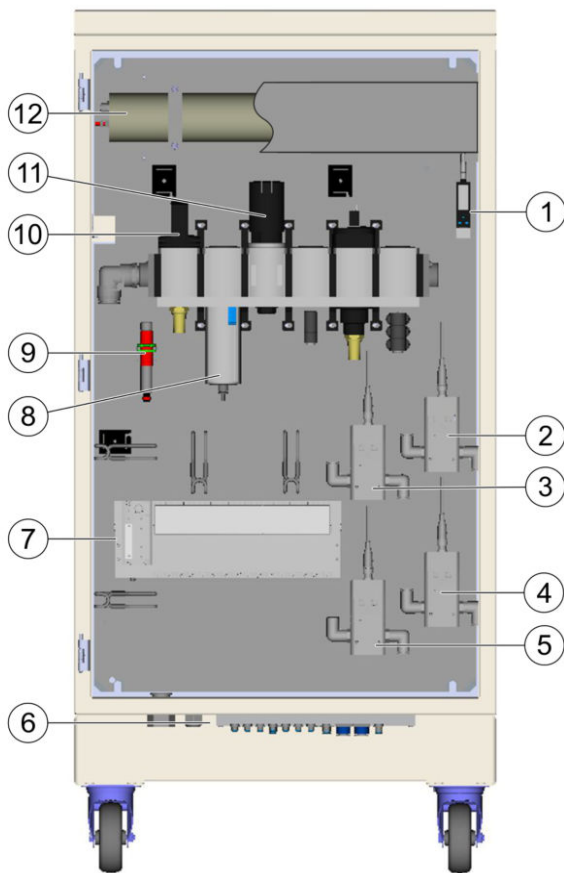


Fig. 10: Interior view rear

- 1 Pressure switch main air and motor bearing air*
- 2 Proportional valve for shaping air 1* / atomizer air* or Materialdruckregler* for P91 - FDS with PJ 1K/2K
- 3 Proportional valve for motor air*
- 4 Proportional valve for paint pressure control*
- 5 Proportional valve for shaping air 2* / atomizer air* or Material pressure controller* for P92 - FDS with PJ 2K
- 6 Connections for application equipment
- 7 Control valve for atomizer, color changer and dosing pump*
- 8 Air filter
- 9 R/O converter for monitoring rotation speed
- 10 Lockable mains disconnecting device of the compressed air supply
- 11 Compressed air regulator
- 12 High voltage generator G100*/G500* with cover

An asterisk (*) marks an optional component.

3.3 Interfaces

Optical speed recorder connection

Only for versions with rotary atomizer (EC, DC and HRZ)

The control system determines the rotational speed of the turbine and the rotary bell by means of the optical sensor. Integrated control expects two cycles per revolution (Light on - Light off - Light on - Light off)

Frequency converter

Only for versions with dosing pump (1DP and 2DP)

The frequency inverters are loaded with drive parameters and verified with the following motors:

Designation	Value	Device category
MSK030C-0900-NN-S1-NSNN		3G
MKE037B-144-AP0-BENN	0.8 Nm 9000 1/min	2G
MKE037B-144-AP0-BENN		FM

Actuation and feedback of the displacement volume is controlled in Control cabinet according to the configured variant and visually output.

3.4 Operator panel

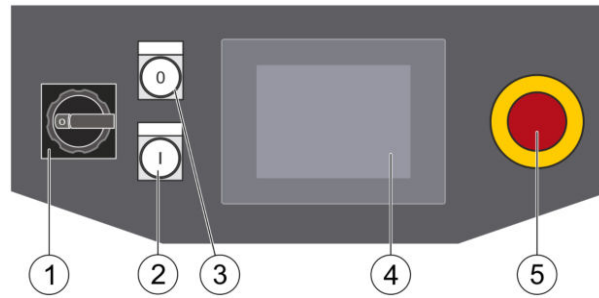


Fig. 11: Operator panel

Item	Designation	Function
1	Electrical mains disconnecting device	Turn on or turn off power supply
2	Illuminated push button [I]	Switching on process release
3	Illuminated push button [0]	Switching off the process release
4	Operator interface	Display of the operator interface The operator interface is a touch display.
5	Emergency stop button	Carrying out the emergency stop function

3.5 User management

The user levels control the access to individual functions in the visualizer. The operator must replace the passwords of the delivery objects by new passwords before initial commissioning.

Higher user levels have the authorization for lower user levels.

User level	User	Password on dispatch	Authorization
0	Visit	-	Enter password.
			Select menu.
			Activate cleaning.
			Change language.
			Open or close valves.
			Set proportional valves to 0.
1	User	pax1	End metering.
			Start sequences.
			Change brushes.
			Acknowledge messages.
2	Maintenance	ohf8	Release high tension.
			Set the nominal values.
3	Administrator	jbk5	Password management
			Change IP address.

4 Transport, scope of supply and storage

4.1 Unpacking

Personnel:

- Mechanic
- + additional qualification explosion protection

Protective equipment:

- Protective workwear
- Protective gloves
- Safety boots

DANGER!

Electrostatically charged plastic films and foils in potentially explosive areas

The foil can charge electrostatically at the time of unpacking. Electrostatic discharge can cause sparks that in explosive atmosphere can cause a fire or an explosion. Serious injury and death could be the consequence.

- Unpack product outside Ex zones.

1. Check packaging of Control cabinet for damage.
 - ⇒ If there is any damage, notify the customer service immediately ↪ “Hotline and Contact” .
2. Check the position of the Control cabinet on the pallet.
 - ⇒ If there is any damage, notify the customer service immediately ↪ “Hotline and Contact” .
3. Transport Control cabinet on a pallet to the installation location.
4. Lower Control cabinet from the pallet using a suitable hoist.
5. Unpack Control cabinet carefully.



Electrical connections can be loosened in transportation by vibrations.

Check electrical connections in the control cabinet for correct and firm connections.

4.2 Scope of delivery

The scope of supply includes the following components:

- Control cabinet
- Circuit Diagram
- Process procedure
- Process Descriptions for Actuation of the Application

1. Inspect delivery on receipt for completeness and integrity.
2. Report defects immediately. ↪ “Hotline and Contact”

4.3 Handling of packaging material



ENVIRONMENT!

Incorrect disposal

Incorrectly disposed packaging material can damage environment.

- Dispose of material no longer required in an environment-friendly manner.
- Observe local disposal specifications.

4.4 Storage

Storage provisions:

- Do not store outdoors.
- Control cabinet only store when in a clean and dry condition.
- Store in a dust-free place.
- Do not expose to aggressive media.
- Protect from solar radiation.
- Avoid mechanical vibrations.
- Temperature: 0°C to 60 °C
- Relative humidity: 20% to 80%

4.5 Transport



CAUTION!

Danger of Tipping Over

If the control cabinet tips over, it can cause injuries and material damage.

- Transport only mounted on a pallet.
- Do not transport control cabinet using rollers.
- Push control cabinet by using rollers only for short movements for max. 1 m before and after maintenance work.

Personnel:

- Mechanic

Protective equipment:

- Protective workwear
- Protective gloves
- Safety boots

Requirements:

- All lines, cables and hoses are disassembled.

1. Provide pallet with square timber.

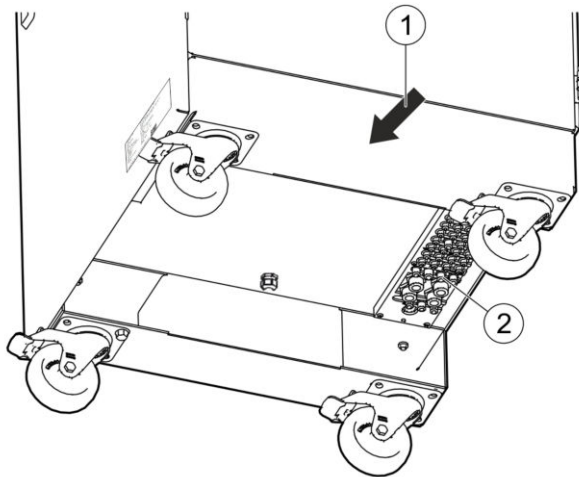


Fig. 12: Transport Control cabinet

2. Do not crush connections (2) when raising the Control cabinet.
Move to the marked location (1) with suitable hoist under the Control cabinet.
3. Raise Control cabinet.
4. Place Control cabinet on the square timber using suitable hoist. Note weight of the Control cabinet (approx. 140 kg).



Fig. 13: Fixing Control cabinet

5. Attach edge protection (3).
6. Lash Control cabinet with packaging tapes (4) on the pallet.

- Transport Control cabinet using suitable hoists or ground conveyor.

Packaging for dispatch



Fig. 14: Control cabinet wrapped in foil

- Protect Control cabinet from external factors by using foils (5).

5 Assembly

5.1 Safety recommendations

⚠ DANGER!

Voltage

Electrical voltage can be present on components and cables despite switched off supply voltage. There is the danger of electrical shock on contact with live components, which can cause death.

- Have only qualified electricians carry out work on the electrical components and cables.
- Prior to starting work, shut down the power supply and secure it personalized from being switched on again.
- Verify that no current is present on the electrical components and cables.
- Follow the circuit diagram.

⚠ DANGER!

Incorrect traverse of electrical cables

Mechanical stresses can damage cables and hoses. Damaged cables and hoses can cause malfunctioning. Serious injuries or death can be the consequence.

- The high voltage cable traverse should be professional.
- Observe the period of use of electrical cables.
- Lay shielded and fixed high voltage cables.

⚠ WARNING!

Disregarding other applicable documents

Details for hose connection and cabling given in the documents accompanying the individual assemblies are relevant for safety. Disregarding the supplied documents can cause serious injuries and property damage.


- Follow the details for hose connection and cabling given in the accompanying documents.

 **WARNING!**

Inadequate grounding

Incorrect grounding of the control cabinet will cause an electrostatic charge to collect on the components. Electrostatic charges can trigger fires, electric shocks and EMC faults. Serious injuries or death can be the consequence.

- Check grounding.
- Observe maintenance intervals ↪ 10.3 “Maintenance schedule” .

 **CAUTION!**

Rolling Away and Tipping Over

If the control cabinet rolls away or tips over, it can cause serious injuries and material damage.

- When moving, ensure that there are no obstacles on the floor, such as hoses.
- Slide it by maximum 1 meter only for assembly and maintenance work.
- Have only two persons sliding it.
- Ensure, both before and after work on the control cabinet, that the brakes are engaged.

5.2 General notes

 **DANGER!**

Not observing the five safety rules

Failure to observe and comply with the five safety rules will pose the danger of an electric shock on contact with live components. Serious injuries and death can be the consequence.

Follow the following five safety rule before all work on control cabinet:


- Disconnection
- Secure against reconnection.
- Ensure that there is no voltage present on any pole.
- Ground and short-circuit.
- Cover and screen off adjacent live parts.

5.3 Requirements for the installation point

- Set up Control cabinet outside potentially explosive areas.
- Set up Control cabinet only on flat and uncluttered industrial floor.
- Required set-up surface of the Control cabinet should be dimensioned such that sufficient space is available for working even with open Control cabinet doors ↪ 12.1 “Dimensions and weight” .
- Escape routes must be accessible.
- Maintain the operating temperature ↪ 12.3 “Operating conditions” .
- Maintain relative humidity ↪ 12.3 “Operating conditions” .
- Maintain input pressure and compressed air quality ↪ 12.4 “Operating values” .
- Maintain connection voltage ↪ 12.2 “Connections” .

5.4 Assembly

5.4.1 Assembling high voltage power cable

 Only for versions with high voltage (rotating atomizer EC and DC)

 **DANGER!**

Incorrect traverse of electrical cables

Mechanical stresses can damage cables and hoses. Damaged cables and hoses can cause malfunctioning. Serious injuries or death can be the consequence.

- The high voltage cable traverse should be professional.
- Observe the period of use of electrical cables.
- Lay shielded and fixed high voltage cables.

 **DANGER!**

Risk of death due to high voltage

After switching off the power supply, the stored residual charges pose the danger of electrical shock, which can lead to death.

- Prior to starting work, switch off the power supply and secure it personalized from being switched on again.
- Discharge the entire system by means of a grounding rod.

- i** Follow the documents below for high voltage cable connection:
- Operating instructions for the high voltage supply G100/G500
 - Circuit diagram ↗ “Applicable documents”

Personnel:

- Electrician
- + additional qualification high tension technology

Protective equipment:

- Safety boots

Material:

- High voltage cable 10 m
- Shielding braid
- Ring shoe 4 mm², M4
- Zip ties
- W32120003 - Petroleum jelly

- i** Requirements for the traverse of the high voltages cable::
- Cover from Control cabinet to the booth wall in a shielding braid and install in a cable duct.
 - Lay with protection from the booth wall to the rotating atomizer and with minimum bend radii.

1. Open rear door on Control cabinet.

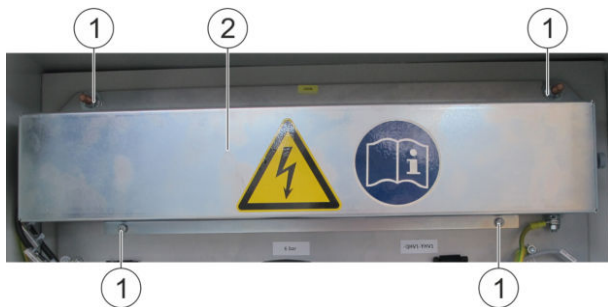


Fig. 15: High voltage generator cover

2. Remove four screws (1) on the cover (2) of the high tension generator.
3. Remove cover (2).

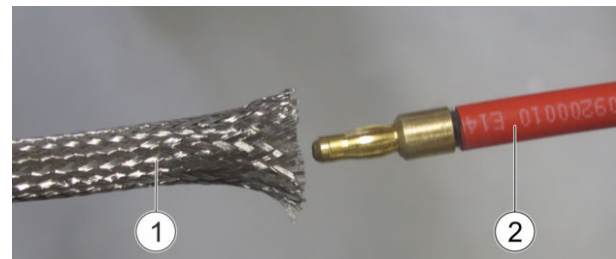


Fig. 16: Guide high voltage cable

4. Slide shielding braid (1) over the high voltage cable (2).

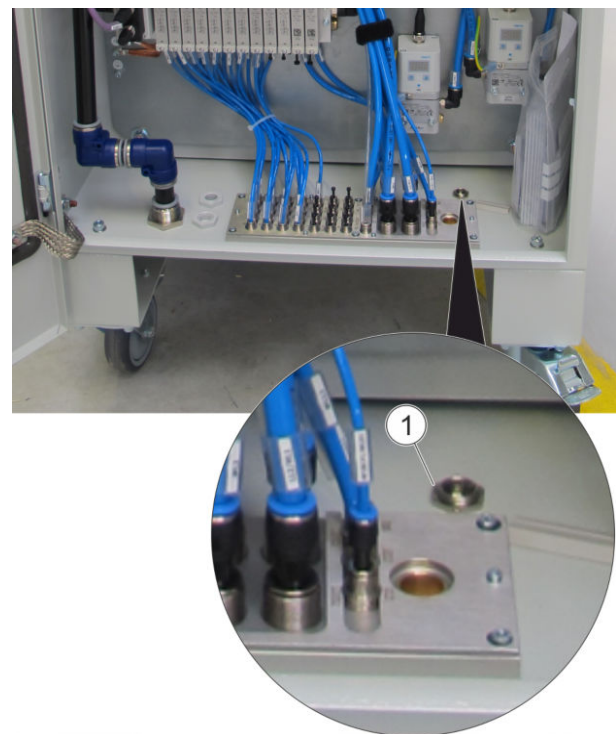


Fig. 17: Guide the EMC screw connection in the Control cabinet

5. high voltage cable with shielding braid through the EMC screw connection (1) in the Control cabinet from below.

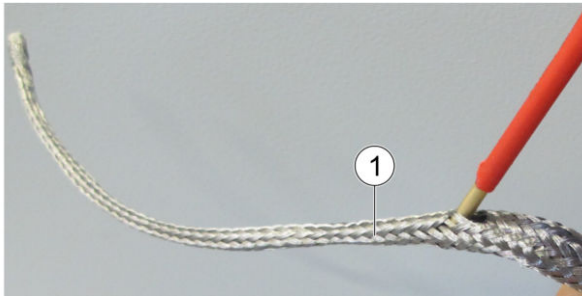



Fig. 18: Widening shielding braid

6.  Leave about 0.1 m free at one end of the cable.
Widen shielding braid (1) using a suitable tool.

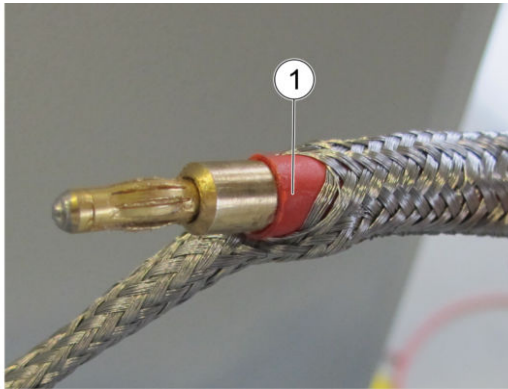


Fig. 19: High tension cable

7. Push high voltage cable (1) through the widened opening in the shielding braid.

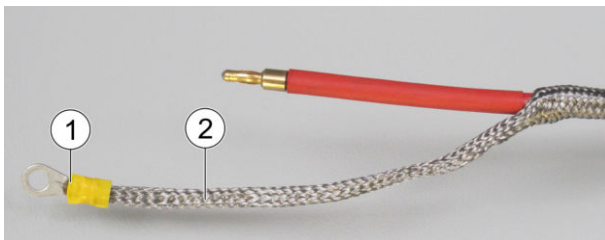



Fig. 20: Assembling ring shoe

8. Place ring shoe (1) on projecting end of the shielding braid (2).
9. Crimp ring shoe (1).

 For isolation, the connection of the high tension cable must be filled with technical petroleum jelly. Observe operating instructions of the high voltage supply.

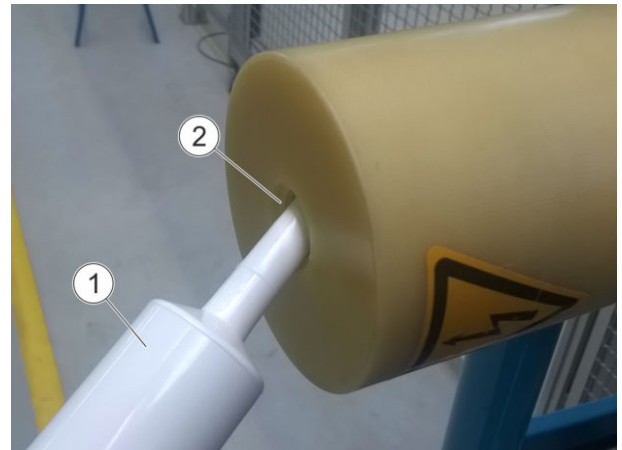


Fig. 21: Fill in petroleum jelly

10. Fill petroleum jelly (1) in the connection of the high voltage generator (2).

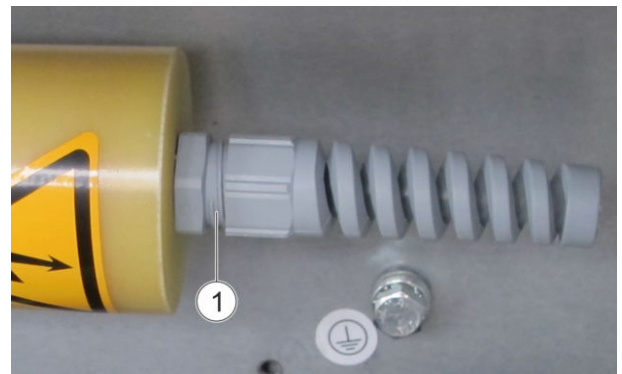



Fig. 22: High voltage generator and screw connection with bend protection.

11. Insert high voltage cable up to the mechanical stop in the high voltage generator (1).
12. Assemble and tighten cable relief with bend protection.
⇒ High voltage power cable can no longer be pulled out from the high voltage generator.

 Follow circuit diagrams for the connection of the shielding braid at the grounding point ↪ “Applicable documents” .

13. Slide washer, ring show and lock washer on the ground screw.

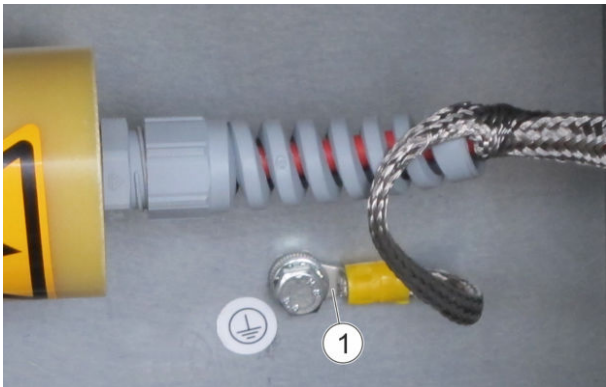


Fig. 23: Connecting the shielding braid

14. Firmly screw down ring shoe with shielding braid (1) to the grounding connection of the assembly plate.
 ⇒ Shielding braid of the high voltage cable is grounded.
15. Make an electrical check of the grounding of the shielding braid.
 Carry out check according to VDE 0100-600 or IEC 60364-6. Obtain measured values to be maintained from the standards.

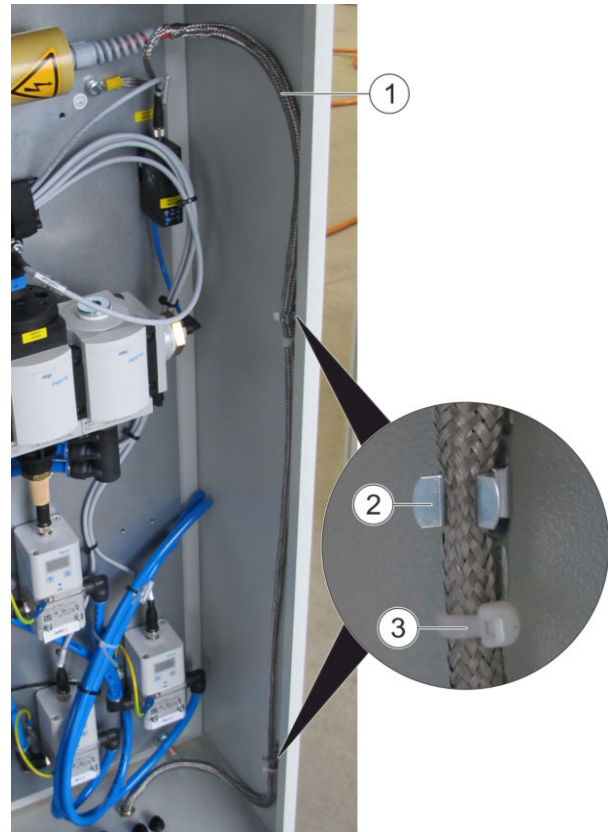



Fig. 24: Fastening the high voltage cable

16.  Follow circuit diagram for the traverse of the high tension cable ↘ “Applicable documents” .
 Lay high tension cable (1) in Control cabinet.
17. Press the high voltage cable (1) into the terminals (2) in Control cabinet.
18. Fix high voltage cable (1) using zip ties (3) on the terminals.
19. Clip off projecting remnants of the cable binder (3).

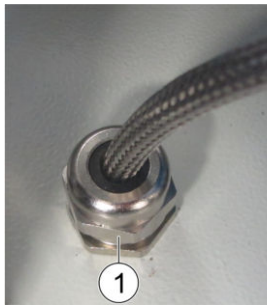


Fig. 25: EMC screw connection

20. Firmly tighten the EMC screw connection (1) onto the Control cabinet floor.



Fig. 26: High voltage generator cover

- 21. Place cover (2) on the high voltage generator.
- 22. Fix cover (2) on the assembly plate with four screws (1).

Grounding cable (3) is connected on the cover (2).

23. Close Control cabinet door.

5.5 Connecting

5.5.1 Overview of the connections

The connections and ducts are in the floor plate on the front side and rear side of the Control cabinet. Hoses and cables are connected from below to the respective plug connections.

All connections are identified at the respective connection in Control cabinet.

Connections/ducts - Front

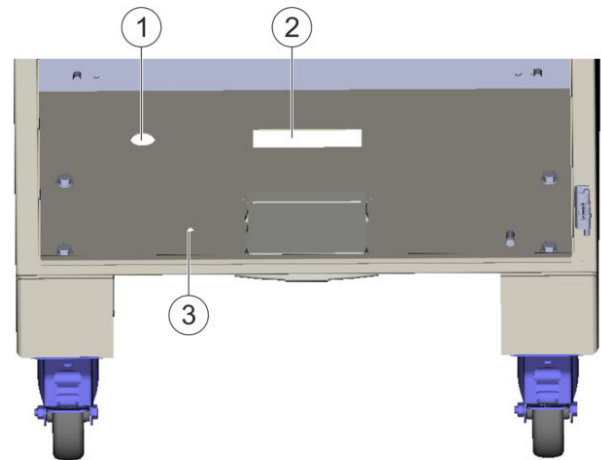


Fig. 27: Connections - Front

- 1 Feed connection
- 2 Customer cable duct
- 3 Grounding connection

Connections/ducts - Rear

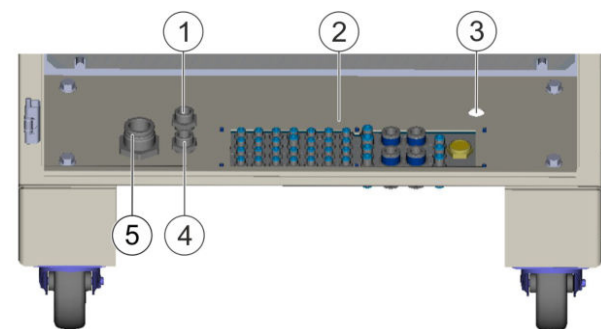


Fig. 28: Connections -Rear

- 1 R/O converter -FOC (fiber optic cable)
- 2 Connector plate
- 3 High voltage power cable duct - WHS
- 4 R/O converter -FOC
- 5 Main air - LV (Compressed air supply)

Connector plate

The hoses are connected from below to the connector plate.

Not all the connections of the connector plate are assigned, depending on the Control cabinet version.

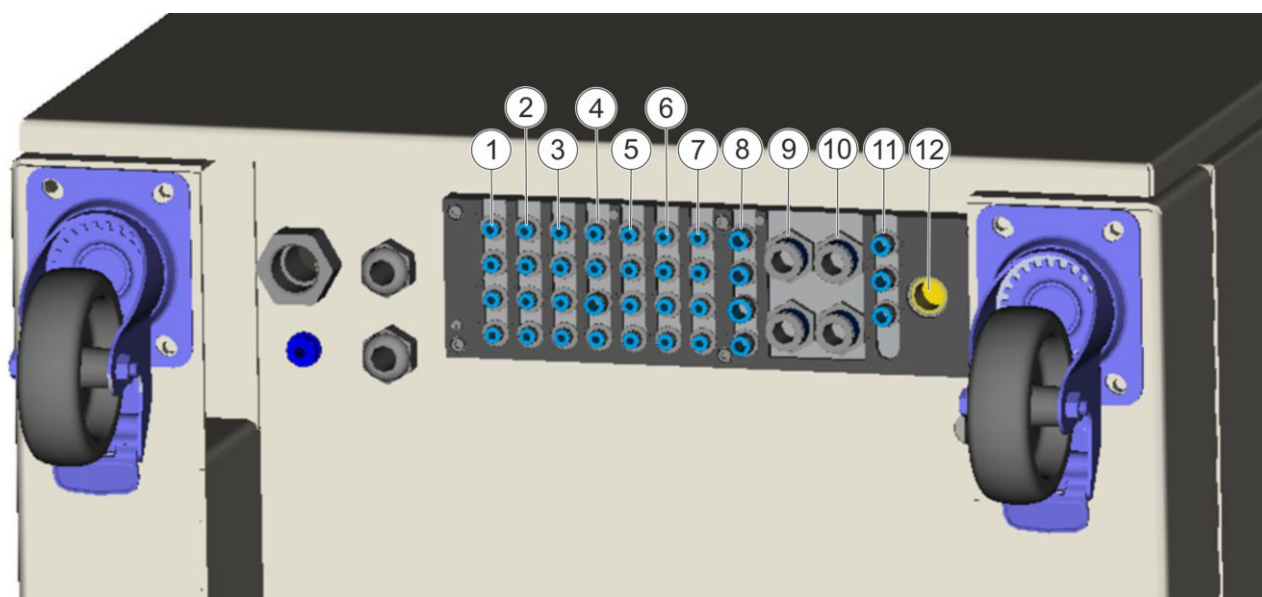


Fig. 29: Connector plate - View from below

Row 1 (Pos. 1)	Row 2 (Pos. 2)	Row 3 (Pos. 3)	Row 4 (Pos. 4)
Color 2 - YF2	Color 6 - YF6	Color 10 - YF10	Recirculation 1 - YRF1
Color 1 - YF1	Color 5 - YF5	Color 9 - YF9	Main needle 1 - YHN1
Pulsation air 1 - YPL1	Color 4 - YF4	Color 8 - YF8	Thinner 3 - YV3
Thinner 1 - YV1	Color 3 - YF3	Color 7 - YF7	-

Row 5 (Pos. 5)	Row 6 (Pos. 6)	Row 7 (Pos. 7)	Row 8 (Pos. 8)
Hardener 2 - YH2	Disengaging valve 1 Master lacquer - YFGV1/SL	Reserve - YRE	Condensation connection - KOA
Hardener 1 - YH1	Thinner 2/Hardener - YV2/H	Reserve - YRE	Main air - LVPL1
Thinner 1/Hardener - YV1/H	Disengaging valve 1/Hardener - YFGV1/H	Pulsation air 2 - YPL2	Brake 1 - YBR1
Short purge 1 - YKSL1	Hardener 3 - YH3	Thinner 2 - YV2	Shaft detent - YWAR1

Row 9 (Pos. 9)	Row 10 (Pos. 10)	Row 11 (Pos. 11)	Item 12
Motor air 2 - BML2	Shaping air 1/atomizer air - BLL1/BLZ1	Recirculation motor bearing air 1 -MLD1	-
-	-	Motor bearing air 1 - MLL1	Air outlet filter, sound muffler
Motor air 1 - BML1	Shaping air 2/horn air - BLL2/BHL1	Paint pressure regulator - BFDS	-

EcoPaintJet connector plate

Row 1 (Pos. 1)	Row 2 (Pos. 2)	Row 3 (Pos. 3)	Row 4 (Pos. 4)
Color 2 - YF2	Color 6 - YF6	Color 10 - YF10	Disposal - YRF1
Color 1 - YF1	Color 5 - YF5	Color 9 - YF9	Main needle - YHN1
Pulsation air 1 - YPL1	Color 4 - YF4	Color 8 - YF8	Thinner 3 - YV3
Thinner 1 - YV1	Color 3 - YF3	Color 7 - YF7	Bypass main paint - BY1

Row 5 (Pos. 5)	Row 6 (Pos. 6)	Row 7 (Pos. 7)	Row 8 (Pos. 8)
Hardener 2 - YH2	Disengaging valve 2 Main paint - YFGV1/SL	Bypass Hardener - YRE2	Condensation connection - KOA
Hardener 1 - YH1	Thinner 2/Hardener - YV2/H	Thinner 3 Hardener- YRE1	Thinner 2/Pulsating air 2- LV/PL1/PL4
Thinner 1/Hardener - YV1/H	Disengaging valve 2/Hardener - YFGV1/H	Pulsation air 2 - YPL4	Release 1 Hardener- YBR1
Disposal main paint - YRF1	Hardener 3 - YH3	Thinner 2 - YV4	Release 1 Main paint- YWAR1

Row 9 (Pos. 9)	Row 10 (Pos. 10)	Row 11 (Pos. 11)	Item 12
-	Paint pressure control Hardener - LL2/HL1	Disposal hardener - MLD1	-
-	-	-	Air outlet filter, sound muffler
-	Paint pressure control main paint - LL1/LZ1	-	-

5.5.2 Connect components



WARNING!

