

Type 8652 AirLINE

Modular valve island for pneumatics



Operating Instructions

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Valve island AirLINE type 8652

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1 THE OPERATING INSTRUCTIONS

The operating instructions describe the entire life cycle of the device.

→ Keep these instructions ready to hand at the operation site.

Important safety information!

- ▶ Carefully read these instructions.
- ▶ Observe in particular the safety instructions, intended use and operating conditions.
- ▶ Persons, who work on the device, must read and understand these instructions.

1.1 Symbols



DANGER

Warns of an immediate danger.

- ▶ Failure to observe the warning will result in a fatal or serious injury.



WARNING

Warns of a potentially dangerous situation.

- ▶ Failure to observe the warning may result a fatal or serious injury.



CAUTION

Warns of a possible danger.

- ▶ Failure to observe the warning may result in a moderate or minor injury.

NOTE

Warns of damage to property.

- ▶ Failure to observe the warning may result in damage to the device or other equipment.



Indicates important additional information, tips and recommendations.



Refers to information in these operating instructions or in other documentation.



Highlights instructions to avoid a danger.



Designates a procedure which you must carry out.



Indicates a result.



Symbol for software interface texts.

1.2 Definition of terms

Term	In these instructions representative for
Actuator, process valve	Pneumatic consumers that are controlled by the valve island
büS	Bürkert system bus, a communication bus developed by Bürkert based on the CANopen protocol
Device, valve island	Valve island AirLINE type 8652
EVS	External Valve Shutdown Valves can be de-energised irrespective of the control signals from the bus master. This safety shutdown can be applied to individual valves, valve units or the complete valve block.
Pneumatic valve, pilot valve	Pneumatic slide valve that can be integrated in the valve block
SIA variant	Variant for safety-related shut-off (see “EVS”)

2 INTENDED USE

The valve island AirLINE type 8652 is designed for controlling pneumatically operated process valves and for recording the switching statuses of these valves.

- ▶ Use the device for its intended purpose only. Non-intended use of the device may be dangerous to people, nearby equipment and the environment.
- ▶ In areas at risk of explosion, only use devices approved for use in those areas. These devices are labeled with a separate Ex type label. When utilized in a potentially explosive atmosphere, always pay attention to the details on the separate Ex type label and the Ex additional instructions contained in the scope of delivery.
- ▶ The prerequisites for safe and efficient operation are correct transport, storage, assembly, installation, start-up, operation, and maintenance.
- ▶ When using the device, observe the permitted data, operating conditions and application conditions. This information can be found in the contractual documents, the operating instructions and on the type label.
- ▶ Use the device only in conjunction with third-party devices and components recommended and authorized by Bürkert.
- ▶ In outdoor areas, make sure the device is installed in a control cabinet that provides a degree of protection of at least IP 65.
- ▶ In indoor areas, make sure the device is installed in a control cabinet that provides a degree of protection of at least IP 20.
- ▶ Do not put any loads on the device (e.g. by placing objects on it or standing on it).
- ▶ Make sure the device is in efficient working order before use.



The valve island is intended only for use in industrial areas.

The valve island is not suitable for use in applications where there is a risk to life and limb.

3 BASIC SAFETY INSTRUCTIONS

These safety instructions do not consider any contingencies or incidents which occur during assembly, operation and maintenance. The operator is responsible for observing the location-specific safety regulations, also with reference to the personnel.



Risk of injury due to high pressure and uncontrolled movement of the actuators.

- Before working on the device or system, secure the actuators against moving.
- Before working on the device or system, switch off the pressure. Vent or drain lines.

Risk of injury from electric shock.

- Before working on the device or system, switch off the power supply. Secure against reactivation.
- Observe applicable accident prevention and safety regulations for electrical equipment.

Risk of burns due to hot device parts.

- Keep the device away from highly flammable substances and media.

Risk of injury due to improper installation and maintenance.

- Only trained technicians may perform installation and maintenance work.
- Only trained technicians may operate the device.
- Perform installation and maintenance with suitable tools only.

Risk of injury due to unintentional activation and uncontrolled start-up of the device and system.

- Secure the device and system to prevent unintentional activation.
- Ensure that the system does not start up in an uncontrolled manner.

Risk of injury from heavy device.

During transportation or installation work, a heavy device may fall down and cause injuries.

- Transport, install and remove heavy device with the aid of a second person only.
- Use suitable tools.

General hazardous situations.

To prevent injury, ensure the following:

- Install the device according to the regulations applicable in the country.
- Do not supply aggressive or flammable media to the media connections of the device.
- Do not supply liquids to the media connections of the device.
- After the process is interrupted, restart in a controlled manner.

Observe sequence:

1. Connect the power supply.
2. Connect the pneumatic supply (with an external pressure supply, initially the external auxiliary pilot air [X / 12/14] and then the medium pressure [P / 1]).

- Do not carry out modifications at the device.
- Do not subject the device to mechanical loads.
- Observe the general rules of technology.

NOTE

Electrostatically sensitive components and assemblies.

The device contains electronic components that are susceptible to electrostatic discharging (ESD). Components that come into contact with electrostatically charged people or objects are at risk. In the worst case scenario, these components are destroyed immediately or fail after start-up.

- ▶ Meet the requirements specified by EN 61340-5-1 to minimize or avoid the possibility of damage caused by sudden electrostatic discharge.
- ▶ Do not touch electronic components when the supply voltage is connected.

4 GENERAL INFORMATION

4.1 Contact address

Germany

Bürkert Fluid Control Systems
Sales Center
Christian-Bürkert-Strasse 13–17
D-74653 Ingelfingen
Tel. +49 (0) 7940 - 10 91 111
Fax +49 (0) 7940 - 10 91 448
Email: info@burkert.com

International

The contact addresses can be found on the last pages of the printed Quickstart.

And also on the Internet at: www.burkert.com

4.2 Warranty

The warranty is only valid if the device is used as intended in accordance with the specified application conditions.

4.3 Information on the Internet

The operating instructions and data sheets for Bürkert products can be found on the Internet at:

www.burkert.com

5 PRODUCT DESCRIPTION

Due to the compact and modular design in terms of pneumatic and electric interfaces, the valve island AirLINE type 8652 provides a flexible solution for varied and complex control activities. The valve island design is optimized for use in control cabinets. The AirLINE Quick adapter plate is already part of the basic valve island version. Using AirLINE Quick, the valve island can be positioned directly at a cut-out on the floor or wall of the control cabinet. Alternatively, a standard rail enables assembly on the rear wall of the control cabinet.

When configured to a maximum degree, the valve island allows application of up to 48 valve functions. A clear operating and display concept facilitates installation and maintenance work. The supply manifold is made of aluminum and provides the necessary stability. It is used to attach the fluidic elements, the pneumatic slide valves, and the electronic modules.

The electrical connection technology occurs via the fieldbus gateway ME43, although various fieldbus protocols can be used.

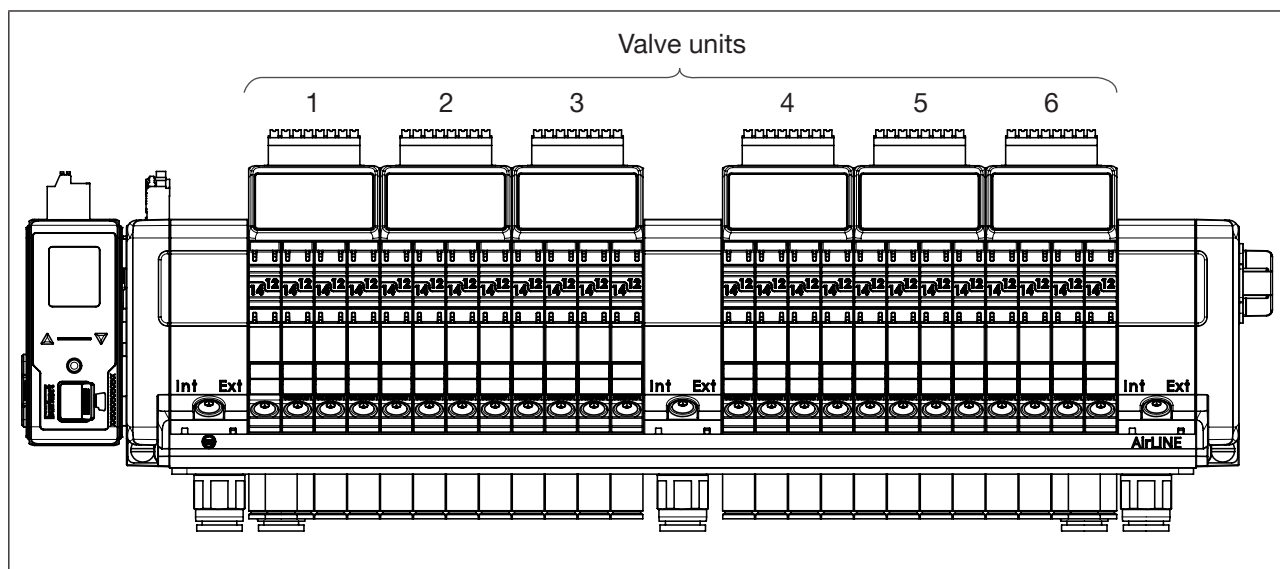


Figure 1: Maximum extension of valve island Type 8652: 6 valve units with a maximum of 8 valve functions per unit

5.1 Valve island design

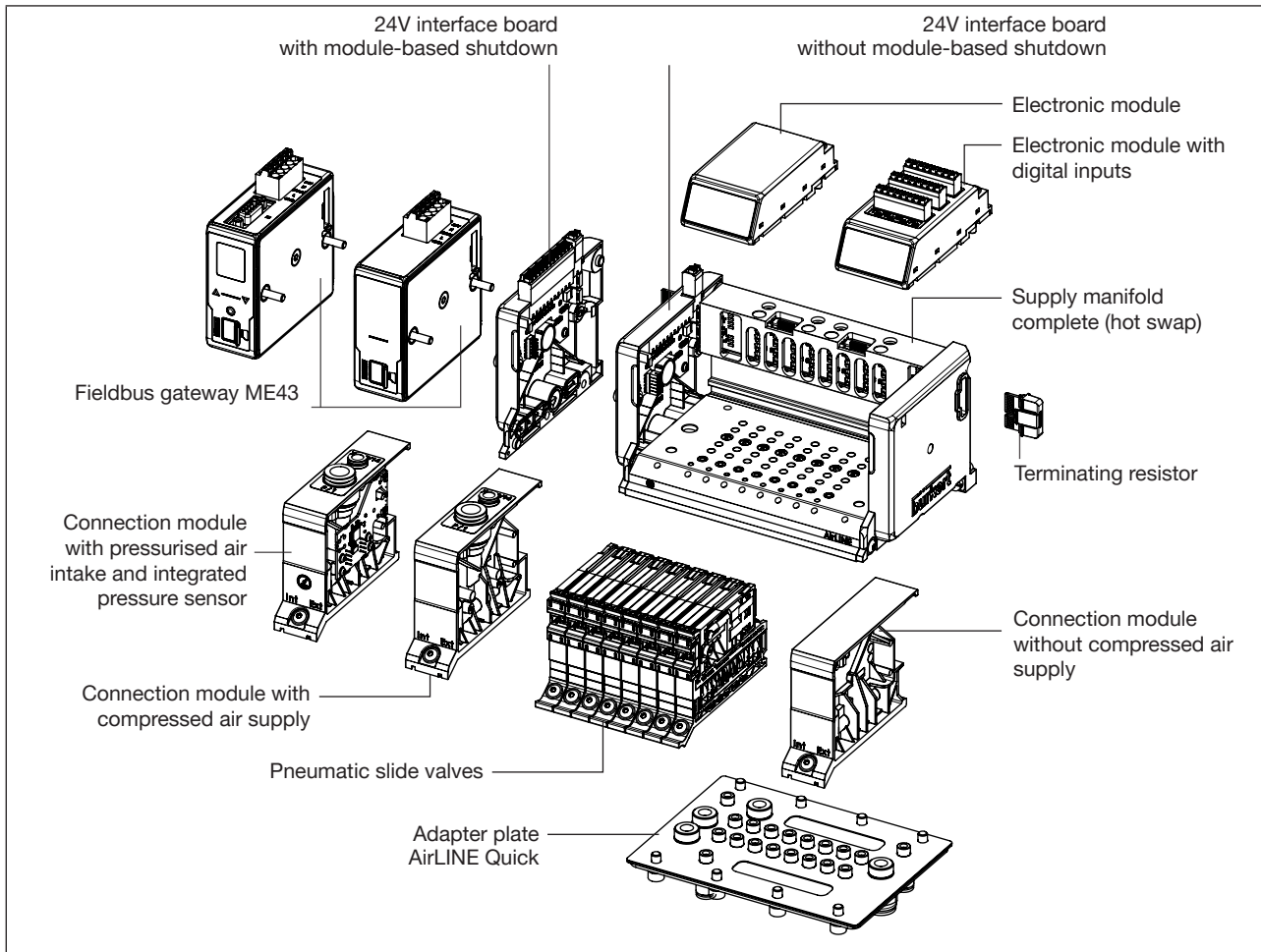


Figure 2: Design of the valve island type 8652

5.1.1 Fieldbus gateway ME43

Electrical connection is via ME43 fieldbus gateway, thereby allowing the use of a wide range of fieldbus protocols. The fieldbus gateway is used as a fieldbus converter between bus/CANopen and Industrial Ethernet, PROFIBUS DPV1 or CC-Link.

