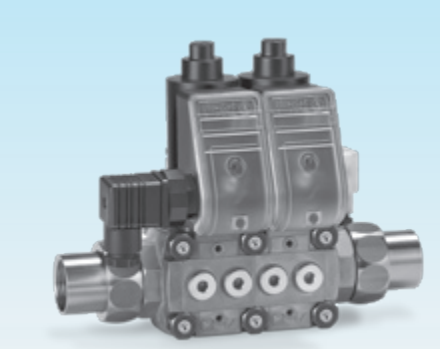
Automatic laboratory safety system consisting of laboratory safety valve VCL and laboratory control unit LCU

Product brochure · GB
5.2.1.4 Edition 04.09

- Fully automatic testing of the downstream installation to check for leaks and that it is in the closed position each time before the system is started
- Protection from manipulation and incorrect use by users
- Short testing time
- Safe system thanks to self-monitoring electronics pursuant to EN 298
- Compact construction VCL
- Easy commissioning
- 1-finger operation (menu prompting with plain-text display)
- Automatic switch-off of the LCU after 60 minutes not in use
- Automatic switch-off of valves after an adjustable period of time
- Easy servicing thanks to informative operating, warning and fault messages
- Automatic shut-down and fault signalling in the event of an installation error
- EC type-tested and certified



VCL

LCU

Laboratory safety valve VCL and laboratory control unit LCU with fully automatic systems leak tightness check

Application

Laboratory safety system to safeguard gas taps in laboratory rooms, teaching rooms and technical work rooms in accordance with DVGW Code of Practice G 621 and for protecting commercial kitchens in accordance with DVGW Code of Practice G 634.

The laboratory safety system comprises the laboratory safety valve VCL and the laboratory control unit LCU. The laboratory safety valve VCL consists of a double solenoid valve VCS, a venting valve VBY, a pressure sensor and a dirt trap.

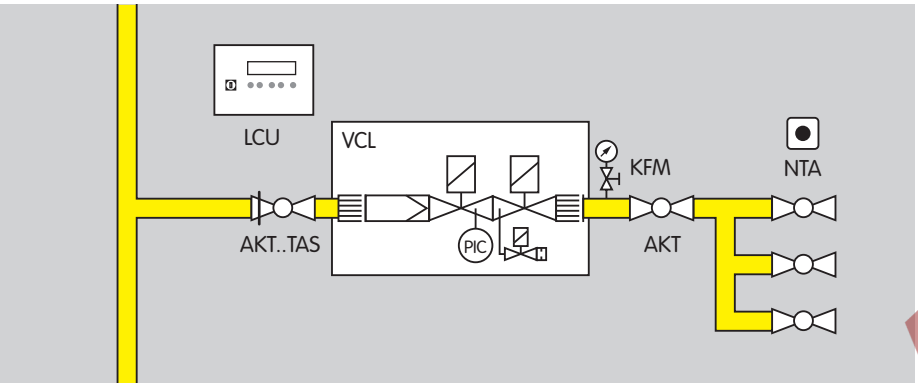
The laboratory safety system can be used for natural gas and LPG systems. It fully automatically checks the downstream installation for leaks, tight closing of valves and adequate inlet pressure before every system start-up, and protects it against tampering and incorrect use by users.

Fume extract cabinet

Laboratory workbenches

Teaching room

Examples of application



Legend:

AKT..TAS = Manual valve with thermal equipment trip,
VCL = Laboratory safety valve,
KFM = Pressure gauge with shut-off valve,
AKT = Manual valve,
LCU = Laboratory control unit,
NTA = Emergency Stop button.