Laser class 2

Marked components emit a visible laser beam of the Class 2. Incidental brief exposure is not dangerous. Long exposure of the eye to laser beam can damage the eyes.

- Do not look into the laser beam.
- If the laser beam does hit your eye, close your eye immediately and avert your gaze.
- Pay attention to safety markings.



Connect electrical connections according to the circuit diagram ↗ “Applicable documents” .

Connect the following components to each other:

- Power cable and transducer lead cable of the dosing pump with the Control cabinet (only for versions with dosing pump (1DP and 2DP))
- speed sensor line (fiber optic cable) of the atomizer with the Control cabinet (only for versions with rotary atomizers (EC, DC and HRZ))

The control system expects four signal changes (bright/ dark) per turbine revolution

- Components required with Control cabinet
- Emergency stop safety circuit 2-channel on customer terminals
- External electrical signals (e.g. entry protection, emergency stop, fire protection system, high voltage warning lamp)
 - For versions with high voltage (rotary atomizer EC and DC): Delayed release for access doors based on discharge of residual energy with high voltage and run down of the rotary bell
- Cable (2x) for pressure sensor (only for versions with 2K process)
 - Copper cable (2x) for pressure sensors with Version 1DP
 - Copper cable (4x) for pressure sensors with Version 2DP

Signal of the pressure sensor must be reduced in power according to the relevant Ex zone

- Always via the ATEX isolation amplifier independent of EC or DC
- Hoses for control air
- Optional: Ethernet cable for the communication with the parent control system

5.5.3 Connect application devices



- Pay attention to the following documents:
- Circuit Diagram ↪ “Applicable documents”
 - Pneumatic hose system: Process procedure ↪ “Applicable documents”
 - Operating instructions of the application devices

Personnel:

- Electrician
- + additional qualification high tension technology

Protective equipment:

- Eye protection
- Use ear protection
- Protective workwear
- Protective gloves
- Safety boots

Requirements:

- Mains disconnecting device is switched off ↪ 7.3 “Switching off” .
- Compressed air supply is switched off and secured against being switched on again.
- Hose lengths are chosen according to the installation situation.
- For hose types, see ↪ “Applicable documents”
- Observe the bend radii of the hoses according to the installation situation.

1. Cut hose (9 x 12 transparent PFA) at a 90° angle using hose cutter (W12030001).



The description for a connection is by way of example.

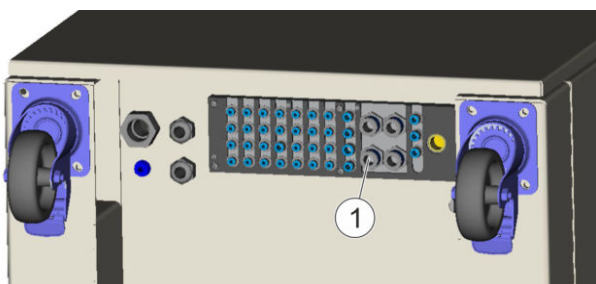


Fig. 30: Connector plate

2. Insert hose in the plug connection (1) from below up to the mechanical stop.
⇒ Hose engages audibly.

3.

! NOTICE!

Material damage due to wrong routing of hose

The hose traverse should be such that there is no tensile stress. Observe allowable bend radii of the hose.

4. Connect hose to the connection of the application device.

5.5.4 Grounding the Control Cabinet

Personnel:

- Electrician

Protective equipment:

- Protective workwear
- Protective gloves
- Safety boots

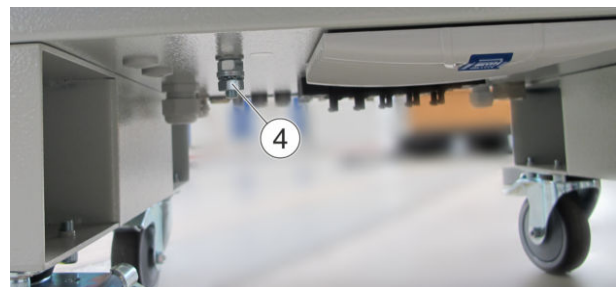


Fig. 31: Grounding bolts below Control cabinet

1. Clamp ground cable to ground bolt (1) below the Control cabinet.
⇒ The Control cabinet is grounded.



For further information, refer to circuit diagram ↪ “Applicable documents”

5.5.5 Connect compressed air supply

Personnel:

- Electrician
- + additional qualification high tension technology

Protective equipment:

- Eye protection
- Use ear protection
- Protective workwear
- Protective gloves
- Safety boots

Requirements:

- Compressed air quality meets the requirements ↪ 12.5 “Compressed air quality” .

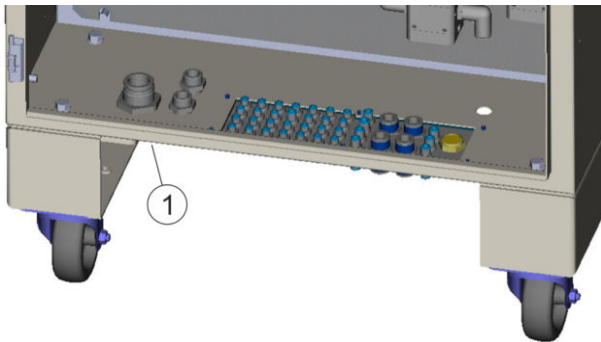


Fig. 32: Compressed air connection

1. Client to provide compressed air supply (1).

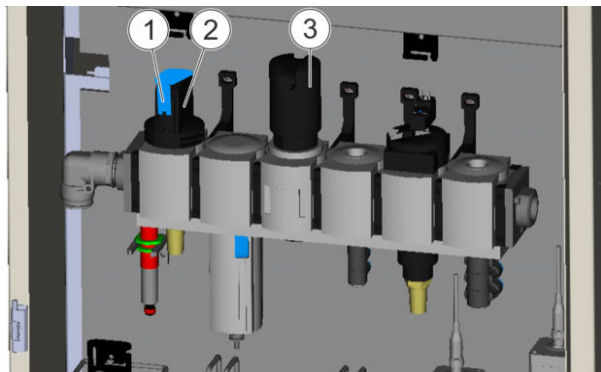


Fig. 33: Maintenance unit

2. Turn the pneumatic mains disconnecting device (2) counterclockwise.
 - ⇒ Plastic toggle (1) points in the direction of flow.
3. Dynamically set compressed air controller (3) to 6 bar ↪ 12.4 “Operating values” .
 - ⇒ Compressed air supply is connected and switched on.

5.5.6 Connecting Infeed

DANGER!

Voltage

Electrical voltage can be present on components and cables despite switched off supply voltage. There is the danger of electrical shock on contact with live components, which can cause death.

- Have only qualified electricians carry out work on the electrical components and cables.
- Prior to starting work, shut down the power supply and secure it personalized from being switched on again.
- Verify that no current is present on the electrical components and cables.
- Follow the circuit diagram.

Personnel:

- Electrician

Protective equipment:

- Eye protection
- Protective workwear
- Protective gloves
- Safety boots

Observe circuit diagram in the chapter “Connection for Feed and External” ↪ “Applicable documents” .

1. Pre-assemble connection line.
2. Connect the connecting cable.
3. Check and measure connection line.

5.5.7 External communication

Ethernet used as hardware and UDP (User Datagram Protocol) are available for communication with another control system.

1. Integrate the control system into the higher level control system as detailed in chapter ↪ “Interfaces - Binary” and ↪ “Interfaces - ASCII” .

6 Commissioning

6.1 Safety notes

DANGER!

Electrostatically charged plastic films and foils in potentially explosive areas

The foil and the product can charge electrostatically at the time of the unpacking. Electrostatic discharge can cause sparks that in explosive atmosphere can cause a fire or an explosion. Serious injury and death could be the consequence.

- Unpack product outside Ex zones.
- Discharge the product.
- Dispose packaging outside of the Ex zone in accordance with the regulation or store properly for a later return.

WARNING!

Inadequate grounding

Incorrect grounding of the control cabinet will cause an electrostatic charge to collect on the components. Electrostatic charges can trigger fires, electric shocks and EMC faults. Serious injuries or death can be the consequence.

- Check grounding.
- Observe maintenance intervals ↪ 10.3 “Maintenance schedule” .

WARNING!

Missing or bridged safety devices

If the control cabinet is put into operation with missing or bridged safety devices, the safety barriers (e.g. fire protection, entry protection) no longer function. Serious injury and death could be the consequence.

- Combine control cabinet with additional signals from safety-relevant parts of controls.

NOTICE!

Faulty connection of the compressed air supply

If the connection pressure is too low or too high, compressed air cannot be switched to the outlets.

- Check compressed air connection.
- Follow technical data ↪ 12.4 “Operating values” .

6.2 General notes

DANGER!

Not observing the five safety rules

Failure to observe and comply with the five safety rules will pose the danger of an electric shock on contact with live components. Serious injuries and death can be the consequence.

Follow the following five safety rule before all work on control cabinet:

- Disconnection
- Secure against reconnection.
- Ensure that there is no voltage present on any pole.
- Ground and short-circuit.
- Cover and screen off adjacent live parts.

6.3 Commissioning

6.3.1 General notes

Personnel:

- Electrician
- + additional qualification high tension technology

Protective equipment:

- Use ear protection
- Protective gloves
- Safety boots

Perform the following checks, among others:

- Additional signals from safety-relevant parts of controls are set up ↪ 2.3 “Safety devices” .
- Electrical connections in the control cabinet have correct and firm connections.
- Control cabinet is grounded.
- Compressed air supply is connected.
- Line voltage on high voltage transformer is set correctly. For configuration, see circuit diagram ↪ “Applicable documents” .
- Application devices are linked with the Control cabinet.
- Unused connections are blocked with blind plugs.
- Entry protection, possibly with bolt
- Delayed release of the booth access
- Set up and check safety switch off for high tension (switch off threshold). You will find the description in the standard EN 50176.
- Capacity measurement is carried out according to the documentation of the respective high tension supply (only for rotating atomizer EC and DC).
- See that all the hoses and lines laid are not buckled.
- Foreign bodies in Control cabinet are removed:
 - Chips
 - U-spacers
 - Screws
 - Cable remnants
 - Insulations
 - Pneumatic hoses
 - Tool etc.
- Brakes on the Control cabinet are secured.

6.3.2 Setting operating parameters

Personnel:

- System operator
- + additional qualification high tension technology

Protective equipment:

- Use ear protection
- Protective gloves
- Safety boots

1. Set operating parameters on touch display if necessary.
For further information, refer to ↪ 12.3 “Operating conditions” and ↪ 12.4 “Operating values”

7 Operation

7.1 Safety recommendations

Requirement for switching on:

- The operator must operate the Control cabinet with additional safety devices ↪ 2.3 “Safety devices” .
- The operator is responsible for the correct grounding of the Control cabinet.

DANGER!

Fire or injury from high voltage flashover

Defective components or insufficient distance to other conductors can cause high voltage flashovers. This can cause fires and serious injuries.

- Switch off high voltage over switch off thresholds.

WARNING!

Inadequate grounding

Incorrect grounding of the control cabinet will cause an electrostatic charge to collect on the components. Electrostatic charges can trigger fires, electric shocks and EMC faults. Serious injuries or death can be the consequence.

- Check grounding.
- Observe maintenance intervals ↪ 10.3 “Maintenance schedule” .

WARNING!

Missing or bridged safety devices

If the control cabinet is put into operation with missing or bridged safety devices, the safety barriers (e.g. fire protection, entry protection) no longer function. Serious injury and death could be the consequence.

- Combine control cabinet with additional signals from safety-relevant parts of controls.

WARNING!

Inadequate qualification

Wrong estimation of dangers can cause serious injury or death.

- Only sufficiently qualified persons may execute all work.
- Some work requires additional qualification. Additional qualifications of specialized personnel are marked with a “+”.

Follow process descriptions for actuation of the application ↪ “Applicable documents” .

7.2 Switching on

Personnel:

- System operator
- + additional qualification high tension technology

Protective equipment:

- Protective workwear
- Safety boots

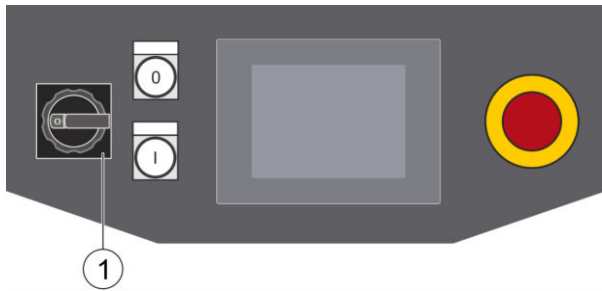


Fig. 34: Turn on power supply

1. Turn mains disconnecting device (1) to the right to the "I ON" position.
 - ⇒ Control cabinet is supplied with voltage. The SPS is started. [0] key lights up. Touch display switches on. When the SPS is started, the touch display connects with the SPS.

Error messages can first be acknowledged above User Level 1.

2. Acknowledge error messages when available:
 - Tap "Reset" on the operator interface. Error messages are acknowledged.

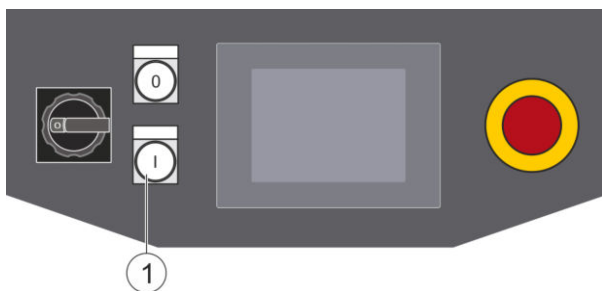


Fig. 35: Switching on process release

3. Press [I (1)] key.
 - ⇒ Process release is switched on. [I (1)] key lights up.

The [I (1)] does not light up for queued errors.

Only for versions with high voltage (EC, DC):

- If process release is switched on and high voltage is switched off, the [I(1)] key will flash.

7.3 Switching off

Personnel:

- System operator

Protective equipment:

- Protective workwear
- Safety boots

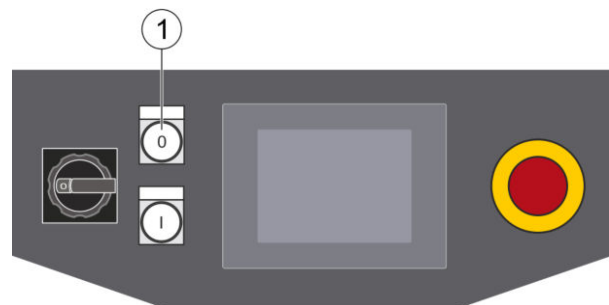


Fig. 36: Switch off process release

1. Press [0 (1)] key.
 - ⇒ Process release is switched off.

The turbine of the atomizer runs down (only for versions with rotary atomizers EC, DC and HRZ). Residual charge for versions with rotary atomizer EC and DC.

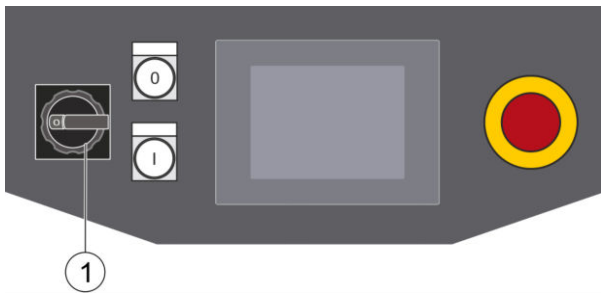


Fig. 37: Operating the mains disconnecting device

2. Turn mains disconnecting device (1) to the left into the “O OFF” position.
 ⇒ Power supply is disconnected on all phases.
 Touch display switches off.

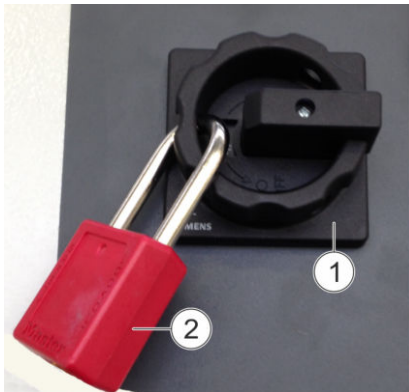


Fig. 38: Mains disconnecting device with padlock

3. Use a padlock (2) to secure mains disconnecting device (1) against reconnection.

7.4 Operating mode

The following operating modes are available:

- Manual
- Brush
- External brush

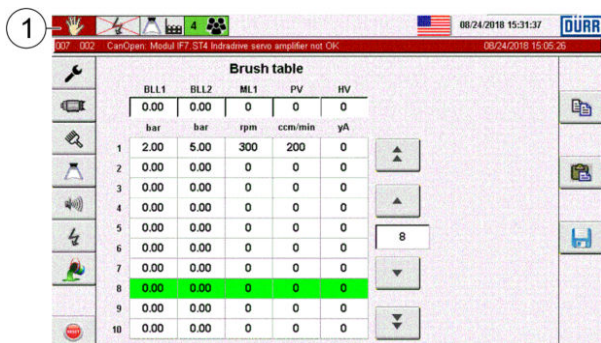


Fig. 39: Active operating mode

The active operating mode (1) is displayed in the header row.

“Manual” operating mode

The “Manual” operating mode is pre-set.

Process functions are manually and individually actuated via the visualizer.

- Actuate valves taking valid interlocks into consideration.
- Actuate process controller.
- Actuate dosing device.
- Control high voltage generator.
- Change nominal values for individual components (e.g. shaping air, turbine speed, high voltage, paint quantity, paint pressure).
- Start timer programs.

“Brush” operating mode

In the semi-automatic operating mode, the process controllers are connected automatically. The nominal values are taken from the “Brush” table and assigned to the individual components. Following functions are possible:

- Select and activate brush values.
- Start timer programs.
- Select color
- Start color change functions.

“External brush” operating mode

The parent control system sends control commands. Following functions are possible:

- Select brush records from the brush table.
- Switching main needle on and off
- Start timer programs.
- Synchronize date and clock time.

Status

The background color of the symbol displays the status of the operating mode.

Symbol	Color	Status
	Green	System is switched on and ready for operation.
	Gray	System is switched off.
	Red	Fault in the system

Switching “Brush” operating mode on and off

1. Tap symbol in the header row.
⇒ A sub-window opens.

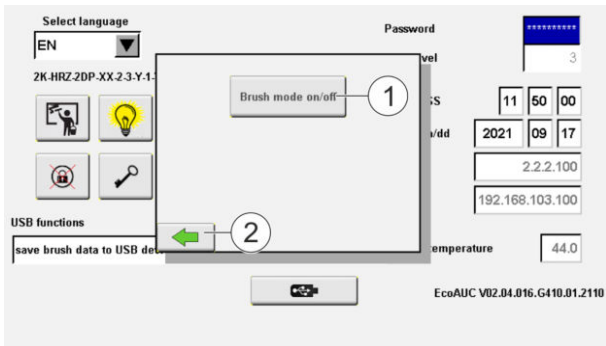


Fig. 40: “Brush” operating mode

2. Tap button (1).
⇒ “Brush” operating mode is switched on.
The button has a green border.
3. Tap button (1) again.
⇒ “Brush” operating mode is switched off.
“Manual” operating mode is enabled again.
4. Exit the window again using the button (2).

Switching “External brush” operating mode on and off

Requirements:

- “Brush” operating mode (1) is switched on.

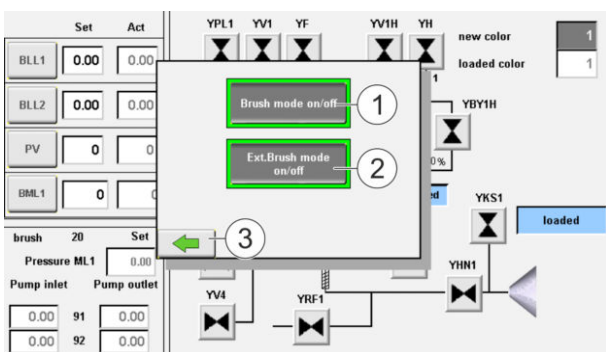


Fig. 41: “External brush” operating mode

1. Tap button (2).
⇒ “External brush” operating mode is switched on.
The button has a green border.
2. Tap button (2) again.

⇒ “External brush” operating mode is switched off.
The button is gray.

3. Exit the window again using the button (3).

8 Visualizer

8.1 Operator Interface

8.1.1 Overview

The operator interface is divided into three areas:

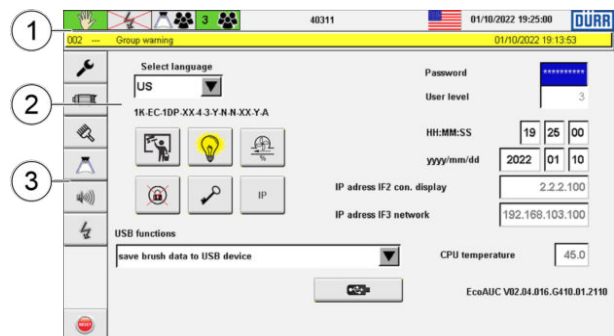


Fig. 42: Operator interface

- 1 Header row
- 2 Work area
- 3 Menu bar

8.1.2 Header row

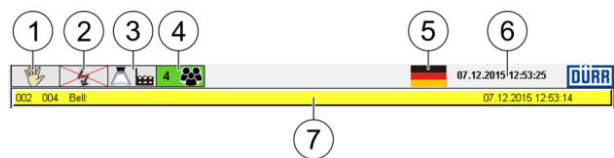


Fig. 43: Header row

- 1 Display and select operating modes
- 2 High voltage status display
- 3 Timer program source
- 4 User level
- 5 Language
- 6 Date and clock time
- 7 Alarm notification line

Timer programs

Symbol	Meaning
	Pre-defined standard timer programs are active (factory setting).
	User-defined timer programs are active.

User level

Symbol	Meaning
0	No user is active.
3	User level 3 is active. User level 1 to 3 are available.

8.1.3 Work area

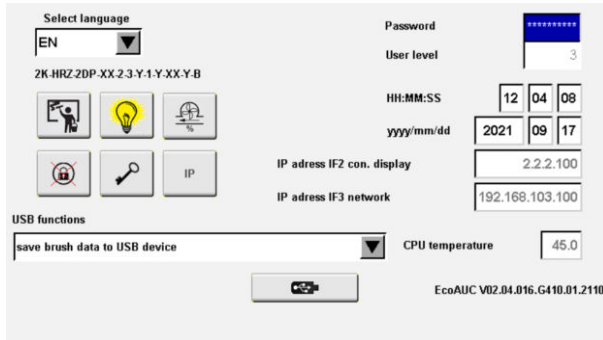


Fig. 44: Work area

The working area shows the buttons and functions of the selected menu.

Other buttons

Button	Meaning
	Confirm input.
	Cancel entry.
	Cancel entry and exit window.

8.1.4 Menu bar



Fig. 45: Menu bar

- 1 System settings
- 2 Atomizer
- 3 Brush
- 4 Timer programs
- 5 Alarms
- 6 High voltage
- 7 Color configuration (optional)
- 8 Acknowledge messages

8.2 System settings

8.2.1 Overview

The "System settings" menu appears as Start menu after switching on the Control cabinet, or it can be opened by using the button.

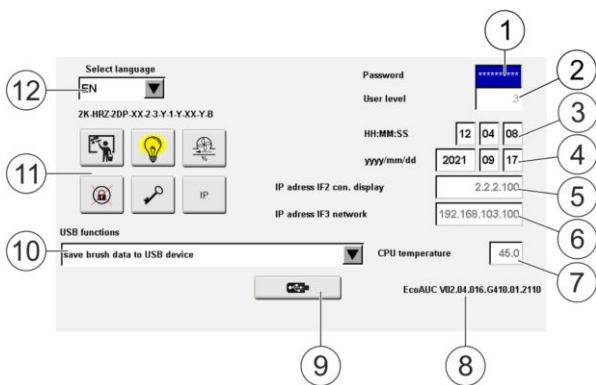


Fig. 46: System settings

- 1 Log in
- 2 Display user level
- 3 Set clock time
- 4 Setting the date
- 5 IP address of the current operator interface
- 6 IP address of the network
- 7 Display CPU temperature
- 8 Display version
- 9 Confirmation button for selection of the USB functions
- 10 USB functions
- 11 User-dependent buttons
- 12 Set language

User-dependent buttons



Fig. 47: User-dependent buttons

- 1 Clean screen
- 2 Lamp test
- 3 Station settings
- 4 Change IP address and port number
- 5 Change password
- 6 Reset password

8.2.2 Screen cleaning

Personnel:

- System operator

1. Open the “Clear screen” menu using the button.
 ⇒ The screen is locked for 15 seconds.
 All button functions are deactivated.



Fig. 48: Clean screen

2. Clean the screen with a lint-free cloth and suitable cleaning agent ↪ 12.7 “Operating and auxiliary materials” .

8.2.3 Lamp test

Personnel:

- System operator

1. Activate the lamp test using the button.
 ⇒ The lamps of the [I] and [O] illuminated push buttons light up for 5 seconds.
2. Replace defective lighting modules ↪ 10.4.3 “Replacing illuminated push button” .

8.2.4 Station settings

Personnel:

- System operator

1. Open “Station settings” menu using the button.

Change hose length



Only for versions with 2K process

Personnel:

- System operator

Main channel hose length:

- In the case of 2K stations, enter the exact hose length between mixer and atomizer. The parameter is important for the pot time monitoring of the 2K components.

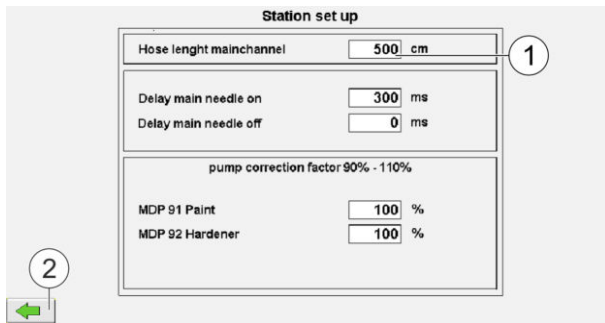


Fig. 49: Change hose length

- Tap field (1).
⇒ The input window opens.
- Enter hose length in cm.
The input area is max. 1000cm.
- Confirm hose length in the input window.
- Exit the menu again using the button (2).

Main needle - Synchronization of the dosing pump

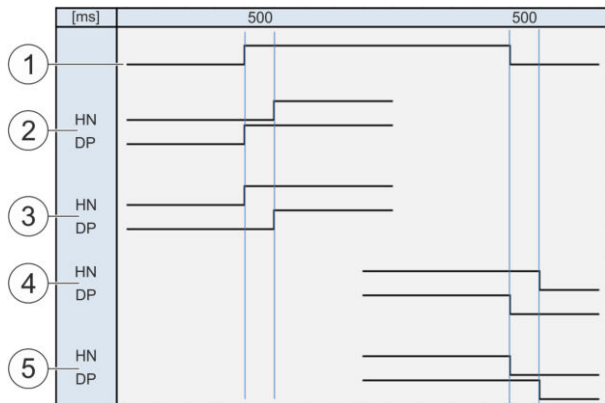


Fig. 50: Chart

HN Main needle

DP Dosing pump

- Trigger HN robot
- HN-OnDelay +500
- HN-OnDelay -500
- HN-OffDelay +500
- HN-OffDelay -500

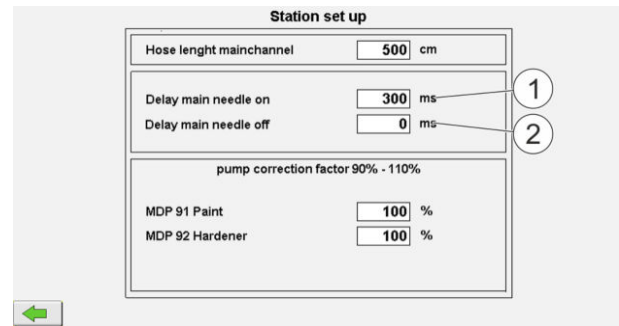


Fig. 51: Main needle - Synchronization of the dosing pump

- OnDelay Main needle/Dosing Pump
- OnDelay Main needle/Dosing Pump
 - OnDelay Main needle/Dosing Pump
 - +500 ms: Main needle switches off 500ms after dosing pump.
 - +500 ms: Dosing pump switches 500ms after main needle.
 - OnDelay Main needle/Dosing Pump
 - +500 ms: Main needle switches off 500 ms after dosing pump.

Change pump factor

User level 3 required

Personnel:

- System operator

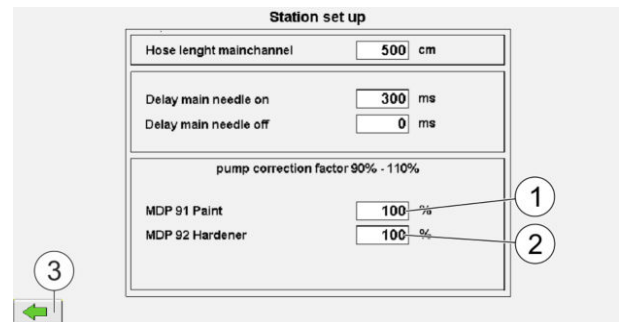


Fig. 52: Change pump factor

- Tap field (1).
⇒ The input window opens.
- Enter pump factor.
The valid input range is between 90% - 110%.
- Confirm pump factor in the input window.
- Exit the menu again using the button (3).

The MDP 92 hardener field (2) is available only for variants with process 2K.

8.2.5 IP address and port number

User level 3 and “External brush” operating mode required

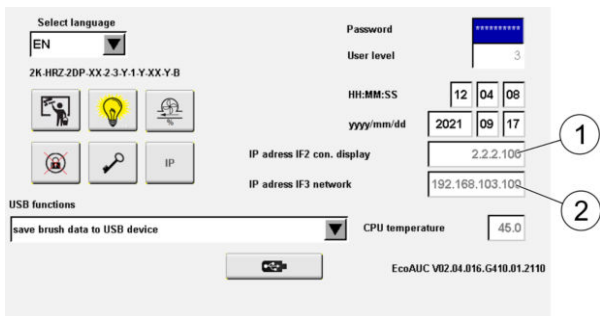


Fig. 53: IP addresses

The field (1) shows the IP address of the IF 2 interface of the control system. The screen is connected to the control system through this IP address. The IP address of the IF 2 interface cannot be changed.

The field (2) shows the IP address of the interface IF3 of the control system. The control system is integrated in a network through this IP address.