5.1.2 Connection module

The connection module is used for the internal distribution of the pilot pressure on the pilot valves. Through a seal in the connection module it is possible to switch to internal or external pilot pressure supply. Connection modules with a compressed air supply enable the additional compressed air supply of medium pressure and pilot pressure.

Connection module with pressure sensor

This variant of the connection module is equipped with an integrated pressure sensor. The pressure sensor monitors the medium pressure of the unit and reports the current pressure to the controller. The current medium pressure can be indicated on the valve unit displays.

Minimum values and maximum values for the issuance of warning and error alerts can be specified with the web server (for PROFINET, EtherNet/IP or Modbus TCP) or the software Bürkert Communicator.

5.1.3 Interface board

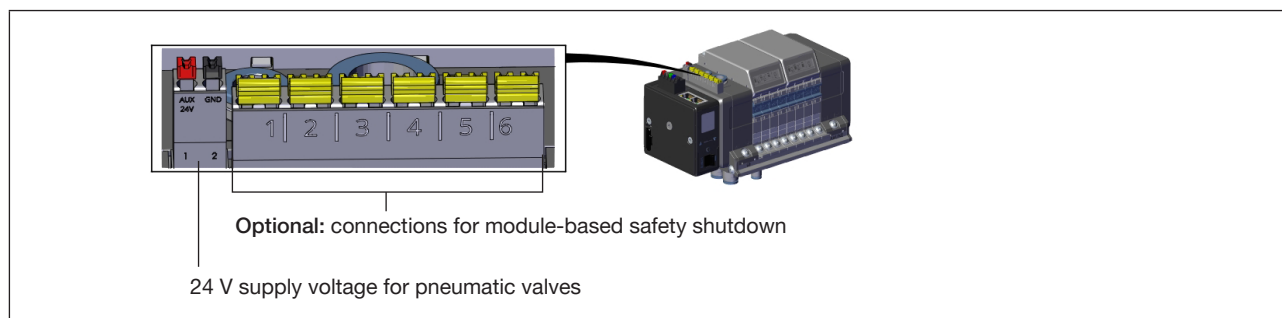


Figure 3: Connections for EVS on the interface board

The interface board has a 2-pole spring-loaded terminal to which the supply voltage for the pneumatic slide valves is connected. This allows the voltage for all pneumatic slide valves of the valve island to be shut down irrespective of the communication to the superordinate controller (PLC). If the voltage is shut down or interrupted, the message “EVS active” appears on all valve island displays.

The interface board can be optionally equipped with a 12-pole spring-loaded terminal for module-based safety shutdown. The spring-loaded terminal is bridged upon delivery. If the bridge is removed, module-based safety shutdown can be performed by means of a connection to a safety relay. All 4 valve slots of a valve unit can therefore be shut down without impacting on further functions of the valve island. If the voltage is shut down or interrupted, the message “EVS active” appears on the display of the respective valve unit.

5.1.4 Electronic module

The electronic module shows the valve status via an LC display. If electronic modules with digital inputs are used, they supply electric power to the connected position feedbacks. Thanks to the position feedbacks, error messages, maintenance intervals or other information on the device status can be displayed on the LC display of the electronic module.

Standard 3-wire sensors and 2-wire sensors with voltages between 10...30 V as well as mechanical limit switches can be used.

The following data may be output depending on the sensor used:

Possible data	3-wire sensors	2-wire sensors	Mechan. limit switches
Sensor actuated	X	X	X
Sensor not actuated	X	X	X
Short circuit	X	–	–
Broken wire	–	X	–

Examples of applicable position feedbacks

3-wire sensors:

Bürkert type 8697 (3-wire)

Turck Ni1,5-BKT-AP7X

Balluff BES-M08EA

2-wire sensors:

Bürkert type 8697 (2-wire)

Turck Ni5-K11-Y1

Turck Bi2-EG08-AG41X

Turck Bi3-M12-AD4X

Mechanical limit switch:

Bürkert type 8697 (micro switch)

5.1.5 Pneumatic slide valve type 6534

Operation of the pneumatic slide valves is based on a soft-seated slide principle. The individual technical values and the various circuit functions of the pneumatic slide valves are described on the valve island type 8652 data sheet (see www.burkert.com).

Pneumatic slide valves type 6534 come with manual override. The manual override operates without the valve island being connected to the power supply and enables manual switching of the valves (see chapter “20.2”).

Manual override provides both spring-return and latching action as standard. Use of the additional element “MO locking” limits the manual override function (just spring return or blocked).

SIA variant (for safety-related shutdown)

Valves Type 6534 “SIA variant” are equipped with additional connection terminals. The circuit of a valve can therefore be interrupted by an external switch. Manual override is not required for these valve variants.

5.1.6 Supply manifold

The supply manifold is used to supply the individual valves. The supply manifold is available with or without check valves. The application of P shutoff (Hot Swap) enables the swapping of individual valves during operation. The check valves in the exhaust ducts help to avoid unwanted actuator switching (e.g. due to uncontrolled pressure peaks).

The supply manifold is designed to allow the valve island to be mounted on the standard rail or directly on the floor or wall of the control cabinet as AirLINE Quick.

5.1.7 Adapter plate AirLINE Quick

The stainless steel adapter plate AirLINE Quick enables, e.g., utilization of the valve island in hygienic applications without extensive installation work. The adapter plate guarantees simple and secure assembly on the floor or wall of the control cabinet.

5.1.8 Terminating resistor

Each type 8652 valve island has 1 terminating resistor upon delivery (see “Fig. 1”). If several valve islands are connected in series, only the last device within this series can have a terminating resistor. The terminating resistors of the other devices must be extracted from the devices by pulling them to the right.

5.2 External safety-related shutdown of valves

There are several ways to de-energise valves irrespective of the control signals from the bus master.

- **Only individual valves:**

Pneumatic slide valves Type 6534 “SIA variant” are equipped with additional connection terminals. The circuit of a valve can therefore be interrupted by an external switch.

- **All the valves of a valve unit (module-based safety shutdown):**

If the interface board is additionally equipped with a 12-pole spring-loaded terminal, module-based safety shutdown is possible.

The spring-loaded terminal is bridged upon delivery. If the bridge is removed, all 4 valve slots of a valve unit can be shut down by means of a connection to a safety relay without impacting on further functions of the valve island.

If a valve unit is shut down, the message “EVS active” appears on the display of the valve unit.

- **All valves of the valve block:**

By shutting down the supply voltage of the valve block (via the 2-pole spring-loaded terminal), all valves are immediately de-energised (the energy contained in the energy packs of the valve block is negligible). The message “EVS active” is displayed on all displays of the valve island.

The latter two options have the advantage that the logic, display and diagnostics continue unaffected, thus remaining available.

6 TECHNICAL DATA

6.1 Conformity

The device conforms to the EC directives as per the EC Declaration of Conformity (if applicable).

6.2 Standards

The applied standards, which are used to demonstrate conformity with the EC Directives, are listed in the EC type examination certificate and/or the EC Declaration of Conformity (if applicable).

6.3 Operating conditions

NOTE

► Use safety extra-low voltage in accordance with protection class 3 EN 61140, VDE 0140.

Ambient temperature	−10...+55 °C
Storage temperature	−10...+60 °C
Altitude	Restricted to max. 2000 m above sea level for UL approved versions
Compressed air quality	ISO 8573-1:2010, Class 7.4.4

6.4 General technical data

Valve slots	Max. 24
Position feedback	Max. 48
Degree of protection	IP20

6.5 Pneumatical data

Control medium	Druckluftqualität ISO 8573-1:2010, Klasse 7.4.4	
Pressure range	see chapter “6.7”	
Ports:		
Pressure port (P/1) Exhaust ports (S/3, R/5)	Plug-in coupling Ø 6 mm or Ø D1/4	
Pressure port auxiliary pilot air (X / 12/14) Exhaust port auxiliary pilot air (R' / 82/84)		
Working ports		

6.6 Electrical data

Nominal operating mode	Continuous operation (100% duty cycle)												
Operating voltage	24 V DC \pm 10% residual ripple at fieldbus interface 1 Vss ¹⁾												
Protection class	III in accordance with EN 61140, VDE 0140												
Current consumption	<p>Current consumption depends on the valve island configuration.</p> <p>The total current for the fieldbus interface is calculated using the formula:</p> $I_{\text{total}} = I_{\text{backgr.}} + (n \times I_{\text{valve}}) + (m \times I_{\text{pos. feedback}}) + (k \times I_{\text{display mod.}})$ <p>I_{total}: Total current</p> <p>$I_{\text{backgr.}}$: Background current dependent on the fieldbus system</p> <table> <tr> <td>PROFINET IO:</td> <td>135 mA</td> </tr> <tr> <td>EtherNet/IP:</td> <td>135 mA</td> </tr> <tr> <td>Modbus TCP:</td> <td>135 mA</td> </tr> <tr> <td>PROFIBUS DPV1:</td> <td>100 mA</td> </tr> <tr> <td>DeviceNet:</td> <td>35 mA</td> </tr> <tr> <td>CANopen:</td> <td>35 mA</td> </tr> </table> <p>n: Number of valves</p> <p>I_{valve}: Nominal current of the valve (35 mA)</p> <p>m: Number of position feedbacks</p> <p>$I_{\text{pos. feedback}}$: Current consumption of position feedbacks (max. 22 mA)</p> <p>k: Number of display modules</p> <p>$I_{\text{display mod.}}$: Current consumption display modules (10 mA)</p>	PROFINET IO:	135 mA	EtherNet/IP:	135 mA	Modbus TCP:	135 mA	PROFIBUS DPV1:	100 mA	DeviceNet:	35 mA	CANopen:	35 mA
PROFINET IO:	135 mA												
EtherNet/IP:	135 mA												
Modbus TCP:	135 mA												
PROFIBUS DPV1:	100 mA												
DeviceNet:	35 mA												
CANopen:	35 mA												

¹⁾ UL approved Versions must be supplied by one of the following:
a) Limited Energy Circuit (LEC) according to UL/ IEC 61010-1
b) Limited Power Source (LPS) according to UL/ IEC 60950
c) SELV/ PELV with UL Recognized Overcurrent Protection dimensioned according to UL/ IEC 61010-1 Table 18
d) NEC Class 2 power source

6.7 Pneumatic slide valve type 6534

Circuit function (CF)	2 x CFC² NC (normally closed) 2 x 3/2-way 2 x CFD NO (normally open) 2 x 3/2-way	CFH² 5/2-way monostable CFZ 5/2-way bistable	CFL² 5/3-way locked CFM 5/3-way pressurized CFN 5/3-way exhausted
Flow rate Q_{Nn}	Up to 310 l _N /min (see data sheet for exact flow rate values for the various circuit functions)		
Medium pressure ³	0...10 bar		
Pilot pressure ⁴	3...10 bar		
Electr. power before/ after power reduction	2 x 0.7 W / 2 x 0.175 W	0.7 W / 0.175 W	0.7 W / 0.175 W
Power before/after power reduction	2 x 29 mA / 2 x ≤ 10 mA	29 mA / ≤ 10 mA	

2) Also available as SIA variant (see chapter "8.4" on page 37).

3) At levels of vacuum up to 3 bar, observe the pilot pressure diagram and set the feed of auxiliary pilot air to "external" (see chapter "9.1.2 External and internal auxiliary pilot air" on page 43).

4) With the external auxiliary pilot air variant, select the pilot pressure in accordance with the pilot pressure diagram.

