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1. Introduction

Thank you for purchasing a Füll VX5 dispenser.

The compact, simultaneous VX5, with its patented double-action piston pumps and pumpselector, is designed for semi-industrial and high-volume retail use.

This manual will instruct you how to unpack, install, use and maintain your VX5.

Product specifications

- Dispensing unit upto 18, 24 or 32 components
- Patented double-action piston pump for double dispensing speed
- Automatic pump selector, reducing wear by 80%
- Pump capacity 0.5 – 1.0 l/min*) per pump
- Smallest dispensing amount 0.05 ml, Accuracy $\pm 1\%$ *)
- Integrated 5, 10 and 28 liter stainless steel canisters
- Interchangeable, airtight canisters with click-connect coupling system
- Automatic can lift with servodrive (option: manual can lift or no can lift)
- 100% support for the new UDCP**) standard, allowing easy connection to external formulation and spectro-software
- Other mainstream protocols like Gretag, FLink, etc. available as options

*) Depending on fluid rheology and dispensed amount

**) Universal Dispenser Communication Protocol

Shipping specifications

Dimensions (W x D x H) and weights:

VX5-1616	113 x 95 x 140 (cm)	250 kg
VX5-1624	141 x 95 x 140 (cm)	300 kg
VX5-1632, VX1636	169 x 95 x 140 (cm)	350 kg
VX5-1640	197 x 95 x 140 (cm)	375 kg
VX5-1648, VX5-1652	225 x 95 x 140 (cm)	400 kg
VX5-1660	253 x 95 x 140 (cm)	500 kg
VX5-2432	183 x 95 x 140 (cm)	405 kg
VX5-2440	210 x 95 x 140 (cm)	425 kg
VX5-2448, VX5-2452	238 x 95 x 140 (cm)	475 kg

Dimensions and weights are based on standard configurations. Special configurations have special dimensions.

Electrical requirements

100 – 120 VAC 50/60Hz 11 A (max, excluding peripheral equipment like pc, monitor, etc)

200 – 240 VAC 50/60Hz 4 A (max, excluding peripheral equipment like pc, monitor, etc)

IMPORTANT: The dispenser requires a properly grounded AC outlet.



General precautions

- Before filling inspect each canister for debris and clean if needed.
- The dispenser must be placed in a well-ventilated area free of explosive gasses.
- The dispenser must be placed in a dry environment with minimum temperature fluctuations.
- The operating ambient temperature should be between 10° and 40°C and non-condensing.

The dynamically loaded O-rings used in the dispenser typically are made of Viton/FKM, EPDM, or special solvent-resistant Compounds. These O-rings are important for errorfree, accurate dispensing. The used compound should match the chemical properties of the dispensed components.

IMPORTANT: When filling a canister with a new colorant or flushing the system with a cleaning fluid, make sure that the chemical properties of the used fluid do not have a negative effect on any of the dispenser materials in general and the O-rings in particular. Typically acetone and strong acids are never allowed, alcohols and esthers are not allowed with Viton and hydrocarbons are not allowed with EPDM. When in doubt contact FÜLL Systembau.

Only connect the product to an electric powersupply having the same configuration as the plug. This product is for use on either a 230-VAC or 115-VAC single-phase circuit and has a grounding plug attached. An adapter with good conductivity on phase, neutral and ground can be used. If the power supply is instable, we advise you to install a voltage regulator or uninterruptable powersupply (UPS) for your area. Damage due to instable power, especially voltage surges and dips is not covered by the warranty.

2. Safety Instructions

Qualified service personnel only is allowed to maintain and service the dispenser. Those persons who have received the proper technical training are considered to be qualified personnel and are aware of the hazards to which they are exposed and use adequate safety equipment.

Füll accepts no liability if the SAFETY INSTRUCTIONS are not followed.

Comply with Electrical Codes

Connections and all electrical wiring must comply with applicable local codes.

If further information is required consult the appropriate regulatory agency.

In accordance with all local codes and ordinances the dispenser's power plug must be connected to a properly installed and grounded power supply.

DANGER – Improperly installed grounding plug can result in an electric shock.

- Don't startup if the machine appears damaged. Contact your supplier or service centre.
- For indoor use only.
- All panels should be fitted securely during normal operation.
- Do not attempt to override the door / cover interlock mechanism. Control unit's top panels and doors must be closed during normal operation.



- Before servicing ensure that the dispenser is disconnected from the mains power supply.
- Connect the main power cord to a mains power circuit meeting the electrical requirements and free from any other power equipment if possible.

It's not allowed to use colors / inks with a flamepoint lower then 52°C / 125°F in the VX5 Dispenser without written permission.

3. Installation

Tools required for installation

To remove the dispenser from the pallet the only tool needed is a medium-large (#2) Philips screwdriver. For general installation and inspection the following tools are recommended:

- Cordless drill/driver, preferably with flexible extension
- Medium-large (#2) Philips screwdriver bit
- 8 mm socket or wrench
- 10 mm socket or wrench

Unpacking

Inspect the entire dispenser for damage. Do not install if damaged.

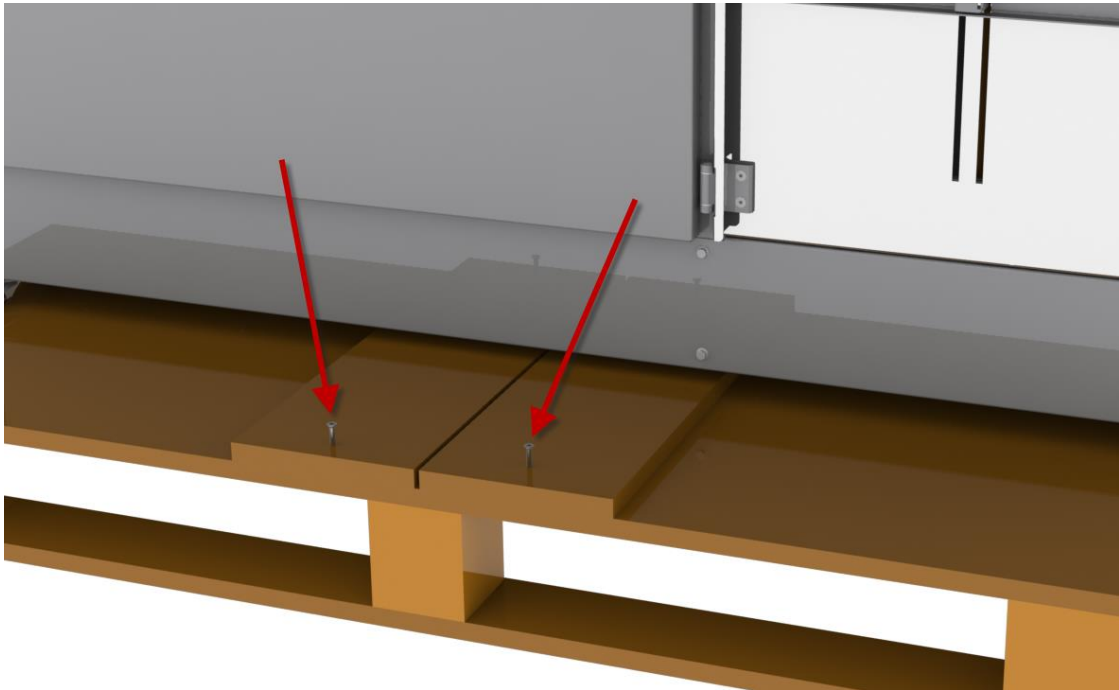
If damage has occurred during shipping please contact the transport company directly.