Personnel:

- System operator

- Open the IP settings menu with the button

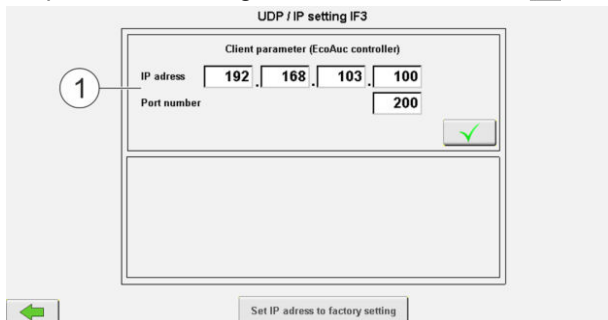


Fig. 54: IP settings

- Display of IP address and port number of Control cabinet

Change IP address and port number

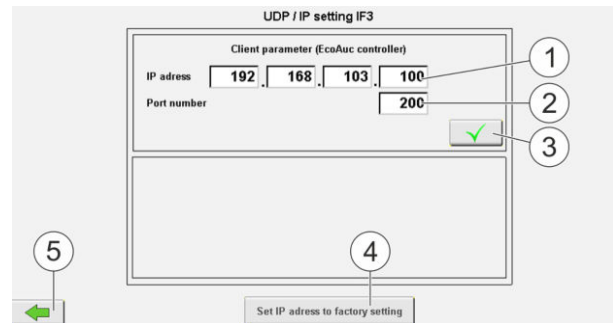


Fig. 55: Change IP address and port number

- Tap field (1). Enter new IP address.
- Confirm input (3).
⇒ The new value is stored.
- Tap field (2). Enter new port number.
- Confirm input (3).
⇒ The new value is stored.
- Exit the menu again using the button (5).

Reset IP address

- Tap field (4).
⇒ The IP address of the interface IF3 is reset to the factory settings.

The subnet mask is predefined: 255.255.255.0
The IP address of the external control and of the **EcoAUC-Control** cabinet must be in the same sub-network.
The IP addresses of the interfaces IF2 and IF3 must not be in the same sub-network.

8.2.6 Change password

Personnel:

- System operator

User level 3 required

- Open the "Change password" menu using the button.



Fig. 56: Change password

- Tap field (1) and enter user level.
- Tap field (2) and enter current password.
- Tap field (3) and enter new password.
- Tap field (4) and enter new password again.
- Tap button (5).
⇒ The changes are confirmed.
- Exit the window again using the button (6).

8.2.7 Reset password

Personnel:

- System operator

User level 3 required

- Open "Reset password" menu using the button.

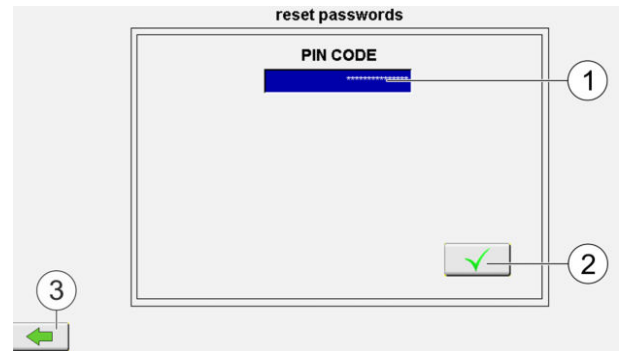


Fig. 57: Reset password

- Tap field (1).
- Tap button (2).
⇒ The passwords are reset to factory settings.
- Exit the window again using the button (3).

8.2.8 Log on and Log off

Personnel:

- System operator

Log in



Fig. 58: Work area with screen keypad

- Tap field (1).
- Enter the password for the user level using the on-screen keyboard (2).
- Confirm password entry using button (3).
⇒ The current user level is displayed through the field (1).

Log off

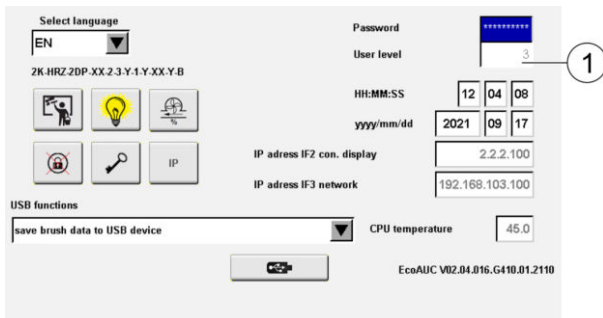


Fig. 59: Work area

1. Tap field (1).
⇒ The user level is reset to "0".

8.2.9 Setting Date and Clock Time

Personnel:

- System operator

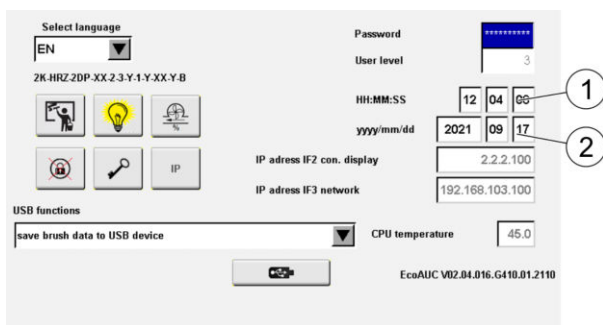


Fig. 60: Set date and clock time

1. Tap field (1).
⇒ The input window is opened.
2. Enter and confirm clock time.
3. Tap field (2).
⇒ The input window is opened.
4. Enter and confirm date.

8.2.10 Set language

Personnel:

- System operator

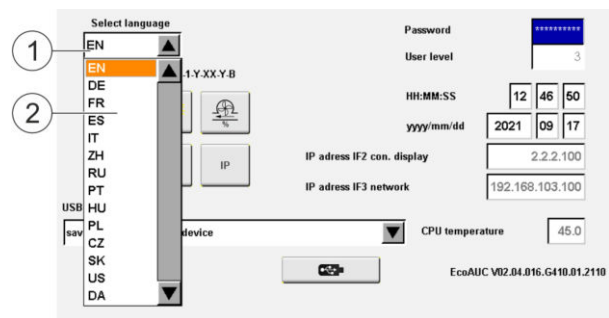


Fig. 61: Set language

1. Tap field (1).
⇒ The dropdown list opens.
2. Tap the desired language in the dropdown list (2).
⇒ The language is reset.

8.2.11 USB functions

The following data can be saved on a USB stick through the "USB Functions" drop down menu, or transferred from a USB stick to the control system:

- Brush data
- Configuration data of the station
- Color configuration table (only present for versions with 2K process)
- Timer programs

Back up data regularly onto a USB stick.

Personnel:

- System operator

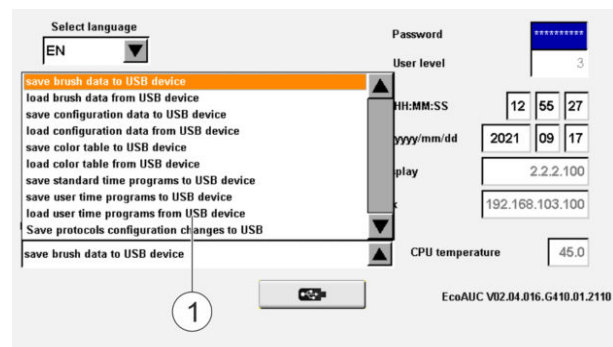


Fig. 62: USB functions

1. Select the desired function (1) in the drop down menu.

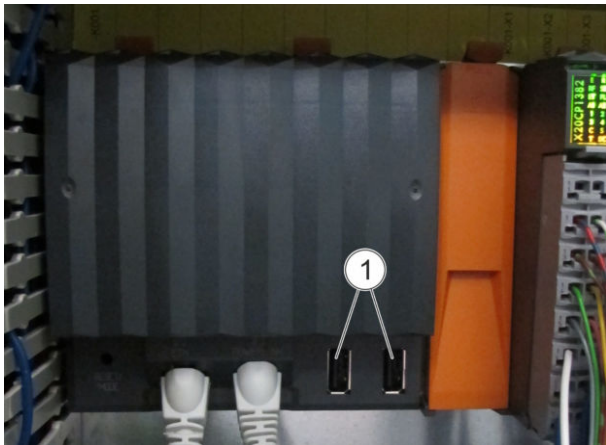




Fig. 63: USB port in the Control cabinet

2. Insert USB data carrier into USB port (1) in Control cabinet.
3. Enable selection using the  button.
⇒ Data are saved or loaded.

 The “Back up/load color configuration table onto USB stick” function is only available for versions with 2K process. For versions with 1K process, the color number = Valve number.

8.3 Atomizer

8.3.1 Overview

Personnel:

- System operator

1. Open the “Atomizer” menu using the  button.

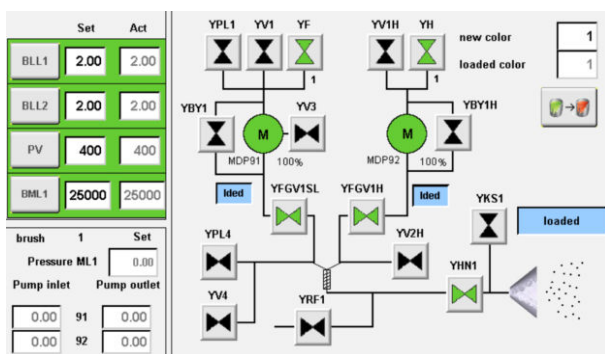


Fig. 64: “Atomizer” menu

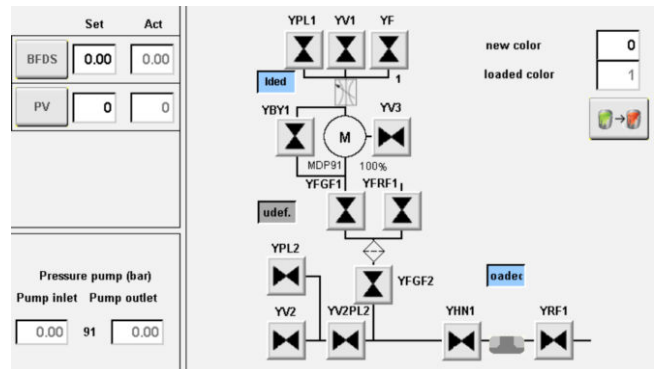


Fig. 65: Atomizer” menu”, Versions 1K PJ

The menu displays status, nominal values and actual values of the following components:

- Valves Y...
- Pressure controller BLL1/BLL2 and ZL/HL
- Dosing pump FM and paint pressure regulator
- Speed regulator BML1

In the “Manual” operating mode, the components are separately actuated.

8.3.2 Valves

Meaning of abbreviations:

- YBY1 - Bypass valve main paint
- YF - Paint valve
- YHN1 - Main valve needle
- YKS - Short purge valve for cleaning the rotary bell.
- YPL1 - Pulsation air valve
- YRF1 - Recirculation valve (optional)
- YV3 - Thinner valve 3
- YV1 - Thinner valve 1
- YWAR1 - Valve for shaft detent

Only valid for versions with 2K process:

- YH - Hardener valves 1-3
- YFGV1H - Disengaging valve hardener
- YFGV1SL - Disengaging valve Main paint
- YPL4 - Pulsation air 4 for Main channel (mixed)
- YV4 - Thinner valve 4
- YV1H - Thinner valve 1 Hardener
- YV2H - Thinner valve 2 Hardener

Meaning of abbreviations for versions with 1K PJ process:

- YBY1 - Bypass valve main paint
- YF - Paint valve
- YHN1 - Main valve needle
- YFRF1 - Disposal valve Main paint
- YPL - Pulsation air valve
- YRF1 - Disposal valve
- YV - Thinner valve
- YFGF1 - Disengaging valve Main paint
- YFGF2 - Disengaging valve 2 Main paint
- YV2PL2 - Disengaging valve purge cycle

Status display

Symbol	Meaning
	Valve is closed.
	Valve is opened.

Actuate valves manually

Personnel:

- System operator

Requirements:

- Control cabinet is switched on.
 - "Manual" operating mode is enabled.
 - No fault is present.
1. Open or close valve manually:
 - Tap button of the desired valve on the operator interface.

Valve locks

Requirement	Work instructions
Turbine speed "ML1" is available.	Open main needle valve "YHN1".
Turbine speed "ML1" is switched on.	Open short purge valve "YKS".
Color change status "loaded"	Open paint valves: The paint valve corresponding to the number of the loaded color opens.
Main needle valve "HN" is opened.	Actuate paint quantity "FM".

- The valves YPL1, YV1 and YF1-10 are locked against each other.

Additional valve interlocks (only valid for versions with 2K process)

Requirement	Work instructions
Color change channels Hardener, master paint and main channel display the "Loaded" status.	Open the YFGV1SL and YFGV1H channel release valves.
Color change channel displays the "loaded" status.	Open paint valves YH1-3 and YF1-10.
Color change status "loaded"	Open hardener valves and master paint valves: The valves are opened corresponding to the number of the loaded paint. See color configuration table ↪ 8.8 "2K color configuration".

- The valves YPL4, YV4 and YV2H are locked against each other.
- The valves YV1H and YH1-3 are locked against each other.

Additional valve interlocks (only valid for versions with 1K PJ process)

Requirement	Work instructions
Color change channels Hardener, master paint filter and main channel display the “Loaded” status.	Open the YFGF1 and YFGF2 channel release valves.
Color change channel displays the “loaded” status.	Open paint valve YF1-10.
Color change status “loaded”	Open master paint valves: The paint valve corresponding to the number of the loaded color opens.

- The valves YV2PL2 and YFGF1 are locked against each other.

Definition of the color change channels

Only valid for versions with 2K process

- The paint channel is a part of the color change system which contains the master paint components.
- The hardener channel is a part of the color change system which contains the hardener component.
- The main channel is part of the color change system that can contain 2K material.

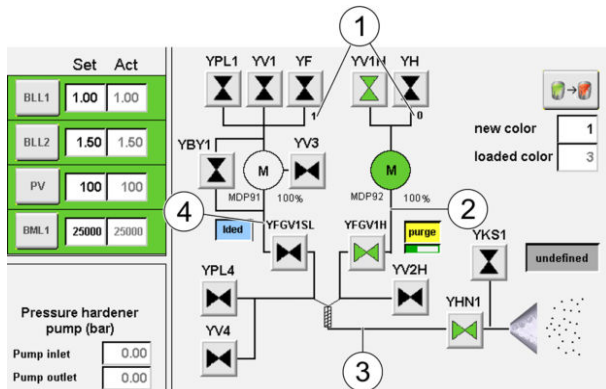


Fig. 66: Definition of the color change channels

- 1 Valve number of the actuated paint valves/hardener valves
- 2 Hardener channel
- 3 Main channel
- 4 Paint channel

Definition of the color change channels

Only valid for versions with 1K PJ process

- The paint channel is a part of the color change system which contains the master paint components.
- The paint filter channel is part of the color change system that contains the master paint components.
- The main channel is part of the color change system that can contain 1K-material.

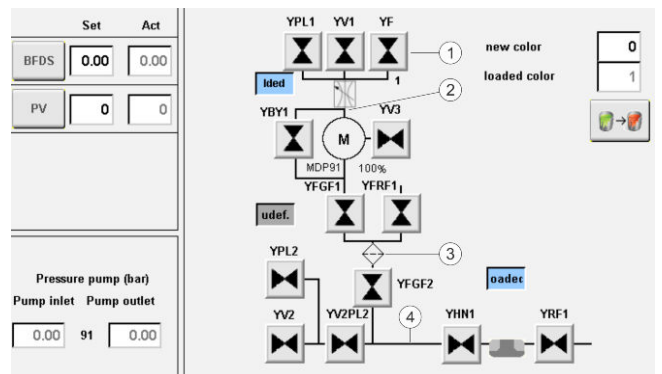


Fig. 67: Definition of the color change channels

- 1 Valve number of the actuated paint valves/hardener valves
- 2 Paint channel
- 3 Paint filter channel
- 4 Main channel

8.3.3 Process components

	Set	Act
BLL1	1.00	1.00
BLL2	1.50	1.50
PV	100	100
BML1	25000	25000

Fig. 68: Nominal values and actual values

Status, nominal values and actual values of the process components are displayed on the left side of the atomizer menu.

Meaning of abbreviations:

- BLL1/Z - Pressure controller for shaping air 1 / atomizer air
L Value range 0 to 6bar
- BLL2/H - Pressure controller for shaping air 2 / horn air
L Value range 0 to 6bar
- FM - Paint quantity of the dosing pump
Value range 0 to 600 ml/min or 0 to 100%
- BML1 - Pressure controller for controlling the turbine speed
Nominal value input 0 - 70000rpm
Nominal value of speed is converted to a nominal pressure value through software regulator.

Status display

Color	Meaning
Gray	Component is not switched on.
Green	Component is switched on and ready for operation.
Yellow	Nominal value deviation and actual value deviation within the tolerance time.
Red	Nominal value deviation and actual value deviation are too high. A fault is present.

Manually actuate process components

Personnel:

- System operator

Requirements:

- Control cabinet is switched on.
- "Manual" operating mode is enabled.
- No fault is present.

Switch on process components:

1. Tap the button of the desired process component e.g. .
⇒ The process component is switched on.

Switch off process components:

1. Tap the button of the desired process component e.g. .
⇒ The process component is switched off.

Nominal value input in "Manual" operating mode

Personnel:

- System operator

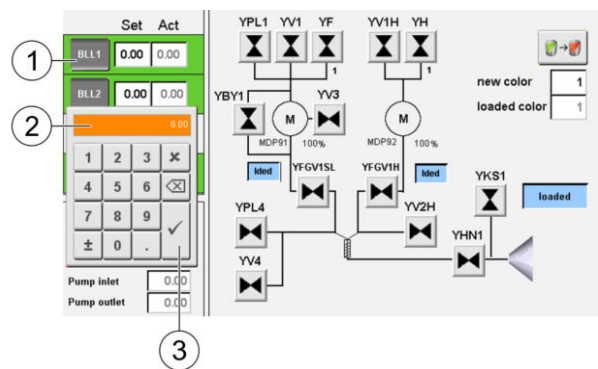


Fig. 69: Nominal value input in "Manual" operating mode

1. Tap the desired nominal value (1).
2. Enter new nominal value (2) in the input window.
3. Confirm input (3).
⇒ Nominal value is verified for its limits. If exceeded, the maximum value is set automatically.

8.3.4 Color changer

Status display

Display	Meaning	Requirement
"undefined"	Color changer is not purged and not loaded.	The status is displayed in the following cases: <ul style="list-style-type: none"> The currently running timer program was canceled due to an error. Thinner or pulsation air valve was manually opened in loaded or purged state.
"purged"	Color changer has been purged.	If the "Purge" timer program was ended without error, this status is displayed.
"loaded"	Color Changer is loaded with a color.	If the "Load" timer program was ended without error, this status is displayed.
"Purge"	"Purge" timer program is active. The complete system is purged.	-
"Load"	"Load" timer program is active. The system is filled with paint.	-
"Short purge"	"Short purge" timer program is active. Rotary bell is cleaned.	The timer program has no influence on the statuses "Charged", "Purged" and "undefined". The status of the timer program is the same when starting or ending.

Start color change

Personnel:

- System operator

Requirements:

- Control cabinet is switched on.
- "Manual" or "Brush" operating mode is enabled.
- No fault is present.



Fig. 70: Start color change

- Tap field (2).
- Enter the desired color number in the input window.
- Confirm input.

⇒ Color number is displayed next to the "New color" (2) field.

- Tap field (1).
 - ⇒ Color change starts.

Corresponding timer programs are started depending on the status of the color changer:

- If the color change status is "Loaded" or "Undefined", the "Purge" program starts. When purging ends, the "Load" timer program starts automatically. Sequence:
 - "Loaded"/"Undefined" - "Purge" - "Purged" - "Load" - "Loaded"
- If the color change status is "Purged", the "Charge" timer program starts. Sequence:
 - "purged" - "load" - "loaded"
- When the "Load" timer program ends, the color change status is set to "Loaded". The field "loaded Color" (3) displays the currently loaded color.

8.3.5 Shaft detent

The turbine shaft must be locked in order to disassemble the rotary bell.

Requirements:

- Control cabinet is switched off.
- "Manual" operating mode is enabled.
- Turbine speed "ML1" is not activated.
- Turbine speed is not higher than 3000 RPM.

Switching on

Personnel:

- System operator

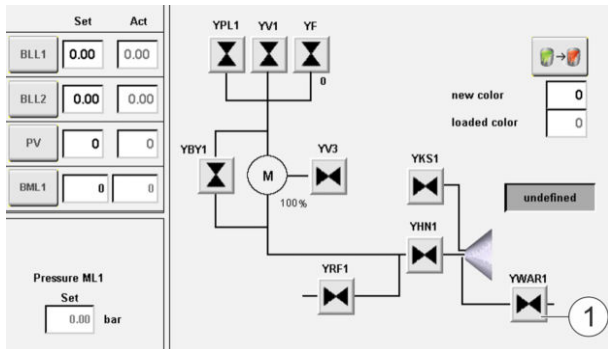


Fig. 71: Switch on shaft detent

1. If the requirements are met, the button (1) is visible.

Tap button (1).

- ⇒ The valve switches after 30 seconds. The symbol is displayed during this period.
- Shaft detent is switched on. The symbol is displayed.

Switching off

Personnel:

- System operator

It is not possible to control the turbine rotary speed with shaft detent switched on.

There are two options for switching off the shaft detent:

- Tap "YWAR1" on the touch display.
- Switch on [I] key on the operator panel.

Tap button "YWAR1":

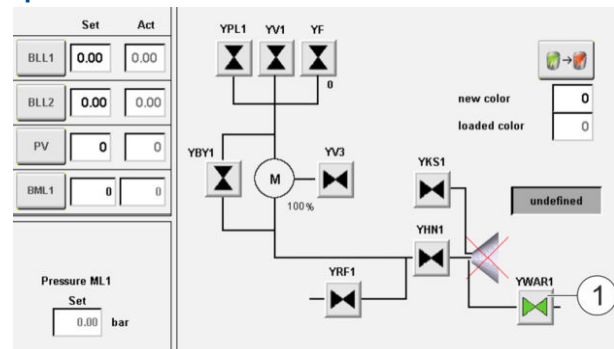


Fig. 72: Switch off shaft detent

1. Tap button (1).
 - ⇒ The symbol is displayed.
 - Shaft detent is switched off.

Switch on [I] key on the operator panel:

2. Press [I] key on the operator panel.
 - ⇒ Shaft detent is switched off.

8.4 Brush

8.4.1 Overview

A brush record collects the process nominal values that are needed for a painting process:

- Shaping air 1 and 2
- Turbine speed
- Paint quantity
- Paint pressure
- High voltage

Two additional buttons are enabled in the "Brush" menu:

- Manage brush parameters
- Interface for external control

8.4.2 Select brush record

In “Brush” operating mode



Fig. 73: Brush record

- 1 Brush process nominal values
- 2 Input field
- 3 Manage brush parameters
- 4 Interface for external control
- 5 Confirmation button
- 6 Actuate main needle HN1
- 7 Display of paint quantity of the dosing pump (only for versions with 2K process)

Personnel:

- System operator

Requirements:

- “Brush” operating mode is enabled ↪ 7.4 “Operating mode” .

1. Open the “Brush” menu using the button.
2. Enter Brush record in the input field (2).
3. Enable brush record (5).
4. Engage or disengage main needle during ongoing operation (6).

During ongoing operation, only the main needle “HN1” can be manually controlled. This is not possible with any other process controllers and valves.

In “External brush” operating mode

Requirements:

- “External brush” operating mode is enabled ↪ 7.4 “Operating mode” .

Selection of a brush record and actuation of the main needle are executed in the “External brush” operating mode via the interface to the parent control system. Drop down menu and “HN1” button are hidden in the “External brush” operating mode.

8.4.3 Manage brush parameters

Parameterization of a brush record can be performed in any operating mode.

Save brush record

500 brush records can be defined in the “Manage brush parameters” menu.

Personnel:

- System operator

1. Open the “Manage brush parameters” menu using the button.

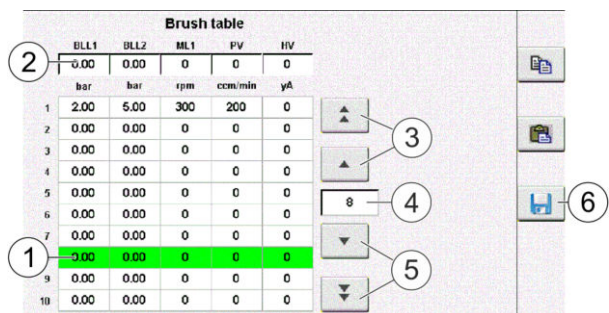


Fig. 74: Manage brush parameters

2. Select brush record:
 - Variant 1:
 - Using arrow keys (3) or (5).
 - Variant 2:
 - Direct selection of the brush number via the field (4)
3. Tap brush record in the table.
 - ⇒ The selected brush record has a green background (1).
 - The brush record is displayed in a separate line (2).
4. Tap the desired field in the row (2).
 - ⇒ Input window opens.
5. Change and confirm values.
6. Save record (6).
 - ⇒ Values are incorporated in the Brush table and stored on the Flash card of the control system.

The “Brush” table shows 500 data records. Maximum 500 brush records can be parameterized.

Brush 20 is a system brush and cannot be edited. If no other brush is created or selected, Brush 20 is selected.

Special function of the brush number 19

If the brush number 19 was selected in the “External brush operation” by means of the external control system, the corresponding nominal values of the internal Brush table are not activated. The nominal values are specified directly through the interface of the external control system.

The function can be used to manage the brush data in the external control system.

Copying brush record

Personnel:

- System operator

- Select brush record in the table by tapping.
- Tap button.
⇒ Brush record is copied.
- Tap new brush record
- Tap button.
⇒ The copied brush record is copied in the selected brush record.

8.4.4 Interface for external control

Personnel:

- System operator

- Open the “Interface for external control” menu using the button.

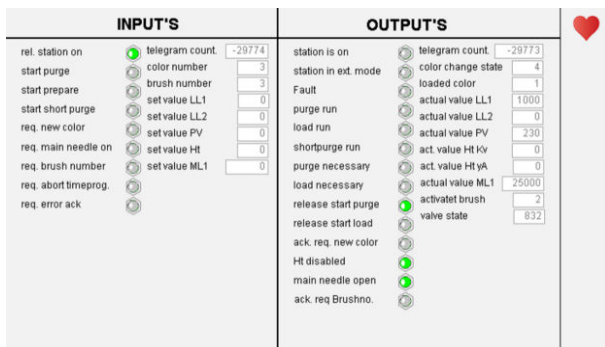


Fig. 75: Interface for external control

The menu shows the entries and outlets.

8.5 Timer programs

8.5.1 Overview

Timer programs for 1K process:

- Purge
- Short purge (not available for 1K Gun process)
- Load
- Volumetric measurement

Timer programs for 2K process:

- Purge or load Main channel.
- Purge or load paint channel.
- Purge or load hardener channel.
- Short purge (not available for 2K Gun process)
- Volumetric measurement mixed, master paint or hardener

Timer programs for PJ process:

- Purge or load main channel.
- Purge or load paint channel.
- Purge or load paint filter.
- Volumetric measurement

The pre-installed timer programs relate to a certain test structure. The timer programs must be suitably adjusted for the installation and possibly for the paint properties.

8.5.2 Switching on and canceling timer program

Switch on timer program

Personnel:

- System operator

If the number of the paint to be loaded is entered in the input field “New paint”, the “Load” timer program can be started. The status of the color changer must be “Purged”.

The timer programs “Purge” and “Short purge” can be started independently of the status of the color changer.

Requirements:

- Control cabinet is switched on.
- “Manual” or “Brush” operating mode is selected.
- No fault is present.

1. Open the “Timer programs” menu with the button.

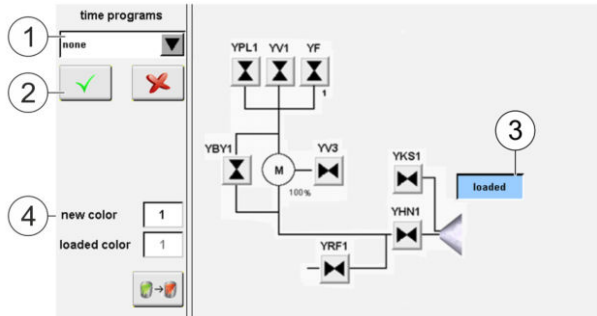


Fig. 76: 1K timer programs

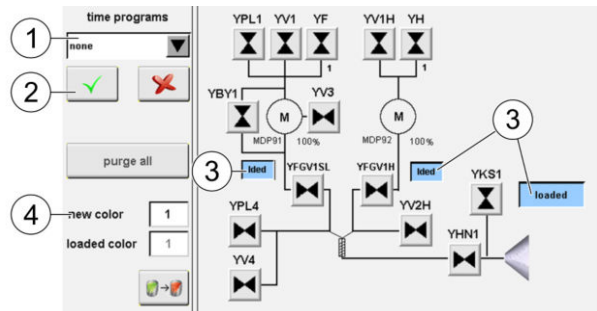


Fig. 77: 2K timer programs

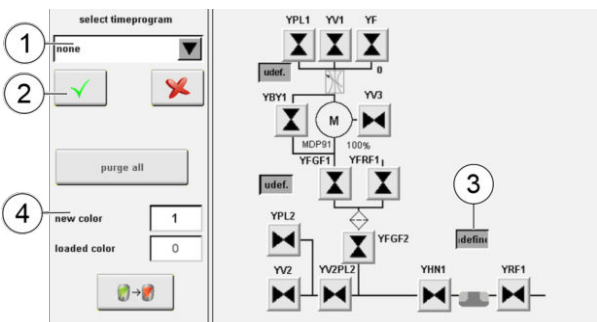


Fig. 78: PJ timer programs

2. Select timer program in the drop-down menu (1).
3. Tap button (2).
⇒ Timer program is confirmed and started.

Field (3) displays the status of the timer program.

Requirement for the “Load” timer program:

- Enter the paint to be loaded in field (4).
- Status display “Purged” is displayed.

The timer programs “Purge” and “Short purge” are started independently of the status.

While a timer program is active, no additional timer program can be started.

Cancel timer program

Active timer programs can be canceled at any time.

Personnel:

- System operator

1. Tap button.

⇒ The active timer program is aborted.

Status is set to “Undefined” after abort.

2K applications

When loading the main channel, observe that hardener channel and paint channel are loaded with the corresponding components.

Prerequisite for starting a timer program:

- All channels can be purged or loaded separately.
- In the case of the color selected for loading, the corresponding parameter must be stored in the color configuration table.
- Hardener and master lacquer are assigned.
- The mixing ratio (max. 10 to 1) of master paint to hardener is entered.
- Warning times and alarm times for the pot time monitoring are entered, see “Color configuration”
↳ 8.8 “2K color configuration” .

8.5.3 Start color change

Chapter ↳ 8.3.4 “Color changer” describes the “Starting color change” function.

8.5.4 Volumetric measurement

Personnel:

- System operator

Requirements:

- Atomizer with the desired paint is charged ↪ 8.3.4 “Color changer” .
- Volumetric measurement tank is available.

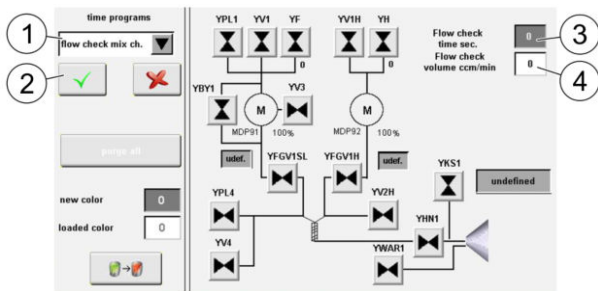


Fig. 79: Volumetric measurement

- Select “Volumetric measurement” in the drop-down menu (1).
- Tap button (2).
⇒ Selection is confirmed.

WARNING!

Rotary bell disk

Touching the bell disk while it is rotating can entail deep cutting injuries.

- Make sure that the bell disk is standing still before carrying out any work on the atomizer.
- Personally secure turbine against switching on again.
- Wear protective hand gloves.

Disassemble bell disk, see operating instructions of the rotating atomizer.