6.7.1 Pilot pressure diagram

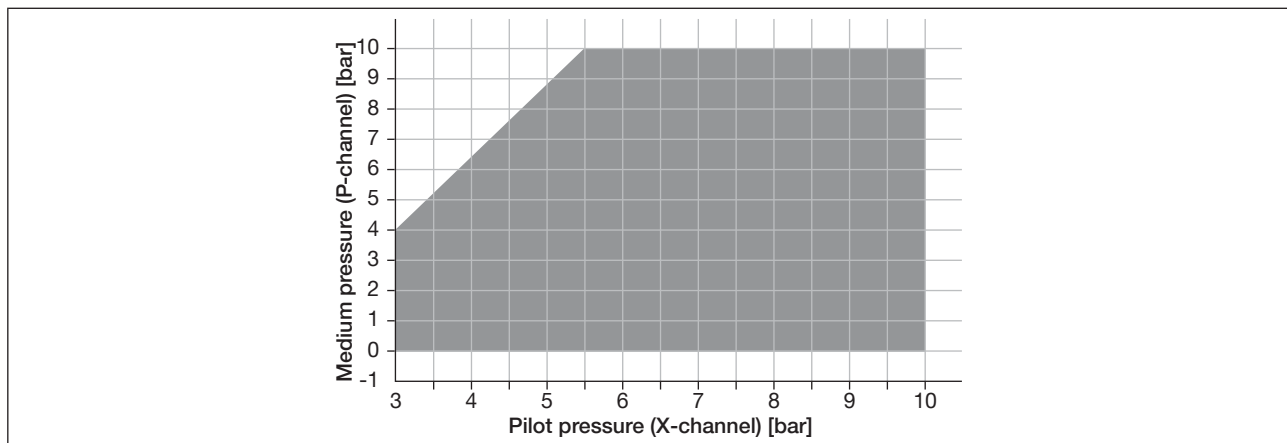


Figure 4: Pilot pressure diagram for pneumatic slide valve type 6534

6.8 Circuit function (CF)

Circuit function (CF)	Symbol in accordance with ISO 1219-1	Description
2 x CFC ⁵		In idle position, port 2 and port 4 exhausted.
2 x CFD		In idle position, port 2 and port 4 vented.
CFH ⁵		In idle position, pressure port 1 with port 2 connected, port 4 exhausted.
CFZ		<p>5/2-way bistable valve; depending on the switch position either port 2 vented and port 4 exhausted or port 2 exhausted and port 4 vented.</p> <p>For CFZ*:</p> <p>With regard to valves with circuit function Z*, the valve island software ensures that the newly installed valve adopts the switch setting of the original valve in the event that a valve is replaced (hot swap).</p> <p>For valves with circuit function Z*, manual override is disabled after the first electrical activation.</p>
CFZ*		
CFL ⁵		In idle position, all ports locked.
CFM		In idle position, port 2 and port 4 pressurized.
CFN		In idle position, port 2 and port 4 de-energized.

⁵⁾ Type 6534 SIA variant (variant for safety-related shut-off)
Optionally, Type 6534 valves can be equipped with a second electrical connection (connection terminal). Safety-related shut-off is therefore possible for each channel individually. The valve variants are without manual override. See also chapter "8.4" on page 37.

6.9 Type label standard (example)

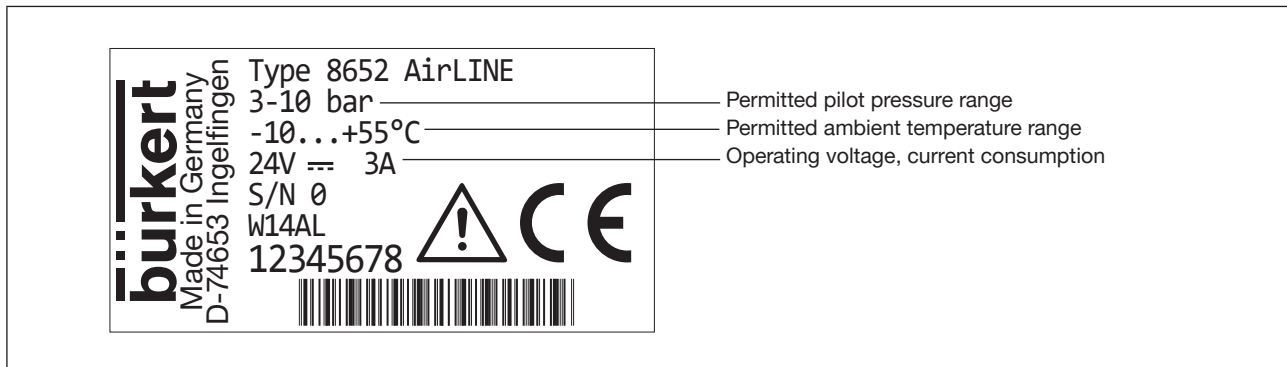


Figure 5: Type label standard for valve island type 8652

6.10 Type label UL (example)

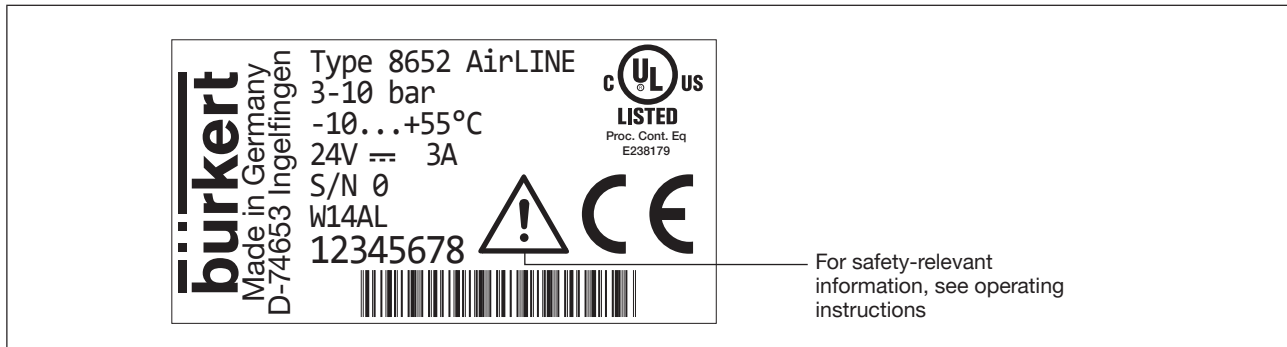


Figure 6: Type label UL for valve island Type 8652

6.11 Specifications of industrial Ethernet

6.11.1 PROFINET IO

Topology recognition	LLDP, SNMP V1, MIB2, physical device
Minimum cycle time	10 ms
IRT	Not supported
MRP media redundancy	MRP client is supported
Further supported functions	DCP, VLAN priority tagging, shared device
Transmission speed	100 Mbit/s
Data transport network	Ethernet II, IEEE 802.3
PROFINET IO specification	V2.3
Application relations (AR)	The device can simultaneously process up to 2 IO ARs, 1 Supervisor AR, and 1 Supervisor DA-AR.

6.11.2 EtherNet/IP

Predefined standard objects	Identity Object (0x01) Message Router Object (0x02) Assembly Object (0x04) Connection Manager (0x06) DLR Object (0x47) QoS Object (0x48) TCP/IP Interface Object (0xF5) Ethernet Link Object (0xF6)
DHCP	Supported
BOOTP	Supported
Transmission speed	10 and 100 Mbit/s
Duplex modes	Half duplex, full duplex, auto negotiation
MDI modes	MDI, MDI-X, auto MDI-X
Data transport network	Ethernet II, IEEE 802.3
Address Conflict Detection (ACD)	Supported
DLR (ring topology)	Supported
Integrated switch	Supported
CIP reset service	Identity object reset service type 0 and type 1

6.11.3 Modbus TCP

Modbus function codes	1, 2, 3, 4, 6, 15, 16, 23
Operation mode	Message mode: Server
Transmission speed	10 and 100 Mbit/s
Data transport network	Ethernet II, IEEE 802.3

6.11.4 EtherCAT



Industrial Ethernet interface X1, X2	X1: EtherCAT IN X2: EtherCAT OUT
Maximum number of cyclic input and output data	512 bytes in total
Maximum number of cyclic input data	1024 bytes
Maximum number of cyclic output data	1024 bytes
Acyclic communication (CoE)	SDO SDO master-slave SDO slave-slave (depends on master capacity)
Type	Complex slave
FMMUs	8
Sync Managers	4
Transmission speed	100 Mbit/s
Data transport network	Ethernet II, IEEE 802.3

EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany

6.11.5 CC-Link IE field basic

Number of occupied stations	1 to 16
Acyclic communication	SLMP Server
Data transport layer	Ethernet II, IEEE 802.3, 100 MBit/s
CC-Link interface	Cyclic data 61450 (UDP) Discovery and SLMP Server 61451 (UDP) SLMP Parameter 45237 (UDP) SLMP Communication 20000 (UDP)

6.12 Specifications PROFIBUS DPV1

Acyclic communication	DPV1 class 1 read/write DPV1 class 1 alarm DPV1 class 2 read/write/data transport
Transmission speed	Fixed values of 9.6 kbit/s up to 12 Mbit/s Autodetect mode is supported
Maximum size of the transmitted data	Input data: 244 bytes Output data: 244 bytes

6.13 Specifications CC-Link

Remote I/O Station	only I/O points
Remote Device Station	I/O points and Words
Configurable number of occupied stations	1...4
Configurable number of extension cycles	1, 2, 4, or 8
Supported protocols	CC-Link version 2.0 CC-Link version 1.1
CC-Link version 2.0	
Number of stations	up to 4 occupied stations
Maximum number of input data	368 bytes
Maximum number of output data	368 bytes
Input data	112 bytes (RY) and 256 bytes (RWw)
Output data	112 bytes (RX) and 256 bytes (RWr)
Extension cycles	1, 2, 4, 8
Transmission speed	156 kbit/s, 625 kbit/s, 2500 kbit/s, 5 Mbit/s, 10 Mbit/s
CC-Link version 1.1	
Number of stations	up to 4 occupied stations
Maximum number of input data	48 bytes
Maximum number of output data	48 bytes
Input data	4 bytes (RY) and 8 bytes (RWw) per occupied station
Output data	4 bytes (RX) and 8 bytes (RWr) per occupied station
Transmission speed	156 kbit/s, 625 kbit/s, 2500 kbit/s, 5 Mbit/s, 10 Mbit/s

7 ASSEMBLING THE VALVE ISLAND IN THE CONTROL CABINET



WARNING

Risk of injury due to incorrect assembly.

- ▶ Assembly work should be carried out by fully trained personnel only.
- ▶ Use suitable tools to perform assembly work.



CAUTION

Risk of injury from heavy device.

During transportation or installation work, a heavy device may fall down and cause injuries.

- ▶ Transport, install and remove heavy device with the aid of a second person only.
- ▶ Use suitable tools.



The valve island AirLINE type 8652 is supplied as a fully assembled device. Modifications should only be performed by Bürkert.

This does not apply to the valves which the user can replace with the same type of valves.

There are two ways to position the valve island in the control cabinet:

1. On the floor or wall of the control cabinet with AirLINE Quick

The adapter plate AirLINE Quick is a standard component of the valve island. Using the adapter plate AirLINE Quick, the valve island can be positioned directly at a cut-out on the floor or wall of the control cabinet. This enables pneumatic connection of the valve island outside the control cabinet.

2. On the control cabinet rear wall with standard rail

Mounting the valve island on the control cabinet rear wall using a standard rail.

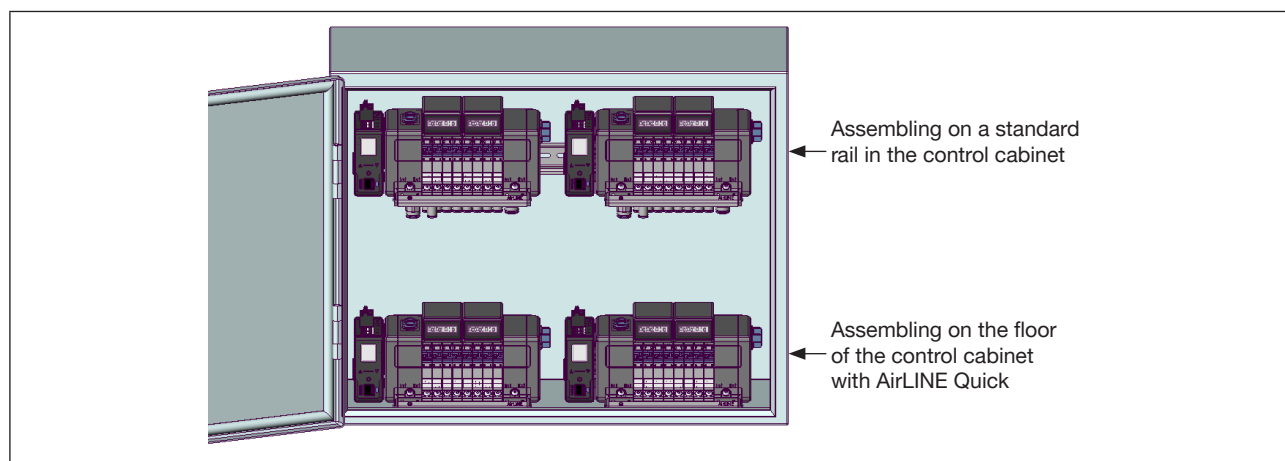


Figure 7: Possibilities for positioning the valve island in the control cabinet

7.1 Assembling on the floor or wall of the control cabinet with AirLINE Quick

When assembling with AirLINE Quick, a cut-out and holes for the fastening screws must be provided on the floor or wall of the control cabinet. The cut-out can, e.g., be either lasered or punched (see “7.1.1 Dimensions of flange fitting AirLINE Quick” on page 27).

NOTE

The cut-out at the control cabinet must be free from burr to ensure the seal between AirLINE Quick and the control cabinet is not damaged.

Note when measuring the cut-out:

To be able to utilize the Hot Swap function (easy valve replacement during operation), always observe a minimum distance to the front edge of the control cabinet when installing the valve island in the control cabinet (see “Figure 9”). The valves can only be extracted from the front of the valve island when the minimum distance has been observed.

