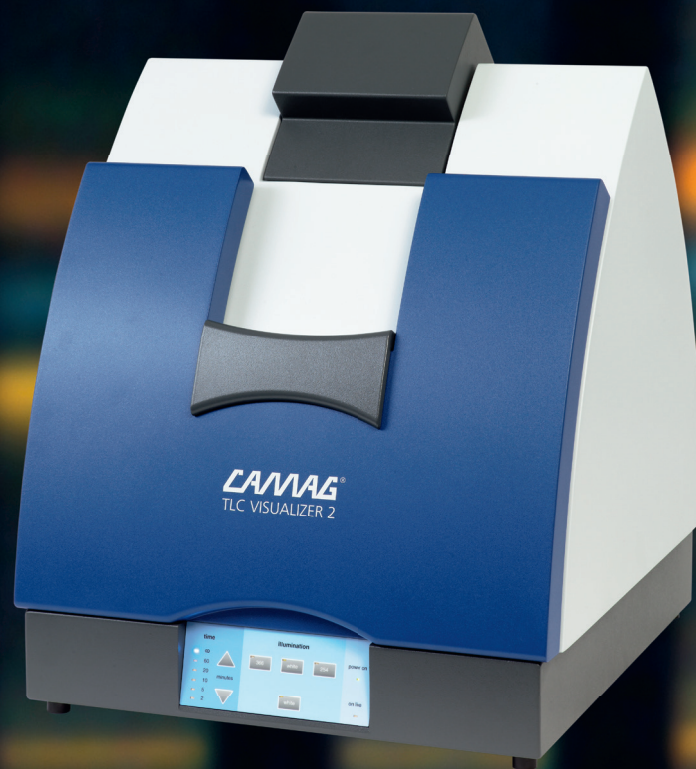


CAMMAG®



INSTRUCTION MANUAL TLC VISUALIZER 2



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1 Introduction

The CAMAG Visualizer 2 has been designed specifically for digital documentation of thin-layer chromatograms and similar flat objects.

UVA (365 / 366 nm broadband) direct light. (see appendix)

This type of illumination is used for thin-layer chromatograms and other fluorescent objects.

Under this light fluorescent objects appear as bright and often differently coloured spots on a dark background. The higher the density of the UV radiation and the more effectively the visible light is filtered out and extraneous light screened off, the greater the sensitivity of detection by this method. The fluorescence indicator F254 frequently present on thin-layer plates is not necessary for this mode of detection, but does not interfere with it either.

UVC (254nm narrowband) direct light. (see appendix)

This type of illumination is used almost exclusively for thin-layer chromatograms.

Substances which absorb this light appear under it as dark spots on a bright background if the layer contains an appropriate F254 fluorescent indicator. UV density and elimination of visible light are less critical for this mode of detection.

White light (direct or transmitted, separately and combined)

Used for recording visible, opaque objects.

For recording translucent objects such as thin-layer chromatograms, direct light alone gives the best color accuracy, a combination of direct and transmitted light intensifies the contrast.

Transmitted light should be used for recording transparent objects.

1.1 Precaution



- Please read this operating manual before starting the installation!
- This manual contains information and warnings the user has to follow to ensure reliable operation of the instrument.
- Some interior parts of the instrument are under AC power. Careless and improper use can cause injury. Unauthorized manipulations can cause damage
- This sign indicates (on instrument and in this manual) that failure to take note of the accompanying information may result in damage of the instrument
- The instrument is manufactured and tested in accordance with the respective European safety regulations (see Declaration of Conformity). The instrument complies with safety class 1 and has been designed for indoor

use only (IP 20). Further, this device has passed the CAMAG Quality Assurance tests and has been delivered in a safe operating condition. For detailed instrument data see chapter technical data