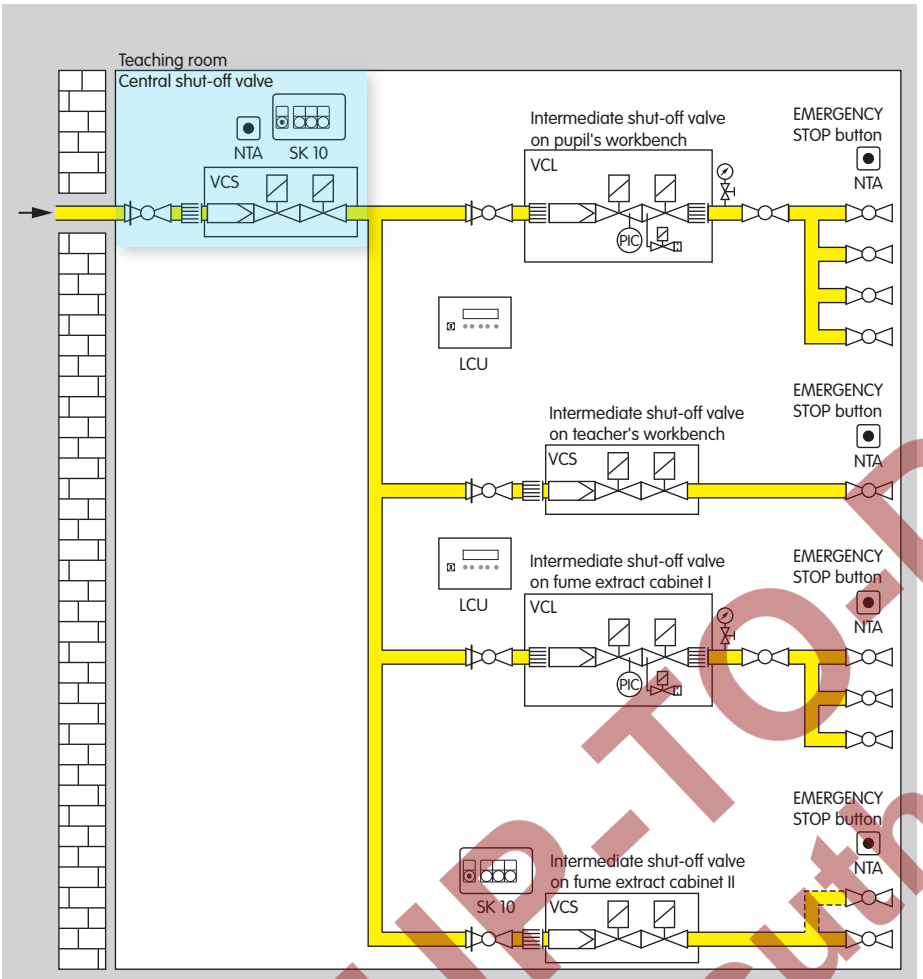
The laboratory safety system consists of the laboratory safety valve VCL and the laboratory control unit LCU. It ensures that no non-combusted gas enters the rooms when a tapping point is open.

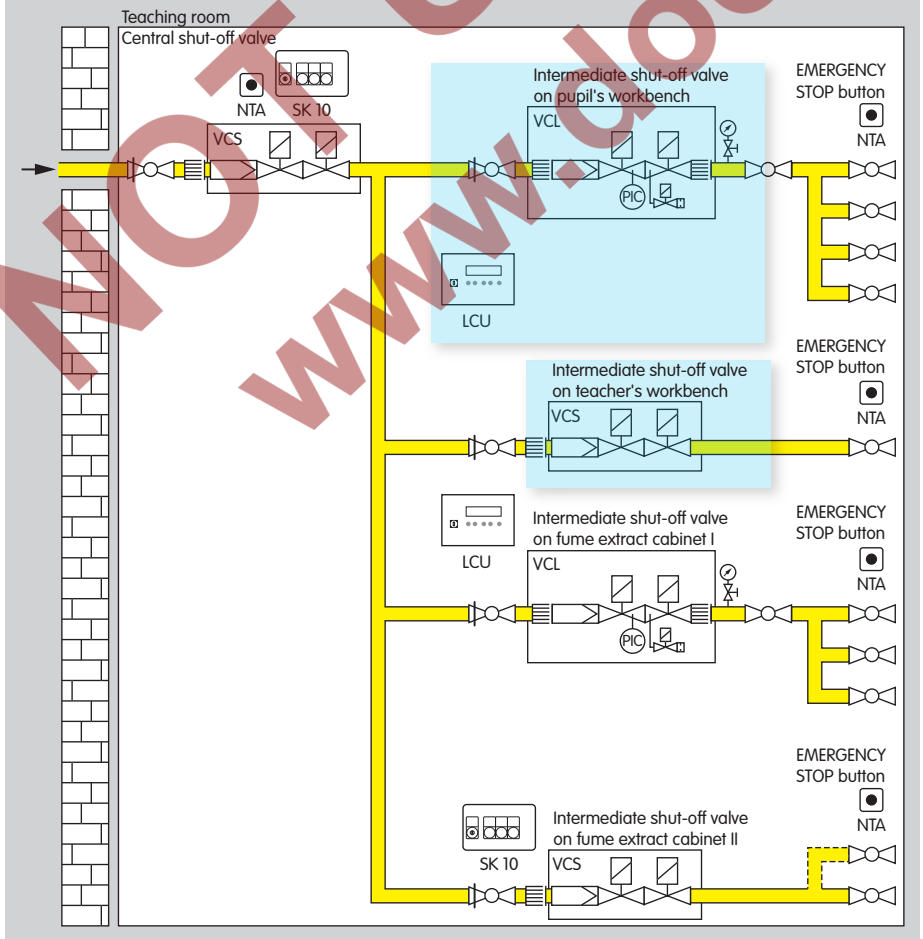
The downstream system is checked automatically for leaks, tight closing of valves and adequate inlet pressure before every system start-up. When this check has been successfully completed, the laboratory control unit LCU issues an Enable signal and the system is then ready for operation. The double solenoid valve of the laboratory safety valve VCL opens. If there is a power or gas shortage, the gas supply is shut off automatically.