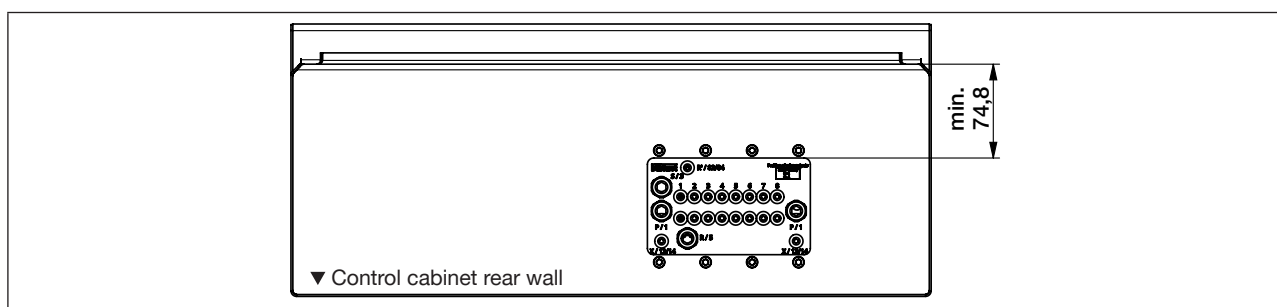


Figure 8: Make a cut-out in the floor of the control cabinet close to the control cabinet rear wall.

The minimum distances to the left, right, front, and top depend on the position of the valve island in the control cabinet:

Position in the control cabinet	front	left	right	top	bottom
Assembly on the floor of the control cabinet	60.5 mm	30 mm	50 mm	50 mm	–
Assembly at the right-hand wall of the control cabinet	60.5 mm	50 mm	–	50 mm	30 mm
Assembly at the left-hand wall of the control cabinet	60.5 mm	–	50 mm	30 mm	50 mm

Table 1: The minimum distances are measured from the outer edge of the valve island to the inner edge of the control cabinet

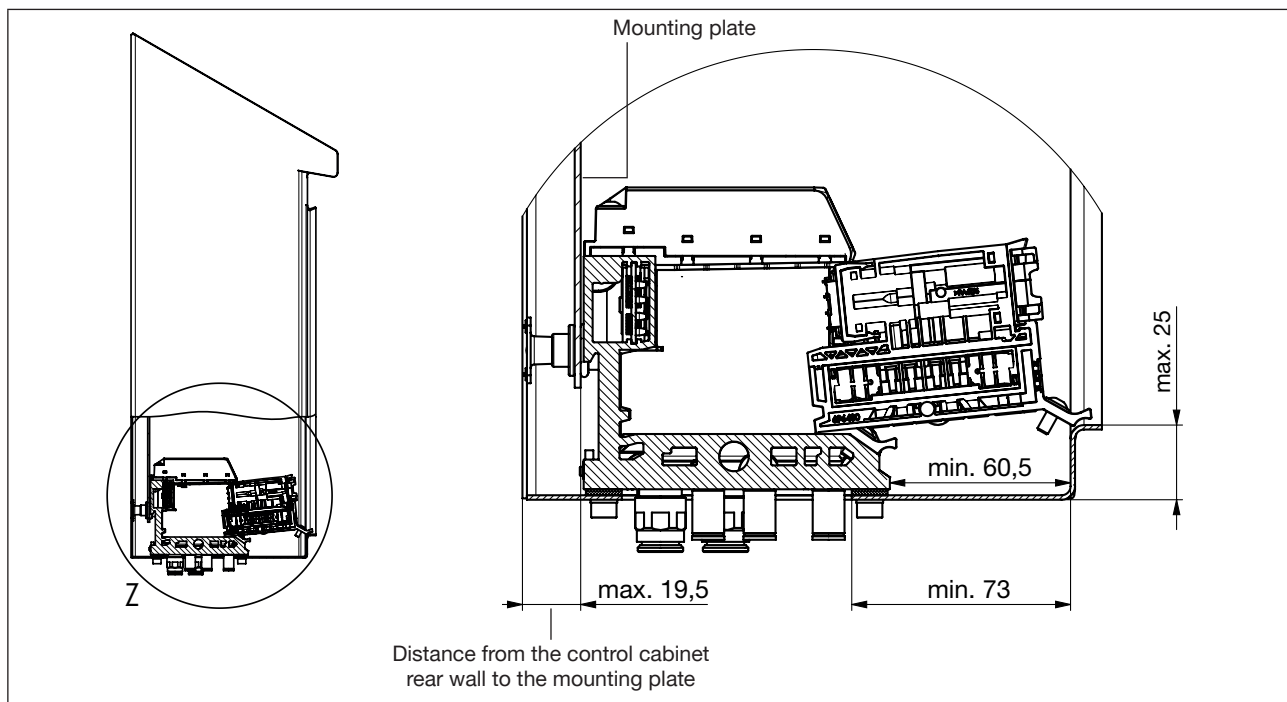


Figure 9: To be able to utilize the Hot Swap function always observe a minimum distance to the front edge of the control cabinet when installing the valve island in the control cabinet

7.1.1 Dimensions of flange fitting AirLINE Quick

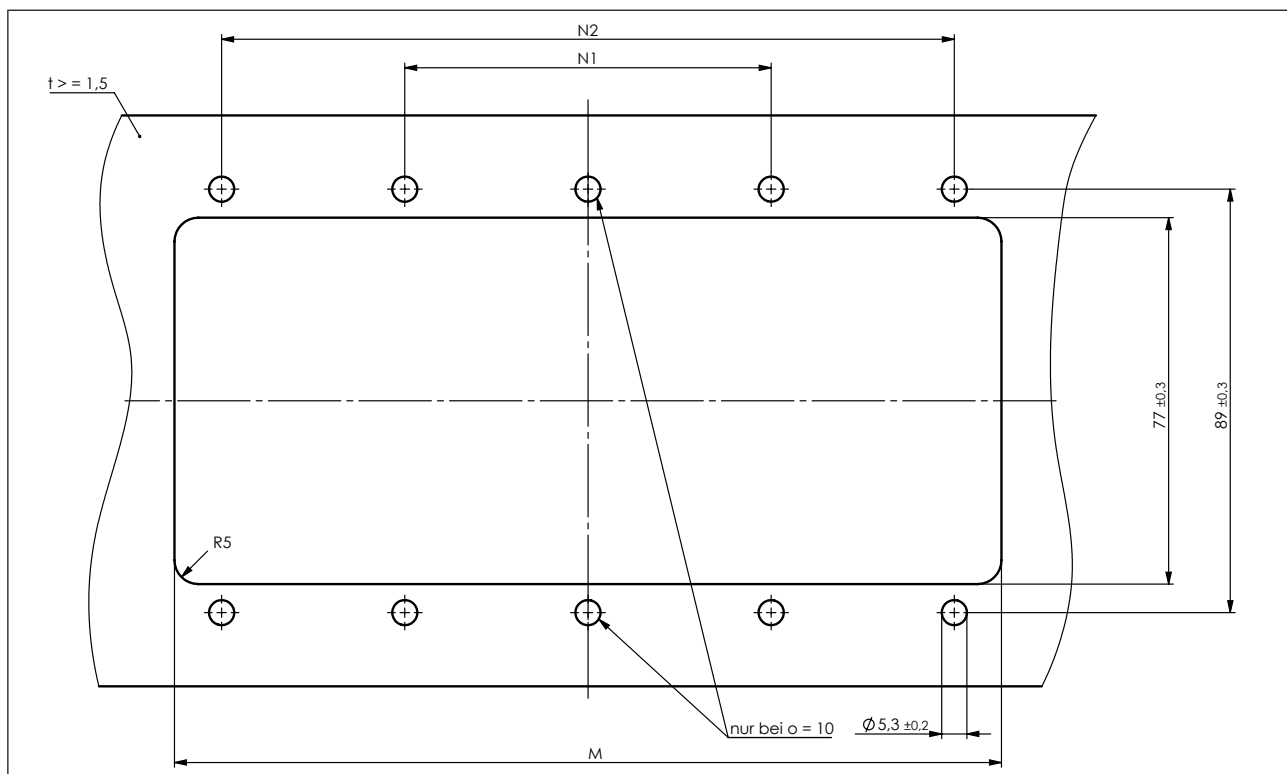


Figure 10: Flange fitting AirLINE Quick – for dimensions see Table 2

Number of valves	M [mm]	N1 [mm]	N2 [mm]	Number of boreholes
4	85.8 ±0,3	66 ±0,3	-	4
8	129.8 ±0,4	37 ±0,3	111 ±0,4	8
12	173.8 ±0,4	77 ±0,3	154 ±0,4	10
16	244 ±0,4	112 ±0,3	224 ±0,4	10
20	288 ±0,4	134 ±0,3	268 ±0,4	10
24	332.1 ±0,4	156 ±0,3	312 ±0,4	10

Table 2: Dimensions flange fitting AirLINE Quick

7.1.2 Assembling the valve island in the control cabinet

- Make sure the seal between AirLINE Quick and the control cabinet is undamaged.
- Position the valve island in the control cabinet at the prepared cut-out.
- Fasten with M5x10 screws from the exterior (tightening torque 2.5 Nm).

7.2 Assembling on standard rail

NOTE

- To guarantee the best possible EMC protection, ground the standard rail with low impedance.



The valve island must be freely accessible from the top. Ensure good heat dissipation.

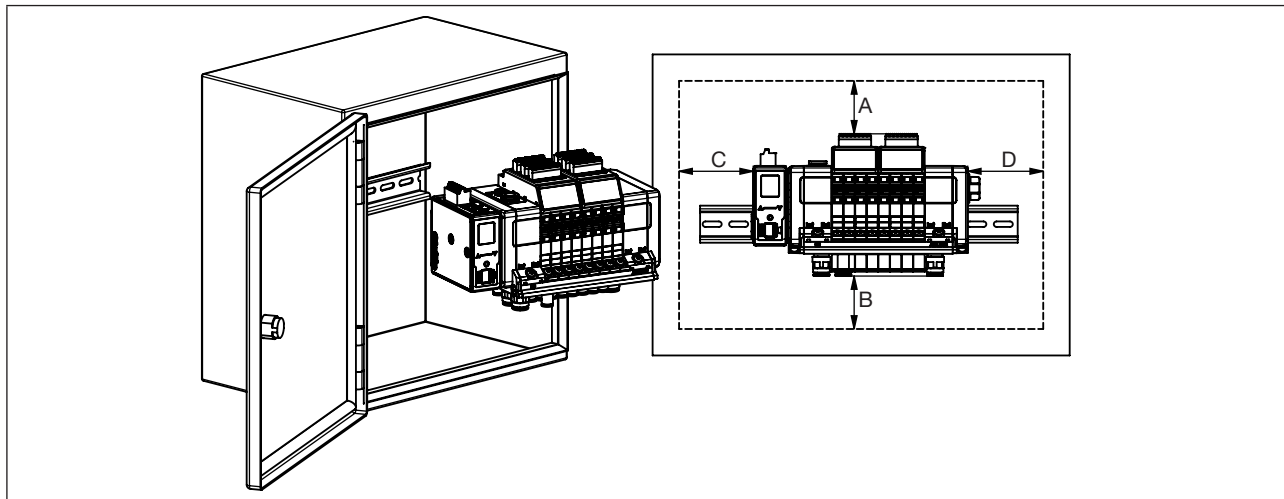


Figure 11: Recommended minimum distances when assembling on a standard rail in the control cabinet

Recommended minimum distances [mm]

A	B	C	D
50	30	30	50

- Install the standard rail firmly in the control cabinet.
- Establish a short, wide PE connection between the standard rail and the control cabinet.
- Hook the valve island to the upper guide of the standard rail.
- Use the two fastening screws to fix the valve island to the standard rail (tightening torque 1.5 Nm).

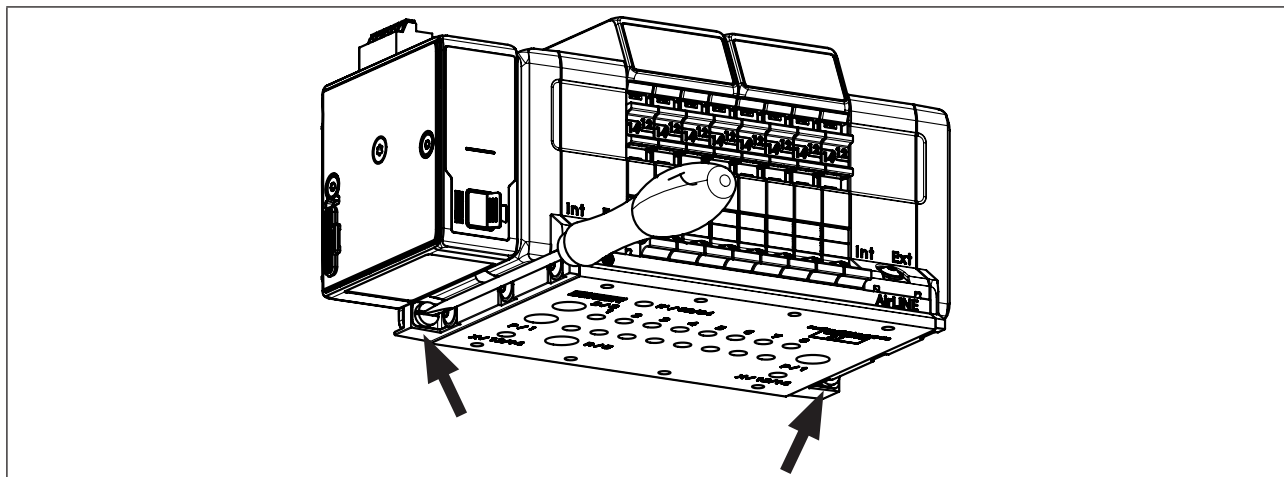


Figure 12: Valve island fastening screws at the standard rail

7.3 Connecting the functional earth



WARNING

Malfunctioning caused by electrostatic discharge.