Check shipment for completeness including:

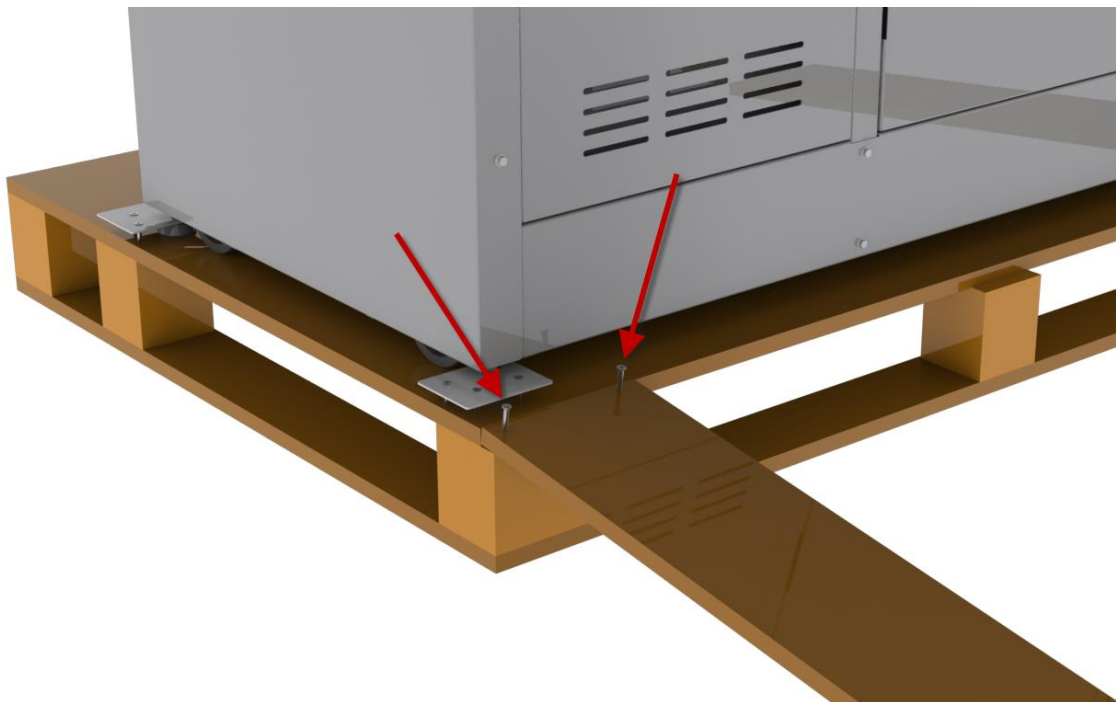
- 1x Removable can table
- 1x Door key
- 1x RS232 cable
- 1x Grease spray 400ml (for spindles and gears, silicone free)
- 1x Sealpack placement tool (to slide seals over piston-rod)
- 1x Clamp for 4 pumps High (sparepart to bridge unused pump-position)
- 1x Clamp for 4 pumps Low (idem)
- 1x This manual

Placement

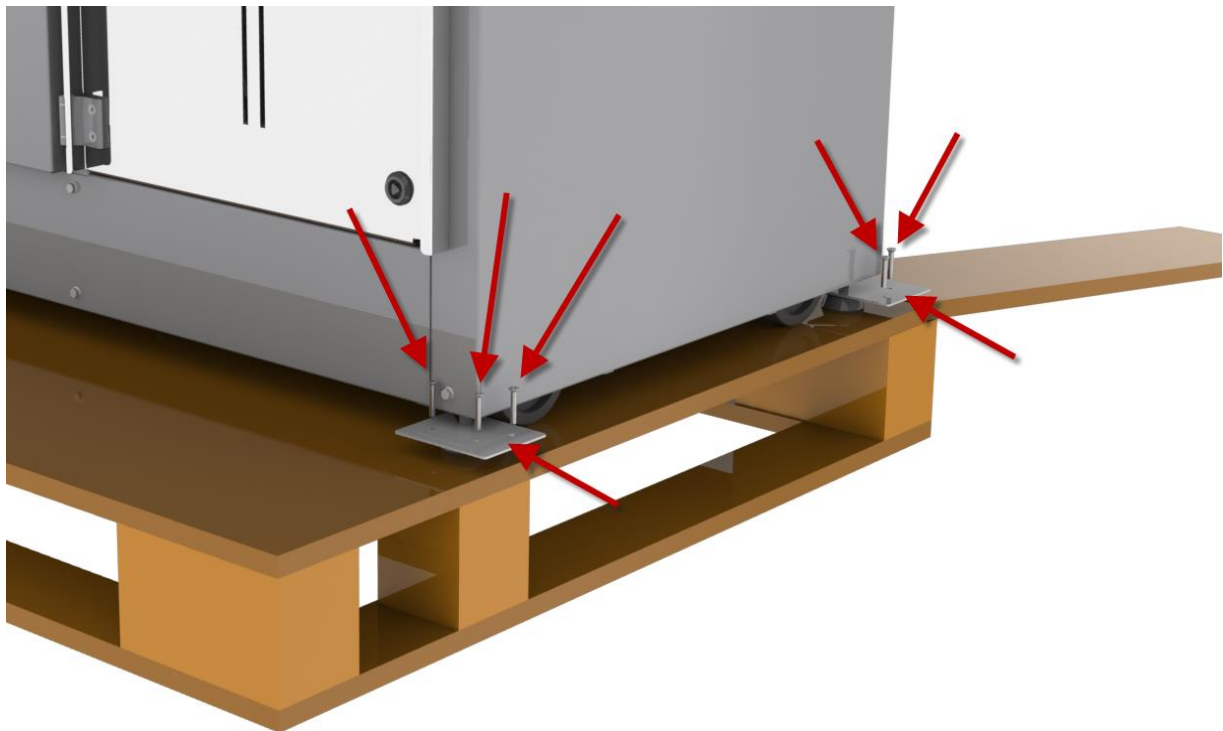
- Remove screws from the 2 boards and the pallet and remove the boards.