The laboratory safety valve VCL can be controlled remotely using the laboratory control unit LCU. The LCU has an activation lock using a key-operated switch (except LCU..M).

When used in combination with a manual valve with thermal equipment trip AKT..TAS (pursuant to TRGI), the laboratory safety system as a gas safety system features enhanced fire protection.

In this application (figure), the gas supply can be shut off manually at the inlet using manual valve AKT..TAS and at the outlet using manual valve AKT. The integral strainer in the laboratory safety valve VCL protects downstream equipment from dirt. The gas outlet pressure is displayed on a pressure gauge with a shut-off valve.





Installation example for teaching rooms

The DVGW Code of Practice G 621 requires that a central shut-off valve be fitted upstream of the entire installation in a teaching room and that a separate intermediate shut-off valve with safety device be fitted on pupils' workbenches. An intermediate shut-off valve must be fitted for all areas which are accessible to pupils (e.g. Fume extract cabinet I).

Central shut-off valve

The central shut-off valve VCS, positioned inside or outside the teaching room, shuts off the gas supply safely if there is a power shortage.

It can be controlled remotely using switch box SK 10. The switch box SK 10 itself should be positioned inside the teaching room at an easily accessible point (for example teacher's workbench). It has an activation lock using a key-operated switch.

A gas pressure control system with gas filter can be installed upstream of the central shut-off valve if the local pressure situation so requires or downstream controls must be protected from dirt.