Electrostatic discharge at the device may cause malfunctioning.

- ▶ Connect the device to the functional earth according to the installation situation.

Assembly on standard rail:

Use a **short** cable with a **large** cross-section to connect the standard rail to the functional earth (FE).

Assembly on the floor / wall of the control cabinet (AirLINE Quick):

Use a **short** cable with a **large** cross-section to connect the control cabinet housing to the functional earth (FE).

Danger due to electromagnetic fields.

If the functional earth (FE) is not connected, the conditions of the EMC Law are not observed.

- ▶ Connect the device to the functional earth according to the installation situation.

Assembly on standard rail:

Use a **short** cable with a **large** cross-section to connect the standard rail to the functional earth (FE).

Assembly on the floor / wall of the control cabinet (AirLINE Quick):

Use a **short** cable with a **large** cross-section to connect the control cabinet housing to the functional earth (FE).

8 ELECTRICAL CONNECTION

⚠ CAUTION

Risk of injury from electric shock.

- Before working on the device or system, switch off the power supply. Secure against reactivation.
- Observe applicable accident prevention and safety regulations for electrical equipment.

Risk of injury due to incorrect electrical connection work.

- The electrical connection work should be carried out by fully trained personnel only.
- Use suitable tools to establish the electrical connection.

8.1 Electrical connection fieldbus gateway

NOTE

To ensure electromagnetic compatibility (EMC):

- Only use shielded cables.
- To guarantee the best possible EMC protection, ground the standard rail with low impedance.
- With AirLINE Quick, connect the control cabinet housing to the functional earth (FE) to connect the cable shielding to ground.



Further information on cabling BüS networks can be found under the following link:

[Guide for planning of büS networks](#)

8.1.1 Gateway with CANopen/büS interface

→ Connect the 5-pole spring-loaded terminal according to the assignment.

Possible cable cross-section: $\leq 1.5 \text{ mm}^2$ (also see chapter “27 Accessories”)

Assignment of the 5-pole spring-loaded terminal		
View of pins	Color of terminal	Description
	Red	Supply voltage 24 V ===
	White	CAN H (büS connection)
	Green	Shielding
	Blue	CAN L (büS connection)
	Black	GND

Table 3: Assignment of the 5-pole spring-loaded terminal

8.1.2 Gateway with industrial Ethernet interface

The following protocols are supported:

- EtherCAT
- EtherNet/IP
- Modbus TCP
- PROFINET

→ Connect the 5-pole spring-loaded terminal according to the assignment.

Possible cable cross-section: $\leq 1.5 \text{ mm}^2$ (also see chapter “27 Accessories”)

→ Connect the connectors of the Ethernet cables to the sockets of the interfaces X1 and X2.

The interfaces X1 and X2 for the RJ45 push-in connectors are equivalent.

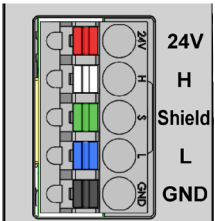
Assignment of the 5-pole spring-loaded terminal		
View of pins	Color of terminal	Description
	Red	Supply voltage 24 V \equiv
	White	CAN H (bùS connection) ⁶
	Green	Shielding
	Blue	CAN L (bùS connection) ⁶
	Black	GND

Table 4: Assignment of the 5-pole spring-loaded terminal

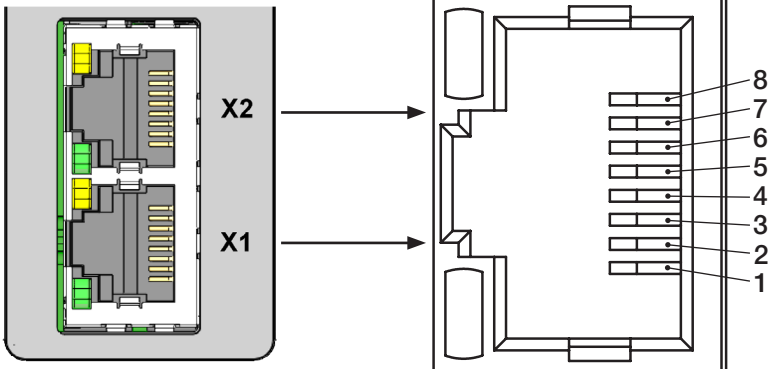
Assignment of interfaces X1 and X2		
	Pin	Pin assignment RJ45
	1	TX+
	2	TX–
	3	RX+
	4	Unassigned
	5	Unassigned
	6	RX–
	7	Unassigned
	8	Unassigned

Figure 13: Assignment of interfaces X1 (EtherCAT IN) and X2 (EtherCAT OUT); connection to the fieldbus

⁶⁾ Only assigned when using several Bürkert devices (EDIP) or in conjunction with the Communicator.

8.1.3 Gateway with PROFIBUS DPV1 interface

→ Connect the 5-pole spring-loaded terminal according to the assignment.

Possible cable cross-section: $\leq 1.5 \text{ mm}^2$ (also see chapter “27 Accessories”)

→ Connection of a 9-pole D-Sub connector to the PROFIBUS DPV1 interface according to the assignment.

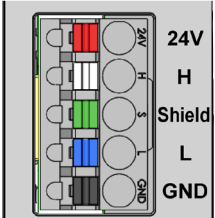
Assignment of the 5-pole spring-loaded terminal		
View of pins	Color of terminal	Description
	Red	Supply voltage 24 V ===
	White	CAN H (bùS connection) ⁷
	Green	Shielding
	Blue	CAN L (bùS connection) ⁷
	Black	GND

Table 5: Assignment of the 5-pole spring-loaded terminal

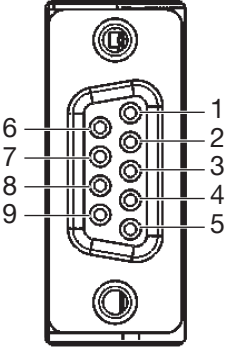
Assignment of push-in connector D-Sub, 9-pole				
D-Sub, 9-pole	Pin	Signal	Function	Connection
	1	Not assigned		
	2	Not assigned		
	3	RxD/TxD-P	Data line P (B-conductor)	Mandatory
	4	CNTR-P	Repeater direction check	Optional
	5	DGND	Ground	Optional
	6	VP	+5 V	Optional
	7	Not assigned		
	8	RxD/TxD-N	Data line N (A-conductor)	Mandatory
	9	Not assigned		

Figure 14: PROFIBUS DPV1, assignment of push-in connector D-Sub, 9-pole

⁷⁾ Only assigned when using several Bürkert devices (EDIP) or in conjunction with the Communicator.

8.1.4 Gateway with CC-Link interface

→ Connect the 5-pole spring-loaded terminal according to the assignment.

Possible cable cross-section: $\leq 1.5 \text{ mm}^2$ (also see chapter “27 Accessories”)

→ Connection of a 9-pole D-Sub connector to the CC-LINK interface according to the assignment.

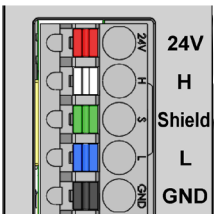
Assignment of the 5-pole spring-loaded terminal		
View of pins	Color of terminal	Description
	Red	Supply voltage 24 V ===
	White	CAN H (bùS connection) ⁸
	Green	Shielding
	Blue	CAN L (bùS connection) ⁸
	Black	GND

Table 6: Assignment of the 5-pole spring-loaded terminal

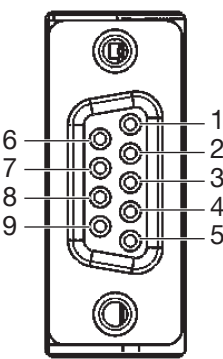
Assignment of push-in connector D-Sub, 9-pole				
D-Sub, 9-pole	Pin	Signal	Function	Connection
	1	Not assigned		
	2	Not assigned		
	3	DA	Data line A	Mandatory
	4	DG	Data ground	Mandatory
	5	Not assigned		
	6	Not assigned		
	7	Not assigned		
	8	DB	Data line B	Mandatory
	9	Not assigned		

Figure 15: CC-Link, assignment of push-in connector D-Sub, 9-pole

⁸⁾ Only assigned when using several Bürkert devices (EDIP) or in conjunction with the Communicator.

8.2 24 V supply voltage for pneumatic valves

The interface board has a 2-pole spring-loaded terminal to which the supply voltage for the pneumatic valves is connected. This allows the voltage for all pneumatic valves of the valve island to be shut down irrespective of the communication to the superordinate controller (PLC).

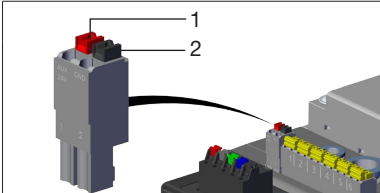

	Terminal	Assignment
	1, red	AUX 24 V
	2, black	GND

Figure 16: Assignment of the 2-pole spring-loaded terminal

8.3 Electrical connection electronic module with digital inputs (option)

-  Switch off the supply voltage.
- Connect position feedbacks according to the assignment on the electronic module.
Possible cable cross-section: $\leq 1.5 \text{ mm}^2$
Maximum cable length: $< 30 \text{ m}$

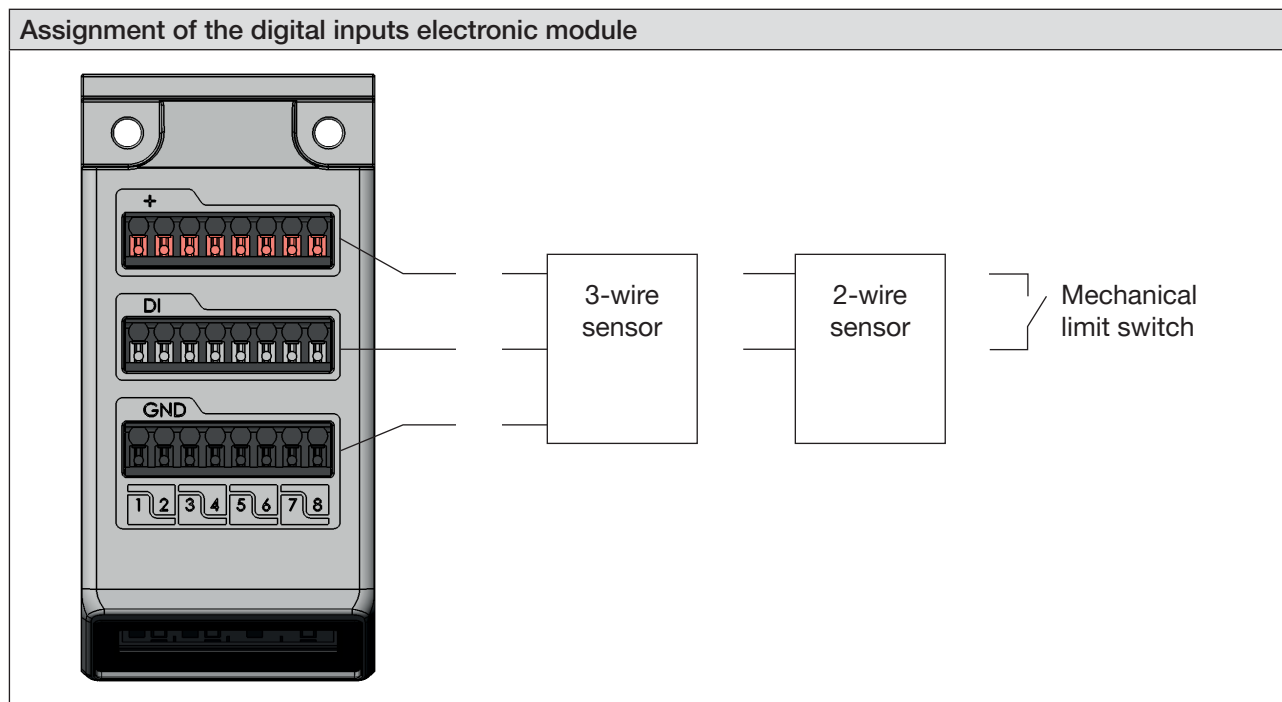


Figure 17: Assignment of the digital inputs of the electronic module

The position feedbacks are supplied (24 V) by the electronic module.

The current is limited to maximum 30 mA per position feedback.

Standard 3-wire sensors and 2-wire sensors with voltages between 10...30 V as well as mechanical limit switches can be used.