Only valid for versions with rotating atomizer (HRZ).

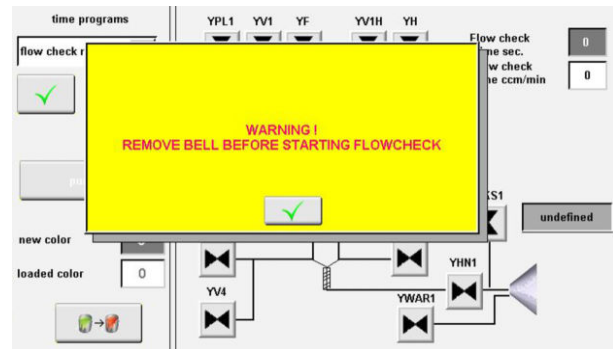


Fig. 80: Warning

- Confirm warning message.
- Set volumetric measurement time (3) between 15 and 120 seconds.
- Enter volumetric measurement quantity (4).
The input is entered within the valid maximum values.
- Tap button (2).
⇒ Volumetric measurement is confirmed and started.

Purge channels.

Only valid for versions with 2K and 1K PJ process

Personnel:

- System operator

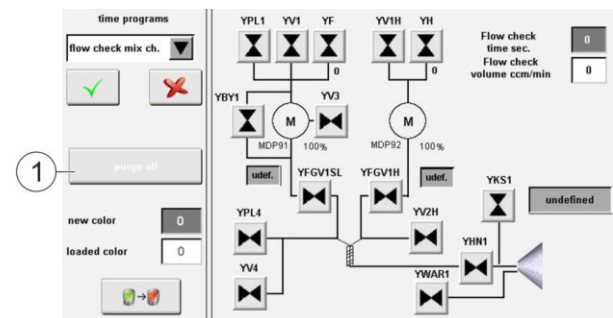


Fig. 81: Purge

- Tap “Purge all” (1).
⇒ Hardener, paint channel and main channel are purged successively.

For PJ process: Paint channel, paint filter channel and main channel are purged sequentially.

8.6 Alarms

8.6.1 Overview

All the currently queued messages are displayed in the "Alarms" menu.

Personnel:

- System operator

1. Open "Alarms" menu:

- Open "Alarms" menu using the button. or
- Tap the alarm notification line in the header row.

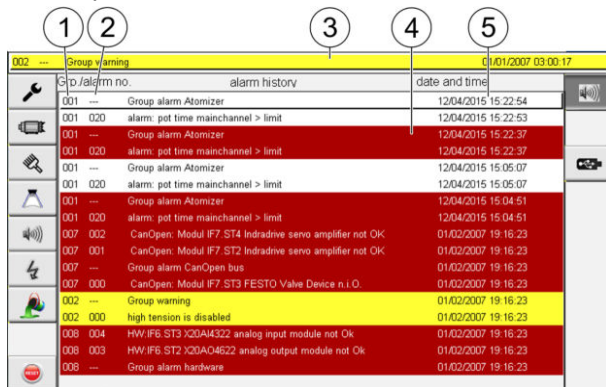


Fig. 82: "Alarms" menu

- Alarm group
- Alarm number
- Last registered alarm
- Alarm text
- Date and time of the alarm event

For notes on troubleshooting, see operating instructions for the application devices.

2. **WARNING!**
Material and personal injury due to unprofessional troubleshooting!

Cancel messages following the associated component documentation.

- Tap button.
 ⇒ Canceled messages are deleted.

"Alarm history" menu

Personnel:

- System operator

Requirements:

- "Alarms" menu is opened.
- Tap button.
 ⇒ The alarm history opens.

Grp./alarm no.	alarm history	date and time
001 ---	Group alarm Atomizer	12/04/2015 15:22:54
001 020	alarm: pot time mainchannel > limit	12/04/2015 15:22:53
001 ---	Group alarm Atomizer	12/04/2015 15:22:37
001 020	alarm: pot time mainchannel > limit	12/04/2015 15:22:37
001 ---	Group alarm Atomizer	12/04/2015 15:05:07
001 020	alarm: pot time mainchannel > limit	12/04/2015 15:05:07
001 ---	Group alarm Atomizer	12/04/2015 15:04:51
001 020	alarm: pot time mainchannel > limit	12/04/2015 15:04:51
007 002	CanOpen: Modul IF7 ST4 Inradrive servo amplifier not OK	01/02/2007 19:16:23
007 001	CanOpen: Modul IF7 ST2 Inradrive servo amplifier not OK	01/02/2007 19:16:23
007 ---	Group alarm CanOpen bus	01/02/2007 19:16:23
007 000	CanOpen: Modul IF7 ST3 FESTO Valve Device n.i.O.	01/02/2007 19:16:23
002 ---	Group warning	01/02/2007 19:16:23
002 000	high tension is disabled	01/02/2007 19:16:23
008 004	HW:IF6 ST3 X2DAI4322 analog input module not Ok	01/02/2007 19:16:23
008 003	HW:IF6 ST2 X2DAQ4622 analog output module not Ok	01/02/2007 19:16:23
008 ---	Group alarm hardware	01/02/2007 19:16:23

Fig. 83: Alarm history

Up to 400 messages can be stored in the Alarm history.

Copy alarm history

Personnel:

- System operator

- Connect USB drive.
- Tap button in the menu bar at right.
 ⇒ Alarm history is copied onto the USB data drive.

The sequence can last a few seconds. In the header row, the symbol flashes.

- If the symbol no longer flashes, remove USB data drive.

8.6.2 Error codes

Messages:

- Faults are highlighted in red.
- Warnings are highlighted in yellow.
- Notes are highlighted in white.

Alarm group 1 - Alarm of the atomizer

Alarm number	Alarm text	Cause	Measures
0	LL1 IST < > SOLL Nominal value not reached	Leakage air hoses Nominal value too high	Check hose. Replace if necessary. Nominal value <= 5bar.
1	LL2 IST < > SOLL Nominal value not reached	Leakage air hoses Nominal value too high	Check hose. Replace if necessary. Nominal value <= 5bar.
2	ML1 IST < > SOLL Nominal value not reached	1. Leakage air hoses 2. Turbine sluggish (defective) 3. No increments of speed measurement LWL	1. Check hose. Replace if necessary. 2. Replace turbine of the rotary atomizer. 3. Check the fiber optic cable (LWL). Replace if necessary.
3	Valve lock 1		
4	Valve lock 2		
5	Valve lock 3		
6	Valve lock 4		
7	Bell: Turbine speed > max. (75,000 RPM)		Check the fiber optic cable connection (LWL).
8-10	Reserve		
11	Bell: Speed increases despite active braking	On braking, turbine rotates in the wrong direction.	Replace brake valve.
12	Bell: No increments of turbine (fiber optic cable)	No increments of speed measurement LWL	Check the fiber optic cable (LWL). Replace if necessary.
13	Reserve		
14	Monitoring main valve no pressure	Supply pressure too low (< 5.5bar) or too high (> 7bar) 1. Pressure supply closed. 2. Pressure supply set too low. 3. Pressure supply line defective. 4. Pressure on the maintenance unit is set incorrectly. 5. Pressure monitor is set incorrectly.	1. Open pressure supply. 2. Adjust pressure supply setting (> 6bar). 3. Check the pressure supply line. 4. Set the pressure correctly on the pressure gauge of the maintenance unit (6bar dynamic). 5. Parameterize the pressure monitor. Lower limit = 5.5bar, upper limit 6.5bar.
15	No pressure in motor bearing air	1. Pressure supply closed. 2. Hose for supplying or monitoring motor bearing air is defective. 3. Pressure monitor is set incorrectly.	1. Open pressure supply. 2. Check hoses. Replace if necessary. 3. Parameterize the pressure monitor. Lower limit = 5.5bar.
16	Bell: Actual value jump too big	Faulty signal from the turbine	Check turbine or fiber optic cable. Replace if necessary.
17-19	Reserve		

Alarm number	Alarm text	Cause	Measures
20	Alarm: Pot time mixer channel > limit value	Pot time for mixed material has expired (only for 2K).	Purge main channel (only in the case of 2K). Note: If the station is switched on, automatic purging takes place.
21	Alarm: Timer program contains no end marker	Timer program incorrectly created or loaded.	Reload timer program or confirm configuration.
22-35	Reserve		

Alarm group 2 - warnings

Alarm number	Alarm text	Cause	Measures
0	High voltage is deselected	The warning "High voltage is deselected through the visualizer" is displayed.	Switch on high voltage via visualizer.
1	Loading color not possible, no color selected	Color change function selected via visualizer but no color selected.	Set color selection on the color to be changed.
2	Loading color not possible color changing not purged	"Load new color" function selected. But the color changer does not have the "purged" status.	Execute the "Purge" function before loading a new paint. It is only possible to load a new color from the purged state.
3	Color change not possible and/or no different color selected	Color change function selected via visualizer but currently loaded and newly selected color is identical.	
4	Bell: Shaft detent activated	The warning "Shaft detent function is enabled" is displayed.	Deactivate shaft detent via the visualizer.
5	YHN1 valve: Wear counter > 1,500,000	The warning "Valve had more than 1.5mil switch actions" is displayed.	Acknowledge message. Replace valve promptly.
6	YRF1 valve: Wear counter > 1,500,000		
7	YPL1 valve: Wear counter > 1,500,000		
8	YV1 valve: Wear counter > 1,500,000		
9	YBYP1 valve: Wear counter > 1,500,000		
10	YV3 valve: Wear counter > 1,500,000		
11	YKS valve: Wear counter > 1,500,000		
12	YWAR1 valve: Wear counter > 1,500,000		
13	YBR1 valve: Wear counter > 1,500,000		
14	YHV1 valve: Wear counter > 1,500,000		
15	YF1 valve: Wear counter > 1,500,000		
16	YF2 valve: Wear counter > 1,500,000		
17	YF3 valve: Wear counter > 1,500,000		
18	YF4 valve: Wear counter > 1,500,000		

Alarm number	Alarm text	Cause	Measures
19	YF5 valve: Wear counter > 1,500,000		
20	YF6 valve: Wear counter > 1,500,000		
21	YF7 valve: Wear counter > 1,500,000		
22	YF8 valve: Wear counter > 1,500,000		
23	YF9 valve: Wear counter > 1,500,000		
24	YF10 valve: Wear counter > 1,500,000		
25	YV1H valve: Wear counter > 1,500,000		
26	YV4 valve: Wear counter > 1,500,000		
27	YFGV1_H valve: Wear counter > 1,500,000		
28	YFGV1_SL valve: Wear counter > 1,500,000		
29	YH1 valve: Wear counter > 1,500,000		
30	YH2 valve: Wear counter > 1,500,000		
31	YH3 valve: Wear counter > 1,500,000		
32	YV2H valve: Wear counter > 1,500,000		
33	YPL4 valve: Wear counter > 1,500,000		
34	YBY1H valve: Wear counter > 1,500,000		
35	Warning: Pot time mixer channel > limit value	The warning "Pot time for mixed material shortly before sequence" (only for 2K) is displayed.	Purge mixed channel (main channel).
36	Warning: Pressure monitoring DP92PE battery charge low		
37	Warning: Pressure monitoring DP92PA battery charge low		
38	Warning: Volumetric measurement not possible because not all color change blocks are loaded	The warning "Volumetric measurement function was activated but not all the necessary paint channels are loaded" (only for 2K) is displayed.	Only enable the "Volumetric measurement" function if all paint channels show the "loaded" status.
39	Reserve		

Alarm number	Alarm text	Cause	Measures
40	Warning: no USB device found	The warning "USB function started but no USB storage medium available (plugged in)" is displayed.	Plug USB storage medium into USB port.
41	Warning: Source file "{TxtSnipUsbFileName}" not found	The warning "the file to be copied is not available on the storage medium" is displayed.	
42	Main needle of HW inlet and UDP interface actuated at same time	The control system receives signals for actuating the main needle of two different interfaces.	The control system needs a clear signal for actuating the main needle
43	Automatic paint quantity reduction is active, timer program is extended	The combination of paint quantity and mixing ratio with a timer programm leads to a pump speed outside the working area of the pump.	The pump speed is reduced and the time program is changed so that all the pumps in their work area are operated and the desired amount is dosed
44	Limitation of external high voltage to 60 KV active	In the Ready2Spray Robot and direct loading configuration, the external high voltage nominal value is limited at 60 KV.	Change external high voltage nominal value to a maximum of 60 KV
45	The external high voltage nominal value has fallen below the lower limit	The external nominal value has fallen below the permitted area (30 KV or 100 μ A).	Change external nominal values
46	YV3_H valve: Wear counter > 1,500,000		
47	YV2_PL2 valve: Wear counter > 1,500,000		
48	YFGF1 valve: Wear counter > 1,500,000		
49	YFRF1 valve: Wear counter > 1,500,000		
50	YFGF1_H valve: Wear counter > 1,500,000		
51	VFRF1_H valve: Wear counter > 1,500,000		
52	Warning: Pressure monitoring DP91PE battery charge low		
53	Warning: Pressure monitoring DP91PA battery charge low		
54	Warning: DP91 nominal value less 20 rpm		
55	Warning: DP92 nominal value less 20 rpm		

Alarm group 3 - Alarm of the high voltage generator

Alarm number	Alarm text
0	High voltage I threshold
1	High voltage U threshold
2	High voltage collective fault
3	High voltage I start
4	High voltage U dynamic
5	High voltage I dynamic
6	High voltage CURRENT<>TARGET nominal value not reached.
7	High voltage Current value threshold not reached.
8	Reserve

Alarm group 4 - Alarms from console, fuses, return circuits etc.

Alarm number	Alarm text	Cause	Measures
0	Time monitoring Power on	Guards Q1DP or Q2DP are defective.	Check guards. Replace if necessary.
1	Motor circuit breaker Q0DP_Q0HS	Motor circuit breaker Q0DP or Q0HS has been triggered.	Check motors or lines. Turn on motor circuit breaker.
2	Fuse 24V supply	Fuse F72 has tripped (24V supply).	Switch on fuse. If needed, check power circuits for short circuits.
3	Emergency off	Emergency off switch was operated. Entry protection has triggered. Fire protection has triggered.	Check the emergency off switch. Unlock if necessary. Check entry protection devices.
4	External emergency off		
5-6	Reserve		

Alarm group 5 - Alarm of the IndraDrive CS (Fault class F)

Alarm number	Alarm text
1	F2002 Assignment coder for synchronization is not allowed.
2	F2003 Movement step skipped
3	F2005 Curve table invalid
4	F2007 Switchover to uninitialized operating mode
5	F2008 RL. The motor type has changed.
6	F2009 PL Load default values of the parameters.
7	F2010 Error in initialization of the digital I/O
8	F2011 SPS - Error No. 1
9	F2012 SPS - Error No. 2
10	F2013 SPS - Error No. 3
11	F2014 SPS - Error No. 4
12	F2015 SPS - Error No. 5
13	F2016 SPS - Error No. 6
14	F2017 SPS - Error No. 7
15	F2018 Device overheating switch off
16	F2019 Motor overheating switch off
17	F2021 Motor temperature monitoring defective
18	F2022 Device temperature monitoring defective
19	F2025 Drive not ready for release
20	F2026 Undervoltage in the power unit
21	F2027 Impermissible vibration in intermediate circuit
22	F2028 Excessive control deviation
22	F2028 Excessive control deviation
23	F2031 Error Encoder 1: Signal amplitude faulty
24	F2032 Commutation fine tuning plausibility error
25	F2036 Excessive actual positional value difference
26	F2037 Excessive positional target value difference
27	F2040 Device overheating 2 Shutdown
28	F2042 Encoder 2: Encoder signals faulty
29	F2043 Transducer: Encoder signals faulty
30	F2048 Battery undervoltage
31	F2050 Overrun position specification storage
32	F2051 No consecutive clause in the position specification memory
33	F2053 Incremental encoder emulator: Frequency too high
34	F2054 Incremental encoder emulator: Hardware fault
35	F2057 Target position outside the movement range
36	F2058 Internal overrun due to position specification
37	F2059 Incorrect nominal value direction in positioning
38	F2063 Internal overrun lead axis generator

Alarm number	Alarm text
39	F2064 Incorrect nominal value direction lead axis generator
40	F2067 Synchronization on master communication faulty
41	F2068 Error Brakes
42	F2072 Error brake power supply
43	F2074 Actual position value 1 outside absolute encoder window
44	F2075 Actual position value 2 outside absolute encoder window
45	F2076 Actual position value 3 outside absolute encoder window
46	F2077 Current measurement calibration faulty
47	F2086 Supply module error
48	F2087 Module network communication error
49	F2100 Faulty access to the fixed data storage
50	F2101 File system structure error on the memory card
51	F2102 I2C memory could not be addressed.
52	F2103 EnDat memory could not be addressed.
53	F2104 Commutation offset invalid
54	F2105 Hyperface memory could not be addressed.
55	F2110 Power unit requirement data communication error
56	F2120 Memory card initialization failed.
57	F2131 Incorrect switching state of the measurement sensor-1-input signal
58	F2140 CCD Slave error
59	F2150 MLD Motion FB error
60	F2174 Reference loss motor encoder
61	F2175 Reference loss optional encoder
62	F2176 Reference loss transducer
63	F2177 Module delimitation error motor encoder
64	F2178 Module delimitation error optional encoder
65	F2179 Module delimitation error transducer
66	F2190 Ethernet configuration faulty
67	F2270 Analog input, wire break
68	F2816 Soft start error supply module
69	F2818 Phase failure
70	F2819 Network failure
71	F2820 Brake resistance overload
72	F2821 Error in actuation brake resistance
73	F2825 Switch-on threshold brake resistance too small
74	F2836 Error symmetry monitoring intermediate circuit
75	F2860 Over-current in network power unit
76	F3000 CRC error during secure cyclical transmission
77	F3001 Time error during secure cyclical transmission

Alarm number	Alarm text
78	F3002 Log error during secure cyclical transmission
79	F3003 Secure communication: Error in internal data transfer
80	F3004 Secure communication: Error in data management
81	F3005 Secure communication: Error in setting up/removing connection
82	F3006 Data management error of individual assemblies
83	F3010 SMO: Error inputs linking logic
84	F3100 F3 Test error machine acceptance
85	F3101 Missing axis validation
86	F3115 Brake test time interval exceeded
87	F3119 Initialization "P-0-3212, code words for tests" faulty
88	F3120 Maximum number of warnings to be processed exceeded
89	F3121 Diagnosis processing faulty
90	F3131 Error reviewing zone acknowledgment
91	F3132 Error safety zone
92	F3134 Dynamization interval faulty
93	F3141 Plausibility error selection of operating status
94	F3142 Time for confirmation expired
95	F3150 Safety zones module: Error temperature monitoring
96	F3151 Safety zones module: Error 24 Volt
97	F3152 Safety zones module: Error DYN
98	F3153 Safety zones module: Error SZE/SZA
99	F3153 Safety zones module: Error SZE/SZA
100	F4001 Sync telegram failure
101	F4002 RTD telegram failure
102	F4003 Switch off invalid comm. phase
103	F4004 Error in phase turn up
104	F4005 Error in phase turn down
105	F4006 Phase switchover without ready indication
106	F4009 Bus failure
107	F4011 Watchdog communication: Overload cyclical communication
108	F4012 Incorrect I/O length
109	F4016 SPS double real time channel failure
110	F4017 sercos: Process flow for phase switchover not correct
111	F4020 sercos: Cable break (L+F after NRT)
112	F4034 E-Stop enabled
113	F4140 CCD Communication error
114	F4141 CCD: ID configuration changed
115	F4142 CCD: Ring Memory Overflow
116	F6002 Assignment coder for synchronization is not allowed.
117	F6003 Movement step skipped

Alarm number	Alarm text
118	F6004 Motion profile error
119	F6005 Curve table invalid
120	F6006 Initialization of effective lead axis position faulty
121	F6007 Switchover to uninitialized operating mode
122	F6010 SPS run time error
123	F6024 Maximum brake time exceeded
124	F6028 Position limit value crossed (overflow)
125	F6029 Position limit value crossed positively
126	F6030 Position limit value crossed negatively
127	F6034 E-Stop enabled
128	F6042 Both movement range switches actuated
129	F6043 Movement range switch actuated positive
130	F6044 Movement range switch actuated negative
131	F6058 Internal overrun due to position specification
132	F6059 Incorrect nominal value direction in positioning
133	F6140 CCD Slave error (emergency stop)
134	F6200 Speed nominal value > Standstill window in SOS
135	F7010 Securely limited incremental jog exceeded
136	F7013 Speed threshold exceeded
137	F7014 Time for securely monitored transient oscillation expired
138	F7020 Secure maximum speed exceeded
139	F7030 Position window secure operation stop exceeded
140	F7031 Incorrect movement direction
141	F7032 Error safety zone
142	F7033 Safety zones module: Error Hardware
143	F7034 Safety zones module: Error SDL
144	F7035 Safety zones module: Error zone bus
145	F7050 Maximum threading time exceeded
146	F7051 Securely monitored delay exceeded
147	F7052 Selected target speed exceeded
148	F7100 F7 Test error machine acceptance
149	F8000 Fatal hardware error
150	F8010 Automatic Commutation: Max. Reverse travel movement range
151	F8011 Commutation offset could not be determined.
152	F8012 Automatic Commutation: Max. Movement range
153	F8013 Automatic commutation: Current too low
154	F8014 Automatic commutation: Over-current
155	F8015 Automatic Commutation: Time out
156	F8016 Automatic Commutation: Iteration without result
157	F8017 Automatic Commutation: Commutation balancing faulty

Alarm number	Alarm text
158	F8018 Device overheating switch off
159	F8022 Encoder 1: Encoder signals faulty (can be deleted in phase 2)
160	F8025 Surge in the power unit
161	F8027 STO/SBC with set motor authorization
162	F8028 Surge in the power unit
163	F8042 Error Encoder 2: Signal amplitude faulty
164	F8044 Device's internal assembly communication disturbed
165	F8060 Surge in the power unit
166	F8064 Interruption motor phase
167	F8069 Error device-internal power supply
168	F8070 Control voltage failure
169	F8071 Surge in control voltage
170	F8076 Error in tracking angle controller
171	F8078 Error in speed controller circuit
172	F8079 Speed limit value exceeded
173	F8091 Power unit defective
174	F8100 Error during initialization of parameter handling
175	F8102 Error during power unit initialization
176	F8118 Impermissible power unit/firmware combination
177	F8120 Impermissible control unit/firmware combination
178	F8122 Power unit defective
179	F8128 Error during initialization of an option interface
180	F8129 Firmware option module faulty
181	F8140 Fatal CCD error
182	F8300 Pulse duration dynamization faulty
183	F8301 Error reviewing selection signals
184	F8302 Error reviewing shut-off channels STO/SBC
185	F8304 SMO: System error
186	F8304 SMO: System error
187	F8313 SMO: Parameterization faulty
188	F8314 SMO: Configuration faulty
189	F8315 SMO: Encoder initialization faulty
190	F8316 SMO: System status change faulty
191	F8319 SMO: INIT system error
192	F8323 SMO: Deactivation faulty
193	F8324 SMO: Activation faulty
194	F8330 SMO: Configuration record is not enabled.
195	F8351 Securely monitored delay exceeded
196	F8352 Set drive authorization in STO
197	F8353 SBC System error

Alarm number	Alarm text
198	F8354 Error reviewing shut-off thread
199	F8355 Diagnosis processing faulty
200	F8356 SMO: Parameter processing faulty
201	F8359 SMO: Error encoder assessment
202	F8360 SMO: System error local I/O
203	F8361 SMO: Error zone acknowledgment
204	F8361 SMO: Error zone acknowledgment
205	F8380 Secure communication: Error in program schedule
206	F8381 Secure communication: Incorrect stack status
207	F8382 Error in the status machine of the safety stack
208	F8383 Secure communication: Error in data management
209	F8838 Over-current in the external brake resistance
210	F9001 Error during internal functional call
211	F9002 Error during internal RTOS functional call
212	F9003 Watchdog
213	F9005 Processor exception
214	F9100 Hardware watchdog
215	F9200 Boot error programming module
216	F9201 Boot error device
217	F9202 Watchdog processor
218	Reserve



The alarms of the IndraDrive CS MDP92 are identical to the alarms of MPD91. Follow associated application description of Rexroth IndraDrive MPx-17.

Alarm group 6 - General alarms of the metering unit

Alarm number	Alarm text	Cause	Measures
0	Collective error metering unit DP91		
1	Collective error metering unit DP92		
2	Dosing pump DP91 nominal value > max. limit pump (reduce nominal value in brush table)	Max. Nominal value of the pump exceeded (only in the case of 2K) Mixing ratio of the total output quantity does not match the pump size. 4.5ccm Pump = max. 900ml/min 3ccm Pump = max. 600ml/min	Reduce the nominal value or adjust the mixing ratio to the color configuration table.
3	Hardener dosing pump DP92 nominal value > max. limit pump (reduce nominal value in brush table or adjust mixing ratio in color configuration table)	Max. Nominal value of the pump exceeded (only in the case of 2K) Mixing ratio of the total output quantity does not match the pump size. 3ccm Pump = max. 600ml/min 2ccm Pump = max. 400ml/min 1ccm Pump = max. 200ml/min 0.45ccm Pump = max. 90ml/min	Reduce the nominal value or adjust the mixing ratio to the color configuration table.
4	MDP91 Pressure < min. limit pump inlet	No paint pressure from the paint supply	Check pressure setting of the paint supply.
5	MDP91 Pressure > max. limit pump inlet	Paint pressure from the paint supply too high	Check pressure setting of the paint supply.
6	MDP91 pressure < minimum limit pump outlet	1. Alarm setting too high (minimum limit) 2. Pump defective. 3. Sensor defective.	1. Check alarm setting (minimum limit). 2. Check pump. 3. Check sensor.
7	MDP91 pressure > maximum limit pump output	1. Material hardened in the mixed channel. 2. Main needle defective.	1. Check paint hose. Replace if necessary. 2. Replace main needle valve.
8	MDP92 pressure < min. limit pump inlet	No paint pressure from the paint supply	Check pressure setting of the paint supply.
9	MDP92 Pressure > max. limit pump inlet	Paint pressure from the paint supply too high	Check pressure setting of the paint supply.
10	MDP92 pressure < minimum limit pump outlet	1. Alarm setting too high (minimum limit). 2. Pump defective. 3. Sensor defective.	1. Check alarm setting (minimum limit). 2. Check pump. 3. Check sensor.
11	MDP92 pressure > maximum limit pump output	1. Material hardened in the mixed channel. 2. Main needle defective.	1. Check paint hose. Replace if necessary. 2. Replace main needle valve.

Alarm number	Alarm text	Cause	Measures
12	No metering unit release: Pressure > max. limit	Excess pressure after the pump. Pump actuation is blocked; manual actuation of the valves is still possible.	If possible, reduce excess pressure by manually opening the main nozzle. Otherwise replace hose or main needle valve.
13	MDP91 No metering unit release: Pressure > max. limit	Excess pressure after the pump. Pump actuation is blocked; manual actuation of the valves is still possible.	If possible, reduce excess pressure by manually opening the main nozzle. Otherwise replace hose or main needle valve.
14	Alarm: DP91 nominal value < 10 rpm	Nominal value too small.	Enlarge brush quantity.
15	Alarm: DP92 nominal value < 10 rpm	Nominal value too small.	Enlarge brush quantity.
16	Collective alarm paint pressure regulator	Upper or lower limit reached.	Check proportional valve BFDS1
17-20	Reserve		

Alarm group 7 - Alarm of the CanOpen bus

Alarm number	Alarm text	Cause	Measures
0	CanOpen: Module IF7.ST3 FESTO valve terminal NOK	1. Valve terminal is defective. 2. Bus connector is not inserted correctly. 3. Cable break bus line DIP switch setting on the valve terminal incorrect.	1. Check connections. 2. Check position of the DIP switch. 3. Replace valve terminal.
1	CanOpen: Module IF7.ST2 Indradrive servo amplifier NOK	Servo amplifier defective. Bus connector not inserted correctly. Do not transfer drive parameters to the drive amplifier.	Check connections. Replace drive amplifier.
2	CanOpen: Module IF7.ST4 Indradrive servo amplifier NOK	Servo amplifier defective. Bus connector not inserted correctly. Do not transfer drive parameters to the drive amplifier.	Check connections. Replace drive amplifier.
3-15	Reserve		

Alarm group 8 - General system alarms

Alarm number	Alarm text	Cause	Measures
0	HW:IF6.ST1 X20CM8281 digital In/Output module NOK	Module is defective.	Replace module.
1	UDP Connection: No vital signs from external control.		
2	CPU Serial number < > configured serial number (Station start not possible)		
3	HW:IF6.ST2 X20AO4622 analog output module NOK	Output module is defective.	Replace module.
4	HW:IF6.ST3 X20AI4322 analog input module NOK	Input module is defective.	Replace module.
5	HW:IF6.ST3 X20AI4322 Channel 1 limit value error	Cable break pressure control valve LL1/ZL1	Check pressure control valve or connection cable (shaping air 1 / atomizer air).
6	HW:IF6.ST3 X20AI4322 Channel 2 limit value error	Cable break pressure control valve LL2/HL1	Check pressure control valve or connection cable (shaping air 2 / horn air).
7	HW:IF6.ST3 X20AI4322 Channel 3 limit value error	Cable break pressure control valve DP91IN	Check cable between pressure sensor and isolating switch amplifier or between isolating switch amplifier and input card (paint pump input pressure sensor).
8	HW:IF6.ST3 X20AI4322 Channel 4 limit value error	Cable break pressure control valve DP91OUT	Check cable between pressure sensor and isolating switch amplifier or between isolating switch amplifier and input card (paint pump output pressure sensor).
9	HW: -K111 Paint pressure minimum limit crossed	Cable break pressure control valve PPR (Paint pressure regulator)	Check pressure control valve or connection cable.
10	HW: -K111 Paint pressure maximum limit exceeded	Cable break pressure control valve DP92IN	Check pressure control valve or connection cable. Check pressure inlet - Pressure should be +1 bar greater than the set point.
11	HW:IF6.ST4 X20AI4322b hardener pump pressure inlet limit value error	Cable break pressure control valve DP92OUT	Check cable between pressure sensor and isolating switch amplifier or between isolating switch amplifier and input card (hardener pump input pressure sensor).

Alarm number	Alarm text	Cause	Measures
12	HW:IF6.ST3 X20AI4322 Hardener pressure outlet limit value error	-	Check cable between pressure sensor and isolating switch amplifier or between isolating switch amplifier and input card (hardener pump output pressure sensor).
13	HW:IF6.ST4 X20AI4322b analog input module NOK,	Input module is defective.	Replace module.

8.7 High voltage

8.7.1 Overview

Only for versions with high voltage (rotating atomizer EC and DC)

Personnel:

- System operator
- Open the “high voltage” menu using the

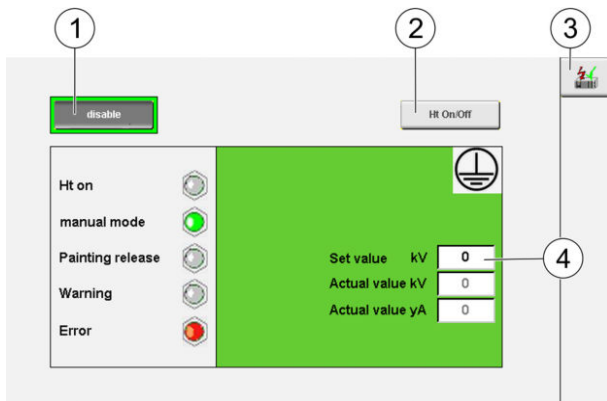


Fig. 84: “High voltage” menu

- Release/block high voltage
- Switch high voltage on/off
- High voltage self-test
- Nominal value input

Status displays

Status display in the window	
Display	Status
	High voltage is deselected and switched off.
	High voltage is selected but not switched on.
	High voltage is switched on.
	There is a warning message of the high voltage generator.
	High voltage generator is disturbed.