Intermediate shut-off valve Pupil's workbench/Fume extract cabinet I

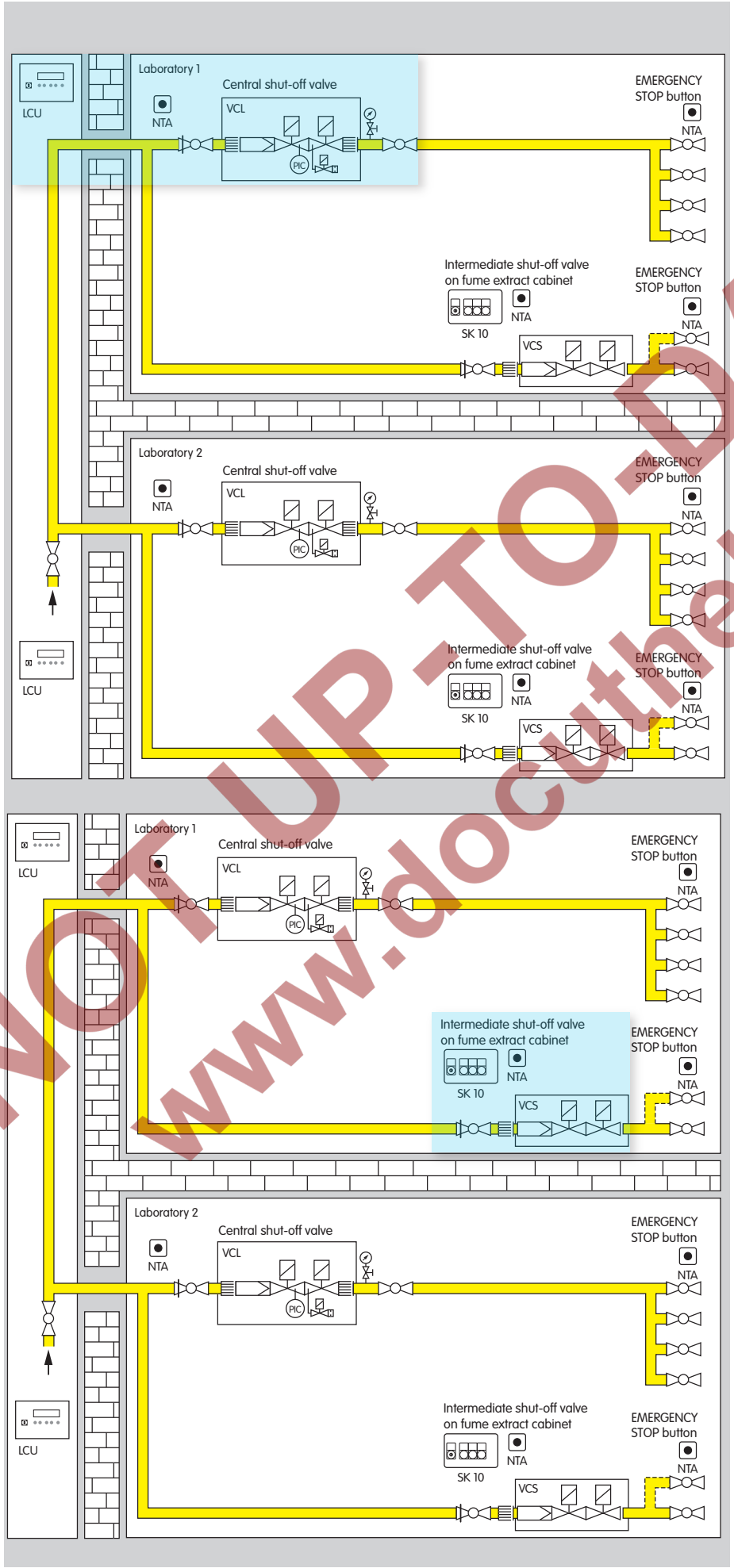
Before every system start-up, the laboratory control unit LCU automatically checks the entire installation on the pupils' workbenches, upstream of the laboratory safety valve VCL, for leaks, tight closing of valves and adequate inlet pressure. The laboratory control unit LCU only issues the Enable signal once all tapping points are closed and the pupils' workbenches are ready for use. If there is a power or gas shortage, the gas supply is shut off automatically.

This also applies to Fume extract cabinet I. This area is accessible to pupils.

Intermediate shut-off valve Teacher's workbench/Fume extract cabinet II

The intermediate shut-off valve VCS on the teacher's workbench can be controlled remotely using the laboratory control unit LCU. It shuts off the valves safely if there is a power shortage.

This also applies to Fume extract cabinet II. This area is only accessible to teachers.



Installation example for laboratories

A laboratory is to be operated by qualified or instructed persons. The DVGW Code of Practice G 621 requires that a central shut-off valve with safety device be fitted to protect laboratories.