- Attention: For safety reasons the instrument may only be used for the purposes described in the operating manual
- To avoid injury use adequate safety equipment (protective goggles, gloves etc.) when working with the instrument
- Before first operation, check whether the voltage shown on the instrument matches your local mains voltage. The power cord may only be connected to a grounded, fused (not higher than 16A) outlet. Do not use extension cords without ground contact
- Risk of finger squeeze between moving parts; be careful closing the door
- The instrument may be used only by properly trained laboratory staff
- The instrument may not be used in rooms with danger of explosions
- The instrument contains highly sophisticated electronics and optical parts. It may be operated only in a non-condensing atmosphere between 15 and 30° C (59 - 86 degrees Fahrenheit). Before installation and use, the instrument should be acclimated properly
- Use a damp lint free cloth for cleaning the instrument surface. Do not employ aggressive detergents
- Protect yourself and the instrument from electrostatic shock which can cause damage to the electronic parts
- Only authorized personnel may open the instrument. Service and repair is only to be performed by trained specialists. Use spare parts and consumables supplied by CAMAG only. The warranty is voided if parts from other sources are used. Check the service manual before you start service to reduce product-specific risks
- The power cord has to be removed before the instrument is opened. It is not permitted to work on an instrument that has been opened and is connected to the power supply
- Spare fuses must be of the type specified by the instrument manufacturer. It is forbidden to short-circuit or manipulate fuses
- If the instrument is found to be defective, it must be switched off and steps must be taken to ensure that it cannot be switched on by mistake
- Carry out all safety checks and the preventive maintenance as recommended by the manufacturer in order to assure your personal safety and the full functionality of the instrument. Have an authorized service specialist perform any service not described by this manual

- See original manufacturers' manuals for further safety data on third party equipment supplied with the system
- Lift/move/transport the system with the necessary care (remove the glass plate before transport, transport it only in the original packaging)
- The safety of any system incorporated with the equipment is the responsibility of the assembler of the system
- This symbol indicates that this equipment must not be disposed of as unsorted municipal waste but is to be collected separately as electrical and electronic equipment (WEEE-Directive 2002/96/EC). To properly recycle the instrument or parts of it you are requested to send the equipment back to the distributor, producer or an adequate collection system at the end of its life. This will have potential effects on the environment and human health
- When working with UV light, especially with short-wave UV light, be sure to protect your eyes and skin from direct radiation, which inevitably causes irritation and inflammation. Ordinary goggles provide protection, but it is advisable to wear safety glasses or a face shield and gloves.



1.2 Parts supplied

CAMAG TLC Visualizer 2 basic comprising:

Part no	Units	Description
959.0520	1	Lens 12mm with NIR filter or
959.0521	1	Lens 16mm with NIR filter
115.9802	1	TLC-Plate positioner
692.0024	1	Opal glass
	1	Power cord
125.1021	1	RS232 connecting cable
B.022.9810E	1	Operating Instruction
958.0866	1	USB 3.0 cable, angled
022.9596	1	Resolution test sheet

Accessories and spare parts

Part no	Description
352.0010	UV tube short wave (254nm) 8W, D=16mm, L=288mm
352.0011	UV tube long wave(366nm) 8W, D=16mm, L=288mm
352.0015	White light tube 8W, D=16, L=288mm
362.0006	Fuses 250V 1AT (2pcs)
692.0021	Spare UV 254 filter for side reflectors
692.0022	Spare UV 366 filter for side reflectors
692.0023	Spare glass for side reflectors
692.0024	Spare opaque glass
115.9785	Filter support left complete
115.9786	Filter support right complete

2 Unpacking/Installation

2.1 Unpacking

- Observe the environmental requirements (2.2 Installation environment) when setting up the instrument
- Carefully unpack all components and accessories listed on the shipping list. Make sure the shipment is complete
- Carefully remove the instrument from the package and place it on a table
- **Attention:** Do not pull out the instrument by holding it at the blue sliding gate; grab the instrument at the bottom when taking it out of the package and carrying it around!

2.2 Installation environment

The place for installation must meet the following requirements:

Bench space	Width 50 cm Depth 60 cm (add adequate space for the connecting cables) Height 65 cm
Weight	17kg
Operating temperature	The temperature should be within a range of 15 to 35 degrees centigrade
Humidity	Humidity and temperature conditions must not cause condensation
Atmospheric conditions	Adequate ventilation free from acidic, alkaline or other gas that may corrode metal or painted surfaces must be secured
Line voltage	100-240V (see rating plate on instrument)
Frequency	50 – 60 Hz
Power capacity	50 W Illumination unit / 3.5 W Camera (USB 3)
Ground terminal	A grounded outlet should be located within 2 meters of the instrument

Further requirements:

- Do not expose the instrument to any strong vibration or shock
- Avoid placing the instrument near equipment that radiates heat. Do not place the instrument near gas burners, electric heaters or ovens
- Do not place the instrument near equipment that generates intense magnetic fields such as electric welding equipment, high frequency furnaces, pole transformers, etc.
- Protect the instrument from excessive dust
- Connect the instrument to power lines that are free from sudden changes or voltage fluctuations
- If you must use power motor driven equipment (such as a stirrer or shaker) in the same line as your instrument, ensure that a noise reduction unit is in the same power line

2.3 Connection

- Use the original supplied power cord for connecting the instrument to the mains outlet
- Connect the serial cable to the instrument and to a free COM-port of the PC



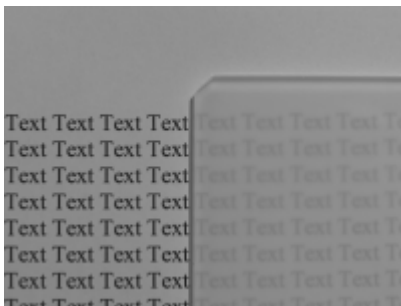
Fig. 1 Back view with serial connector (left) and mains connector (right)

2.4 Mount the opaque glass and L-shaped plate adjuster

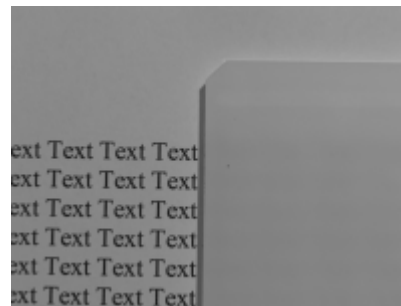
- After unpacking the opaque glass plate insert it, opaque side down, into the open frame inside of the CAMAG TLC Visualizer 2

How to identify the opaque side:

Hold the opaque glass over a piece of paper with printed text. The opaque side is down if you can read the text.



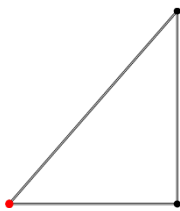

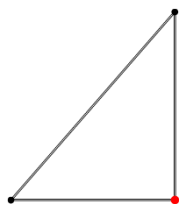

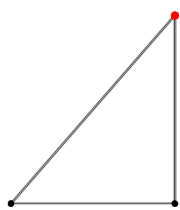

Correct: Opaque side down



Wrong: Opaque side up

- Insert the L-shaped plate positioner in one of the three possible positions
- To relocate the L-shaped plate positioner, lift it slightly and move it along the guiding slots leading to one of the three different positions (Positions are adjusted to the TLC/HPTLC plate size in use).

Make sure the cams have snapped into the desired position.

Plate size	Position of plate positioner	Instrument
10x10		
20x10		
20x20		

2.5 Digital camera

When the CAMAG TLC Visualizer 2 is shipped the camera is already mounted in an adjusted position, therefore no mechanical adjustment is necessary.

- In order to work with the USB Camera, visionCATS requires the installation of appropriate camera driver on the PC. The related driver files can be found on the visionCATS installation media in the drivers directory
- In the Baumer Camera Directory choose the sub directory appropriate to the instrument and current operation system. Double click the "bdriver_usbxx.msi" file and follow the instructions on screen
- Remove the black cover on the camera lens

2.6 Settings in visionCATS

Reference point

Under Options/General Setting/ Global Configuration the setting „TLC Visualizer 2 uses the same reference point as a TLC Scanner 3/4“ is active by default. This sets the reference point as on the TLC Scanner, ATS 4 and Linomat 5. If active, the plate has to be inserted with the application position first. If the instrument is used to check the plate through the viewing flap or if the reference point has to be identical as in first generation CAMAG TLC Visualizer, this option has to be disabled in visionCATS. The plate has to be inserted with the solvent front first. To change the reference point:

- Go to Options/General Setting/ Global Configuration
- Under Analysis deactivate the point “TLC Visualizer 2 uses the same reference point as a TLC Scanner 3/4”
- Save the setting

Set the lens focal length

- Double click the TLC Visualizer in the “Instruments” window
- In the “Properties” sub-tab, under “Lens” choose the correct focal length for the lens of this specific CAMAG TLC Visualizer
- Save the setting



If this setting was changed (by accident or the lens had to be changed), the Diagnostics session needs to be re-done.

Electronic adjustment

To record images with the correct settings (white adjustment and position), the Diagnostics session has to be performed.