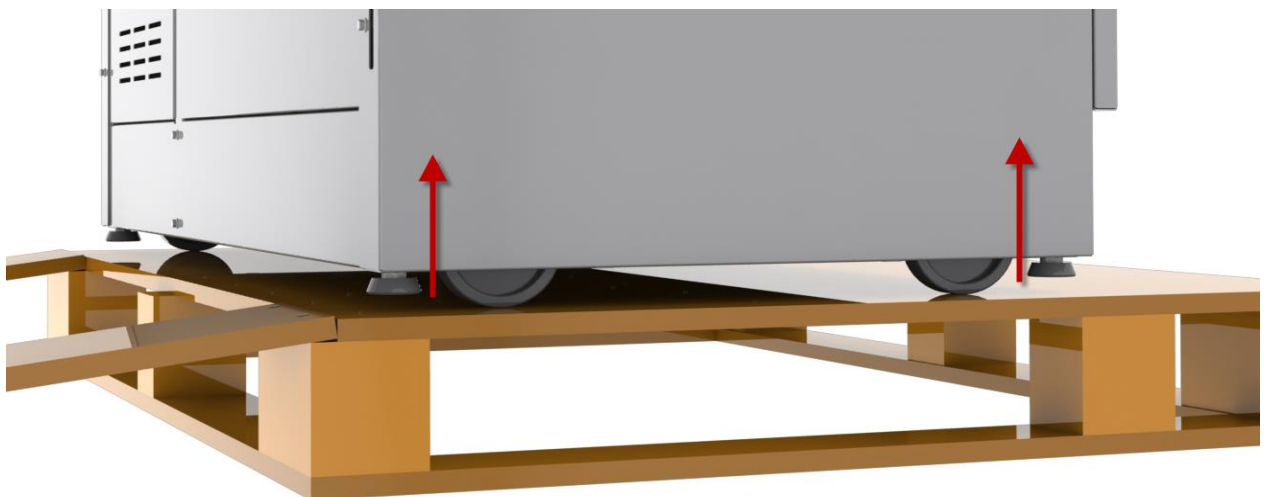
- Place the boards in line with the dispenser wheels and fix the boards to the pallet. Make sure that the top of the boards is flush with the top of the pallet.



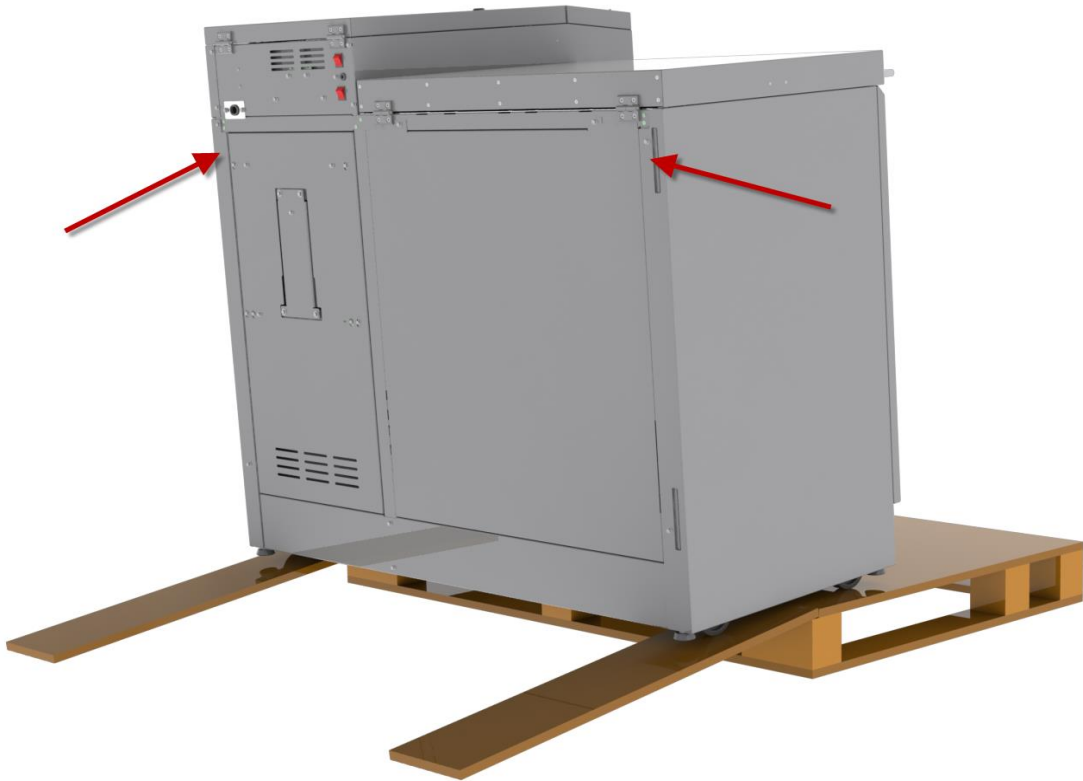
- Remove screws and transportation brackets.



- Turn the dispenser feet to the highest position.