Status display in the header row

Symbol	Status
	High voltage is deselected and switched off.
	High voltage is selected but not switched on.
	High voltage is switched on.
	There is a warning message of the high voltage generator.
	High voltage generator is disturbed.

8.7.2 High voltage On/ Off

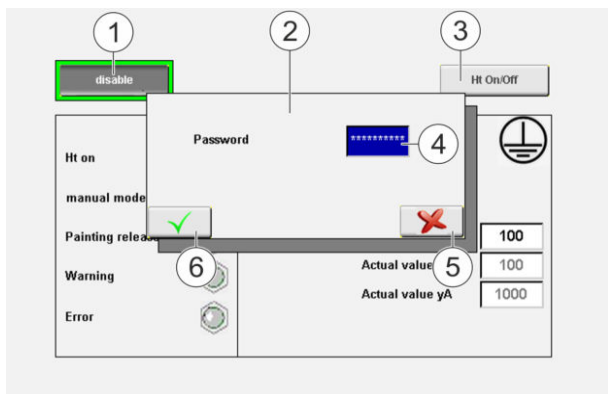


Fig. 85: High voltage On/ Off

Personnel:

- System operator
- + additional qualification high tension technology

Switch on high voltage

1. Tap “Release” button (1).
⇒ Window (2) opens for password input.
2. Tap field (4).
3. Enter password using the on-screen keyboard.
4. Confirm password entry using button (6).
⇒ The “Release” button changes to “Block”.

The button has a green border.

If you would like to cancel password entry, tap the button (5).

5. Press [I] key on the operator panel.
6. Tap “HS On/ Off” button (3).

⇒ High voltage is switched on.

The button has a green border.

Switch off high voltage.

1. Press [0] key on the operator panel.
2. Tap “HS On/ Off” button (3).
⇒ High voltage is switched off.

Block high voltage

Requirements:

- High voltage is switched off ⇨ “Switch off high voltage.”

1. Tap “Block” button (1).
⇒ High voltage is blocked.

Button changes to “Release”.

The button is gray.

If the Control cabinet is operated without high voltage, high voltage must be deselected. In deselected state, all messages of the high voltage generator are suppressed. This results in all the remaining components not being switched off in the event of a fault in the high voltage generator.

8.7.3 Set nominal value of the high voltage generator

The nominal values for the high voltage generator are manually entered in the “Manual” operating mode. The nominal values from the brush records are specified in the “Brush” or “External brush” operating mode.

Input in “Manual” operating mode

Personnel:

- System operator
- + additional qualification high tension technology

Requirements:

- “Manual” operating mode is selected.

Nominal values smaller than 30kV (in DC) and smaller 100μA (in EC) are interpreted and processed as nominal value of “0”.

1. Tap field next to “kV nominal value” or “μA nominal value”.
2. Enter nominal value for high voltage.

Input in the “Brush” / ”External brush” operating mode

Personnel:

- System operator
- + additional qualification high tension technology

Requirements:

- “Brush” or “External brush” operating mode is selected.
1. Nominal values are specified from the respective brush records ↪ 8.4 “Brush” .
 2. Depending on the high voltage generator, a nominal voltage value or nominal current value is specified.

8.7.4 High voltage self-test

In the high voltage self-test, the safety disconnections U-safety and I-safety are automatically checked in the high voltage generator. The process flow of the test is recorded in the control system and cannot be influenced. The high voltage generator runs with a defined nominal value. The test recognizes defects and manipulations on the switch off functions and on the actual value recording.

Start high voltage self-test

Personnel:

- System operator
- + additional qualification high tension technology

Requirements:

- “Manual” operating mode is enabled.
 - Rotary atomizer and high voltage are selected.
 - High voltage is released and switched on.
1. Open the sub-menu “High voltage self-test” in the menu bar to the right using the button.

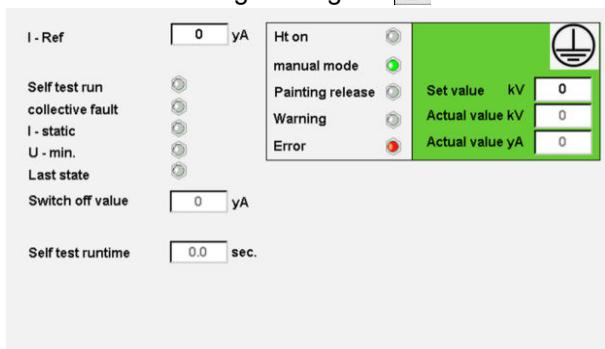


Fig. 86: “High voltage self-test” sub-menu

2. Start high voltage self-test in the visualizer (see station instructions of the application system).

The following actions are performed automatically after the start:

- Reading out the nominal value settings (U-safety/ I-safety) from the controller.
- Switching on the high voltage with the value 20kV
- Wait until the voltage has reached the required value.
- Starting the high voltage self-tests.
- Nominal value specification in the range of settings
- Recording the actual values on triggering the switch off.
- Compare actual cutout values with the nominal value settings.
- Ending the high voltage self-tests.
- Check whether output voltage is switched off.

8.8 2K color configuration

Only for versions with 2K process

The material mixture is configured in the “color configuration menu”. A maximum 20 brush records can be parameterized.

Personnel:

- System operator

1. Open “Color configuration” menu using the button.

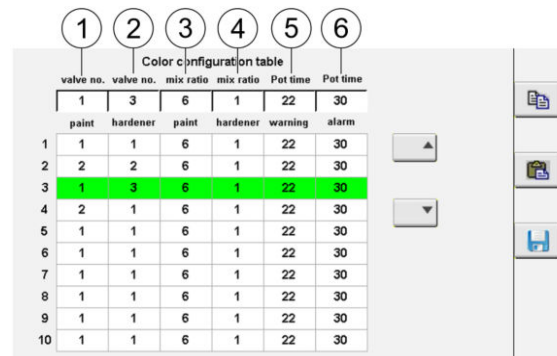


Fig. 87: “2K color configuration” menu

Item	Description
1	Enter the number of the paint valve for the material mixture. Up to 10 colors are possible.
2	Enter the number of the hardener valve for the material mixture. Up to 3 hardeners are possible.
3	Enter the proportion of the paint for the mixing ratio (max. 10).
4	Enter the proportion of the hardener for the mixing ratio (max. 10).
5	The pot time monitors how long the material mixture has not been renewed. This helps avoid hardening of the mixture in the main channel. <ul style="list-style-type: none"> Enter time in minutes. On expiry of the period, a warning is issued.
6	The pot time monitors how long the material mixture has not been renewed. This helps avoid hardening of the mixture in the main channel. <ul style="list-style-type: none"> Enter time in minutes. Upon expiration of the period, an alarm message is issued.

If the station is switched on, automatic purging of the main channel starts if the pot time alarm is enabled. If purging was ended without error, the pot time alarm is reset.

It is only possible to monitor the main channel if the exact hose length is entered in the "Station settings" menu ↪ 8.2.4 "Station settings" .

Changing record

Personnel:

- System operator

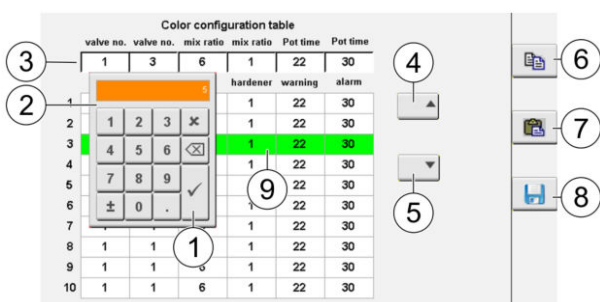


Fig. 88: Change color configuration

- Select a record with the arrow keys (4) and (5).
⇒ Selected record (9) has a green background.

Values of the record are displayed in a separate row (3).

- Tap any value in the row.
⇒ Input window (2) opens.
- Enter and confirm new value (1).
- Tap "Save" button (8).
⇒ New value is incorporated into the table and saved on the storage card.

Copy record

- Select record with the arrow keys (4) and (5).
⇒ Selected record (9) has a green background.
- Tap "Copy" button (6).
⇒ Record is copied.
- Tap "Add" button (7).
⇒ Record is added in any arbitrary record. The old record is overwritten by the new one.

8.9 Application

Given below as an example how an application is executed.

Personnel:

- System operator
- + additional qualification high tension technology

Protective equipment:

- Protective workwear
- Safety boots

- Turn on power supply ↪ 7.2 "Switching on" .
- Switch on Control cabinet ↪ 7.2 "Switching on" .
⇒ Operator interface is ready. Start window is displayed. System is in the "Manual" operating mode.

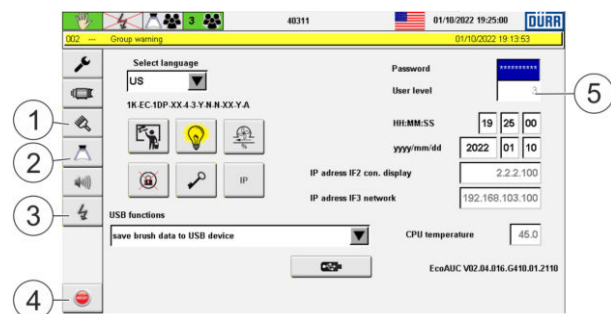


Fig. 89: Start window

- Log-on at the visualizer (5). ↪ 8.2.8 "Log on and Log off" .

4. Optional: Acknowledge error messages (4).
5. Open the “High voltage” menu with the button (3).

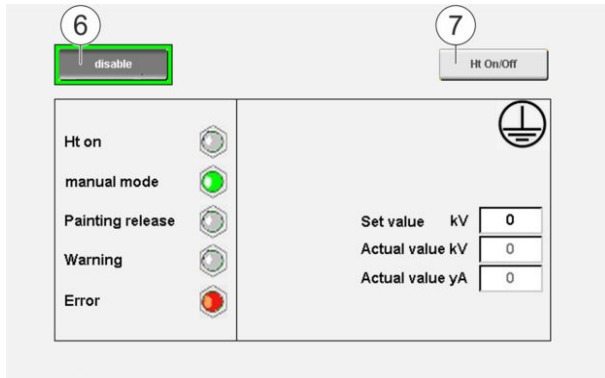


Fig. 90: “High voltage” menu

6. Release (6) and switch on (7) high voltage 8.7 “High voltage” .
7. Open “Brush” menu with the button (1).
8. Switch to the “Manage brush parameters” menu using the button.

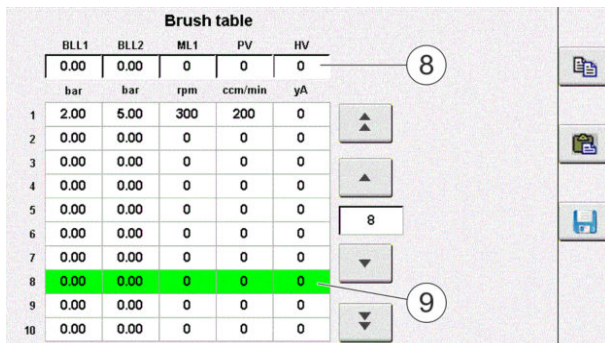


Fig. 91: “Brush parameters” menu

9. Create brush records (8) 8.4.3 “Manage brush parameters” .
10. Enable “Brush” operating mode 7.4 “Operating mode” .
11. Open the “Timer programs” menu with the button (2).

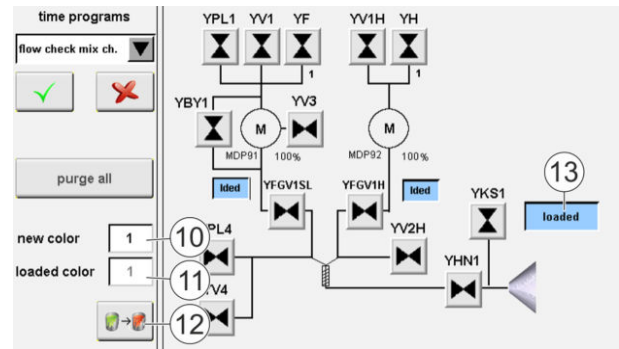


Fig. 92: “Timer programs” menu

12. Enter the color number to be applied in the “New color (10)” input window.
 13. Start color change (12) 8.3.4 “Color changer” .
 If the status of the color changer is “Charged” (13) and the selected color number is displayed in the “Charged color” (11) input window, the color change is complete.
 14. Switch to the “Brush” menu with the button (1).
 15. Select the brush record (9) required for application 8.4.3 “Manage brush parameters” .
 16. Enable brush record using the button.
 All process components are automatically actuated with the nominal values of the brush record.
- In the Brush menu, the “HN1” main needle can be opened and closed for outputting the color.

The brush records can be changed and enabled during the application, as required.

17. Open the “Timer programs” menu with the button (2) after terminating the application.
18. Select “Purging” function in the drop-down menu.
19. Start “Purging” function using the button.
 The purging program ends when the color changer shows the status as “Purged”.

Only for versions with 2K process:
 On clicking the “Purge all” button in the “Timer programs” menu, all ducts are purged successively.

9 Cleaning

9.1 Safety recommendations

DANGER!

Voltage

Electrical voltage can be present on components and cables despite switched off supply voltage. There is the danger of electrical shock on contact with live components, which can cause death.

- Have only qualified electricians carry out work on the electrical components and cables.
- Prior to starting work, shut down the power supply and secure it personalized from being switched on again.
- Verify that no current is present on the electrical components and cables.
- Follow the circuit diagram.

DANGER!

Risk of death due to high voltage

After switching off the power supply, the stored residual charges pose the danger of electrical shock, which can lead to death.

- Prior to starting work, switch off the power supply and secure it personalized from being switched on again.
- Discharge the entire system by means of a grounding rod.

Working space in front of and behind the Control cabinet

For cleaning work, the Control cabinet must be accessible from all sides.

- Dimensions of working space: minimum 1200mm
- Push maximum 1m to ensure access to the rear side of the Control cabinet.
- 180° opening of the Control cabinet doors must be guaranteed.

9.2 General notes

DANGER!

Not observing the five safety rules

Failure to observe and comply with the five safety rules will pose the danger of an electric shock on contact with live components. Serious injuries and death can be the consequence.

Follow the following five safety rule before all work on control cabinet:

- Disconnection
- Secure against reconnection.
- Ensure that there is no voltage present on any pole.
- Ground and short-circuit.
- Cover and screen off adjacent live parts.

9.3 Cleaning

NOTICE!

Unsuitable cleaning agents

Solvent-based and abrasive cleaning agents can damage the surfaces.

- Only use solvent-free household cleaner for scratch-sensitive surfaces.

Requirements:

- Observe five safety rules ↪ 10.2 “General notes” .
- Control cabinet is in a position, in which work can be executed.
- Brakes on the Control cabinet are secured.

Cleaning the touch display

Personnel:

- Cleaning staff

Protective equipment:

- Protective workwear
- Protective gloves

1. Enable “Clean the screen” menu. ↪ 8.2.2 “Screen cleaning”
2. Moisten a piece cloth with solvent-free detergent.
3. Wipe down touch display with a damp cloth.

Clean the Control cabinet Housing from Outside

Personnel:

- Cleaning staff

Protective equipment:

- Protective workwear
- Protective gloves

1. Moisten a piece cloth with solvent-free detergent.
2. Damp wiping down of the housing

Cleaning Fan Cover

Personnel:

- Cleaning staff

Protective equipment:

- Protective workwear
- Protective gloves

1. Moisten a piece cloth with solvent-free detergent.
2. Damp wiping down of the fan cover.

10 Maintenance

10.1 Safety notes

DANGER!

Voltage

Electrical voltage can be present on components and cables despite switched off supply voltage. There is the danger of electrical shock on contact with live components, which can cause death.

- Have only qualified electricians carry out work on the electrical components and cables.
- Prior to starting work, shut down the power supply and secure it personalized from being switched on again.
- Verify that no current is present on the electrical components and cables.
- Follow the circuit diagram.

DANGER!

Risk of death due to high voltage

After switching off the power supply, the stored residual charges pose the danger of electrical shock, which can lead to death.

- Prior to starting work, switch off the power supply and secure it personalized from being switched on again.
- Discharge the entire system by means of a grounding rod.

WARNING!

Escaping compressed air

Escaping compressed air can cause serious injury.

Before working on the product:

- Disconnect the system with the product from compressed air.
- Secure system personalized from being switched on again.
- Depressurize the lines.
- Bleed the product.
- Wear specified protective equipment.

WARNING!

Unsuitable spare parts

Spare parts of third-party suppliers may possibly not be able to hold the loads. Serious injury and death could be the consequence.

- Use exclusively original spare parts.

Working space in front of and behind the Control cabinet

For maintenance work, the Control cabinet must be accessible from all sides.

- Dimensions of working space: minimum 1200mm
- Push maximum 1m to ensure access to the rear side of the Control cabinet.
- 180° opening of the Control cabinet doors must be guaranteed.

10.2 General notes



Not observing the five safety rules

Failure to observe and comply with the five safety rules will pose the danger of an electric shock on contact with live components. Serious injuries and death can be the consequence.

Follow the following five safety rule before all work on control cabinet:

- Disconnection
- Secure against reconnection.
- Ensure that there is no voltage present on any pole.
- Ground and short-circuit.
- Cover and screen off adjacent live parts.

10.3 Maintenance schedule

The maintenance intervals given below are based on experiential values. Adjust maintenance intervals individually if necessary.

Interval	Maintenance work
Daily	<p>Check the emergency stop function by pressing the emergency stop button.</p> <p>Check correct connection of the ground cable.</p>
Weekly	<p>Cleanse Control cabinet housing and Touch display ↗ 9.3 “Cleaning” .</p> <p>Check shielding braid of the high voltage cable for damage (if the line is movable).</p>
Monthly	<p>Check filter of the maintenance unit for impurities. If necessary, replace.</p> <p>Check electrical fuses.</p>
Annually	<p>Replace filter of the maintenance unit ↗ 10.4.2 “Replace filter of the maintenance unit.” .</p> <p>Check pneumatic assembly on the back of the Control cabinet for functioning and leakages.</p> <p>Check compressed air manual controller in the maintenance unit for functioning and leakage.</p> <p>Check that cable connections and plugs are seated correctly.</p> <p>Check pressure switch for functioning.</p> <p>Check R/O converter for functioning.</p> <p>Check switch-on valve in the maintenance unit for functioning.</p> <p>Check ground resistance on the shielding braid of the high voltage cable.</p> <p>Check shielding braid of the high voltage cable for damage (for fixed traverse).</p> <p>Check ground cable. If necessary, replace.</p> <p>Check safety switch off for high tension (switch off thresholds). You will find the description in the standard EN 50176.</p> <p>Check filter mat of the blower. If necessary, replace. See manufacturer’s document.</p>

10.4 Maintenance work

10.4.1 Replace compressed air hoses.

Personnel:

- Electrician
- + additional qualification high tension technology


Protective equipment:

- Eye protection
- Use ear protection


- Protective workwear
- Protective gloves
- Safety boots

Requirements:

- Control cabinet is in a position, in which work can be executed.
- Brakes on the Control cabinet are secured.
- Control cabinet is switched off and secured against being switched on again.
- Verified that no current is present.
- Compressed air supply is switched off.
- System is depressurized:
 - Close shutoff valve on the maintenance unit. Use a padlock to secure it against reconnection.
- Observe five safety rules ↪ 10.2 “General notes” .

 For hose types, see Procedure diagram ↪ “Applicable documents” .

1. Pull out compressed air hose from the plug connection.
2. Cut off new compressed air hose at a 90° angle using hose cutter (W12030001)
3. Press new compressed air hose up to the mechanical stop in the plug-in connection.
4. Perform the following checks:
 - Check plugged connection for escaping compressed air.
 - Check compressed air hose for flexing.
 - Check allowable bend radii of the compressed air hose.
 - Check error-free traverse of the compressed air hose without tensile load.

 Remove all external objects (e. g. tools) in Control cabinet after concluding all work.

10.4.2 Replace filter of the maintenance unit.

Personnel:


- Electrician
- + additional qualification high tension technology

Protective equipment:

- Eye protection
- Use ear protection
- Protective workwear
- Protective gloves
- Safety boots

Requirements:

- Control cabinet is in a position, in which work can be executed.
 - Brakes on the Control cabinet are secured.
 - Control cabinet is switched off and secured against being switched on again.
 - Verified that no current is present.
 - Compressed air supply is switched off.
 - System is depressurized:
 - Close shutoff valve on the maintenance unit. Use a padlock to secure it against reconnection.
 - Observe five safety rules ↪ 11.2 “General notes” .
1. Replace filter as specified in documentation Maintenance units MS6 / MS4.

 Remove all external objects (e. g. tools) in Control cabinet after concluding all work.

10.4.3 Replacing illuminated push button

Personnel:

- Electrician

Protective equipment:

- Safety boots

Requirements:

- Control cabinet is in a position, in which work can be executed.
- Brakes on the Control cabinet are secured.
- Control cabinet is switched off and secured against being switched on again.
- Verified that no current is present.
- Compressed air supply is switched off.
- System is depressurized:
 - Close shutoff valve on the maintenance unit. Use a padlock to secure it against reconnection.
- Observe five safety rules ↪ 11.2 “General notes” .



Fig. 93: Replacing illuminated push button

1. Open Control cabinet.
2. Using a screwdriver, press against the fixation (1).
3. Disconnect cable on the illuminated push button.
4. Connect cable to the new illuminated push button.
5. Insert new illuminated push button.
⇒ Illuminated push button latches in place.

Remove all external objects (e. g. tools) in Control cabinet after concluding all work.

11 Decommissioning and Disposal

11.1 Safety recommendations

DANGER!

Risk of death due to high voltage

After switching off the power supply, the stored residual charges pose the danger of electrical shock, which can lead to death.

- Prior to starting work, switch off the power supply and secure it personalized from being switched on again.
- Discharge the entire system by means of a grounding rod.

CAUTION!

Rolling Away and Tipping Over

If the control cabinet rolls away or tips over, it can cause serious injuries and material damage.

- When moving, ensure that there are no obstacles on the floor, such as hoses.
- Slide it by maximum 1 meter only for assembly and maintenance work.
- Have only two persons sliding it.
- Ensure, both before and after work on the control cabinet, that the brakes are engaged.

11.2 General notes

DANGER!

Not observing the five safety rules

Failure to observe and comply with the five safety rules will pose the danger of an electric shock on contact with live components. Serious injuries and death can be the consequence.

Follow the following five safety rule before all work on control cabinet:

- Disconnection
- Secure against reconnection.
- Ensure that there is no voltage present on any pole.
- Ground and short-circuit.
- Cover and screen off adjacent live parts.

11.3 Decommissioning

Personnel:

- Electrician
- + additional qualification high tension technology

Protective equipment:

- Protective workwear
- Use ear protection
- Protective gloves
- Safety boots

Requirements:

- Control cabinet is switched off and secured against being switched on again ↪ 7.3 “Switching off” .

1. Disconnect power supply.
2. Discharge total system by means of a grounding rod.

Disconnect compressed air supply



Fig. 94: Mains disconnecting device on maintenance unit

3. Turn mains disconnecting device (1) in clockwise direction.
⇒ Plastic toggle (2) points to the front.
4. Pull out plastic toggle (2).
5. Use a padlock (3) to secure it against reconnection.
⇒ System is depressurized.
6. Disassemble all connected components, hoses and cables.

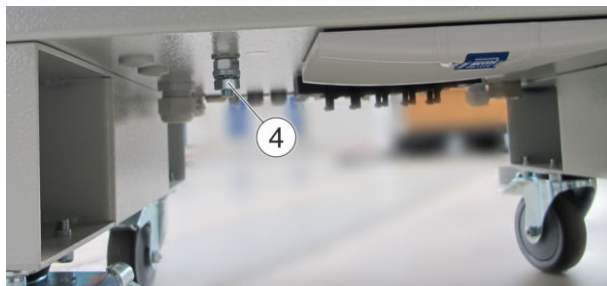


Fig. 95: Grounding bolts below Control cabinet

7. Unclamp ground cable on ground bolt (4) below the Control cabinet.

11.4 Disposal

ENVIRONMENT!

Improper waste disposal

Improper waste disposal threatens the environment and prevents re-use and recycling.

- Clean components before their disposal.
- Always dispose of components in accordance with their characteristics.
- Collect leaked out utilities and auxiliaries completely.
- Dispose of work equipment soaked in coating materials or operating substances according to the disposal provisions in force.
- Dispose of utilities and auxiliaries according to the disposal provisions in force.
- In case of doubt, refer to the local disposal authorities.

12 Technical data

12.1 Dimensions and weight

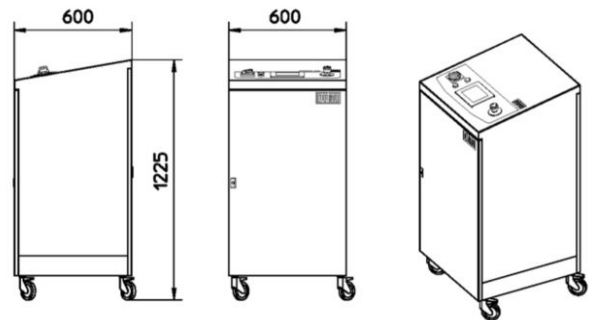


Fig. 96: Dimensions

Detail	Value
Height	1225 mm
Width	600 mm
Depth	600 mm
Weight	approx. 140kg

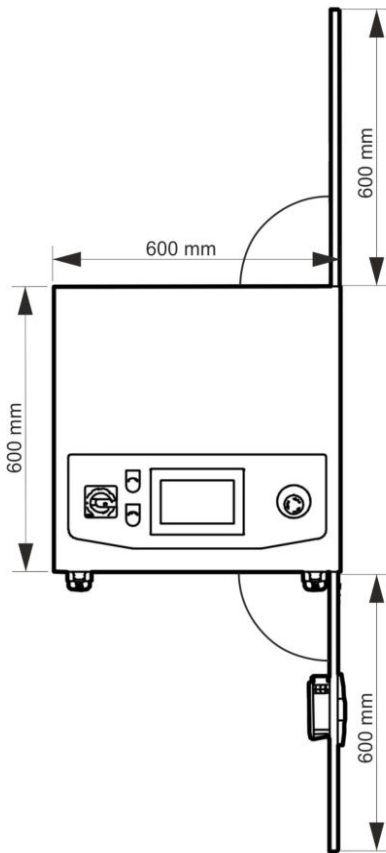
Dimensions with opened Control cabinet doors


Fig. 97: Dimensions - View From Top

12.2 Connections
Maximum hose lengths and cable lengths

Detail	Value
Paint hose, max.	5 m
Control cabinet to atomizer, max.	10 m
Control cabinet to pump, max.	10 m
Color changer to paint pressure regulator/dosing pump	0.2m

12.3 Operating conditions

Detail	Value
Operating temperature, min.	10 °C
Operating temperature, max.	40 °C
Min. relative humidity	20 %
Relative humidity, max.	80 %
Installation altitude, max.	2000 m (NHN)
Protection type	IP54

12.4 Operating values

Detail	Variant	Value
High voltage	EC	80kV/400 μ A
	DC	80kV/100 μ A
Voltage, min.	-	3 x 380V
Voltage, max.	-	3 x 480V
Current strength	-	16A
Frequency	-	50/60Hz
Power, max.	1K, 1PPR	4 kW
	1K, 1DP	
	2K	
Speed, max.	EC, DC, HRZ	70,000 RPM
Braking time (from 70,000 RPM to 5,000 RPM) without load, max.	EC, DC, HRZ	15s
Input pressure, min.	-	6bar (dynamic) at max. 96m ³ /h
Input pressure, max.	-	8bar (dynamic) at max. 96m ³ /h
Air consumption, max.	EC, DC, HRZ	1600 NI/min
	AS, AA, AL, PJ	1200 NI/min

The technical data on the applicators is found in the operating instructions of the **EcoBell** rotary atomizer and the **EcoPaintJet** application device.

12.5 Compressed air quality

- Purity classes in accordance with ISO 8573-1: 1:4:1
- Limitations for purity class 4 (pressure dew point max.):
 - $\leq -3^{\circ}\text{C}$ at 7bar absolute
 - $\leq +1^{\circ}\text{C}$ at 9bar absolute
 - $\leq +3^{\circ}\text{C}$ at 11bar absolute

12.6 Type plate

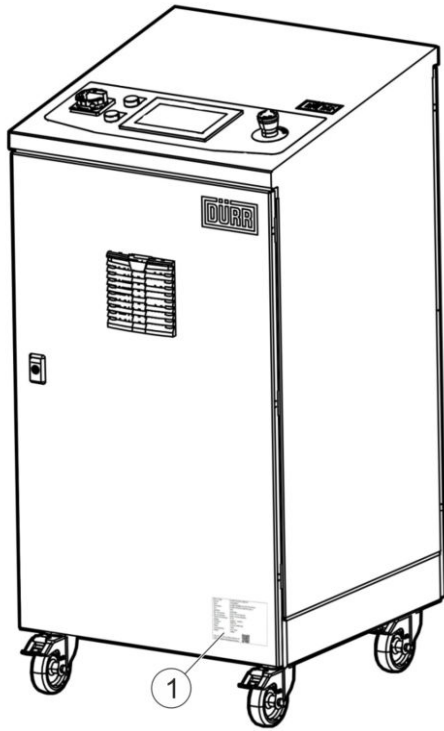


Fig. 98: Position of type plate

The type plate (1) shows the following details:

- Product denomination
- Material number
- Order code
- Year of manufacture
- Minimum air pressure
- Maximum air pressure
- Protection type
- Voltage
- Frequency
- Current strength
- Power
- Protection
- Weight
- Manufacturer
- QR-Code

12.7 Operating and auxiliary materials

Do not use corrosive cleaning agents to clean the Control cabinet.

Denomination	Specification
Touch display	Solvent-free cleaning agents
Cable connection to high voltage generator	Technical petroleum jelly ↪ 13.3 "Accessories"

13 Spare parts, tools and accessories

13.1 Spare parts

Following information is required for ordering spare parts:

- Serial number of Control cabinet
- Complete configuration key
The information on the type plate is not sufficient.

In the event of replacement of the CPU card (item 1039) only Dürer Systems can install the associated software ↪ "Hotline and Contact" .