The following data may be output depending on the sensor used:

Possible data	3-wire sensors	2-wire sensors	Mechan. limit switches
Sensor actuated	X	X	X
Sensor not actuated	X	X	X
Short circuit	X	–	–
Broken wire	–	X	–

8.4 Electrical connection Type 6534 valves for safety-related shut-off, SIA variant (option)

DANGER

Risk of injury due to unintentional movement of the actuators.

If the shut-off function is required to control safety-critical processes, hazardous movements of the actuators may be triggered when the switch-off function is faulty.

- Make sure the shut-off function is working properly before start-up.

WARNING

Risk of injury and property damage due to electrical faults.

If the connections for the safety-related shut-off are not connected correctly, there is a risk of injury due to uncontrolled behaviour of the plant.

- When using several SIA variant valves, connect each connection to an individual potential-free contact (mechanical switch or relay). **Never connect several contacts together under any circumstances!**
- Do not apply voltage to the connections (risk of damage to the valves).

Risk of injury due to sharp edges.

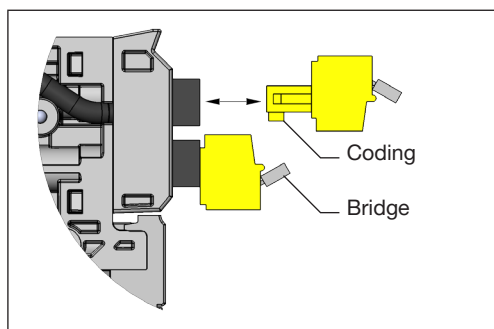
Sharp edges on the connection or on the contacts of the screw-type terminal can cause cuts.

- Wear suitable protective gloves.

Type 6534 valves for safety-related shut-off (SIA variant) are equipped with additional connection terminals. The circuit of a valve can therefore be interrupted by an external switch. Manual override is not required for these valve variants.

The technical data of the Type 6534 SIA variant valves corresponds to the data of the standard device.

To use the shut-off function, connect the connection to a potential-free contact (mechanical switch or relay).



The yellow connection terminals are pluggable and can be removed to facilitate connection of a cable. Except for CFH, there are always 2 connection terminals. To avoid mixing up the connections, the connection terminals are coded.

On delivery, the connection terminals are provided with a bridge to ensure the valve can be put into operation immediately. Remove the bridge before connecting a cable.

Connection terminals:	Pluggable screw-type terminal, 2-pole, coded wire cross-section (rigid or flexible) 0.14 mm ² ...1.5 mm ² (AWG 28...16)
Required switching capacity of the contact:	0.5 A / 24 V DC

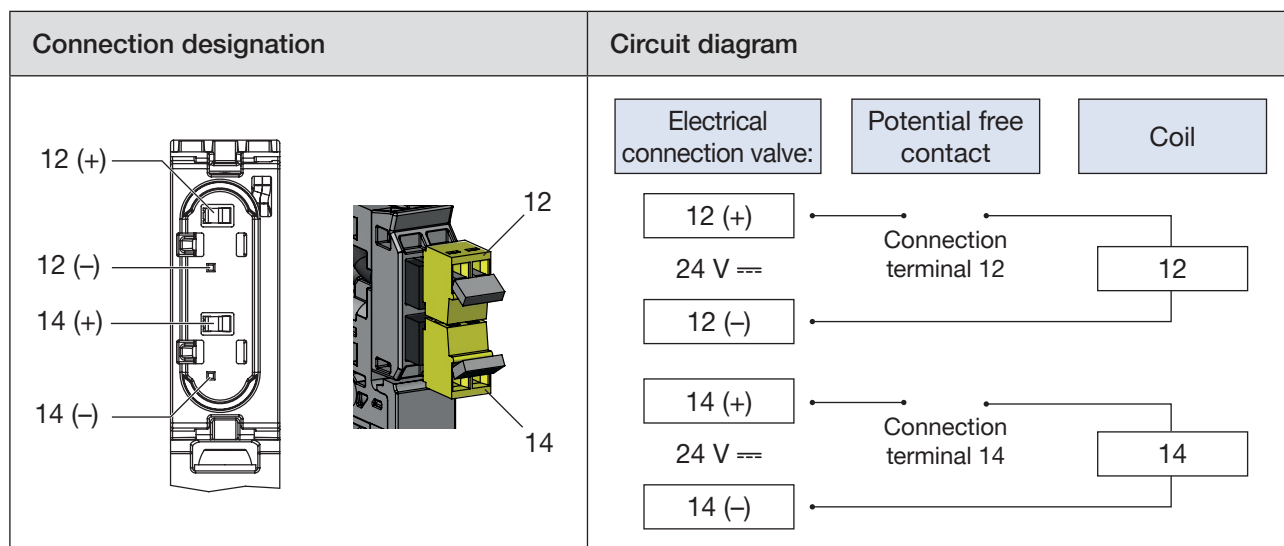


Figure 18: Connection designation and circuit diagram of all circuit functions available as SIA variant, except circuit function H (CFH see "Figure 19")

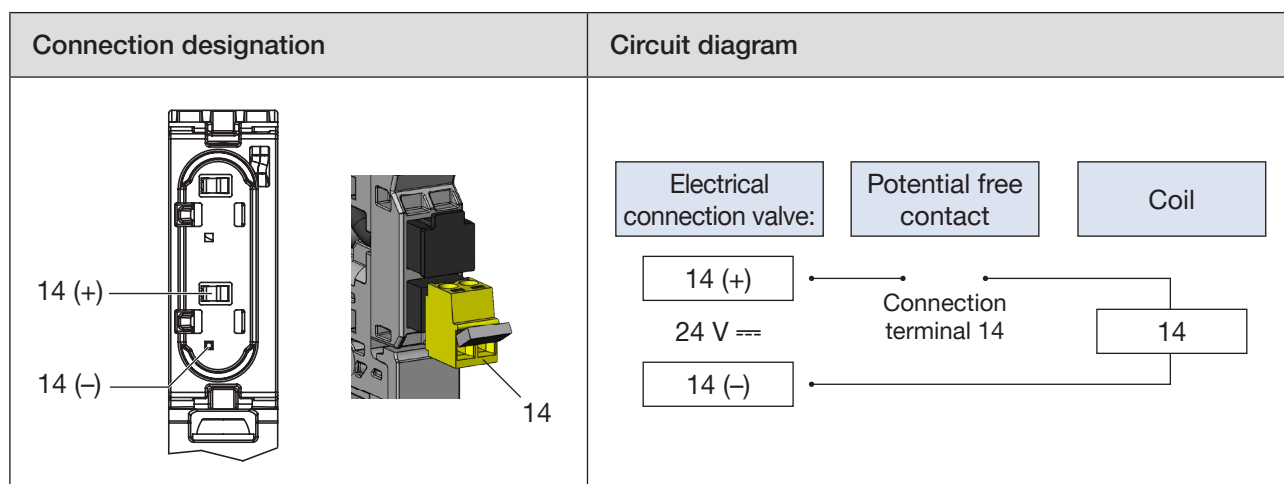


Figure 19: Connection designation and circuit diagram SIA variant, circuit function H (CFH)

The designations 12 and 14 are described in chapter "20.2" on page 74.

8.5 Module-based safety shutdown (option)

DANGER

Risk of injury due to unintentional movement of the actuators.

If the shutdown function “Module-based safety shutdown” is required to control safety-critical procedures, hazardous movements of the actuators may be triggered if the shutdown function is faulty.

- ▶ Make sure the shutdown function is working properly before start-up.

In spite of the activated shutdown function “Module-based safety shutdown”, actuators can be moved through manual overrides of the valves. If the shutdown function is used to control safety-critical procedures:

- ▶ Take suitable measures to prevent unintentional activation of the valves (e.g. lockable control cabinet or use valve variants without manual override).

WARNING

Risk of injury and property damage due to electrical faults.

If the connections for module-based safety shutdown are not connected correctly, there is a risk of injury due to uncontrolled behaviour of the plant.

- ▶ If several valve units are to be shut down in a safe manner, connect each connection to an individual potential-free contact (mechanical switch or relay). **Never interconnect several contacts!**
- ▶ Do not supply voltage to the connections for module-based safety shutdown (risk of damaging the valves).

Risk of injury due to sharp edges.

Sharp edges on the connection or on the contacts of the 12-pole spring-loaded terminal can cause cuts.

- ▶ Wear suitable protective gloves.

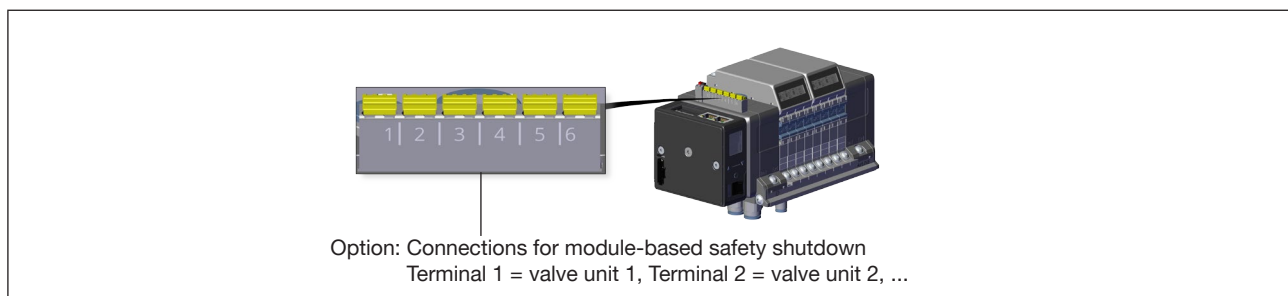


Figure 20: Connections for module-based safety shutdown

The interface boards for module-based safety shutdown are additionally equipped with a 12-pole spring-loaded terminal. As a result, the electric circuit of a valve unit (4 pneumatic valves) can be interrupted by an external switch, e.g. to implement functions such as “Central system off” or to deactivate actuators group by group.

The interruption will immediately cause a single-pole interruption of the common supply to all valves of the valve unit (see “Figure 21”).

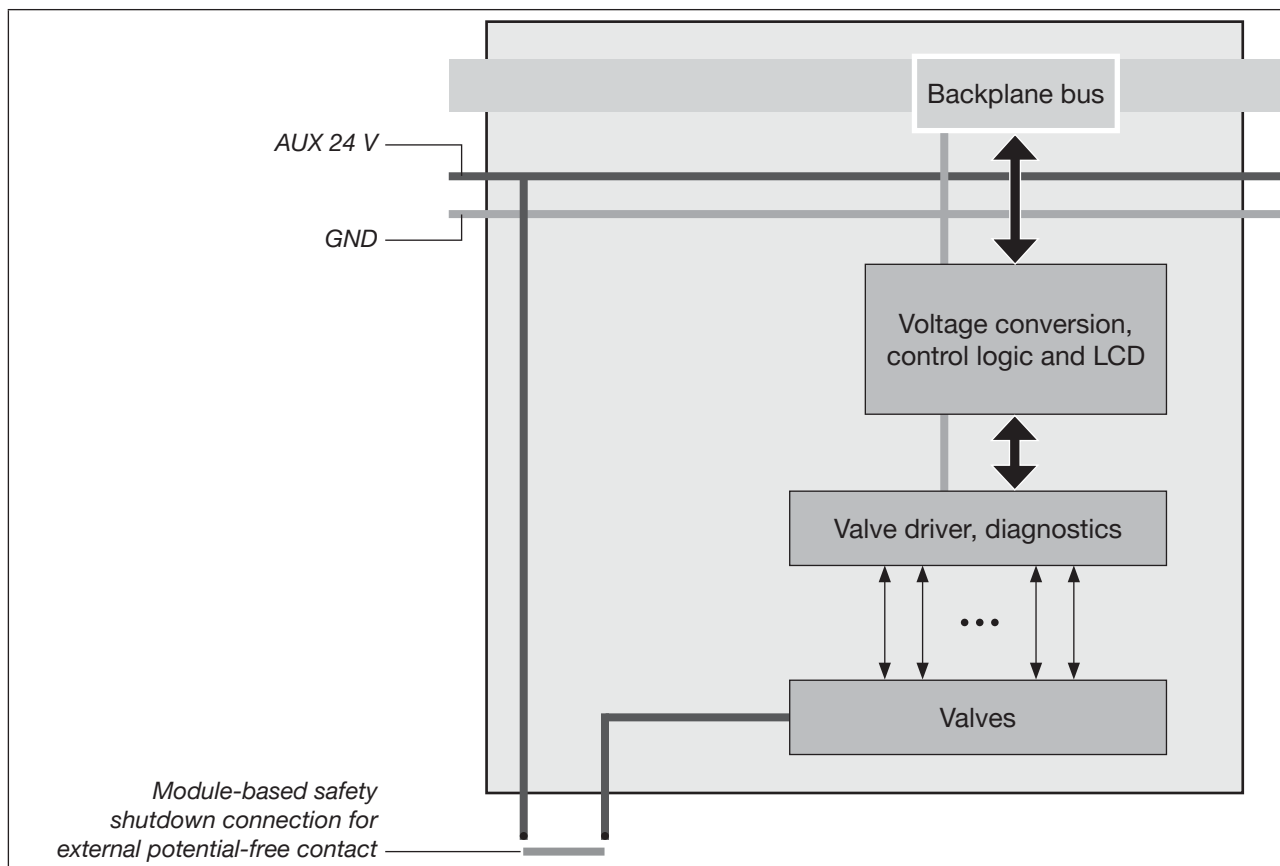


Figure 21: Schematic representation of a valve unit with shutdown function “Module-based safety shutdown”

For use, the “Module-based safety shutdown” connection must be connected to a potential-free contact (mechanical switch or relay).