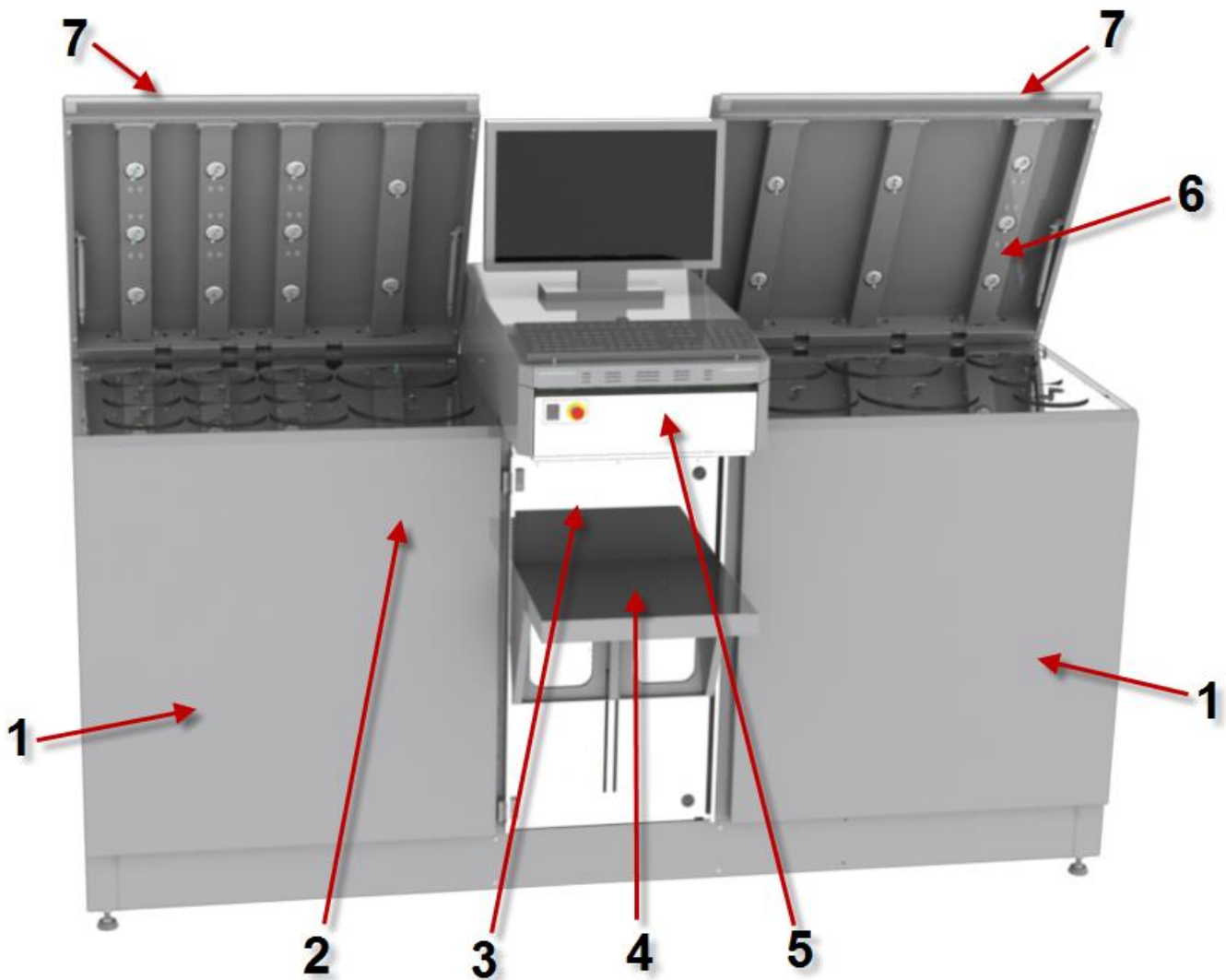


- Gently guide the dispenser off the pallet with at least 2 persons. Do not grip at the top covers, but at the points displayed below.
- After the dispenser has been removed from the shipping pallet ensure the dispenser is installed on a level surface. Adjust the feet to stabilize and level the dispenser.





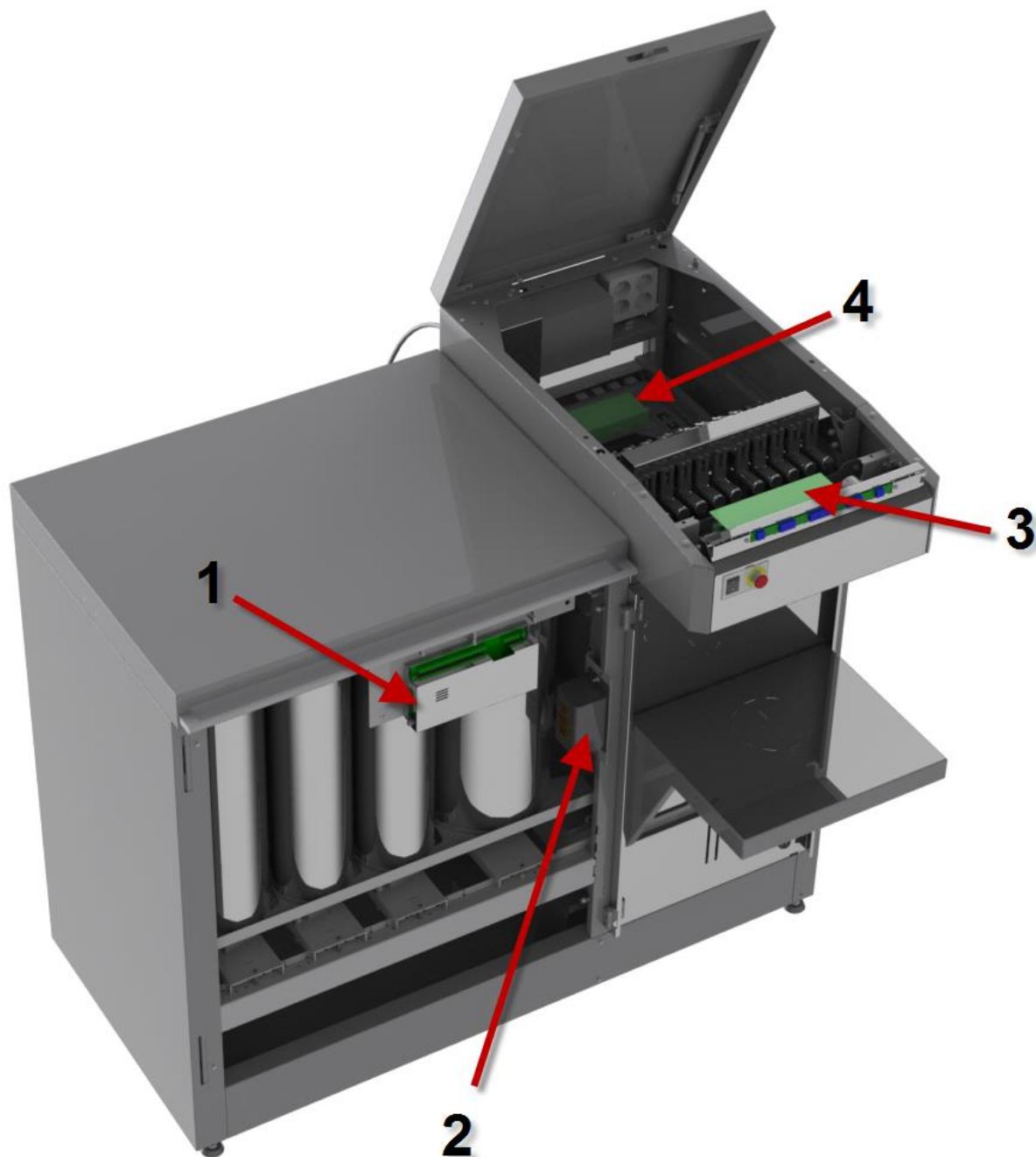
General dispenser modules



- 1 Canister module
- 2 Electronics masterboard (behind left front cover)
- 3 Pump drive unit (behind can lift door)
- 4 Can lift
- 5 Control unit
- 6 Stirring drive unit
- 7 Canister module cover



Electronics locations



	VX5-16xx	VX5-24xx
1	Masterboard	Masterboard
2	Servodrive unit (BDE)	Servodrive unit (BDE)
3	Slaveboard 1 (Valves 1-18)	Slaveboard 1, 2 (Valves 1-18, 19-32)
4	Slaveboard 3 (Selector 1-18)	Slaveboard 3, 4 (Selector 1-18, 19-32)
5	Slaveboard 5 (Stirrer 1-18)	Slaveboard 5 (Stirrer 1-18)