F30310001V

Item	Description	Quantity	Order number	Spare part/Wear part
101	DRIVE CONTROL UNIT\18A HCS01.1 CANopen	1	E03140091	E
102	DRIVE CONTROL UNIT\18A HCS01.1 CANopen	2	E03140091	E

Item	Description	Quantity	Order number	Spare part/Wear part
103	LINE FILTER\480V 16A F.DKC-CONTR. DEVICE	1	E05020030	E
104	CLAMP SCREEN TERMINAL\F.4-13.5mm SCREW	1	E14460013	N
105	CLAMP SCREEN TERMINAL\F.4-13.5mm SCREW	2	E14460013	N
201	INPUT CARD\ANALOG 4 In 0-20mA TYP X20	1	E03020113	E
202	OUTPUT CARD\ANALOG 4 OUT 0-20mA +/-10V	1	E03030093	E
203	INPUT CARD\ANALOG 2 In 0-20mA	1	E03020112	E
204	CONNECTION CARD\PLACE HOLDER (DUMMY)	1	E03170005	N
205	CPU-CARD\X20CP1382	1	E03110142	N
206	I/O-CARD\4INP/2OUT DIGITAL 1IN ANALOG	1	E03440037	E
207	FIELD TERM.\X20 12-POL.24VDC coded TB12	4	E03910001	E
208	BUS MOD.\X20 24V	4	E03910002	E
209	PLUG\2-POL.SPR. BAL. 3.81 1.5 mm ²	1	E20010426	E
210	CONTROL PANEL\POWER PANEL T30 7"	1	F02030035	E
211	INTERFACE MODULE\RJ45 ZU RJ45	1	E40050034	E
301	FRONT PLATE\F.CONTR. ELECTR.HSP G500 GB	1	E06010012	
302	EcoHT2 G500 GENERATOR	1	E80010008	V
303	HS CASCADE KPL.\15-906-049	1	E10110013	V
304	HV SLOT\EcoHT G100 1/2 19"	1	F08080017	E
305	HV SLOT\EcoHT G500 1/2 19"	1	F08080019	E
306	CLAMP. PIECE\D70 93x90x20 HV-CASCADE PPh	2	M24010290	
307	COVER HOOD\520x127x94 pcs.	1	M59020757	N
308	PIPE BRACKET\D50 PP	2	M62020006	
309	HATCH\HV-INSTALLATION	1	M64010029	
310	NOTES FILM\F. CASCADE HIGH VOLTAGE	1	M44030010	N
311	PETROL. JELLY\BERULUB PV DAB 10 20g BAG	1	W32120006	V
401	R/O CONVERTER DRI\HN M18 Eex 2/1	1	E34010034	E
402	BRACKET\40x100x5x40 Al	1	M19102011	N

Item	Description	Quantity	Order number	Spare part/Wear part
404	ISOLATING SWICH AMPLIFIER\MACX 0/4-20mA	2	E03220051	E
405	ISOLATING SWICH AMPLIFIER\MACX 0/4-20mA	4	E03220051	E
406	GROUND TERMINAL\Cable 6-8mm M4	2	E11020019	N
407	GROUND TERMINAL\Cable 6-8mm M4	2	E11020019	N
408	GROUND TERMINAL\Cable 6-8mm M4	4	E11020019	N
409	END BRACKET\CLIPFIX 35	17	E11060010	N
410	END BRACKET\CLIPFIX 35	15	E11060010	N
411	COVER PLATE\2mm GREY ZPV	4	E11070046	N
412	COVER PLATE\ID-ST 2.5 GREY	4	E11070047	N
413	COVER PLATE\ID-ST 2.5 GREY	3	E11070047	N
414	COVER PLATE\ID-ST 2.5 QUATTRO GREY	2	E11070053	N
415	COVER PLATE\ID-ST 6 GREY	1	E11070054	
416	PROTECTIVE WARNING\YELLOW W. BLACK FLASH	2	E11090006	N
417	BUS BAR SUPPORT\1-POL.TO 30x10 mm	2	E14400011	N
418	BUS BAR SUPPORT\AB/SS-M F.3x10mm	2	E14400013	N
419	RELAY MOD.\PLC SERIES CHANGEOVER RELAYS	2	E16050010	E
420	ILLUM. PUSH BUTTON\ID22 RD FLAT CLEAR EN.	1	E17040077	E
421	SWITCHING ELEMENT\1Ö FRONT SPR. BAL.	1	E17180015	V
422	MAIN SWITCH\16A 3-POL FRONT ATTACHMENT.	1	E17100028	V
423	LAMP HOLD.\LED 24V WHITE SPRING BAL.FRO.	1	E02100036	E
424	TAG HOLDER\50x30 F.LABEL 17.5x27	2	M44110033	N
425	DESCR.LABEL\SYMBOL LABEL PUSH BUTTON O	1	M44010399	N
426	POWER SWITCH\TRANSFORMER 11-16A BGR.S00	1	E17210086	V
427	POWER SWITCH\TRANSFORMER 11-16A BGR.S00	1	E17210086	V
428	POWER SWITCH\TRANSFORMER 11-16A BGR.S00	1	E17210086	V
429	POWER SWITCH\TRANSFORM. 2.2-3.2A BGR.S00	1	E17210088	V

Item	Description	Quantity	Order number	Spare part/Wear part
430	POWER SWITCH\TRANS-FORMER 0.55-0.8A S00	1	E17210106	V
431	AUXILIARY CIRCUIT SWITCH\1S 1Ö DIAGON.	2	E17220023	V
432	AUXILIARY CIRCUIT SWITCH\1S 1Ö DIAGON.	1	E17220023	V
433	ACCESSOR.\LOCC-BOX SUPPLY SET	1	E18990019	N
434	MONITOR. CURRENCY\LOCC BOX 24VDC 1-10A	4	E18260003	E
435	MAIN PROTECTION\3kW/400V 1Ö 24VDC	2	E19010040	E
436	MAIN PROTECTION\3kW/400V 1Ö 24VDC	2	E19010040	E
437	MAIN PROTECTION\3kW/400V 1Ö 24VDC	2	E19010040	E
438	AUX. SWITCH BLOCK\2S/2Ö F.CONT. S0/S00	2	E19030033	V
439	AUX. SWITCH BLOCK\2S/2Ö F.CONT. S0/S00	2	E19030033	V
440	AUX. SWITCH BLOCK\2S/2Ö F.CONT. S0/S00	2	E19030033	V
441	EMER. STOP SWITCH. DEV. \24VDC 3S 1Ö PNOZ	1	E19500017	V
442	PLUG\F.COMPLETION DDL M12 A-cod.	1	E20010238	E
443	PLUG\D-SUB 9-POL CAN/M12	2	E20010448	E
444	PLUG\D-SUB 9-POL CAN/M12	1	E20010448	E
445	PLUG UNIT\T-BUS HOUSING 5POL	2	E20710022	N
446	PLUG UNIT\T-BUS HOUSING 5POL	4	E20710022	N
447	TRANSFORMATOR\HT2	1	E21010155	N
448	VARISTOR\24-70VDC 24-48VAC BGR.S00	2	E31010009	E
449	VARISTOR\24-70VDC 24-48VAC BGR.S00	2	E31010009	E
450	VARISTOR\24-70VDC 24-48VAC BGR.S00	2	E31010009	E
451	FAN\24VDC 55m³/h 148x148 mm	1	F10030030	V
452	SWITCH. POWER SUPP. \340-550VAC 24VDC/20A	1	F12040020	V
453	TERMINAL BLOCHE\ST2,5-QUATTRO PE GN/GE	4	E11040105	
454	TERMINAL BLOCK\0,2-10mm² GRAY ST6	3	E11040135	N

Item	Description	Quantity	Order number	Spare part/Wear part
455	TERMINAL BLOCK\0,2-10mm ² BLUE ST6 BU	1	E11040112	
456	TERMIN. BLOCK\ST6-PE SPRING BAL.	1	E11040106	
457	TERMINAL BLOCK\0.14-2.5mm ²	10	E11040086	N
458	TERMIN. BLOCK\SPRING BALAN. THROU.CLAMPS	14	E11040087	
459	TERM. BLOCK\SPR. BALAN. PROT. CONDUCT.	4	E11040088	
460	TERMIN. BLOCK\SPRING BALAN. THROU.CLAMPS	18	E11040087	
461	TERM. BLOCK\SPR. BALAN. PROT. CONDUCT.	5	E11040088	
462	GROUNDING RAILS\10x3x1000 N Cu	1	E04020008	N
463	CONNECTION TERMINAL\F.5mm RAIL 2.5-16mm ²	14	E11200010	N
464	BUS BAR\30x5 L2400 E-Cu	1	E14420013	N
465	CLAMP SCREEN TERMINAL\SK8	2	E14460008	
466	CLAMP SCREEN TERMINAL\SK8	2	E14460008	
467	CLAMP SCREEN TERMINAL\SK8	3	E14460008	
468	CLAMP SCREEN TERMINAL\SK8	1	E14460008	
469	SUPPORT\SWITCHING ELEMENT 3-FOLD 3SU1500	2	E14330059	E
470	MUSHROOM BUTTON\D22 EMERGENCY STOP RED	1	E17160062	E
471	SWITCHING ELEMENT\2Ö FRONT SPR. BAL.	2	E17180018	V
472	DESCR. LABEL"EMERG. STOP" D75 DE/EN/IT	1	M44010382	N
473	ILLUM. PUSH BUT.\1S LED CLEAR FLAT SPR.	1	E17040070	E
474	DESCR.LABEL\SYMBOL LABEL PUSH BUTTON 1	1	M44010400	N
501	CABLE ROUTING\16B SIZE KDL/E 24/10	1	E14210006	
502	CABLE SLEEVE\DUMMY SLEEVE SW	8	E14340020	
503	CABLE SLEEVE\ROUTING 6-7mm KDL/E	5	E14340026	E
504	CABLE SLEEVE\ROUTING 8-9mm KDL/E	5	E14340028	
505	CABLE GLAND\M20x1.5 9-17 IP PA	1	E14800004	E
506	CABLE GLAND\EMV M16x1.5 4.5-9 IP	1	E14800013	E

Item	Description	Quantity	Order number	Spare part/Wear part
507	CABLE GLAND\M16x1.5 4-9 Exi PA	2	E14810005	E
508	CABLE GLAND\M16x1.5 4-9 Exi PA	4	E14810005	E
509	LOCKNUT\M16x1.5 PA	5	E14820002	E
510	LOCKNUT\M20x1.5 PA	3	E14820003	E
511	LOCKNUT\M20x1.5 PA	1	E14820004	E
512	LOCKNUT\M16x1.5 PA	1	E14820009	E
513	BLIND PLUG\M16 IP PA	4	E14840002	E
514	BLIND PLUG\M16 IP PA	2	E14840002	E
515	BLIND PLUG\M16 IP PA	1	E14840002	E
516	BLIND PLUG\M20x1.5 IP PA	2	E14840003	E
517	BLIND PLUG\M20x1.5 IP PA	1	E14840003	E
521	FOIL\EcoAUC" 60mm SELF-ADHESIVE	1	M44090024	N
522	FOIL\EcoAUC" 30mm SELF-ADHESIVE	1	M44090025	N
523	FOIL\ADHESIVE FOIL OPERATOR CONS. EcoAUC	1	M44090014	N
525	CONSOLE HOUSING\SZAFKA CONTROL CABINET	1	N29100039	N
526	AIR FILTER\OUTLET FILTER F.SK 3238.1xx	1	N35010240	V
527	AIR FILTER\OUTLET FILTER F.SK 3238.1xx	2	N35010240	V
528	INDIC. LABEL\READ OPER. INSTR. PVC D30	1	M44210080	N
529	INDIC. LABEL\LIGHTG.FLASH SL50 FOIL SELF	1	M44210015	E
530	SIGN\LIGHTG. FLASH FOIL APT/PFS	1	M44210107	N
531	PLUGS\D8 L20	8	M48010262	N
601	PLUG CONNECTION CABLE\CAT6A L2m	1	E09070204	E
602	PLUG CONNECTION CABLE\CAT6A L0.5m	1	E09070203	E
603	PLUG CONNECTION CABLE\5-POL.M12 PUR 2 m	1	E09070187	E
604	PLUG CONNECTION CABLE\5-POL.M12-M12 0.3m	1	E09070184	E
605	CONTR.CAB.\2x1.0mm ² OIL-FLEX-110 GRAY	1	E09330002	E
606	PLUG CONNECTION CABLE\5-POL.M12-M12 2 m	1	E09070185	E

Item	Description	Quantity	Order number	Spare part/Wear part
607	CONNECTION CABLE\M12 BU OPEN 5-POL.3M	1	E09060525	E
608	CONNECTION CABLE\M12 BU OPEN 5-POL.3M	2	E09060525	E
609	CONTR.CAB.\17Gx1.0mm ² OIL-FLEX-110 GRAY	1	E09330015	E
610	CONNECTION CABLE\M12 ST OPEN 5-POL.3M	1	E09060526	E
611	PLUG CONNECTION CABLE\25-POL.D SUB 3m	1	E09070188	E
1000	CONTROLLER COMPRESSED AIR\G1/2 MS6 LI.	1	N26050108	E
1001	PROPORTIONAL VALVE\VPPE	1	E34030038	E
1002	AIR FILTER\G1/2" FINEST FILTER MS6 LI.	1	N35010145	V
1003	VALVE UNIT\VTUG EcoAUC BELL 1K HRZ	1	M54120085	E
1004	VALVE UNIT\VTUG EcoAUC BELL 1K GUN	1	M54120086	E
1005	VALVE UNIT\VTUG EcoAUC BELL 2K GUN	1	M54120087	E
1006	VALVE UNIT\VTUG EcoAUC BELL 2K HRZ	1	M54120088	E
1007	3/2 SOLENOID VALVE\2-F.NC 470 l/min VUVG	1	M54210147	E
1008	5/2 SOLENOID VALVE\G1/2" MS6 LI.	1	M54210093	E
1009	5/2 SOLENOID VALVE\BG14mm 550l/min VUVG	1	M54220053	E
1010	SHUT-OFF VALVE\G1/2" MS6 LI.	1	M54330176	E
1011	PRESSURE SWITCH\0-10bar 2CHANNEL M12	1	E22030060	E
1012	DISTRIBUTION BLOCK\G1/2" MS6 LI.	1	M27020039	E
1013	SOUND MUFFLER\G1/2" 0-12bar Ms	1	M54610037	E
1014	SOUND MUFFLER\G1/4" L13.8 SHORT	1	M54610075	E
1015	SOUND MUFFLER\M5 L8.7 SHORT	1	M54610074	E
1016	SOUND MUFFLER\G1/8" L11.8 SHORT	1	M54610071	E
1017	SOUND MUFFLER\G1/2" L19 SHORT	1	M54610076	E
1018	ELBOW SCREWED PLUG-IN CONNECT.D22 G3/4"	1	M57310026	E

Item	Description	Quantity	Order number	Spare part/Wear part
1019	ELBOW SCREWED PLUG-IN CONN.\D6 M5 N Ms	1	M57310032	E
1020	ELBOW SCREWED PLUG-IN CONNEC.\D8 G1/4"	1	M57310058	E
1021	ELBOW SCREW. PLUG-IN CONN.\D6 G1/8" N Ms	1	M57310038	N
1022	ELBOW SCREWED PLUG CONNECTION\D4 R1/4"	1	M57310085	E
1023	ELBOW SCREWED PLUG-IN CONNEC.\D10 G1/4"	1	M57310099	E
1024	ELBOW SCREWED PLUG-IN CONNEC.\D10 R1/8"	1	M57310086	E
1025	SCREWED PLUG-IN CONNEC.\D6 G1/8" N Ms	1	M57380058	E
1026	SCREWED PLUG-IN CONNEC.\D6 G1/8-I N Ms	1	M57380090	E
1027	SCREWED PLUG-IN CONNEC.\D4 G1/8-I N Ms	1	M57380092	E
1028	SWIVEL SCREW CONNECTION\G3/8" D8 3-FOLD	1	M57020120	V
1029	SWIVEL SCREW CONNECTION\G3/8" D10 6-FOLD	1	M57020121	V
1030	BUS MODULE\CTEU-CO	1	E50030007	E
1031	COUPLING\5-POL.PLUG SOCKET M12 BU STR.	1	E20310073	V
1032	ELBOW PLUG\2-POL. 24V M12	1	E20020027	E
1033	CONNECTION CABLE\M8 5-POL.3ADR.GER.2.5m	1	E09060615	V
1034	CONNECTION CABLE\M12 5-POL.3ADR.GER.2.5m	1	E09060616	V
1035	CONNECTION CABLE\M12 5-POL.GER.2.5m	1	E09060614	V
1036	PLUG DOSE ADAPT.\BUS-KNOT.SUB-D/2XM12	1	E20020083	E
1037	CONTR.CAB.\5G0,75mm ² OIL-FLEX-110 GRAY	1	E09330056	E
1038	ELBOW SCREWED PLUG-IN CONNECT.\R1/8" D6	1	M57310045	E
1039	CPU-CARDX20CP1382 – HW+SW	1	E03110152	E

F30920001 - Pneumatic assembly 1K HRZ PPR

Item	Description	Quantity	Order number	Spare part/Wear part
160	REGULATOR, COMPRESSED AIR\G1/2 MS6 LE.	1	N26050108	E
216	PROPORTIONAL VALVE\VPPE	4	E34030038	E
293	AIR FILTER\G1/2" FINEST FILTER MS6 LI.	1	N35010145	V
370	VALVE UNIT\VTUG ECOAUC BELL 1K HRZ	1	M54120085	E
425	3/2 SOLENOID VALVE\2-F.NC 470 l/min VUVG	10	M54210147	E
441	3/2 SOLENOID VALVE\G1/2" MS6 LI.	1	M54210093	E
477	5/2 SOLENOID VALVE\BG 14mm550 l/min VUVG	2	M54220053	E
584	SHUT-OFF VALVE\G1/2" MS6 LI.	1	M54330176	E
644	PRESSURE SWITCH\0-10bar 2K M12	1	E22030060	E
670	DISTRIBUTOR BLOCK\G1/2" MS6 LI.	2	M27020039	E
758	SOUND MUFFLER\G1/2" 0-12bar Ms	2	M54610037	E
759	SOUND MUFFLER\G1/4" L13.8 SHORT	4	M54610075	E
760	SOUND MUFFLER\M5 L8.7 SHORT	2	M54610074	E
761	SOUND MUFFLER\G1/8" L11.8 SHORT	4	M54610071	E
762	SOUND MUFFLER\G1/2" L19 SHORT	1	M54610076	E
786	CONNECTOR PLATE\F.VUVG 10 VALVE PLACES	1	M54020106	N
787	CONNECTOR PLATE\G3/4i MS6	1	M54020069	
1247	RED NIPPLE\G3/8"i-G1/2"a L15.5 Ms	2	M56100353	
1248	RED NIPPLE\G3/4"a-G1/4" W/ SEALING RING	1	M56100508	N
1296	CONNECTING PIECE\LONG MS6	5	M33430018	
1298	CONNECTING PIECE\WITHOUT BRACKET MS6	2	M33430020	
1580	ELBOW SCREWED PLUG-IN CONNEC.\D22 G3/4"	1	M57310026	E
1606	ELBOW SCREWED PLUG-IN CONNEC.\D6 M5 N Ms	1	M57310032	E
1607	ELBOW SCREWED PLUG-IN CONNEC.\D8 G1/4"	1	M57310058	E

Item	Description	Quantity	Order number	Spare part/Wear part
1608	ELBOW SCREWED PLUG-IN CON.\D6 G1/8" N Ms	1	M57310038	N
1611	ELBOW SCREWED PLUG-IN CONNEC.\D4 R1/4"	1	M57310085	E
1612	ELBOW SCREWED PLUG-IN CONNEC.\D10 G1/4"	2	M57310099	E
1613	ELBOW SCREWED PLUG-IN CONNEC.\D10 R1/8"	13	M57310086	E
1622	SCREWED PLUG-IN CONNECTION\D6 G1/8" N Ms	1	M57380058	E
1643	SCREWED PLUG-IN CONNEC.\D6 G1/8-I N Ms	5	M57380090	E
1645	SCREWED PLUG-IN CONNEC.\D4 G1/8-I N Ms	19	M57380092	E
1788	Y-PLUG-IN CONNECTION\D10 NBR PBT	1	M57410025	N
1789	Y-PLUG-IN CONNECTION\D10-10	1	M57410033	N
1860	REDUCTION\D12a D10i	4	M58200098	N
1877	REDUCTION\D6a D4i NBR,PBT	1	M58200042	N
1878	REDUCTION\D8a D6i NBR,PBT	2	M58200041	
1879	REDUCTION\FOR HOSE D8a	2	M58200075	N
1900	BULDHEAD PLUG-IN CONNECTION\D12-12 Ms	4	M57390048	N
1901	BULDHEAD PLUG-IN CONNECTION\D8 Ms	1	M57390052	N
1902	BULDHEAD PLUG-IN CONNECTION\D6 Ms	7	M57390051	N
1903	BULDHEAD PLUG-IN CONNECTION\D4 Ms	27	M57390050	N
2070	SWIVEL SCREW CONNECTION\G3/8" D8 3-FOLD	1	M57020120	V
2071	SWIVEL SCREW CONNECTION\G3/8" D10 6-FOLD	1	M57020121	V
2274	BUS MODULE\CTEU-CO	1	E50030007	E
2363	COUPLING\5-POLE OUTLET M12 BU STRAIGHT	1	E20310073	V
2382	ELBOW PLUG\2-POL. 24V M12	2	E20020027	E
2389	PLUG SCREW\M5 L8.5 AI	1	M41090125	
2396	PLUG SCREW\R1/8" L10 SW5 St	3	M41090105	
2419	CLOSURE PUSH-ON NIPPLE\D10	2	M58020019	N
2422	CLOSURE PUSH-ON NIPPLE\D4	3	M58020014	
2423	CLOSURE PUSH-ON NIPPLE\D6	2	M58020011	N
2831	VELCRO\216.5x20 W/SUPPORTS	4	M53260011	N

Item	Description	Quantity	Order number	Spare part/Wear part
3448	CONNECTION CABLE\M8 5-POL.3ADR.GER.2.5m	1	E09060615	V
3449	CONNECTION CABLE\M12 5-POL.3ADR.GER.2.5m	1	E09060616	V
3450	CONNECTION CABLE\M12 5-POL.GER.2.5m	4	E09060614	V
3565	CYL SCREW\M4x18 DIN912 8.8 Z St	6	D09120183	
3566	CYL SCREW\M3x8 DIN84 4.8 Z St	1	D00840068	
3727	PLUG\DOSE ADAPT.BUS-KNOT.SUB-D/2XM12	2	E20020083	E
3728	CONTR.CAB.\5G0.75mm ² OIL-FLEX-110 GRAY	1	E09330056	E

F30920002 - Pneumatic assembly 1K HRZ

Item	Description	Quantity	Order number	Spare part/Wear part
160	REGULATOR, COMPRESSED AIR\G1/2 MS6 LE.	1	N26050108	E
216	PROPORTIONAL VALVE\VPPE	3	E34030038	E
293	AIR FILTER\G1/2" FINEST FILTER MS6 LI.	1	N35010145	V
370	VALVE UNIT\VTUG ECOAUC BELL 1K HRZ	1	M54120085	E
425	3/2 SOLENOID VALVE\2-F.NC 470 l/min VUVG	10	M54210147	E
441	3/2 SOLENOID VALVE\G1/2" MS6 LI.	1	M54210093	E
477	5/2 SOLENOID VALVE\BG 14mm550 l/min VUVG	2	M54220053	E
584	SHUT-OFF VALVE\G1/2" MS6 LI.	1	M54330176	E
644	PRESSURE SWITCH\0-10bar 2K M12	1	E22030060	E
670	DISTRIBUTOR BLOCK\G1/2" MS6 LI.	2	M27020039	E
758	SOUND MUFFLER\G1/2" 0-12bar Ms	2	M54610037	E
759	SOUND MUFFLER\G1/4" L13.8 SHORT	4	M54610075	E
760	SOUND MUFFLER\M5 L8.7 SHORT	2	M54610074	E
761	SOUND MUFFLER\G1/8" L11.8 SHORT	3	M54610071	E
762	SOUND MUFFLER\G1/2" L19 SHORT	1	M54610076	E
786	CONNECTOR PLATE\F.VUVG 10 VALVE PLACES	1	M54020106	N
787	CONNECTOR PLATE\G3/4i MS6	1	M54020069	
1247	RED NIPPLE\G3/8"i-G1/2"a L15.5 Ms	2	M56100353	
1248	RED NIPPLE\G3/4"a-G1/4" W/ SEALING RING	1	M56100508	N
1296	CONNECTING PIECE\LONG MS6	5	M33430018	
1298	CONNECTING PIECE\WITHOUT BRACKET MS6	2	M33430020	
1580	ELBOW SCREWED PLUG-IN CONNEC.\D22 G3/4"	1	M57310026	E
1606	ELBOW SCREWED PLUG-IN CONNEC.\D6 M5 N Ms	1	M57310032	E
1607	ELBOW SCREWED PLUG-IN CONNEC.\D8 G1/4"	1	M57310058	E

Item	Description	Quantity	Order number	Spare part/Wear part
1611	ELBOW SCREWED PLUG-IN CONNEC.\D4 R1/4"	1	M57310085	E
1612	ELBOW SCREWED PLUG-IN CONNEC.\D10 G1/4"	2	M57310099	E
1613	ELBOW SCREWED PLUG-IN CONNEC.\D10 R1/8"	12	M57310086	E
1622	SCREWED PLUG-IN CONNEC-TION\D6 G1/8" N Ms	1	M57380058	E
1643	SCREWED PLUG-IN CONNEC.\D6 G1/8-I N Ms	5	M57380090	E
1645	SCREWED PLUG-IN CONNEC.\D4 G1/8-I N Ms	19	M57380092	E
1788	Y-PLUG-IN CONNECTION\D10 NBR PBT	1	M57410025	N
1789	Y-PLUG-IN CONNECTION\D10-10	1	M57410033	N
1860	REDUCTION\D12a D10i	3	M58200098	N
1877	REDUCTION\D6a D4i NBR,PBT	1	M58200042	N
1878	REDUCTION\D8a D6i NBR,PBT	2	M58200041	
1879	REDUCTION\FOR HOSE D8a	2	M58200075	N
1900	BULDHEAD PLUG-IN CONNEC-TION\D12-12 Ms	4	M57390048	N
1901	BULDHEAD PLUG-IN CONNEC-TION\D8 Ms	1	M57390052	N
1902	BULDHEAD PLUG-IN CONNEC-TION\D6 Ms	7	M57390051	N
1903	BULDHEAD PLUG-IN CONNEC-TION\D4 Ms	27	M57390050	N
2070	SWIVEL SCREW CONNEC-TION\G3/8" D8 3-FOLD	1	M57020120	V
2071	SWIVEL SCREW CONNEC-TION\G3/8" D10 6-FOLD	1	M57020121	V
2274	BUS MODULE\CTEU-CO	1	E50030007	E
2363	COUPLING\5-POLE OUTLET M12 BU STRAIGHT	1	E20310073	V
2382	ELBOW PLUG\2-POL. 24V M12	2	E20020027	E
2389	PLUG SCREW\M5 L8.5 AI	1	M41090125	
2396	PLUG SCREW\R1/8" L10 SW5 St	3	M41090105	
2419	CLOSURE PUSH-ON NIPPLE\D10	2	M58020019	N
2422	CLOSURE PUSH-ON NIPPLE\D4	3	M58020014	
2423	CLOSURE PUSH-ON NIPPLE\D6	2	M58020011	N
2831	VELCRO\216.5x20 W/SUPPORTS	4	M53260011	N
3448	CONNECTION CABLE\M8 5-POL.3ADR.GER.2.5m	1	E09060615	V

Item	Description	Quantity	Order number	Spare part/Wear part
3449	CONNECTION CABLE\M12 5-POL.3ADR.GER.2.5m	1	E09060616	V
3450	CONNECTION CABLE\M12 5-POL.GER.2.5m	3	E09060614	V
3565	CYL SCREWM4x18 DIN912 8.8 Z St	6	D09120183	
3566	CYL SCREWM3x8 DIN84 4.8 Z St	1	D00840068	
3727	PLUG\DOSE ADAPT.BUS-KNOT.SUB-D/2XM12	2	E20020083	E
3728	CONTR.CAB.\5G0.75mm ² OIL-FLEX-110 GRAY	1	E09330056	E

F30920003 - Pneumatic assembly 2K HRZ

Item	Description	Order number	Quantity	Spare part/Wear part
160	REGULATOR, COMPRESSED AIR\G1/2 MS6 LE.	1	N26050108	E
216	PROPORTIONAL VALVE\VPPE	3	E34030038	E
293	AIR FILTER\G1/2" FINEST FILTER MS6 LI.	1	N35010145	V
373	VALVE UNIT\VTUG ECOAUC BELL 2K HRZ	1	M54120088	E
425	3/2 SOLENOID VALVE\2-F.NC 470 l/min VUVG	14	M54210147	E
441	3/2 SOLENOID VALVE\G1/2" MS6 LI.	1	M54210093	E
477	5/2 SOLENOID VALVE\BG 14mm550 l/min VUVG	2	M54220053	E
584	SHUT-OFF VALVE\G1/2" MS6 LI.	1	M54330176	E
644	PRESSURE SWITCH\0-10bar 2K M12	1	E22030060	E
670	DISTRIBUTOR BLOCK\G1/2" MS6 LI.	2	M27020039	E
758	SOUND MUFFLER\G1/2" 0-12bar Ms	2	M54610037	E
759	SOUND MUFFLER\G1/4" L13.8 SHORT	4	M54610075	E
760	SOUND MUFFLER\M5 L8.7 SHORT	2	M54610074	E
761	SOUND MUFFLER\G1/8" L11.8 SHORT	3	M54610071	E
762	SOUND MUFFLER\G1/2" L19 SHORT	1	M54610076	E
786	CONNECTOR PLATE\F.VUVG 10 VALVE PLACES	1	M54020106	N
787	CONNECTOR PLATE\G3/4i MS6	1	M54020069	
1247	RED NIPPLE\G3/8"i-G1/2"a L15.5 Ms	2	M56100353	
1248	RED NIPPLE\G3/4"a-G1/4" W/ SEALING RING	1	M56100508	N
1296	CONNECTING PIECE\LONG MS6	5	M33430018	
1298	CONNECTING PIECE\WITHOUT BRACKET MS6	2	M33430020	
1580	ELBOW SCREWED PLUG-IN CONNEC.\D22 G3/4"	1	M57310026	E
1606	ELBOW SCREWED PLUG-IN CONNEC.\D6 M5 N Ms	1	M57310032	E
1607	ELBOW SCREWED PLUG-IN CONNEC.\D8 G1/4"	1	M57310058	E

Item	Description	Order number	Quantity	Spare part/Wear part
1611	ELBOW SCREWED PLUG-IN CONNEC.\D4 R1/4"	1	M57310085	E
1612	ELBOW SCREWED PLUG-IN CONNEC.\D10 G1/4"	2	M57310099	E
1613	ELBOW SCREWED PLUG-IN CONNEC.\D10 R1/8"	6	M57310086	E
1622	SCREWED PLUG-IN CONNEC-TION\D6 G1/8" N Ms	1	M57380058	E
1643	SCREWED PLUG-IN CONNEC.\D6 G1/8-I N Ms	6	M57380090	E
1645	SCREWED PLUG-IN CONNEC.\D4 G1/8-I N Ms	26	M57380092	E
1788	Y-PLUG-IN CONNECTION\D10 NBR PBT	1	M57410025	N
1860	REDUCTION\D12a D10i	3	M58200098	N
1878	REDUCTION\D8a D6i NBR,PBT	2	M58200041	
1879	REDUCTION\FOR HOSE D8a	2	M58200075	N
1900	BULDHEAD PLUG-IN CONNEC-TION\D12-12 Ms	4	M57390048	N
1901	BULDHEAD PLUG-IN CONNEC-TION\D8 Ms	1	M57390052	N
1902	BULDHEAD PLUG-IN CONNEC-TION\D6 Ms	7	M57390051	N
1903	BULDHEAD PLUG-IN CONNEC-TION\D4 Ms	27	M57390050	N
2070	SWIVEL SCREW CONNEC-TION\G3/8" D8 3-FOLD	1	M57020120	V
2071	SWIVEL SCREW CONNEC-TION\G3/8" D10 6-FOLD	1	M57020121	V
2274	BUS MODULE\CTEU-CO	1	E50030007	E
2363	COUPLING\5-POLE OUTLET M12 BU STRAIGHT	1	E20310073	V
2382	ELBOW PLUG\2-POL. 24V M12	2	E20020027	E
2389	PLUG SCREW\M5 L8.5 Al	1	M41090125	
2396	PLUG SCREW\R1/8" L10 SW5 St	3	M41090105	
2419	CLOSURE PUSH-ON NIPPLE\D10	2	M58020019	N
2422	CLOSURE PUSH-ON NIPPLE\D4	2	M58020014	
2423	CLOSURE PUSH-ON NIPPLE\D6	3	M58020011	N
2831	VELCRO\216.5x20 W/SUPPORTS	4	M53260011	N
3448	CONNECTION CABLE\M8 5-POL.3ADR.GER.2.5m	1	E09060615	V
3449	CONNECTION CABLE\M12 5-POL.3ADR.GER.2.5m	1	E09060616	V
3450	CONNECTION CABLE\M12 5-POL.GER.2.5m	3	E09060614	V