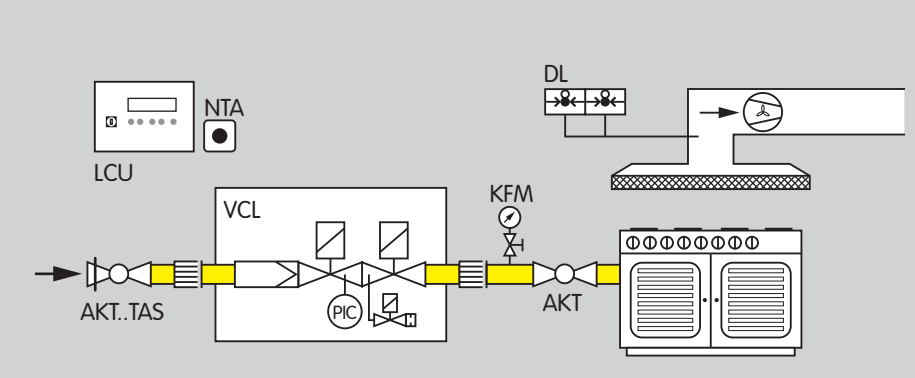
Central shut-off valve

Before every system start-up, the laboratory control unit LCU automatically checks the entire installation upstream of the laboratory safety valve VCL for leaks, tight-closing valves and adequate inlet pressure. The laboratory control unit LCU only issues the Enable signal once all tapping points are closed and the system is ready for operation. If there is a power or gas shortage, the gas supply is shut off automatically.

The central shut-off valve VCL can be positioned inside or outside the room. The laboratory control unit LCU itself should be installed at an easily accessible point outside the laboratory but close to it.

Intermediate shut-off valve on Fume extract cabinet

The intermediate shut-off valve VCS can be controlled remotely and can be operated using the laboratory control unit LCU, instead of switch box SK 10. It shuts off the valves safely if there is a power shortage.



Legend:
AKT..TAS = Manual valve with thermal equipment trip,
VCL = Laboratory safety valve,
KFM = Pressure gauge with shut-off valve,
AKT = Manual valve,
LCU = Laboratory control unit,
NTA = Emergency Stop button,
DL = Air pressure switch combination.

Kitchen safety equipment for commercial kitchens

The DVGW Code of Practice G 634 requires that an automatic shut-off valve be fitted in the gas path to ensure extraction by extractor hoods for type B devices (cooker systems).

In addition, the intermediate shut-off valve ensures that the double solenoid valve of the laboratory safety valve VCL remains closed when the gas supply to the cooker system is open. If the flue air extraction system or filter fails, the air pressure switch combination closes the laboratory safety valve VCL.

The downstream system is checked automatically for leaks, tight closing of valves and adequate inlet pressure before every system start-up. When this check has been successfully completed, the laboratory control unit LCU issues an Enable signal and the system is then ready for operation. The laboratory safety valve VCL opens. If there is a power or gas shortage, the gas supply is shut off automatically.

When a manual valve with thermal equipment trip AKT..TAS (pursuant to TRGI) is installed, the gas safety system features enhanced fire protection.

In this application (figure), the gas supply can be shut off manually at the inlet using manual valve AKT..TAS and at the outlet using manual valve AKT. The integral strainer in the laboratory safety valve VCL protects downstream equipment from dirt. The gas outlet pressure is displayed on a pressure gauge with a shut-off valve.

Technical data

VCL

Types of gas: natural gas, LPG (gaseous) and air.
The gas must be dry in all temperature conditions and must not contain condensate.

Inlet pressure p_e max.: 100 mbar.

Ambient temperature:
0 – 40°C, no condensation permitted.

Mains voltage:
230 V AC, +10/-15%, 50/60 Hz;
120 V AC, +10/-15%, 50/60 Hz.

Power consumption: 70 W.

Opening time:
Quick opening: ≤ 0.5 s.

Closing time:
Quick closing: < 1 s.

Safety valve:
Class A to EN 161.

Electrical connection:
plug with socket to EN 175301-803.

Enclosure: IP 54.

Duty cycle: 100%.

Power factor of the solenoid coil: cos φ = 1.

Switching frequency: any.

Valve housing: aluminium.

Valve seal: NBR.

Connection flange with internal thread:
Rp to ISO 7-1.

Pressure sensor

Prefabricated electrical connection:
plug with socket to EN 175301-803-C,
socket: GDSN 307 black,
enclosure: IP 65,
number of pins: 2 + screen,
cable gland: PG 7,
cable type: length 5 m, LIYCY,
max. 2 x 0.75 mm², screened.
Cable ends and shield with wire end ferrules prepared for connection to the LCU.

Connect the shield to one side of the LCU only.

LCU

Type of gas	Inlet pressure range p_e [mbar]
Natural gas	10 – 30
LPG	10 – 30
LPG	25 – 60
Air	10 – 30

Mains voltage:
LCU 100..R: 115 V AC, 50/60 Hz;
LCU 100..W: 230 V AC, 50/60 Hz.