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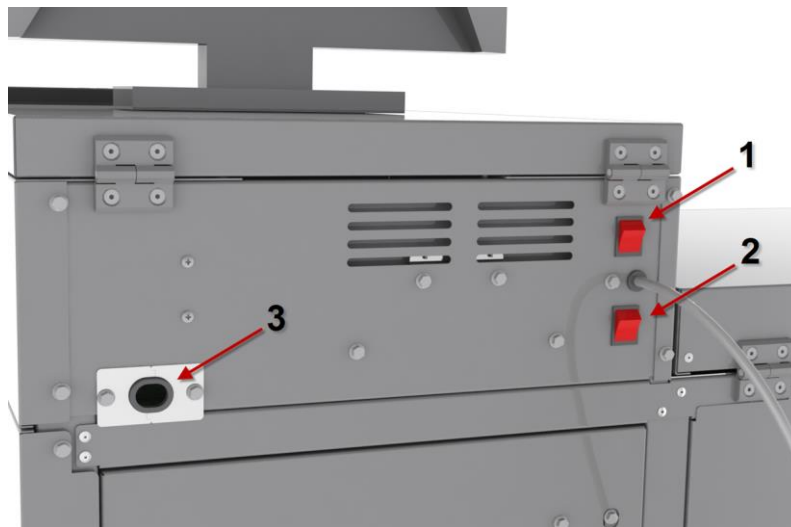


4. Operation

Switching ON dispenser & computer

The VX5 has 2 power switches on the back of the control unit. The upper switch controls the peripherals and the lower switch controls the dispenser power itself.

- ⑩ We recommend to keep the machine switched on at all times to enable all AutoTasks, such as automatic stirring and recirculation.



- 1 Peripheral switch
- 2 Dispenser switch
- 3 Peripheral cables entrance (behind this entry a wallsocket for upto 4 peripherals is located)

The red stop button is located at the front of the control unit. If pressed turn the stop button to the left to release it and allow further operation.

Note: Pressing the stop button stops the machine immediately without further actions. When releasing it, the VX5 automatically resets itself.

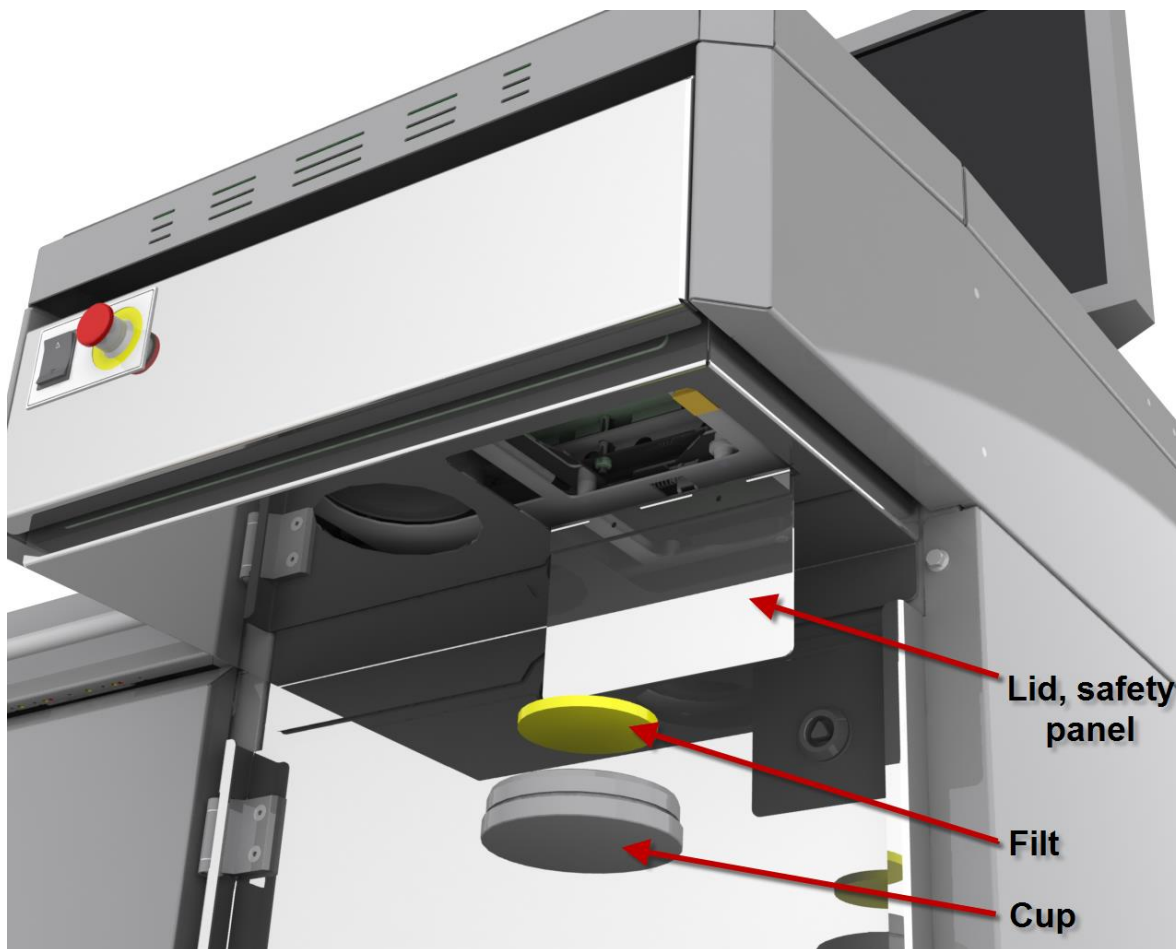




Moisten felt in the nozzle cap

Use the appropriate command from the DispenserManager software to open the nozzle cap. Open the lid on the safety panel. Remove the cap and moisten the felt. Place the cap back in the holder and **close the lid** on the safety panel.

Note: For the exact procedure follow the instructions displayed by the DispenserManager.