Item	Description	Order number	Quantity	Spare part/Wear part
3565	CYL SCREWM4x18 DIN912 8.8 Z St	6	D09120183	
3566	CYL SCREWM3x8 DIN84 4.8 Z St	1	D00840068	
3727	PLUGDOSE ADAPT.BUS-KNOT.SUB-D/2XM12	2	E20020083	E
3728	CONTR.CAB.\5G0.75mm ² OIL-FLEX-110 GRAY	1	E09330056	E

F30920004 - Pneumatic assembly 1K Gun PPR				
Item	Description	Order number	Quantity	Spare part/Wear part
160	REGULATOR, COMPRESSED AIR\G1/2 MS6 LE.	1	N26050108	E
216	PROPORTIONAL VALVE\VPPE	3	E34030038	E
293	AIR FILTER\G1/2" FINEST FILTER MS6 LI.	1	N35010145	V
371	VALVE UNIT\VTUG ECOAUC BELL 1K GUN	1	M54120086	E
425	3/2 SOLENOID VALVE\2-F.NC 470 l/min VUVG	10	M54210147	E
441	3/2 SOLENOID VALVE\G1/2" MS6 LI.	1	M54210093	E
584	SHUT-OFF VALVE\G1/2" MS6 LI.	1	M54330176	E
644	PRESSURE SWITCH\0-10bar 2K M12	1	E22030060	E
670	DISTRIBUTOR BLOCK\G1/2" MS6 LI.	2	M27020039	E
758	SOUND MUFLER\G1/2" 0-12bar Ms	2	M54610037	E
759	SOUND MUFLER\G1/4" L13.8 SHORT	4	M54610075	E
760	SOUND MUFLER\M5 L8.7 SHORT	2	M54610074	E
761	SOUND MUFLER\G1/8" L11.8 SHORT	3	M54610071	E
762	SOUND MUFLER\G1/2" L19 SHORT	1	M54610076	E
786	CONNECTOR PLATE\F.VUVG 10 VALVE PLACES	1	M54020106	N
787	CONNECTOR PLATE\G3/4i MS6	1	M54020069	
1247	RED NIPPLE\G3/8"i-G1/2"a L15.5 Ms	2	M56100353	
1248	RED NIPPLE\G3/4"a-G1/4" W/ SEALING RING	1	M56100508	N
1296	CONNECTING PIECE\LONG MS6	5	M33430018	
1298	CONNECTING PIECE\WITHOUT BRACKET MS6	2	M33430020	
1580	ELBOW SCREWED PLUG-IN CONNEC.\D22 G3/4"	1	M57310026	E
1605	ELBOW SCREWED PLUG-IN CONN.\R1/8" D6	1	M57310045	E
1606	ELBOW SCREWED PLUG-IN CONNEC.\D6 M5 N Ms	1	M57310032	E
1607	ELBOW SCREWED PLUG-IN CONNEC.\D8 G1/4"	1	M57310058	E

Item	Description	Order number	Quantity	Spare part/Wear part
1611	ELBOW SCREWED PLUG-IN CONNEC.\D4 R1/4"	1	M57310085	E
1612	ELBOW SCREWED PLUG-IN CONNEC.\D10 G1/4"	2	M57310099	E
1613	ELBOW SCREWED PLUG-IN CONNEC.\D10 R1/8"	11	M57310086	E
1622	SCREWED PLUG-IN CONNEC-TION\D6 G1/8" N Ms	1	M57380058	E
1643	SCREWED PLUG-IN CONNEC.\D6 G1/8-I N Ms	1	M57380090	E
1645	SCREWED PLUG-IN CONNEC.\D4 G1/8-I N Ms	19	M57380092	E
1788	Y-PLUG-IN CONNECTION\D10 NBR PBT	1	M57410025	N
1860	REDUCTION\D12a D10i	3	M58200098	N
1878	REDUCTION\D8a D6i NBR,PBT	2	M58200041	
1879	REDUCTION\FOR HOSE D8a	2	M58200075	N
1900	BULDHEAD PLUG-IN CONNEC-TION\D12-12 Ms	4	M57390048	N
1901	BULDHEAD PLUG-IN CONNEC-TION\D8 Ms	1	M57390052	N
1902	BULDHEAD PLUG-IN CONNEC-TION\D6 Ms	7	M57390051	N
1903	BULDHEAD PLUG-IN CONNEC-TION\D4 Ms	27	M57390050	N
2070	SWIVEL SCREW CONNEC-TION\G3/8" D8 3-FOLD	1	M57020120	V
2071	SWIVEL SCREW CONNEC-TION\G3/8" D10 6-FOLD	1	M57020121	V
2274	BUS MODULE\CTEU-CO	1	E50030007	E
2363	COUPLING\5-POLE OUTLET M12 BU STRAIGHT	1	E20310073	V
2382	ELBOW PLUG\2-POL. 24V M12	2	E20020027	E
2389	PLUG SCREW\M5 L8.5 Al	1	M41090125	
2396	PLUG SCREW\R1/8" L10 SW5 St	3	M41090105	
2419	CLOSURE PUSH-ON NIPPLE\D10	2	M58020019	N
2422	CLOSURE PUSH-ON NIPPLE\D4	4	M58020014	
2831	VELCRO\216.5x20 W/SUPPORTS	4	M53260011	N
3448	CONNECTION CABLE\M8 5-POL.3ADR.GER.2.5m	1	E09060615	V
3449	CONNECTION CABLE\M12 5-POL.3ADR.GER.2.5m	1	E09060616	V
3450	CONNECTION CABLE\M12 5-POL.GER.2.5m	3	E09060614	V

Item	Description	Order number	Quantity	Spare part/Wear part
3565	CYL SCREWM4x18 DIN912 8.8 Z St	6	D09120183	
3566	CYL SCREWM3x8 DIN84 4.8 Z St	1	D00840068	
3727	PLUG\DOSE ADAPT.BUS-KNOT.SUB-D/2XM12	2	E20020083	E
3728	CONTR.CAB.\5G0.75mm ² OIL-FLEX-110 GRAY	1	E09330056	E

F30920005 - Pneumatic assembly 1K Gun				
Item	Description	Order number	Quantity	Spare part/Wear part
160	REGULATOR, COMPRESSED AIR\G1/2 MS6 LE.	1	N26050108	E
216	PROPORTIONAL VALVE\VPPE	2	E34030038	E
293	AIR FILTER\G1/2" FINEST FILTER MS6 LI.	1	N35010145	V
371	VALVE UNIT\VTUG ECOAUC BELL 1K GUN	1	M54120086	E
425	3/2 SOLENOID VALVE\2-F.NC 470 l/min VUVG	10	M54210147	E
441	3/2 SOLENOID VALVE\G1/2" MS6 LI.	1	M54210093	E
584	SHUT-OFF VALVE\G1/2" MS6 LI.	1	M54330176	E
644	PRESSURE SWITCH\0-10bar 2K M12	1	E22030060	E
670	DISTRIBUTOR BLOCK\G1/2" MS6 LI.	2	M27020039	E
758	SOUND MUFFLER\G1/2" 0-12bar Ms	2	M54610037	E
759	SOUND MUFFLER\G1/4" L13.8 SHORT	4	M54610075	E
760	SOUND MUFFLER\M5 L8.7 SHORT	2	M54610074	E
761	SOUND MUFFLER\G1/8" L11.8 SHORT	2	M54610071	E
762	SOUND MUFFLER\G1/2" L19 SHORT	1	M54610076	E
786	CONNECTOR PLATE\F.VUVG 10 VALVE PLACES	1	M54020106	N
787	CONNECTOR PLATE\G3/4i MS6	1	M54020069	
1247	RED NIPPLE\G3/8"i-G1/2"a L15.5 Ms	2	M56100353	
1248	RED NIPPLE\G3/4"a-G1/4" W/ SEALING RING	1	M56100508	N
1296	CONNECTING PIECE\LONG MS6	5	M33430018	
1298	CONNECTING PIECE\WITHOUT BRACKET MS6	2	M33430020	
1580	ELBOW SCREWED PLUG-IN CONNEC.\D22 G3/4"	1	M57310026	E
1606	ELBOW SCREWED PLUG-IN CONNEC.\D6 M5 N Ms	1	M57310032	E
1607	ELBOW SCREWED PLUG-IN CONNEC.\D8 G1/4"	1	M57310058	E
1611	ELBOW SCREWED PLUG-IN CONNEC.\D4 R1/4"	1	M57310085	E

Item	Description	Order number	Quantity	Spare part/Wear part
1612	ELBOW SCREWED PLUG-IN CONNEC.\D10 G1/4"	2	M57310099	E
1613	ELBOW SCREWED PLUG-IN CONNEC.\D10 R1/8"	10	M57310086	E
1622	SCREWED PLUG-IN CONNEC-TION\D6 G1/8" N Ms	1	M57380058	E
1643	SCREWED PLUG-IN CONNEC.\D6 G1/8-I N Ms	1	M57380090	E
1645	SCREWED PLUG-IN CONNEC.\D4 G1/8-I N Ms	19	M57380092	E
1788	Y-PLUG-IN CONNECTION\D10 NBR PBT	1	M57410025	N
1860	REDUCTION\D12a D10i	2	M58200098	N
1878	REDUCTION\D8a D6i NBR,PBT	2	M58200041	
1879	REDUCTION\FOR HOSE D8a	2	M58200075	N
1900	BULDHEAD PLUG-IN CONNEC-TION\D12-12 Ms	4	M57390048	N
1901	BULDHEAD PLUG-IN CONNEC-TION\D8 Ms	1	M57390052	N
1902	BULDHEAD PLUG-IN CONNEC-TION\D6 Ms	7	M57390051	N
1903	BULDHEAD PLUG-IN CONNEC-TION\D4 Ms	27	M57390050	N
2070	SWIVEL SCREW CONNEC-TION\G3/8" D8 3-FOLD	1	M57020120	V
2071	SWIVEL SCREW CONNEC-TION\G3/8" D10 6-FOLD	1	M57020121	V
2274	BUS MODULE\CTEU-CO	1	E50030007	E
2363	COUPLING\5-POLE OUTLET M12 BU STRAIGHT	1	E20310073	V
2382	ELBOW PLUG\2-POL. 24V M12	2	E20020027	E
2389	PLUG SCREW\M5 L8.5 AI	1	M41090125	
2396	PLUG SCREW\R1/8" L10 SW5 St	3	M41090105	
2419	CLOSURE PUSH-ON NIPPLE\D10	2	M58020019	N
2422	CLOSURE PUSH-ON NIPPLE\D4	4	M58020014	
2831	VELCRO\216.5x20 W/SUPPORTS	4	M53260011	N
3448	CONNECTION CABLE\M8 5-POL.3ADR.GER.2.5m	1	E09060615	V
3449	CONNECTION CABLE\M12 5-POL.3ADR.GER.2.5m	1	E09060616	V
3450	CONNECTION CABLE\M12 5-POL.GER.2.5m	2	E09060614	V
3565	CYL SCREW\M4x18 DIN912 8.8 Z St	6	D09120183	
3566	CYL SCREW\M3x8 DIN84 4.8 Z St	1	D00840068	

Item	Description	Order number	Quantity	Spare part/Wear part
3727	PLUGDOSE ADAPT.BUS-KNOT.SUB-D/2XM12	2	E20020083	E
3728	CONTR.CAB.\5G0.75mm ² OIL-FLEX-110 GRAY	1	E09330056	E

F30920006 - Pneumatic assembly 2K Gun

Item	Description	Order number	Quantity	Spare part/Wear part
160	REGULATOR, COMPRESSED AIR\G1/2 MS6 LE.	1	N26050108	E
216	PROPORTIONAL VALVE\VPPE	3	E34030038	E
293	AIR FILTER\G1/2" FINEST FILTER MS6 LI.	1	N35010145	V
372	VALVE UNIT\VTUG ECOAUC BELL 2K GUN	1	M54120087	E
425	3/2 SOLENOID VALVE\2-F.NC 470 l/min VUVG	14	M54210147	E
441	3/2 SOLENOID VALVE\G1/2" MS6 LI.	1	M54210093	E
477	5/2 SOLENOID VALVE\BG 14mm550 l/min VUVG	2	M54220053	E
584	SHUT-OFF VALVE\G1/2" MS6 LI.	1	M54330176	E
644	PRESSURE SWITCH\0-10bar 2K M12	1	E22030060	E
670	DISTRIBUTOR BLOCK\G1/2" MS6 LI.	2	M27020039	E
758	SOUND MUFFLER\G1/2" 0-12bar Ms	2	M54610037	E
759	SOUND MUFFLER\G1/4" L13.8 SHORT	4	M54610075	E
760	SOUND MUFFLER\M5 L8.7 SHORT	2	M54610074	E
761	SOUND MUFFLER\G1/8" L11.8 SHORT	3	M54610071	E
762	SOUND MUFFLER\G1/2" L19 SHORT	1	M54610076	E
786	CONNECTOR PLATE\F.VUVG 10 VALVE PLACES	1	M54020106	N
787	CONNECTOR PLATE\G3/4i MS6	1	M54020069	
1247	RED NIPPLE\G3/8"i-G1/2"a L15.5 Ms	2	M56100353	
1248	RED NIPPLE\G3/4"a-G1/4" W/ SEALING RING	1	M56100508	N
1296	CONNECTING PIECE\LONG MS6	5	M33430018	
1298	CONNECTING PIECE\WITHOUT BRACKET MS6	2	M33430020	
1580	ELBOW SCREWED PLUG-IN CONNEC.\D22 G3/4"	1	M57310026	E
1606	ELBOW SCREWED PLUG-IN CONNEC.\D6 M5 N Ms	1	M57310032	E
1607	ELBOW SCREWED PLUG-IN CONNEC.\D8 G1/4"	1	M57310058	E

Item	Description	Order number	Quantity	Spare part/Wear part
1611	ELBOW SCREWED PLUG-IN CONNEC.\D4 R1/4"	1	M57310085	E
1612	ELBOW SCREWED PLUG-IN CONNEC.\D10 G1/4"	2	M57310099	E
1613	ELBOW SCREWED PLUG-IN CONNEC.\D10 R1/8"	6	M57310086	E
1622	SCREWED PLUG-IN CONNEC-TION\D6 G1/8" N Ms	1	M57380058	E
1643	SCREWED PLUG-IN CONNEC.\D6 G1/8-I N Ms	6	M57380090	E
1645	SCREWED PLUG-IN CONNEC.\D4 G1/8-I N Ms	26	M57380092	E
1788	Y-PLUG-IN CONNECTION\D10 NBR PBT	1	M57410025	N
1789	Y-PLUG-IN CONNECTION\D10-10	1	M57410033	N
1860	REDUCTION\D12a D10i	3	M58200098	N
1877	REDUCTION\D6a D4i NBR,PBT	1	M58200042	N
1878	REDUCTION\D8a D6i NBR,PBT	2	M58200041	
1879	REDUCTION\FOR HOSE D8a	2	M58200075	N
1900	BULDHEAD PLUG-IN CONNEC-TION\D12-12 Ms	4	M57390048	N
1901	BULDHEAD PLUG-IN CONNEC-TION\D8 Ms	1	M57390052	N
1902	BULDHEAD PLUG-IN CONNEC-TION\D6 Ms	7	M57390051	N
1903	BULDHEAD PLUG-IN CONNEC-TION\D4 Ms	27	M57390050	N
2070	SWIVEL SCREW CONNEC-TION\G3/8" D8 3-FOLD	1	M57020120	V
2071	SWIVEL SCREW CONNEC-TION\G3/8" D10 6-FOLD	1	M57020121	V
2274	BUS MODULE\CTEU-CO	1	E50030007	E
2363	COUPLING\5-POLE OUTLET M12 BU STRAIGHT	1	E20310073	V
2382	ELBOW PLUG\2-POL. 24V M12	2	E20020027	E
2389	PLUG SCREW\M5 L8.5 AI	1	M41090125	
2396	PLUG SCREW\R1/8" L10 SW5 St	3	M41090105	
2419	CLOSURE PUSH-ON NIPPLE\D10	2	M58020019	N
2422	CLOSURE PUSH-ON NIPPLE\D4	2	M58020014	
2423	CLOSURE PUSH-ON NIPPLE\D6	3	M58020011	N
2831	VELCRO\216.5x20 W/SUPPORTS	4	M53260011	N
3448	CONNECTION CABLE\M8 5-POL.3ADR.GER.2.5m	1	E09060615	V

Item	Description	Order number	Quantity	Spare part/Wear part
3449	CONNECTION CABLE\M12 5-POL.3ADR.GER.2.5m	1	E09060616	V
3450	CONNECTION CABLE\M12 5-POL.GER.2.5m	3	E09060614	V
3565	CYL SCREWM4x18 DIN912 8.8 Z St	6	D09120183	
3566	CYL SCREWM3x8 DIN84 4.8 Z St	1	D00840068	
3727	PLUG\DOSE ADAPT.BUS-KNOT.SUB-D/2XM12	2	E20020083	E
3728	CONTR.CAB.\5G0.75mm ² OIL-FLEX-110 GRAY	1	E09330056	E

Delivery times for spare and wear parts are included in the price list. Ordering as well as information on components that are not marked as spare parts or wearing parts in the parts list ↪ “Hotline and Contact” .

- E: Spare part
- V: Wear part (recommended spare part)
- N: No spare part or wearing part

13.2 Tools

There are no special tools available for this product.

13.3 Accessories

Denomination	Material number
Connection cable flange package HS 5 m	E09060504
HS connection cpl. 5 m external charging	M01530015
Connection cable flange package HS 10 m	E09060505
HS connection cpl. 10 m external charging	M01530016
Petroleum jelly Berulrub PV DAB 10 Dose 1000 g	W32120003
Petroleum jelly Berulrub PV DAB 10 Dose 40 g	W32120005
Pipette 50 ml M. Petroleum jelly DAB 10	W32920007

13.4 Order

WARNING!

Unsuitable spare parts

Spare parts of third-party suppliers may possibly not be able to hold the loads. Serious injury and death could be the consequence.

- Use exclusively original spare parts.

Ordering spare parts, tools and accessories as well as information on products that are listed without order number ↪ “Hotline and Contact” .

14 INDEX

1, 2, 3 ...		
2K application		
Start timer program	45	
2K color configuration	65	
5 Safety Rules	17 , 26 , 68 , 70 , 72	
A		
Accessories	100	
Advanced training	10	
Air consumption	74	
Alarm group 1		
Atomizer	48	
Alarm group 2		
Warnings	50	
Alarm group 3		
High voltage generator	53	
Alarm group 4	53	
Alarm group 5		
Error class F	54	
IndraDrive CS	54	
Alarm group 6		
Dosing unit	60	
Alarm group 7		
CanOpen Bus	61	
Alarm group 8		
System alarms	62	
Alarm groups	48	
Alarm history	47	
copy	47	
Alarms		
Overview	47	
Troubleshooting	47	
application	66	
Application devices		
connect	24	
Atomizer		
Overview	37	
Authorizations	13	
Auxiliary materials	75	
B		
Braking time	74	
Brief description	5	
Brush		
Interface for external control	44	
Overview	42	
switching off	30	
switching on	30	
Brush number 19		
Special function	44	
Brush parameters		
manage	43	
Brush record		
copy	44	
manage	43	
parameterizing	43	
save	43	
select	43	
C		
Cable lengths	74	
Cleaning	68	
Safety notes	68	
Cleaning Fan Cover	68	
Clock time		
Set	36	
Color changer		
start	41 , 45	
Status display	41	
Color configuration		
2K	65	
Commissioning		
Notes	26	
Communication		
external	25	
Components		
connect	23	
Compressed air hose		
replacement	70	
Compressed air supply		
connect	25	
Conduct in case of danger	9	
Connections		
Overview	21	
Connector plate		
connect	21	
Connect components	23	
Overview	21	
Contact	2	
Control cabinet		
connect to ground	24	
transporting	14	
D		
Data		
backup	36	
load	36	

Date		High voltage	74
set	36	block	64
decommissioning	72	Overview	63
Depth	73	release	64
Dimensions	73	Status display	63
opened Control cabinet doors	74	switching off	64
Disposal	73	switching on	64
Handling packaging material	14	High voltage cable	
E		assembly	17
Electrical components	11	High voltage generator	12, 64
Exterior view		Nominal values	64
front	10	High voltage self-test	65
rear	10	Hose length	
External brush		change	32
switching off	30	Main channel	32
switching on	30	Hose lengths	74
External fire alarm	9	Hotline	2
External interface	120	Housing	
F		cleaning	68
Fault	47	I	
Filter		Illuminated push button	
replacement	71	replacement	71
Fire alarm		Improper use	6
external	9	Infeed	
Five Safety Rules	17, 26, 68, 70, 72	connect	25
Flow chart		Information about the document	2
Abort active timer program	122	Input pressure	74
Brush change	122	Installation altitude	74
Color change 2K	122	Intended use	5
Color selection change	120	Interface	
External interface	120	external control	44
Fault	120	Frequency converter	12
Purge everything	124	Rotational speed recorder connection	12
Switch main needle	122	Interfaces	25
Switching on and off	120	Interior view	
Vital signs via telegram counter	121	front	11
Frequency	74	rear	12
Frequency converter	12	IP address	
G		change	34
General notes		L	
Five Safety Rules	17, 26, 68, 70, 72	Lamp test	32
Ground line		Language	
disconnect	24	Set	36
Grounding bolts	24	Log in	35
H		log off	35
Header row	30	M	
Height	73	Main needle	
		Synchronization of the dosing pump	33

Maintenance		Product name	2
Intervals	70	Product overview	5
Safety notes	69	Protection type	74
Maintenance schedule	70	Protective equipment	10
Maintenance unit		Electrostatic discharge	10
Replace filter	71	Pump factor	
Maintenance Work		change	33
Compressed air hose	70	Q	
Material number	2	Qualification	9
Menu bar	31	Qualification of the personnel	9
Messages	47	R	
N		Record	
Notes		change	66
Representation	5	copy	66
O		insert	66
Operating Conditions	74	save	66
Operating materials	75	Relative humidity	74
Operating mode	29	Representation	
Brush	29	Notes	5
External brush	29	Residual risks	8
Manual	29	Explosions	8
Operating parameters		Fire	8
Set	27	Laser radiation	8
Operating temperature	74	Safety devices	8
Operator interface		Rotational speed recorder connection	12
Header row	30	S	
Overview	30	Safety	
Operator Interface		Intended use	5
Menu bar	31	Misuse	6
Operator panel	13	Notes	5
Order	100	Residual risks	8
Other applicable documents	2	Safety devices	5
Overview	5	Safety devices	5
P		Safety notes	
Packaging		Assembly	16
Handling packaging material	14	Cleaning	68
Password	13	Commissioning	26
change	35	Disassembly	72
reset	35	Maintenance	69
Personal protective equipment	10	Operation	27
Pneumatic components	12	Safety Signs	6
Port number		Scope of Supply	14
change	34	Scope of the document	2
Power	74	Screen	
Power values	74	clean	32
Process components	39	Service	2
Actuating manually	40	Shaft detent	
Status display	40	switching off	41

switching on	41	Touch display	13
Shaping air	74	cleaning	68
Side wall		Training	10
left	11	Transport Inspection	14
Spare parts	75	Transportation	14
Special function		Type plate	75
Brush number 19	44	U	
Speed	74	unpacking	14
Station settings	32	USB functions	36
Status display		Use	5
Tables	63	User level	13
Window	63	User management	13
Storage	14	User rights	13
switching off	28	V	
in an emergency	9	Valve locks	38
switching on	28	Valves	
System settings		Abbreviations	37
Overview	31	Actuating manually	38
T		Overview	37
Technical data		Status display	38
Compressed air quality	74	Visualizer	30
Technical Data		Voltage	74
Connections	6	volumetric measurement	46
Timer program		W	
cancel	45	Warning	47
Timer programs		Weight	73
Overview	44	Width	73
switching on	44	Work area	31
Tools	100		

Appendix

A Interfaces - Binary

Outputs to external control - global

Address relative	Type	Symbol	Comments
0.0	INT	iTelCount	telegram counter: it has to be copy to AckTelCounter on the remote controller
2.0	INT	iAlarmGrpInfoGlb1	Alarm group information byte 0/1 (global alarms)
4.0	INT	iAlarmGrpInfoGlb2	Alarm group information byte 2/3 (global alarms)
6.0	INT	iAlarmGrpInfoApp1	Alarm group information byte 0/1 (application specific alarms)
8.0	INT	iAlarmGrpInfoApp2	Alarm group information byte 2/3 (application specific alarms)
10.0	INT	iInPressureInDP91	Pressure Pump 91 input
12.0	INT	iInPressureOutDP91	Pressure Pump 91 input
14.0	INT	iInPressureInDP92	Pressure Pump 92 input
16.0	INT	iInPressureOutDP92	Pressure Pump 92 input
18.0	BOOL	mStatOn	Station ready for production
18.1	BOOL	mStatExtMode	Station in external control mode (data from remote controller will use only in this mode)
18.2	BOOL	mStatFault	Global fault station
18.3	BOOL	mStatWarning	Global warning station
18.4	BOOL	mAckSetTime	Acknowledge date and time sync request
18.5	BOOL	mSpare_18_5	Spare
18.6	BOOL	mSpare_18_6	Spare
18.7	BOOL	mSpare_18_7	Spare
19.0	BOOL	mSpare_19_0	Spare
19.1	BOOL	mSpare_19_1	Spare
19.2	BOOL	mSpare_19_2	Spare
19.3	BOOL	mSpare_19_3	Spare
19.4	BOOL	mSpare_19_4	Spare
19.5	BOOL	mSpare_19_5	Spare
19.6	BOOL	mSpare_19_6	Spare
19.7	BOOL	mSpare_19_7	Spare

Outputs to external control - project-specific

Address relative	Type	Symbol	Comments
20.0	INT	iColorChangeState	state of color changer (0 = undefined, 1 = purge active, 2 = purged, 3 = load active, 4 = loaded, 5 = short purge active, 6 = flow check active) main channel
22.0	INT	iActLodedColor	number of actual loaded color

Address relative	Type	Symbol	Comments
24.0	INT	iSpare_24	Spare
26.0	INT	iActValueLL1	actual value shaping air 1mbar
28.0	INT	iActValueLL2	actual value shaping air 2mbar
30.0	INT	iActValuePV	actual value paint volume ml/min
32.0	INT	iActValueHt_U	actual value high tension U
34.0	INT	iActValueHt_I	actual value high tension U
36.0	DINT	dActValueML1	actual value turbine speed rpm
40.0	INT	iActBrushNo	actual number of activated brush data set
42.0	INT	iSpare_42	Spare
44.0	INT	iColorChangeStateHardener	state of color changer (0 = undefined, 1 = purge active, 2 = purged, 3 = load active, 4 = loaded, 5 = short purge active, 6 = flow check active) main channel
46.0	INT	iColorChangeStateStockPaint	state of color changer (0 = undefined, 1 = purge active, 2 = purged, 3 = load active, 4 = loaded, 5 = short purge active, 6 = flow check active) main channel
48.0	INT	iColorChangeStateHardFil	state of color changer (0 = undefined, 1 = purge active, 2 = purged, 3 = load active, 4 = loaded, 5 = short purge active, 6 = flow check active) main channel
50.0	INT	iColorChangeStateStPaintFil	state of color changer (0 = undefined, 1 = purge active, 2 = purged, 3 = load active, 4 = loaded, 5 = short purge active, 6 = flow check active) main channel
52.0	INT	iValveState	Valve state information (false = closed/true = open) 0 = V1, 1 = PL1, 2 = V3, 3 = BY1, 4 = KS, 5 = RF1, 6 = HN1, 7 = WAR1, 8 = FGV1_H, 9 = FGV1_SL, 10 = V4, 11 = PL4, 12 = V2_H, 13 = V1_H, 14 = BY1_H, 15 = V3_H
54.0	INT	iValveState2	Valve state information (false = closed/true = open) 0 = V2_PL2, 1 = FGF1, 2 = FRF1, 3 = FGF1_H, 4 = FRF1_H, spare
56.0	INT	iTimeProgTime	Active time program time
58.0	INT	iConfigIdNo	Configuration ID number
60.0	BOOL	mPurgeRun	Timer program "purge color changer" (1K), "purge mixed channel" (2K) is active
60.1	BOOL	mLoadRun	Timer program "load color changer" (1K), "load mixed channel" (2K) is active

Address relative	Type	Symbol	Comments
60.2	BOOL	mShortPurgeRun	Timer program "short purge bell" is active
60.3	BOOL	mPurgeNecessary	Purge is necessary for new color
60.4	BOOL	mLoadNecessary	Load color changer is necessary for new color
60.5	BOOL	mReleasePurge	Release start "purge color changer"
60.6	BOOL	mReleaseLoad	Release start "load color changer"
60.7	BOOL	mAckStrNewCol	Acknowledge strobe new color
61.0	BOOL	mHtDisabled	High voltage is disabled on Hmi
61.1	BOOL	mMnIsOn	Main needle is open
61.2	BOOL	mAckSetBrush	Acknowledge set brush number
61.3	BOOL	mPurgeHardenerRun	Timer program "purge hardener" is active
61.4	BOOL	mLoadHardenerRun	Timer program "load hardener" is active
61.5	BOOL	mPurgeStockPaintRun	Timer program "purge stock paint" is active
61.6	BOOL	mLoadStockPaintRun	Timer program "load stock paint" is active
61.7	BOOL	mPurgeHardenerNecessary	Purge hardener is necessary for new color
62.0	BOOL	mLoadHardenerNecessary	Load hardener is necessary for new color
62.1	BOOL	mPurgeStPaintNecessary	Purge stock paint is necessary for new color
62.2	BOOL	mLoadStPaintNecessary	Load stock paint is necessary for new color
62.3	BOOL	mReleaseStartColorChange	Release start "ColorChanchge"
62.4	BOOL	mReleasePurgeAll	Release start "purge all channels" 2K only
62.5	BOOL	mPurgeHardenerFilRun	Timer program "purge hardener filter" is active
62.6	BOOL	mLoadHardenerFilRun	Timer program "load hardener filter" is active
62.7	BOOL	mSpare62_7	Spare
63.0	BOOL	mWarningPotTime	Pot time alarm main channel (mixed channel) 2K only
63.1	BOOL	mAlarmPotTime	Pot time alarm main channel (mixed channel) 2K only
63.2	BOOL	mPurgeStockPaintFilRun	Timer program "purge stock paint filter" is active
63.3	BOOL	mLoadStockPaintFilRun	Timer program "load stock paint filter" is active
63.4	BOOL	mPurgeHardenerFilNecessary	Purge hardener filter is necessary for new color
63.5	BOOL	mLoadHardenerFilNecessary	Load hardener filter is necessary for new color