The contact must be in the same control cabinet as the valve island; restrict the maximum cable length to 2 m.

Connection	Pluggable screw-type terminal*, 12-pole cable cross-section (rigid or flexible) 0.14 mm ² ...1.5 mm ² (AWG 26...16)
Required switching capacity of the contact	1,5 A / 24 V DC

*) Upon delivery, the spring-loaded terminal is fitted with a bridge that enables immediate operation of the valve island. Remove the bridge before connecting a cable.

9 PNEUMATIC CONNECTION

DANGER

Risk of injury due to high pressure.

- ▶ Before working on the device or system, secure the actuators against moving.
- ▶ Before working on the device or system, switch off the pressure. Vent or drain lines.

Risk of injury due to incorrect pneumatic connection work.

- ▶ The pneumatic connection work should be carried out by fully trained personnel only.
- ▶ Use suitable tools to establish the pneumatic connection.

CAUTION

Danger due to loud noises.

- ▶ Seal unused connections with sealing plugs (e.g. for 5/2-way valves).

Recommendation

- Only use Bürkert sealing plugs (see chapter “27 Accessories” on page 97). These sealing plugs are tested under laboratory conditions. If plugs from other manufacturers are used, the service life of the device may be limited.
- We recommend the use of original Bürkert accessories only (see chapter “27 Accessories” on page 97).

Plastic hoses for pneumatic system

When using hoses from other manufacturers, make sure the hose diameter remains within the tolerance of ± 0.1 mm.

9.1 Assignment of the pneumatic connections

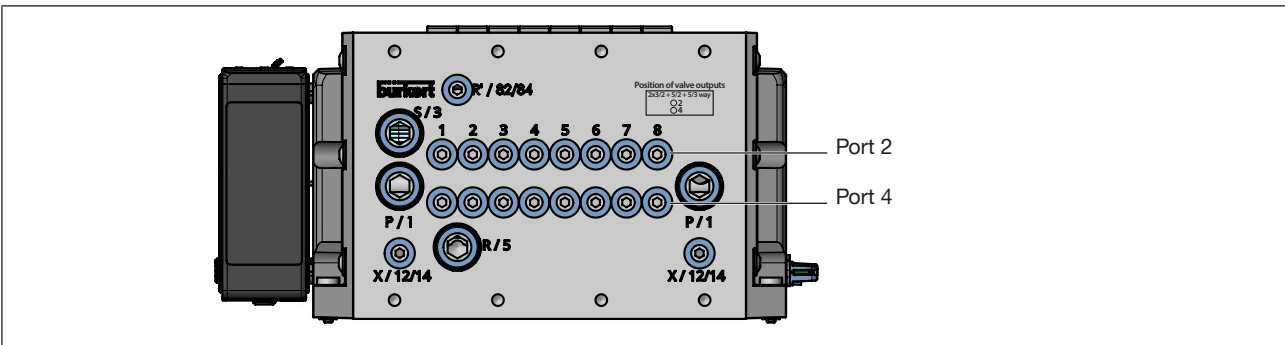


Figure 22: Pneumatic connections of the valve island

Connection	Assignment
1...8	Valve slots
P / 1	Pressure port
X / 12/14	Pressure port for auxiliary pilot air
R / 5	Exhaust ports
S / 3	
R' / 82/84	Exhaust port for auxiliary pilot air

Figure 23: Pin assignment of the valve island

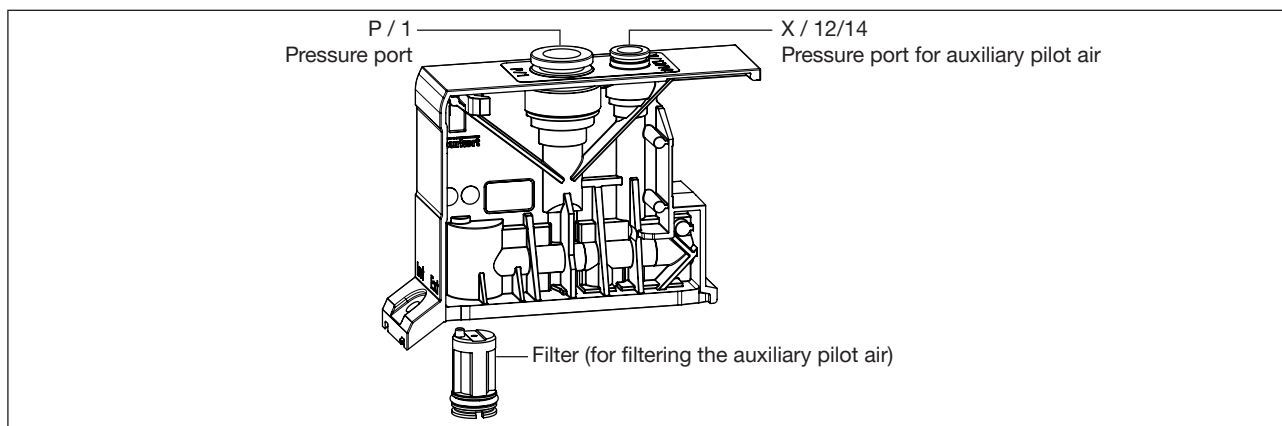


Figure 24: Pneumatic connections of the connection module

9.1.1 Allocation of valve outputs to the pneumatic connections of the valve island

Valve type	Pneumatic connection	
	Valve output	AirLINE Quick
2x3/2-way	Position of valve outputs <div style="border: 1px solid black; padding: 2px; display: inline-block;"> 2x3/2 + 5/2 + 5/3 way O2 O4 </div>	<div style="display: flex; justify-content: space-around;"> 12345678 </div> <div style="display: flex; justify-content: space-around;"> </div>
5/2-way		
5/3-way		<div style="display: flex; justify-content: space-around;"> </div>

See also chapter [“11.3 Bit-by-bit compilation of the inputs and outputs”](#) on page 46.

9.1.2 External and internal auxiliary pilot air

The seals of the connection module are pre-assembled upon delivery. If it becomes necessary to change the supply of auxiliary pilot air, it can be achieved by turning the seal. In this case, always observe the following instructions!

NOTE

Internal short circuit between the auxiliary pilot air and the pilot pressure.

To avoid an internal short circuit, **the seals of the connection module must be positioned the same** (external or internal supply of auxiliary pilot air). Mixing the external or internal supply is not permitted.

► Never mix the external or internal supply.



With an external supply, the X connection always has to be connected.

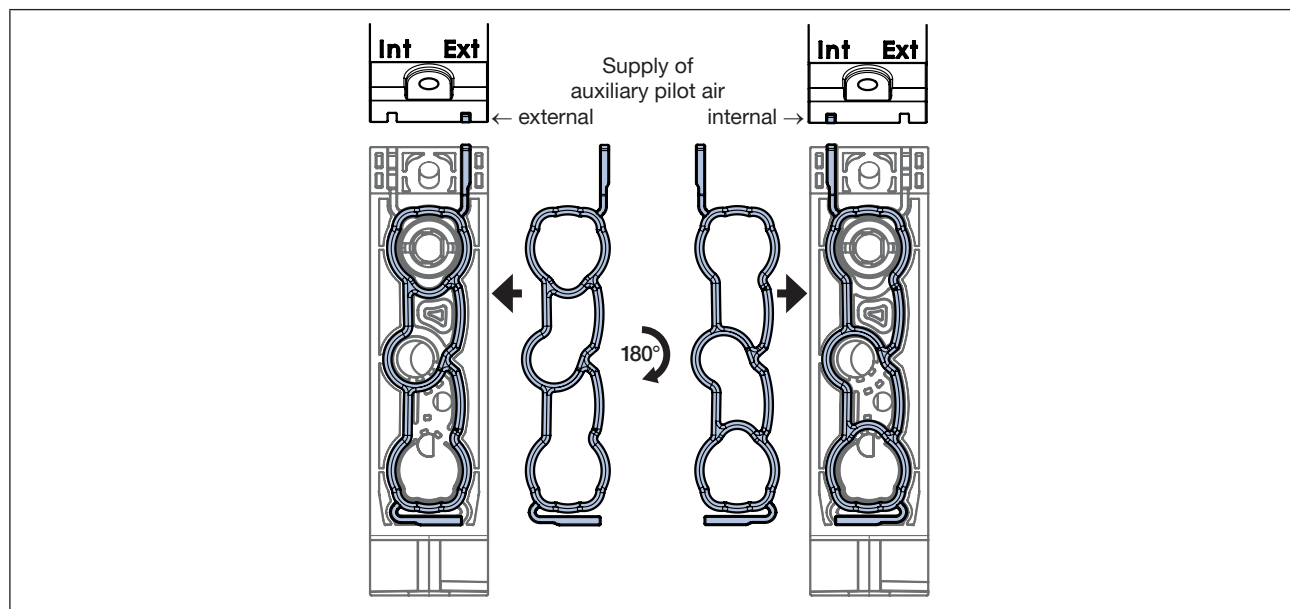


Figure 25: By turning (repositioning) the seal 180° it is possible to set the valves to an external or internal supply of auxiliary pilot air. The type of supply must always be the same inside the valve island!

10 PLC COMPATIBILITY

The software and hardware of the devices were supplemented with new functions. Start-up files of the current software version as well as for older software versions are available for download on our homepage.

If new devices are to be operated with the start-up files of an older software version, e.g. because a replacement device is to be used in an existing automation system, this can be done without issue by converting the PLC compatibility to operation mode **V1.0**.

The compatibility mode can be converted via the fieldbus gateway display or the Bürkert Communicator software.



Devices in compatibility mode **V1.0** do not support all device functions.

Converting via the fieldbus gateway display:

[“14.4 Setting compatibility mode” on page 53](#)

Converting via Bürkert Communicator:

[“18.2.6 Converting compatibility mode” on page 64](#)

10.1 Compatibility mode and start-up files



Start-up files:

www.burkert.com → Type 8652 → Downloads: “Software” → Device Description Files.zip

This zip archive contains 2 folders for each fieldbus:

- File “01_Standard”
Start-up files version V01
Start-up files version V02
- File “02_Extension_Modules”

For compatibility mode **V2.0**:

use the latest start-up file of version V02 from folder “01_Standard”

For converting to compatibility mode **V1.0**:

use the latest start-up file of version V01 from folder “01_Standard”

10.2 Error codes with regard to PLC compatibility

Error code	Description	Troubleshooting
51/103	No or incorrect mapping file available.	<ul style="list-style-type: none"> • If extension modules were used, perform the Extension module settings wizard again. General settings > Parameter > Extension module settings • Use a separate gateway configuration if one has been created.
51/400	Master tried to plug wrong module or submodule.	<ul style="list-style-type: none"> • The version of the start-up file does not match the device (see chapter “10” and “10.1”). • The controller settings do not match the device.

11 CONFIGURATION WITH EXTERNAL CONTROLLER

11.1 Cabling of bÜS networks



Further information on cabling BÜS networks can be found under the following link:

[Guideline for cabling bÜS networks](#)

11.2 Start-up files and description of process data and parameters

The start-up files required by the respective design software and their descriptions are available online.



www.burkert.com → Type 8652 → Downloads: „Software“ → Device Description Files.zip

The zip archive contains 2 folders for each fieldbus:

- **01_Standard**

Start-up files V1.0 (software versions < A3.0)

Start-up files V2.0 (software versions ≥ A3.0)

- **02_Extension_Modules**

Start-up files from older software versions (< A3.0) with extension modules (with designation “EM” in file names). For more information on extension modules see chapter [“18.9 Using extension modules \(EM\)”](#) on page 66.

Fieldbus	Start-up file
CANopen	eds file
CCLink	cspp file
EtherCAT	xml file
EtherNet/IP	eds file
Modbus TCP	txt file
PROFIBUS DPV1	gsd file
PROFINET	gsdml file



The CANopen standard objects are described in separate operating instructions:

www.burkert.com → Type 8652 → Downloads „User Manuals“ → CANopen Network configuration

For instructions on installation of the start-up files, please refer to the documentation of the design software being used.