Fill the canisters with colorant

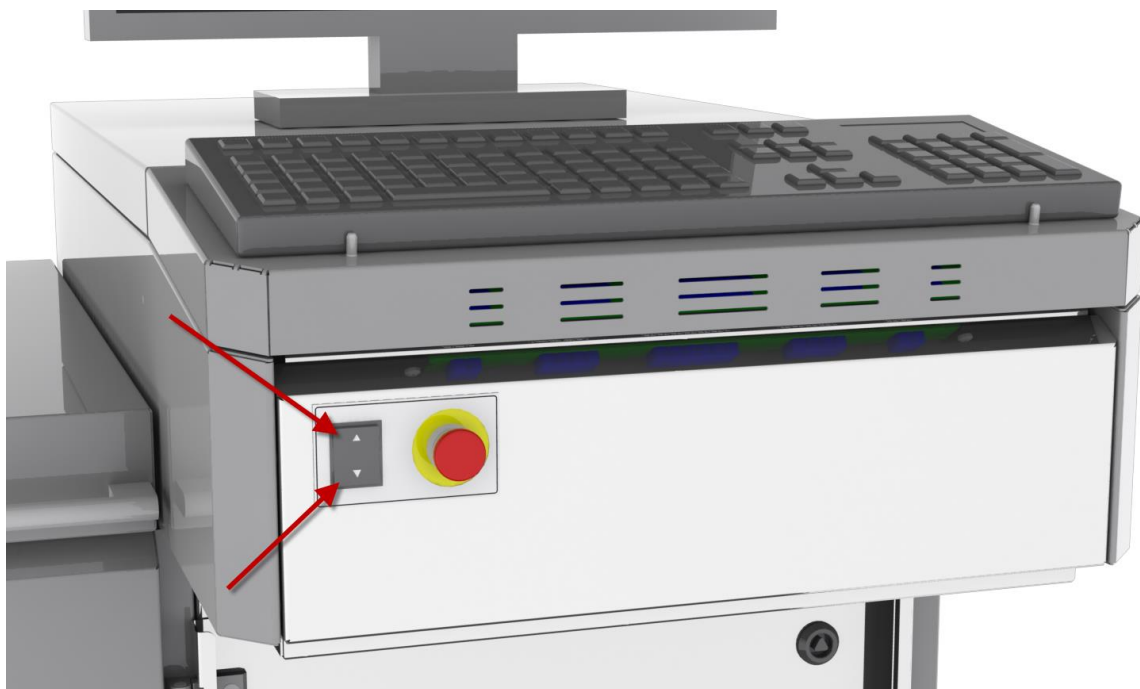
Check the canister configuration in the DispenserManager and fill the correct colorant in each canister. See the software manual for more details. The preferred filling method is:

1. Add one or two refill packages to the first canister to fill it well above the minimum fill level.
2. Enter the filled amount in the canister administration of the DispenserManager.
3. Recirculate each pump connected to the canister until no more air bubbles are surfacing in the canister. Typically 8 recirculation cycles are enough.
4. Place the used refill package below the dispense head and dispense about 300ml. See the following paragraphs for further details of how to dispense.
5. Return the dispensed amount to the canister.

Note that the DispenserManager does NOT subtract the dispensed amount from the canister content administration when a SINGLE colorant is dispensed for service.

Position can for dispense

- Place the can on the can table. Use the centre marking to check if the can is in the right position.
- By pressing the can table up/down switch at the front panel of the control unit the can table moves in the desired direction. The following events stops the movement:
 - When reaching the top/bottom limit switch
 - When the can sensor detects a can while moving up
 - When the up/down switch was pressed shortly to start moving, the lift stops when the up/down switch is pressed again.
 - When the up/down switch was pressed until the movement has started, the lift stops when the up/down switch is released.
 - When an object (typically a can on the can table) is pressed against the safety plate below the dispense head while the lift was moving upwards.
If this occurs while the can is positioned correctly the can sensor sensitivity may need to be adjusted.





Dispense colorant

- Ensure the can opening is under the dispense head and at its optimal height (detected by the can sensor about 1 to 2cm below the safety plate).
- Select the colorant(s) and amount to dispense in the DispenserManager and select Dispense.
- Refer to the software manual and the manual of the formula selection program how to dispense complete formula's.

Initial calibration

For accurate dispensing the pumps need to be calibrated. The DispenserManager provides an easy to use calibration program for this. See the Software Manual for further details.

Dispense using formula selection software

The VX5 is controlled by the DispenserManager. The DispenserManager can be configured to connect to many different formula selection programs. Contact your IT contact to set up this connection.

Check sealpack pump

To check if the sealpack is not worn: dispense a big amount and look at the nozzle to see if there's a steady flow without air. If there's air in the ink / color check the sealpack and piston rod for wear.



5. Maintenance

Daily

- Clean nozzle cap
Note: For non-drying inks this is only needed once per 3 to 6 months
- Inspect nozzles and purge.
Note: For non-drying inks this is only needed once per week
- Refill canisters if needed.
- Clean any spillage immediately.

Weekly

- Inspect & clean drip tray if needed.

Monthly

- Test stirring mechanism for proper operation in all canisters.
- Spray **thick PTFE** grease on the spindles