Address relative	Type	Symbol	Comments
63.6	BOOL	mPurgeStPaintFilNecessary	Purge stock paint filter is necessary for new color
63.7	BOOL	mLoadStPaintFilNecessary	Load stock paint filter is necessary for new color

Inputs from external control - global

Address relative	Type	Symbol	Comments
0.0	INT	iAckTelCount	Acknowledge telegram counter
2.0	INT	iDateYear	Date year
4.0	USINT	bDateMonth	Date month
5.0	USINT	bDateDay	Date day
6.0	USINT	bTimeHouers	Time hours
7.0	USINT	bTimeMinutes	Time minutes
8.0	USINT	bTimeSeconds	Time seconds
9.0	USINT	iSpare_9	Spare
10.0	INT	ISpare_10	Spare
12.0	INT	ISpare_12	Spare
14.0	INT	ISpare_14	Spare
16.0	INT	ISpare_16	Spare
18.0	BOOL	mRelStOn	Release switch on AucBell from main station
18.1	BOOL	mErrAck	Error acknowledge
18.2	BOOL	mTimeSync	set date and time from external control
18.3	BOOL	mSpare_18_3	Spare
18.4	BOOL	mSpare_18_4	Spare
18.5	BOOL	mSpare_18_5	Spare
18.6	BOOL	mSpare_18_6	Spare
18.7	BOOL	mSpare_18_7	Spare
19.0	BOOL	mSpare_19_0	Spare
19.1	BOOL	mSpare_19_1	Spare
19.2	BOOL	mSpare_19_2	Spare
19.3	BOOL	mSpare_19_3	Spare
19.4	BOOL	mSpare_19_4	Spare
19.5	BOOL	mSpare_19_5	Spare
19.6	BOOL	mSpare_19_6	Spare
19.7	BOOL	mSpare_19_7	Spare

Inputs from external control - project-specific

Address relative	Type	Symbol	Comments
20.0	INT	iNoNewColor	color number new color: 2K max 20, min 1. 1K max 10, min 1
22.0	INT	iSpare_22	Spare
24.0	INT	iBrushNumber	Brush number (1-500)
26.0	INT	iSetValueLL1mb	set value shaping air 1 mbar (0 - 6000mbar) = (0.0 - 6.0bar)
28.0	INT	iSetValueLL2mb	set value shaping air 2 mbar (0 - 6000mbar) = (0.0 - 6.0bar)
30.0	INT	iSetValuePv	set value paint volume (0 - 200 * paint pump volume ccm/min with dosing pump) or (0 - 100% = 0 - 6 bar with paint pressure regulator)
32.0	INT	iSetValueHt	set value high tension (0 - 100kV) or (0 - 500µA) Nominal values smaller than 30kV (in DC) and smaller 100µA (in EC) are interpreted and processed as nominal values of "0".
34.0	DINT	dSetValueML1	set value turbine speed (0 - 70000rpm)
38.0	INT	iSpare_38	Spare
40.0	INT	iSpare_40	Spare
42.0	INT	iSpare_42	Spare
44.0	INT	iSpare_44	Spare
46.0	INT	iSpare_46	Spare
48.0	INT	iSpare_48	Spare
50.0	INT	iSpare_50	Spare
52.0	INT	iSpare_52	Spare
54.0	INT	iSpare_54	Spare
56.0	INT	iSpare_56	Spare
58.0	INT	iSpare_58	Spare
60.0	BOOL	mStartPurge	Start timer program "purge color changer" (1K), "purge mixed channel" (2K)
60.1	BOOL	mStartLoad	Start timer program "load color changer" (1K), "load mixed channel" (2K)
60.2	BOOL	mStartShortpurge	Start timer program "short purge bell"
60.3	BOOL	mStrobeNewColor	Strobe for request new color
60.4	BOOL	mMnOn	Switch on main needle
60.5	BOOL	mSetBrush	activate selected brush number
60.6	BOOL	mTpAbort	abort active timer program
60.7	BOOL	mColorchange	Start color change sequence 2K only

Address relative	Type	Symbol	Comments
61.0	BOOL	mStartPurgeAll	Start purge all channels 2K or OFA
61.1	BOOL	mSpare_61_1	Spare
61.2	BOOL	mSpare_61_2	Spare
61.3	BOOL	mSpare_61_3	Spare
61.4	BOOL	mSpare_61_4	Spare
61.5	BOOL	mSpare_61_5	Spare
61.6	BOOL	mSpare_61_6	Spare
61.7	BOOL	mSpare_61_7	Spare
62.0	BOOL	mSpare_62_0	Spare
62.1	BOOL	mSpare_62_1	Spare
62.2	BOOL	mSpare_62_2	Spare
62.3	BOOL	mSpare_62_3	Spare
62.4	BOOL	mSpare_62_4	Spare
62.5	BOOL	mSpare_62_5	Spare
62.6	BOOL	mSpare_62_6	Spare
62.7	BOOL	mSpare_62_7	Spare
63.0	BOOL	mSpare_63_0	Spare
63.1	BOOL	mSpare_63_1	Spare
63.2	BOOL	mSpare_63_2	Spare
63.3	BOOL	mSpare_63_3	Spare
63.4	BOOL	mSpare_63_4	Spare
63.5	BOOL	mSpare_63_5	Spare
63.6	BOOL	mSpare_63_6	Spare
63.7	BOOL	mSpare_63_7	Spare

B Interfaces - ASCII

Outputs to external control - global				
Address relative	ASCII type	Variable type	Symbol	Comments
0.0	STRING[5]	INT	iTelCount	telegram counter: it has to be copy to AckTelCounter on the remote controller
	;			
2.0	STRING[5]	INT	iAlarmGrpInfoGlb1	Alarm group information byte 0/1 (global alarms)
	;			
4.0	STRING[5]	INT	iAlarmGrpInfoGlb2	Alarm group information byte 2/3 (global alarms)
	;			
6.0	STRING[5]	INT	iAlarmGrpInfoApp1	Alarm group information byte 0/1 (application specific alarms)
	;			
8.0	STRING[5]	INT	iAlarmGrpInfoApp2	Alarm group information byte 2/3 (application specific alarms)
	;			
10.0	STRING[5]	INT	ISpare_10	Spare
	;			
12.0	STRING[5]	INT	ISpare_12	Spare
	;			
14.0	STRING[5]	INT	ISpare_14	Spare
	;			
16.0	STRING[5]	INT	ISpare_16	Spare
	;			
18.0	STRING[5]	BOOL	mStatOn	Station ready for production
18.1		BOOL	mStatExtMode	Station in external control mode (data from remote controller will use only in this mode)
18.2		BOOL	mStatFault	Global fault station
18.3		BOOL	mStatWarning	Global warning station
18.4		BOOL	mAckSetTime	Acknowledge date and time sync request
18.5		BOOL	mSpare_18_5	Spare
18.6		BOOL	mSpare_18_6	Spare
18.7		BOOL	mSpare_18_7	Spare
19.0		BOOL	mSpare_19_0	Spare
19.1		BOOL	mSpare_19_1	Spare
19.2		BOOL	mSpare_19_2	Spare
19.3		BOOL	mSpare_19_3	Spare
19.4		BOOL	mSpare_19_4	Spare
19.5		BOOL	mSpare_19_5	Spare

Address relative	ASCII type	Variable type	Symbol	Comments
19.6		BOOL	mSpare_19_6	Spare
19.7		BOOL	mSpare_19_7	Spare
	;			
20.0	STRING[5]	INT	iColorChangeS- tate	state of color changer (0 = undefined, 1 = purge active, 2 = purged, 3 = load active, 4 = loaded, 5 = short purge active, 6 = flow check active) main channel
	;			
22.0	STRING[5]	INT	iActLodedColor	number of actual loaded color
	;			
24.0	STRING[5]	INT	iSpare_24	Spare
	;			
26.0	STRING[5]	INT	iActValueLL1	actual value shaping air 1mbar
	;			
28.0	STRING[5]	INT	iActValueLL2	actual value shaping air 2mbar
	;			
30.0	STRING[5]	INT	iActValuePV	actual value paint volume ml/min
	;			
32.0	STRING[5]	INT	iActValueHt_U	actual value high tension U
	;			
34.0	STRING[5]	INT	iActValueHt_I	actual value high tension U
	;			
36.0	STRING[5]	DINT	dActValueML1	actual value turbine speed rpm
	;			
40.0	STRING[5]	INT	iActBrushNo	actual number of activatet brush data set
	;			
42.0	STRING[5]	INT	iSpare_42	Spare
	;			
44.0	STRING[5]	INT	iColorChangeSta- teHardener	state of color changer (0 = undefined, 1 = purge active, 2 = purged, 3 = load active, 4 = loaded, 5 = short purge active, 6 = flow check active) main channel
	;			

Address relative	ASCII type	Variable type	Symbol	Comments
46.0	STRING[5]	INT	iColorChangeStateStockPaint	state of color changer (0 = undefined, 1 = purge active, 2 = purged, 3 = load active, 4 = loaded, 5 = short purge active, 6 = flow check active) main channel
	;			
48.0	STRING[5]	INT	iColorChangeStateHardFil	state of color changer (0 = undefined, 1 = purge active, 2 = purged, 3 = load active, 4 = loaded, 5 = short purge active, 6 = flow check active) main channel
	;			
50.0	STRING[5]	INT	iColorChangeStateStPaintFil	state of color changer (0 = undefined, 1 = purge active, 2 = purged, 3 = load active, 4 = loaded, 5 = short purge active, 6 = flow check active) main channel
	;			
52.0	STRING[5]	INT	iValveState	Valve state information (false = closed/true = open) 0 = V1, 1 = PL1, 2 = V3, 3 = BY1, 4 = KS, 5 = RF1, 6 = HN1, 7 = WAR1, 8 = FGV1_H, 9 = FGV1_SL, 10 = V4, 11 = PL4, 12 = V2_H, 13 = V1_H, 14 = BY1_H, 15 = V3_H
	;			
54.0	STRING[5]	INT	iValveState2	Valve state information (false = closed/true = open) 0 = V2_PL2, 1 = FGF1, 2 = FRF1, 3 = FGF1_H, 4 = FRF1_H, spare
	;			
56.0	STRING[5]	INT	iTimeProgTime	Active time program time
	;			
58.0	STRING[5]	INT	iConfigIdNo	Configuration ID number
	;			
60.0	STRING[5]	BOOL	mPurgeRun	Timer program "purge color changer" (1K), "purge mixed channel" (2K) is active
60.1		BOOL	mLoadRun	Timer program "load color changer" (1K), "load mixed channel" (2K) is active
60.2		BOOL	mShortPurgeRun	Timer program "short purge bell" is active
60.3		BOOL	mPurgeNecessary	Purge is necessary for new color

Address relative	ASCII type	Variable type	Symbol	Comments
60.4		BOOL	mLoadNecessary	Load color changer is necessary for new color
60.5		BOOL	mReleasePurge	Release start "purge color changer"
60.6		BOOL	mReleaseLoad	Release start "load color changer"
60.7		BOOL	mAckStrNewCol	Acknowledge strobe new color
61.0		BOOL	mHtDisabled	High voltage is disabled on Hmi
61.1		BOOL	mMnIsOn	Main needle is open
61.2		BOOL	mAckSetBrush	Acknowledge set brush number
61.3		BOOL	mPurgeHardenerRun	Timer program "purge hardener" is active
61.4		BOOL	mLoadHardenerRun	Timer program "load hardener" is active
61.5		BOOL	mPurgeStockPaintRun	Timer program "purge stock paint" is active
61.6		BOOL	mLoadStockPaintRun	Timer program "load stock paint" is active
61.7		BOOL	mPurgeHardenerNecessary	Purge hardener is necessary for new color
	;			
62.0		BOOL	mLoadHardenerNecessary	Load hardener is necessary for new color
62.1		BOOL	mPurgeStPaintNecessary	Purge stock paint is necessary for new color
62.2		BOOL	mLoadStPaintNecessary	Load stock paint is necessary for new color
62.3		BOOL	mReleaseStartColorChange	Release start "Color-Chanchnge"
62.4		BOOL	mReleasePurgeAll	Release start "purge all channels" 2K only
62.5		BOOL	mPurgeHardenerFilRun	Timer program "purge hardener filter" is active
62.6	STRING[5]	BOOL	mLoadHardenerFilRun	Timer program "load hardener filter" is active
62.7		BOOL	mSpare62_7	Spare
63.0		BOOL	mWarningPotTime	Pot time alarm main channel (mixed channel) 2K only
63.1		BOOL	mAlarmPotTime	Pot time alarm main channel (mixed channel) 2K only
63.2		BOOL	mPurgeStockPaintFilRun	Timer program "purge stock paint filter" is active
63.3		BOOL	mLoadStockPaintFilRun	Timer program "load stock paint filter" is active
63.4		BOOL	mPurgeHardenerFilNecessary	Purge hardener filter is necessary for new color

Address relative	ASCII type	Variable type	Symbol	Comments
63.5		BOOL	mLoadHardener- FilNecessary	Load hardener filter is necessary for new color
63.6		BOOL	mPurgeStPaintFil- Necessary	Purge stock paint filter is necessary for new color
63.7		BOOL	mLoadStPaintFil- Necessary	Load stock paint filter is necessary for new color
	;			

Inputs from external control - global

Address relative	ASCII type	Variable type	Symbol	Comments
0.0	STRING[5]	INT	iAckTelCount	Acknowledge telegram counter
	;			
2.0	STRING[5]	INT	iDateYear	Date year
	;			
4.0	STRING[5]	USINT	bDateMonth	Date month
	;			
5.0	STRING[5]	USINT	bDateDay	Date day
	;			
6.0	STRING[5]	USINT	bTimeHouers	Time hours
	;			
7.0	STRING[5]	USINT	bTimeMinutes	Time minutes
	;			
8.0	STRING[5]	USINT	bTimeSeconds	Time seconds
	;			
9.0	STRING[5]	USINT	iSpare_9	Spare
	;			
10.0	STRING[5]	INT	ISpare_10	Spare
	;			
12.0	STRING[5]	INT	ISpare_12	Spare
	;			
14.0	STRING[5]	INT	ISpare_14	Spare
	;			
16.0	STRING[5]	INT	ISpare_16	Spare
	;			
18.0	STRING[5]	BOOL	mRelStOn	Release switch on AucBell from main station
18.1		BOOL	mErrAck	Error acknowledge
18.2		BOOL	mTimeSync	set date and time from external control
18.3		BOOL	mSpare_18_3	Spare
18.4		BOOL	mSpare_18_4	Spare
18.5		BOOL	mSpare_18_5	Spare
18.6		BOOL	mSpare_18_6	Spare

Address relative	ASCII type	Variable type	Symbol	Comments
18.7		BOOL	mSpare_18_7	Spare
19.0		BOOL	mSpare_19_0	Spare
19.1		BOOL	mSpare_19_1	Spare
19.2		BOOL	mSpare_19_2	Spare
19.3		BOOL	mSpare_19_3	Spare
19.4		BOOL	mSpare_19_4	Spare
19.5		BOOL	mSpare_19_5	Spare
19.6		BOOL	mSpare_19_6	Spare
19.7		BOOL	mSpare_19_7	Spare
	;			
20.0	STRING[5]	INT	iNoNewColor	color number new color 2K max 2, 1K max 10, min 1
	;			
22.0	STRING[5]	INT	iSpare_22	Spare
	;			
24.0	STRING[5]	INT	iBrushNumber	Brush number (1-500)
	;			
26.0	STRING[5]	INT	iSetValueLL1mb	set value shaping air 1mbar (0 - 6000mbar) = (0.0 - 6.0bar)
	;			
28.0	STRING[5]	INT	iSetValueLL2mb	set value shaping air 2mbar (0 - 6000mbar) = (0.0 - 6.0bar)
	;			
30.0	STRING[5]	INT	iSetValuePv	set value paint volume (0 - 200 * paint pump volume ccm/min with dosing pump) or (0 - 100% = 0 - 6 bar with paint pressure regulator)
	;			
32.0	STRING[5]	INT	iSetValueHt	set value high voltage (0-100kV) or (0-500 mA) nominal values smaller than 30kV (in DC) and smaller 100mA (in EC) are interpreted and processed as nominal values of "0".
	;			
34.0	STRING[5]	DINT	dSetValueML1	set value turbine speed (0-70,000rpm)
	;			
38.0	STRING[5]	INT	iSpare_38	Spare
	;			
40.0	STRING[5]	INT	iSpare_40	Spare
	;			

Address relative	ASCII type	Variable type	Symbol	Comments
42.0	STRING[5]	INT	iSpare_42	Spare
	;			
44.0	STRING[5]	INT	iSpare_44	Spare
	;			
46.0	STRING[5]	INT	iSpare_46	Spare
	;			
48.0	STRING[5]	INT	iSpare_48	Spare
	;			
50.0	STRING[5]	INT	iSpare_50	Spare
	;			
52.0	STRING[5]	INT	iSpare_52	Spare
	;			
54.0	STRING[5]	INT	iSpare_54	Spare
	;			
56.0	STRING[5]	INT	iSpare_56	Spare
	;			
58.0	STRING[5]	INT	iSpare_58	Spare
	;			
60.0	STRING[5]	BOOL	mStartPurge	Start timer program "purge color changer" (1K), "purge mixed channel" (2K)
60.1		BOOL	mStartLoad	Start timer program "load color changer" (1K), "load mixed channel" (2K)
60.2		BOOL	mStartShortpurge	Start timer program "short purge bell"
60.3		BOOL	mStrobeNewColor	Strobe for request new color
60.4		BOOL	mMnOn	Switch on main needle
60.5		BOOL	mSetBrush	activate selected brush number
60.6		BOOL	mTpAbort	abort active timer program
60.7		BOOL	mColorchange	Start color change sequence 2K only
61.0		BOOL	mStartPurgeAll	Start purge all channels 2K or OFA
61.1		BOOL	mSpare_61_1	Spare
61.2		BOOL	mSpare_61_2	Spare
61.3		BOOL	mSpare_61_3	Spare
61.4		BOOL	mSpare_61_4	Spare
61.5		BOOL	mSpare_61_5	Spare
61.6		BOOL	mSpare_61_6	Spare
61.7	BOOL	mSpare_61_7	Spare	
	;			
62.0	STRING[5]	BOOL	mSpare_62_0	Spare

Address relative	ASCII type	Variable type	Symbol	Comments
62.1		BOOL	mSpare_62_1	Spare
62.2		BOOL	mSpare_62_2	Spare
62.3		BOOL	mSpare_62_3	Spare
62.4		BOOL	mSpare_62_4	Spare
62.5		BOOL	mSpare_62_5	Spare
62.6		BOOL	mSpare_62_6	Spare
62.7		BOOL	mSpare_62_7	Spare
63.0		BOOL	mSpare_63_0	Spare
63.1		BOOL	mSpare_63_1	Spare
63.2		BOOL	mSpare_63_2	Spare
63.3		BOOL	mSpare_63_3	Spare
63.4		BOOL	mSpare_63_4	Spare
63.5		BOOL	mSpare_63_5	Spare
63.6		BOOL	mSpare_63_6	Spare
63.7		BOOL	mSpare_63_7	Spare
	;			

C Flow chart of the external interface

The following charts are examples for flow charts of the external interface.

Switching on and off

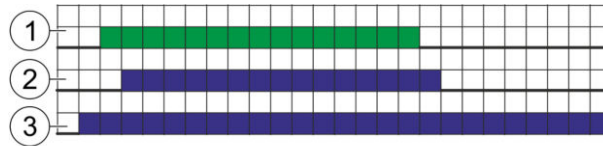


Fig. 99: Switching on and off

- 1 mReleaseStOn: Closing release of external control (no fault etc.)
- 2 mStatOn: Control cabinet is switched on.
- 3 mStatExtMode: Control cabinet in "external brush" mode

Fault

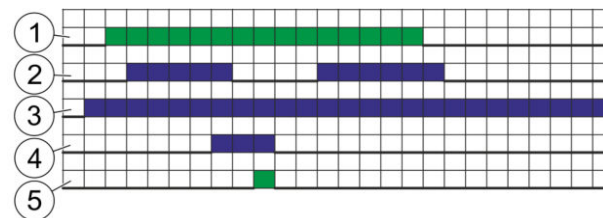


Fig. 100: Fault

- 1 mRelaeseStOn: Closing release of external control (no fault etc.)
- 2 mStatOn: Control cabinet is switched on.
- 3 mStatExtMode: Control cabinet in "external brush" mode
- 4 mStatFault: Control cabinet is malfunctioning.
- 5 mErrAck: Fault acknowledgment

Color selection change from paint 1 to paint 3



Only for versions with 1K process

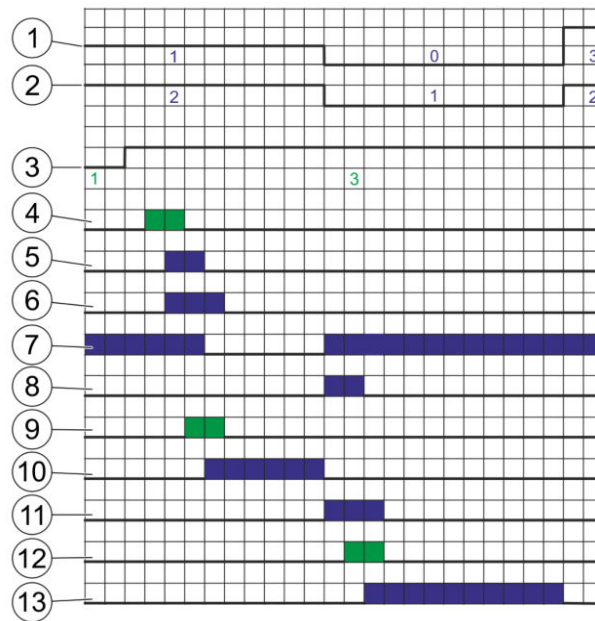


Fig. 101: Color selection change

- 1 iActLoadedCol: Number of the loaded color
- 2 iColorChangeState: Status color changer 0 = undefined, 1 = purged, 2 = paint charged
- 3 iNoNewColor: Number of the newly requested color
- 4 mStrobeNewColor: Request color selection change.
- 5 mAckStrobeNewCo: Acknowledge the new color request.
- 6 mPurgeNecessary: Purging necessary after new color information (for color change status undefined or charged)
- 7 mReleasePurge: Enable "Purge color changer".
- 8 mReleaseLoad: If Color Changer status in "Purged", release "Charge Color Changer".
- 9 mStartPurge: Starting "Purge color changer" timer program.
- 10 mPurgeRun
- 11 mLoadNecessary: Paint charging necessary according to new color information (if color change status "Purged")
- 12 mStartLoad: Starting "Charge Color Changer" timer program.
- 13 mLoadRun: "Charge Color Changer" timer program active.

Vital signs via telegram counter

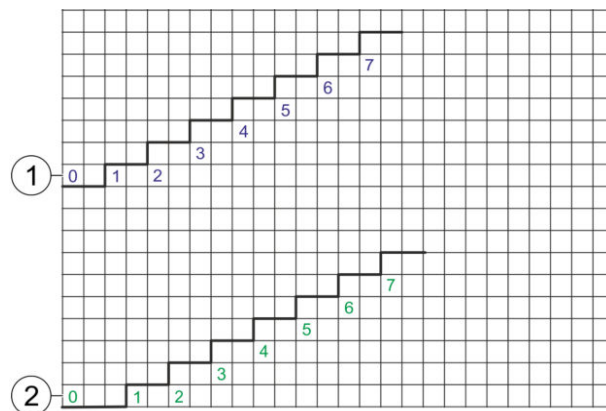


Fig. 102: Vital signs via telegram counter

- 1 oTelCount: Telegram counter (must be mirrored in external control system)
- 2 iAckTelCount: Telegram counter mirrored by external control

Brush change

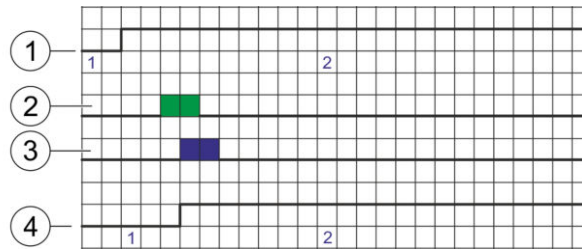


Fig. 103: Brush change

- 1 iBrushNumber: Brush number (1 to 19) selection process nominal values
- 2 mSetBrush: Enable selected brush number.
- 3 mAckSetBrush: Acknowledge the new brush number request.
- 4 iActBrushNo: Current and active brush number

Switch main needle

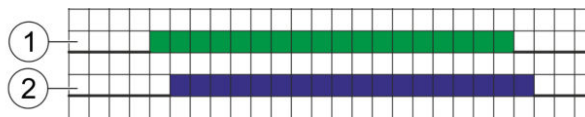


Fig. 104: Switch main needle

- 1 mHnOn: Switch on main needle.
- 2 mMnIsOn: Main needle is open.

Abort active timer program.



Fig. 105: Abort active timer program.

- 1 mPurgeRun: Starting "Purge color changer" timer program.
- 2 mTpAbort: Cancel active timer program.

Color change 2K

Color change to paint combination 3 on 1

Only for versions with 2K process

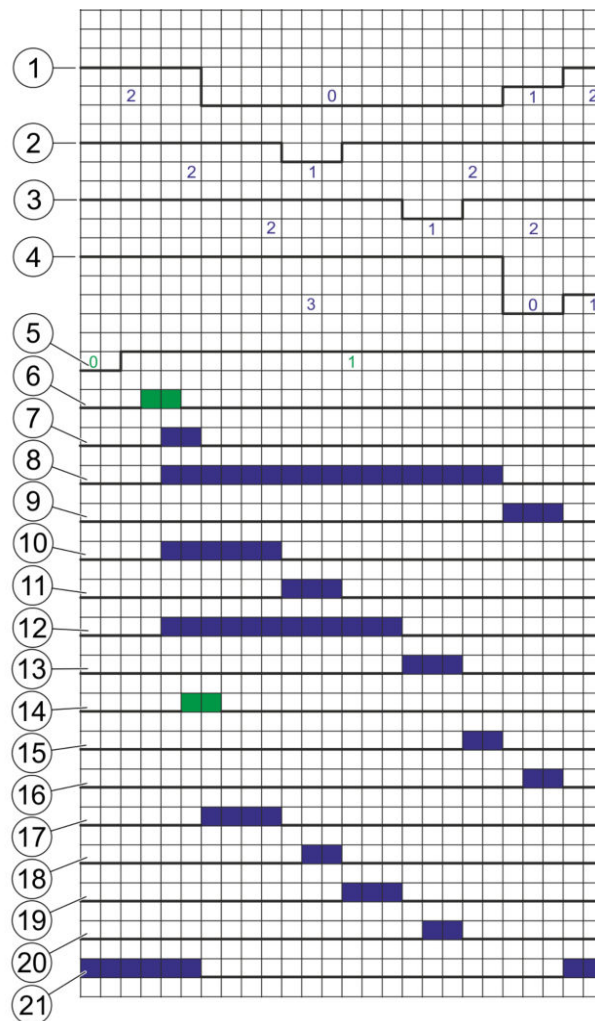


Fig. 106: Color change 2K

- 1 iColorChangeState: Status of the main channel (mixed channel) of the color changer
- 2 iColorChangeStateHardener: Status of hardener channel of the color changer
- 3 iColorChangeStateStockpaint: Status of the master lacquer channel of the color changer
- 4 iActLoadedCol: Currently loaded color combination
- 5 iNoNewColor: Number of the newly requested color
- 6 mStrobeNewColor: Request color selection change.
- 7 mAckStrobeNewCo: Acknowledge the new color request.
- 8 mPurgeNecessary: Necessary to purge main channel
- 9 mLoadNecessary: Necessary to charge main channel
- 10 mPurgeHardenerNecessary: Necessary to purge hardener channel
- 11 mLoadHardenerNecessary: Necessary to charge hardener channel
- 12 mPurgeStPaintNecessary: Necessary to purge master lacquer
- 13 mLoadStPaintNecessary: Necessary to charge master lacquer
- 14 mColorchange: Start color change
- 15 mPurgeRun: Main channel purging enabled
- 16 mLoadRun: Main channel charging enabled
- 17 mPurgeHardenerRun: Hardener purging enabled
- 18 mLoadHardenerRun: Hardener charging enabled
- 19 mPurgeStockPaintRun: Master lacquer purging enabled
- 20 mLoadStockPaintRun: Charging master lacquer active
- 21 mReleaseStartColorChange

Item 14: For versions with 2K process, all the necessary channels are automatically purged and charged as required on setting the bit “mColorchange”. If a timer program is active, the “mColorChange” bit must be reset.

The timer programs for the main channel (purge and press) are actuated individually through the interface, as in versions with 1K process.

Purge everything

All paint channels are purged successively.

Only for versions with 2K process

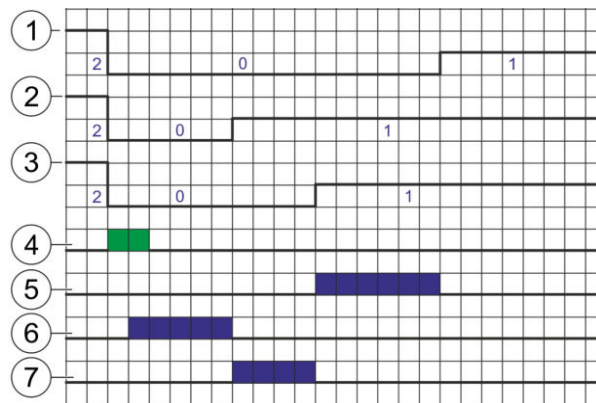


Fig. 107: Purge everything

- 1 iColorChangeState: Status of the main channel (mixed channel) of the color changer
- 2 iColorChangeStateHardener: Status of hardener channel of the color changer
- 3 iColorChangeStateStockpaint: Status of the master lacquer channel of the color changer
- 4 mStartPurgeAll: Start purge everything
- 5 mPurgeRun: Main channel purging enabled
- 6 mPurgeHardenerRun: Hardener channel purging enabled
- 7 mPurgeStockPaintRun: Master lacquer purging enabled

If a timer program is active, the “mStartPurgeAll” bit must be reset.

D Variants of the control cabinet

EcoAUC - XX - XX - XXXX - XX - X - X - X - X - X - X

Ⓐ
Ⓑ
Ⓒ
Ⓓ
①
②
③
④
⑤
⑥

Fig. 108: Variants of the control cabinet

A Process

B Atomizer

C Metering system

D Version

1 Number of colors

2 Master paint pump

3 Purge paint pump

4 Pump Hardener

5 Flange length

6 Recirculation

A Process:

- 1K
- 2K

B Atomizer:

- DC Direct charging
- EC External charging
- HRZ High rotation atomizer
- AS Air atomizer
- AL Airless atomizer
- AA Air-supported atomizer
- PJ PaintJet

C Dosing system:


- 1PPR Paint pressure control
- 1DP Dosing pump
- 2DP Two Dosing pumps


D Version:

- EU
- UL



LEADING IN
PRODUCTION
EFFICIENCY

 Dürr Systems AG
Application Technology
Carl-Benz-Str. 34
74321 Bietigheim-Bissingen
Germany

 Phone +49 7142 78-0

 www.durr.com

Translation of the original operation manual
MCU00001EN, V06

The reproduction and distribution of this document, use and communication of its contents are not permitted without express written approval. Violations will be liable for damages. All rights in the event of a patent grant or design registration are reserved.

© Dürr Systems AG 2016