- Double click on the instrument icon in the “Instruments” window
- Chose the subtab “Diagnostics”
- Press “Start” and follow the instructions

To display images with the correct colour, you will need a calibrated PC screen. To print images (on reports or exported) with the highest possible consistency between screen and printed image, the printer has to be calibrated. Printed images appear different as the printer parameters (resolution and colour depth) are different to those of the PC screen.



As colours are always seen subjectively, slight differences in perception of the plate seen through the viewing flap, the recorded image on screen and the printed image are possible.

3 Getting started

3.1 The Instrument

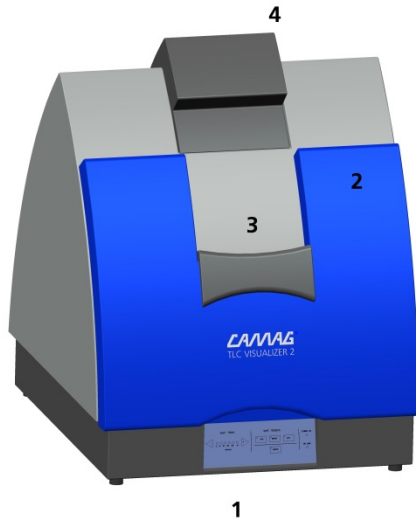


Fig. 2: Front view 1: Control panel; 2: Sliding door; 3: Viewing flap; 4: Camera cover

A sensor system controls and monitors the proper handling and ensures a stable illumination process. In case of failure a signal will sound and an error message will be displayed. For error messages see the chapter "Error messages".

3.2 Control panel

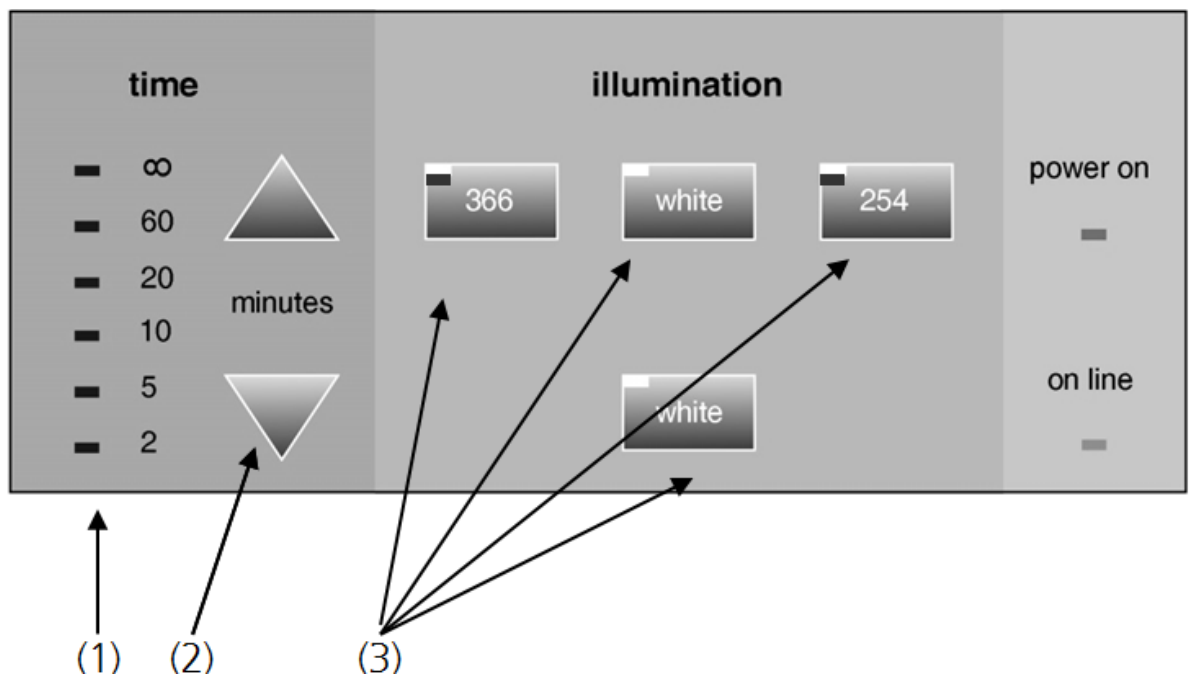


Fig.3: Layout control panel: 1: Timer LED; 2: Timer arrow key 3: Lamp keys with lamp control LEDs

3.3 Illumination

There are 5 different illumination sources available:

R 254	Remission at 254nm
R 366	Remission at 366/365nm
R White	Remission at white light
T White	Transmission at white light
RT White	Remission and transmission at white light

3.4 Operation

- Switch on the instrument. The green LED (power on) indicates the instrument is ready
- Make sure the L-shaped plate positioner is correctly set as described in chapter 2.4
- Insert the plate with the application front first (to the rear of the instrument, check chapter 2.6 Reference point)
- With the timer arrow keys select the lighting time you want
- Press the appropriate lamp key to select an illumination source. The respective control LED of the selected illumination will turn on and the pre-selected blue timer LED will flash
- To start the RT White mode hold down the R White key while pressing the T White key or vice versa
- Lighting continues until the pre-set time has elapsed or the selected lamp key is pressed again
- Changing the time resets the timer and the newly selected time starts without switching off the illumination. Changing the type of lighting immediately turns off the working tubes and turns on the newly selected tubes
- The blue sliding gate must be closed in order to turn on UV light. If you open the gate while a UV light is on, the illumination stops. In both cases an optical and acoustic signal is issued.
- If you have to start UV illumination while the blue sliding gate is open, you have to hold down the UV lamp key for about three seconds until the light is turned on. The light stays on as long as you are holding the lamp key down.



Wear eye and skin protection!

3.5 Viewing flap

When a light source, proper illumination or fluorescence must be controlled visually prior to taking images, open the viewing flap

A filter is present to protect the user when the viewing flap is open!

4 Service and maintenance

4.1 User maintenance

- Clean the instrument inside and outside with a damp lint-free cloth on a regular basis
- Remove the HPTLC plate right after ending the evaluation

4.2 Maintenance Data Sheet

CAMAG Maintenance data sheet	
CAMAG TLC Visualizer 2	
October 2016/UB	

Purpose	The maintenance data sheet informs about maintenance interval of the respective instrument as well as the proposal for IQ/OQ interval if applicable. In addition, it identifies consumable parts with the respective replacement cycle.
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Maintenance interval	
Maintenance	12 month
IQ/OQ	12 month

Consumable parts		
Part No.	Description	Proposed replacement cycle
352.0010	UV tube short wave 254nm	24 month
352.0011	UV tube short wave 366nm	24 month
352.0015	White light tube	24 month
692.0021	Spare UV filter 254nm	Upon need
692.0022	Spare UV filter 366nm	Upon need
692.0023	Spare glass for white light	Upon need
692.0024	Spare opaque glass	Upon need
622.3014	Compensation spring (left/right)	Upon need

4.3 Trouble shooting

Replacing fluorescent tubes

White tubes in the base unit:

- Ascertain which tube has failed
- Switch off the instrument and remove the power cord!
- Remove the opaque glass plate from the CAMAG TLC Visualizer 2
- The defective tube can be taken out of the socket by turning (approx. 90 degrees)
- Proceed in the reverse order when fitting the replacement tube
- Reconnect the mains cable and check that all tubes work properly

Tubes in the side reflectors:

- Switch off the instrument and remove the power cord!
- Remove the lower screws and just loosen the upper screw at the front side plate of the specific side reflector
- Swing the front side plate into the highest upper position
- Pull the filter support carefully out of the guide
- Loosen the defective tube (254nm, 366nm or White) by carefully twisting it clear of its holder and take it out of the side reflector
- Proceed in the reverse order when fitting the replacement tube
- After replacing the tube insert the filter support back into its guide and turn the front side plate back. Tighten it (slightly) with the two screws
- Reconnect the mains cable and check that all tubes work properly

Replacing the fuses

- Switch off the instrument and remove the power cord!
- Unlock the fuse holder over the mains socket with the help of a small screwdriver
- Press it on both sides of the holder into the recess. Now pull out the fuse holder
- Replace the fuse(s). The label 250 V 1.0 AT (slow blow) is valid over the full voltage range
- Push the fuse box back in
- Reconnect the power cord

Camera access

In case access to the camera is required the top cover can be removed by pushing it forcefully in an upwards direction until it detaches.

Error messages

Errors are displayed as follows:

In case of failure a signal will sound and an error message displayed. Initially chasing light will be shown by the timer LEDs for three repetitions. Then the LEDs display a coded error number. If there is a tube defect, the corresponding lamp control LED is on as well. If all lamp control LEDs are on (ALon), the CAMAG TLC Visualizer 2 has a critical error and CAMAG service must be called.