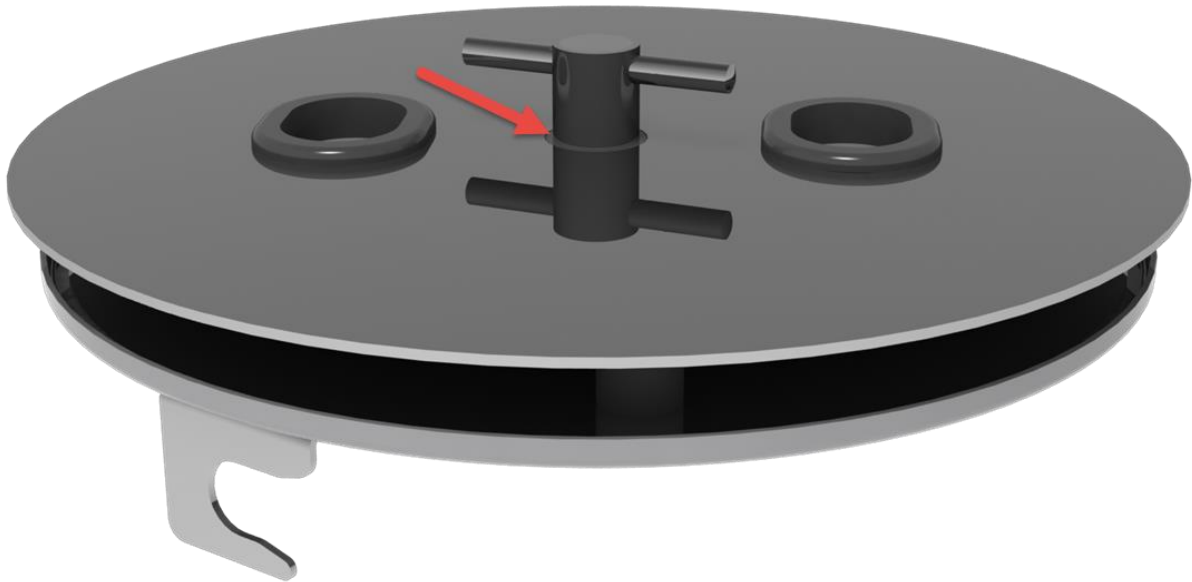
Semiannually

- Spray **thick PTFE** grease on the conical stirring gears

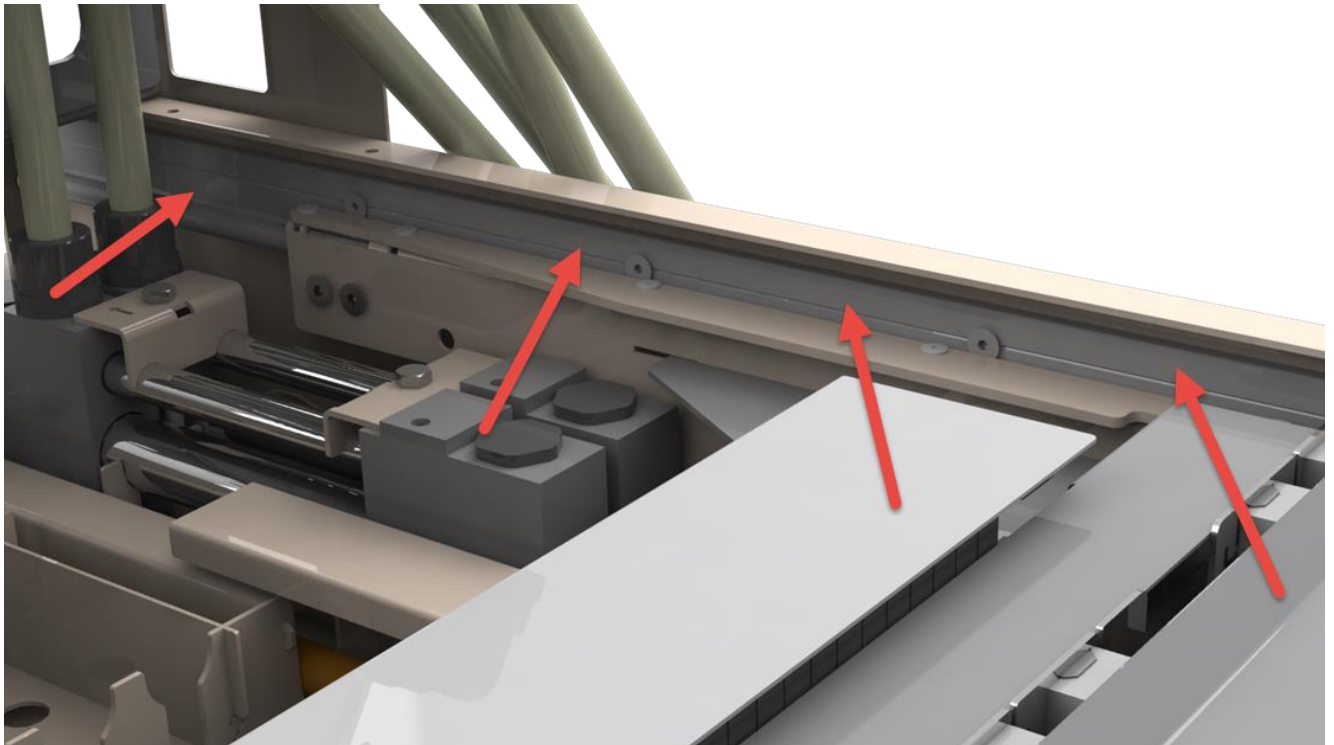




- Spray **thin PTFE** grease on the slide bearing of the canister lid, but more important: don't overfill canisters.

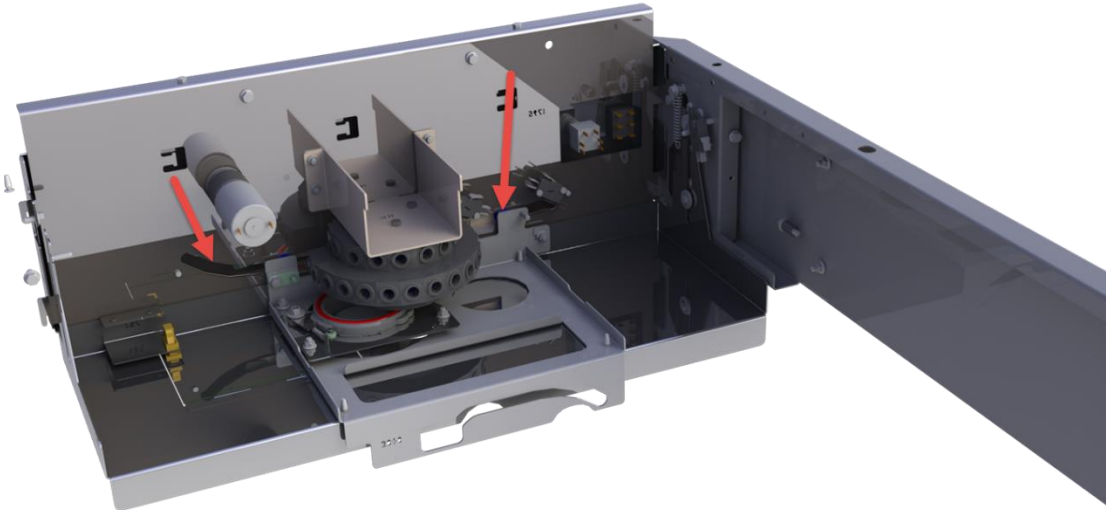


- Spray **thin PTFE** grease on the guide rail of the pump drive unit.





- Spray **thin PTFE** grease on the wheels and guiding of the nozzlecap.



Many colorants are not compatible with silicones, so best use PTFE spray without silicones.

Cleaning when changing colorants

- For waterbased paint → Use water
- For solvent based paint → Use white spirit
- For inks → Use alcohol

6. Troubleshooting

Basic Troubleshooting

Problem	Action
Dispenser will not turn on	<ul style="list-style-type: none">• Check incoming power and main switches.• Check Stop button at the front of the control module• Ensure covers are completely closed and doors are locked.
Lift will not move up	<ul style="list-style-type: none">• Lift door is not locked.• Check Stop button



Inaccurate color dispensed	<ul style="list-style-type: none">• Check can sensor.• Incorrect base paint selected.• Formulation error in dispensing software.• Low colorant level in canister causing air to enter pump assembly. Fill canister with colorant and perform recirculation to remove air from pump.• Check stirring drive mechanism and quality of colorant in the canisters.• Test toggeling valves and selectors• Measure accuracy using the calibration functionality of the DispenserManager
Colours are difficult to reproduce	<ul style="list-style-type: none">• Quality fluctuations in colorant supplied. Contact colorant supplier.• Check stirring drive mechanism and quality of colorant in the canisters• One or more colorants have thickened. Replace colorant
Air is being fed together with the colourant	<ul style="list-style-type: none">• Canister is empty. Refill canister.• Air bubble in the tubing. Recirculate and purge the pump.• Leak in the suction tubing• Pump seals worn out. Replace seal pack
Stirrer is not rotating	<ul style="list-style-type: none">• Top lid not closed properly. Close top lid. Check that the coupling part in the canister lid can be pressed down fully.• Timer setting incorrect. Use the DispenserManager to set the timer correctly.• Defective cable, connectors or stirrer electronics board.
Keyboard is not working	<ul style="list-style-type: none">• Windows regional setting is incorrect. Check windows software manual.• Loose cable.