Protection class: 1.

Power consumption: approx. 20 VA.

Ambient temperature: 0 – 60°C.

Enclosure: IP 54.

Housing colour: RAL 7035 light grey.

Floating operation signalling contact:
max. 0.1 A, 230 V AC.

3 valve outputs for VCL:
Electrical current: 315 mA,
1 valve output for VCS:
Electrical current: 500 mA,
Voltage: 115 V AC, 230 V AC.

LCD display for status and faults:
2x 16 characters.

Activation lock using a key-operated switch (except LCU..M).

Certification

CE

VCL

The laboratory safety valve VCL consists of a double solenoid valve VCS, a venting valve VBY, a pressure sensor and a dirt trap.

EC type-tested and certified
pursuant to

– Gas Appliances Directive (90/396/EEC) in conjunction with EN 161 and EN 13611.

LCU

EC type-tested and certified
pursuant to

– Gas Appliances Directive (90/396/EEC) in conjunction with EN 298, EN 13611, EN 13611-A1, EN 1643.

VCL and LCU

are designed for applications pursuant to DVGW Codes of Practice G 621 and G 634. They comply with the requirements of the following directives and standards:

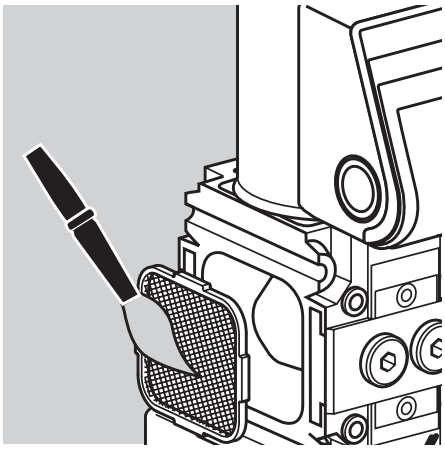
– Low Voltage Directive 2006/95/EC in conjunction with the relevant standards,

– Electromagnetic Compatibility Directive 2004/108/EC in conjunction with the relevant standards.

Maintenance cycles

VCL

Check for internal and external tightness once a year. Clean the nozzles in venting valve VBY and the pressure sensor once a year. If the fl ow rate drops, clean the strainer at the inlet of the double solenoid valve.



LCU

The LCU requires little servicing.

Selection

Selection table Laboratory safety valve VCL

	1	15	20	25	V	01	W	Z*
VCL	●	●	●	●	●	●	●	○

Order example

VCL 125V01W

if "none", this specification is omitted

● = standard, ○ = available

Type code Laboratory safety valve VCL

Code	Description
VCL	Laboratory safety valve
1	Size 1
15	DN 15
20	DN 20
25	DN 25
V	Rp thread with coupling
01	Max. inlet pressure $p_{e\ max.}$ 100 mbar
W	Mains voltage 230 V AC, 50/60 Hz
Z*	Special version

Selection table Laboratory control unit LCU

	100	E	A	U	I	D	GB	W	R	M*	Z*
LCU	●	●	●	●	○	●	●	●	●	○	○

Order example

LCU 100ADW

if "none", this specification is omitted

● = standard, ○ = available

Type code Laboratory control unit LCU

Code	Description
LCU	Laboratory control unit
100	Series
E	Plastic housing for installation
A	Plastic housing for surface-mounting
U	Plastic housing for concealed installation
I	Non-enclosed
D	Menu language German
GB	Menu language English
W	Mains voltage 230 V AC
R	Main voltage 115 V AC
M*	External electrical connections
Z*	Special version

Detailed information on this product

www.docuthek.com ➔ Direct access
Search term: TYP
Kind of document: Technical information

Contact

www.kromschroeder.com ➔ Sales

Elster GmbH
Postfach 2809 · 49018 Osnabrück
Strotheweg 1 · 49504 Lotte (Büren)
Germany

T +49 541 1214-0
F +49 541 1214-370
info@kromschroeder.com

www.kromschroeder.com
www.elster.com

Kromschröder, a product brand of the Elster Group

We reserve the right to make technical modifications in the interests of progress.

03250641 Druck MM.JJ 0.000