The coded error number displayed at the timer LEDs can be read as follows:

Timer LED:	2	5	10	20	60	∞
Number if LED is on:	1	2	4	8	16	32
Example:	⊗	⊗	○	○	○	⊗

⊗ LED is on

○ LED is off

The error number is calculated as: $1 + 2 + 32 = 35$

Error number	Description
15	Front sliding gate is open at start (is not displayed)
16	Lamp current is too high (ALon)
17	Lamp current is too low (ALon)
18	Lamp current can't switch off (ALon).
19	High voltage power supply is too high (ALon)
20	High voltage power supply is too low (ALon)
21	High voltage can't switch on (ALon)
22	High voltage can't switch off (ALon)
32	UV 366nm tube in one of the side reflectors is defective
33	UV 254nm tube in one of the side reflectors is defective
34	White tube in one of the side reflectors is defective
35	White transilluminator tube is defective
36	One transilluminator <u>and</u> one of illumination white tubes are defective
37	One transilluminator <u>or</u> one of illumination white tube is defective
56	Front sliding gate was opened during UV illumination (is not displayed)
31/57	Internal device voltage 15V is too low

ALon means all lamp control LEDs are on

5 Technical data

Line voltage	100-240V (see rating plate on instrument)
Power capacity	50 W Illumination unit / 3.5 W Camera (USB 3)
Frequency	50 – 60 Hz
Lamps switching Frequency	65 kHz
Timer settings	2/5/10/20/60 minutes and endless
Dimensions	Width 50 cm Depth 60 cm Height 65 cm
Weight	17kg

6 Appendix A: Illumination spectra

Spectral intensities of 254nm (narrowband) and 365 / 366nm (broadband) lamps are shown in fig. 4.

Due to the broadband characteristics of the UV 366 tubes their intensities are similar at both 365 and 366 nm and are equally qualified for both (365nm and 366nm) specifications.

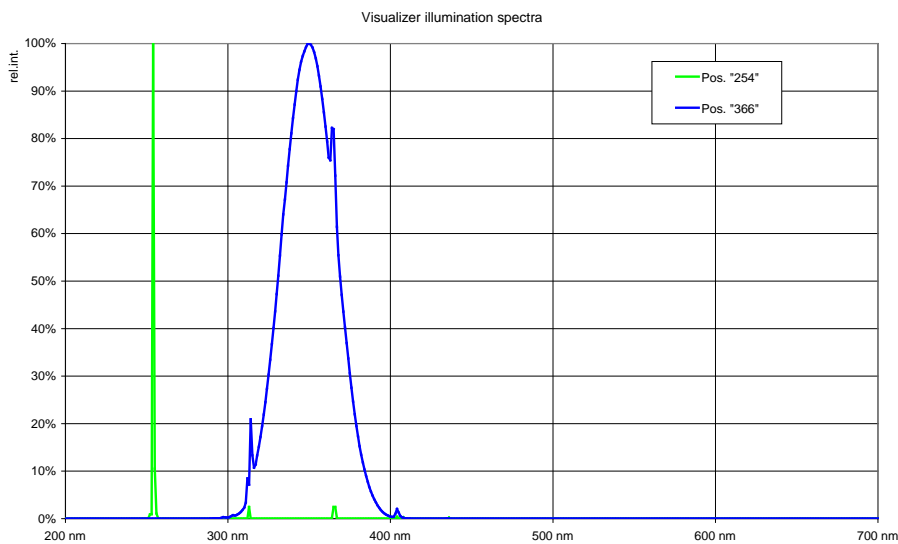


Fig. 4: Spectral intensities of lamp 254nm and 365 / 366nm

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EC – Declaration of Conformity

We, CAMAG Chemie-Erzeugnisse und Adsorptionstechnik AG
Sonnenmattstrasse 11
4132 Muttenz
Switzerland

declare under our sole responsibility that the product

CAMAG® TLC Visualizer 2

Product name

022.9810 / 022.9811

Article number(s)

to which this declaration relates is in conformity with the following provisions of directive(s):

- 2006/95/EC
- 2004/108/EC

Following standard(s) or other normative document(s):

- EN61010-1: 2010
- EN61326-1: 2013

Year of the CE characteristic assignment: 2016

Muttenz, 03 October 2016



Walter Rahm, Head of Quality Management

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