Error codes

In case an error occurs, it is displayed by the DispenserManager together with a short description. Errors generated by the masterboard are also displayed by the 2-digit display on the masterboard. Only when these digits are blinking it is an error.

See the Software Manual for more details. What can you do before calling your service agent if one off these errors occurs.

- Check if the dispenser power supply switch and peripherals switch is on and the service covers are closed and doors are locked.
- Check if the RS232 cable is properly connected
- Check connections on PC, monitor, etc.
- Shut down PC and dispenser. After 30 s switch on the PC and dispenser again. When the PC is restarted wait at least one minute to allow Windows to finish initializing all software and drivers.
- Check if all programs are running (DispenserManager, formula selection program).

When calling your service agent have the following information present:

- The error code and description displayed by the DispenserManager.
- For complex problems all logfiles, electronics parameters, configuration details and service notes can be exported as a single zipfile by the DispenserManager. Send this zipfile to your service agent for optimal diagnosis of the problem.

Note: in the logfiles all error codes are negative numbers to differentiate them from regular results returned by internal functions.

General and External Interface errors

Code Description

- | | |
|----|--|
| 0 | General result code indicating that the request has completed OK |
| 1 | General result code indicating that the request has started OK |
| 2 | The received external command had too many/few parameters |
| 3 | The received external command did not contain a dispense or extended command |
| 4 | The received external command contained an illegal value for one of the parameters |
| 5 | The received external command was aborted by the user |
| | |
| 32 | An exception occurred while parsing the external command file. |
| 33 | The external command file contained more than one command, which is not allowed |
| 34 | The external command file contained an unsupported extended command |
| 35 | The external command file contained an unsupported command |
| 36 | Command failed. Typically dispenser not connected or unspecified error |
| 37 | An exception occurred while processing the external command |
| 38 | Failed to show the ServiceWindow |
| 50 | The sum of all component parts in the external command file is not 1.0 |
| 51 | The external command file contained a component part ≤ 0 |
| 52 | The external command file contained a QUANTITY tag without a preceding RECIPE tag |
| 54 | The external command file did not contain a RECIPE tag |



DCS Dispenser Control Electronics errors

Code	Description
1001	Invalid or missing command
1002	Invalid or missing parameter
1003	invalid result value
1004	Machine is not locked
1005	Failed to start the requested command, because the dispenser is already busy with a command
1006	Command was aborted by the user
1010	Machine is initialising
1011	Stop button is pressed
1012	Control-unit front door is open
1013	Control-unit top cover is open
1014	Tank-module cover is open
1015	Safety plate is pressed upwards
1020	Parameter access failure
1021	Parameter not found
1022	Parameter value is bad
1023	Parameter is read only
1024	Parameter read failure
1025	Parameter write failure
1028	Status not found
1029	Status unknown
1030	Pump state-machine failure
1031	Pumpmotor current too high
1032	Pump home- or end sensor not reached
1033	Pumpmotor driver chip fault
1034	Pumpmotor HALL transition timeout
1035	Pump encoder pulse timeout
1036	Pump encoder failure
1037	Pump did not leave home
1038	Pump did not reach home
1039	Pumping not possible. Motordriver switched to lift
1040	Lift state machine failure
1041	Liftmotor current too high
1042	Lift bottom- or top sensor not reached
1043	Liftmotor driver chip fault
1044	Liftmotor HALL transition timeout
1048	Failed to open nozzlecap. Lift-Up movement not possible.
1049	Moving lift not possible. Motordriver switched to pump
1050	Nozzlecap state-machine failure
1051	Nozzlecap current too hig
1052	Nozzlecap open- or closed sensor not reached
1053	Nozzlecap could not be opened
1054	Nozzlecap disabled
1058	Nozzlecap has no size
1059	Nozzlecap is full
1060	BDE State-machine failure
1061	BDE Motor fault
1062	BDE Run timeout
1063	BDE Status timeout
1064	BDE Init timeout
1065	BDE Reset timeout
1066	BDE Disabled timeout
1067	BDE Ready timeout
1068	BDE Switch-On timeout
1069	BDE Operation timeout



1070	Reset state-machine failure
1071	Test state-machine failure
1072	Tasks state-machine failure
1073	Control state-machine failure
1076	Stirrer over current
1077	Stirrer current too high
1078	Selector current too high
1079	Valve current too high
1080	Pump encoder failure
1081	Pimp did not leave home
1082	Pimp did not reach home
1090	Reset state machine failure
1091	Invalid action event number
1092	Action list not finished
1093	Pumps blocked in pull direction
1094	Pumps blocked in push direction
1097	Stirrer ID not configured
1098	Tank ID not configured
1099	Pump ID not configured

Dispenser Service errors

Code	Description
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2001	Dispenser connection failed, machine not found
2002	Dispenser connection failed, machine is not free
2003	Dispenser connection failed, machine is not connected
2004	Dispenser connection failed, machine connection timeout

DCL Dispenser Driver errors

Code	Description
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3000	DCL Memory allocation error
3001	Dispenser already created
3002	Dispenser not created
3004	Configuration invalid (check directory)
3005	Dispenser not connected
3010	Dispenser protocol failure
3011	Dispenser already busy with command
3012	Dispenser network (DCL-CS) error
3013	CommunicationServer not active

Dispenser Manager errors

Code	Description
------	-------------

4000	Main dispenser object not assigned
4001	An unhandled exception occurred
4002	The previously started action has not finished yet
4003	The calibration curve is descending
4004	Too few calibration points (at least 2 are needed)
4005	Lowest point must have amount 0 ul (pulses may be ≥ 0)
4006	Last calibration point must NOT have amount 0 ul
4007	Last calibration point must be rising
4020	Command not allowed in simulation mode
4021	No pumps need to be purged
4022	Script contains no valid lines
4023	Dispensed below tolerance



4024	Dispensed above tolerance
4025	Total recipe below tolerance
4026	Total recipe above tolerance
4027	DmDispenser.dat config validity error
4100	Recipe contained too many sub-recipes
4101	Main dispenser object not assigned
4102	Tank level too low for requested dispense
4103	Failed to add an amount to the recipe
4104	Recipe contained a component that could not be dispensed
4105	SpindleLeftPos undefined. Torque calculation impossible
4106	Recipe is empty
4120	Dispensed below tolerance
4121	Dispensed below tolerance
4200	Pumpdrive-unit not initialized
4201	No calibration curve found for one or more pumps
4202	Pumpstroke planning failed!
4203	Planned pumpstroke contains too many pulses
4204	Invalid actionlist header
4205	Recirculate requested
4206	When nozzleCap full dispensing not allowed