11.3 Bit-by-bit compilation of the inputs and outputs

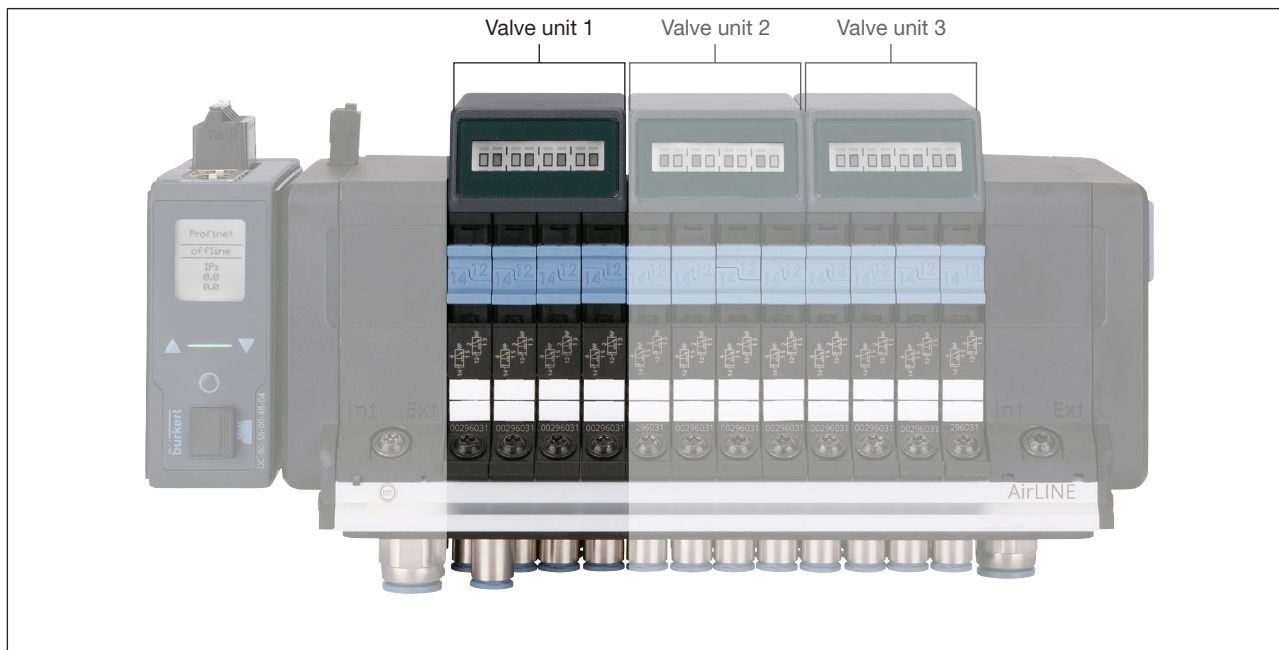


Figure 26: Valve units

The valve island is divided into valve units. A maximum of 8 valves (= 4 double valves!) are possible per unit.

Each valve unit has

- 1 byte cyclic output for current position feedback status of the upper end position
- 1 byte cyclic output for current position feedback status of the lower end position
- 1 byte cyclic input for valves
- 1 byte cyclic input for external position feedback of the upper end position
- 1 byte cyclic input for external position feedback of the lower end position

The coding of the individual bits is always the same. Valve unit 1 is on the left, valve unit 2 is to the right of it, etc.

11.3.1 Examples of bit-by-bit allocations of valve units

Valve unit with 4 double valves (example using BM1_Valves):

BM1_Valves							
Bit 0	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7
Valve 1	Valve 2	Valve 3	Valve 4	Valve 5	Valve 6	Valve 7	Valve 8
Pneumatic connection							
2	4	2	4	2	4	2	4

Table 7: Example for the allocation of bits in the BM1 valves for double valves

If single valves are present in a valve unit, the next bit is skipped after a single valve (see example below).

Valve unit with 2 single valves and 2 double valves (example using BM1_Valves):

BM1_Valves					
2 single valves			2 double valves		
Bit 0	Bit 2	Bit 4	Bit 5	Bit 6	Bit 7
Valve 1	Valve 3	Valve 5	Valve 6	Valve 7	Valve 8
Pneumatic connection					
4	4	2	4	2	4

Table 8: Example for the allocation of bits in the BM1 valves for 2 single valves and 2 double valves

12 EXTENDED FUNCTIONALITIES

12.1 Extended gateway functionalities



For information on

Control Mode (Communication settings),
Control Word (Executing cyclic commands) und
Object Route Function (Enables access to further bÜS objects)

see: www.burkert.com / Type 8652 / User Manuals: „Definition fieldbus“

12.2 Function Switching time monitoring

With this function, wear or possible defects in the process valves (actuators) can be detected early by monitoring the switching time duration, e.g. to optimise maintenance intervals.

The valve island can record and permanently monitor the switching times of individual or all actuators in the ongoing process. Once a process parameter changes and this affects the switching time of the actuators, this is recorded and a maintenance notification is sent to the controller. The device changes the Namur Status to blue. The display and controller indicate which channel the deviation is present in.

The set-up operation takes place in the background and has no impact on the process.

This function requires the use of digital inputs.

13 CONFIGURATION WITH WEB SERVER

The valve island AirLINE Type 8652 has an integrated web server via which the device can be configured.

The web server can be used for the following protocols:

- PROFINET
- EtherNet/IP
- Modbus TCP

For access via web server, the device has its own IP address.

13.1 Establishing a connection to the web server



Configuration of multiple devices:

Because the devices have the same IP address upon delivery, there can only be 1 as yet unconfigured device in the network so that the device can be identified.

- ▶ Connect to the network and configure the devices individually in sequence.

→ Connect the PC to the device via a network cable.

→ Enter the IP address in the address line of the web browser.

With Ethernet/IP and Modbus TCP, the IP address of the device upon delivery is 192.168.0.100.

With PROFINET the IP address is preset to 000.000.0.000. First, an IP address must be issued with a suitable tool, as otherwise there will be no connection to the web server.

If the IP address has been changed to an unknown value, the current IP address can be read in the Bürkert Communicator software or the display of the fieldbus gateway.

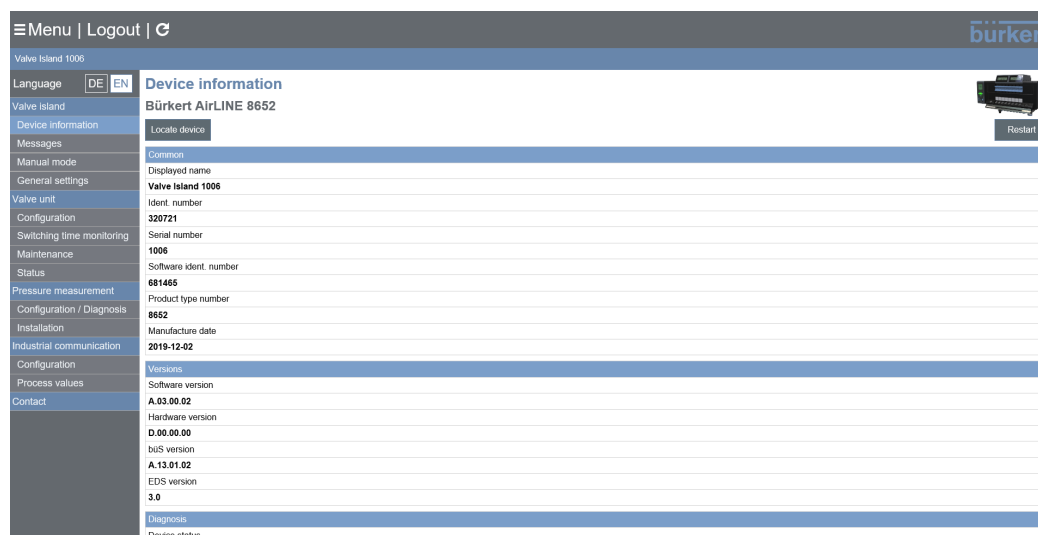


Figure 27: Web server view

13.2 Logging onto the web server

- On the home page, click on **Login** on the top left.
- Enter your user name and password: User name: **admin**
Password: **admin**
- Click on **Login**.

13.3 Passwords

NOTE

Security risk due to standard passwords.

Unauthorised persons can log in to the web server and make changes to the system.

- ▶ Please change standard passwords.
- ▶ If the web server is not needed, disable access via Bürkert Communicator (see chapter “18.8” on page 65).

The following user names and passwords are active by default and are re-enabled when the passwords are reset:

User name:	admin	installer	advanced
Standard password	admin	admin	user

All user names have the same rights.

13.3.1 Change password

- Logging onto the web server
- Enter and confirm the new password in the menu **General settings**.

13.3.2 Factory reset of password

- Click on **Login**.
- On the bottom right of the login window, click on **Reset** passwords.

The device must be rebooted within 3 minutes so that the passwords can actually be reset. A reboot can be performed via the fieldbus gateway display, the Bürkert Communicator software, or via a power reset.

13.4 Locate device

Device information
Bürkert AirLINE 8652

Locate device

Common

Displayed name

In order to localise the currently selected device in the web server when using multiple devices, click the button **Locate device**.

- ✓ The status LED of the selected fieldbus gateway flashes for a few seconds.

13.5 Disabling web server access with Bürkert Communicator

The web server is enabled upon delivery. Web server access can be disabled via the Bürkert Communicator software (see chapter [“18.8”](#) on page 65)

13.6 Information in the web server

13.6.1 Device information

General	<ul style="list-style-type: none"> • Displayed name • Identification number of device • Device serial number • Software ident. number • Product type number • Manufacture date
Versions	<ul style="list-style-type: none"> • Software version • Hardware version • bÜS version • EDS version
Diagnostics	Device status display

13.6.2 Messages

Messages are shown in the order of type, time and message text.

13.7 Setting options in the web server

Valve unit configuration	<ul style="list-style-type: none"> • Valve configuration • Fault action • Fault state • Switching cycle counter • Feedback source • Wire break detection active • Signal inversion
Switch time monitoring of actuators	<ul style="list-style-type: none"> • For information see chapter “12.2 Function Switching time monitoring” on page 47
Maintenance	<ul style="list-style-type: none"> • Channel maintenance
	<ul style="list-style-type: none"> • Reset switching cycle counter of pneumatic slide valve
	<ul style="list-style-type: none"> • Reset switching cycle counter of actuators
	<ul style="list-style-type: none"> • Set date for next routine maintenance
Valve unit status	
Pressure measurement configuration	<ul style="list-style-type: none"> • Alarm limits • Pressure indicators on internal displays • Cyclical output of pressure value
Pressure measurement diagnostics	Current pressure Maximum pressure Minimum pressure
Pressure measurement of installation	Enabling/disabling pressure sensors

13.8 Industrial communication of web server

Configuration	<ul style="list-style-type: none"> • Protocol • IP settings
Information	<ul style="list-style-type: none"> • Protocol • Communication status • Temporary IP address • MAC address
Indication of process values	Process name Process value

14 CONFIGURATION WITH FIELDBUS GATEWAY

If the fieldbus gateway is equipped with display and operating elements, settings can be made via the fieldbus gateway.

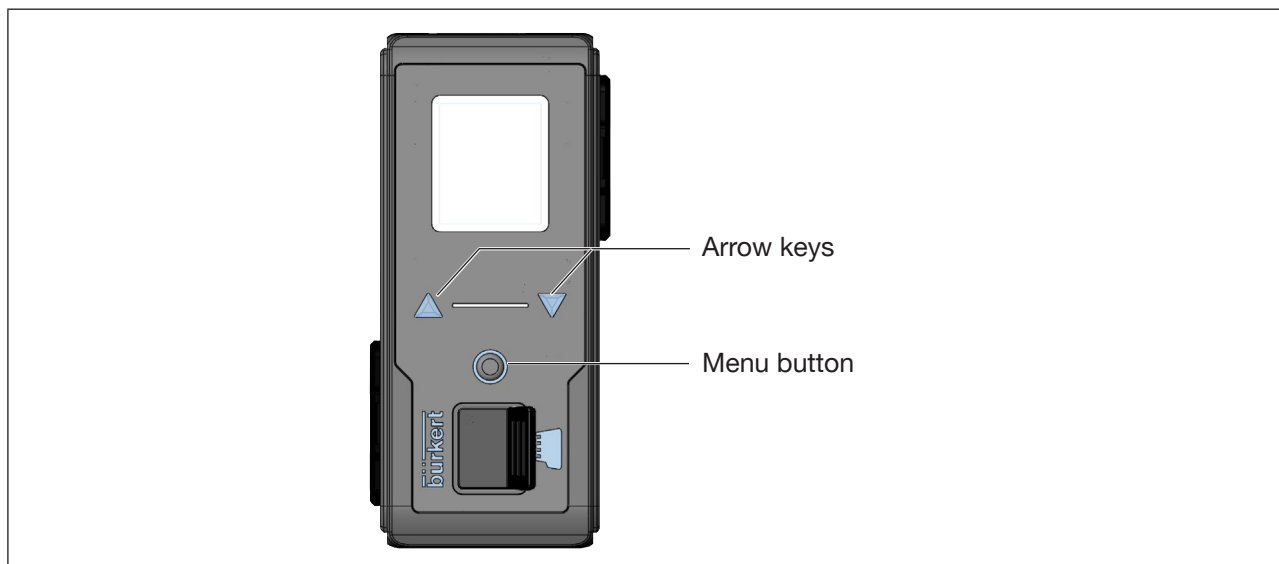


Figure 28: Overview of operating elements of fieldbus gateway ME43

14.1 Operating the fieldbus gateway




Element	Function
 Menu button	<ul style="list-style-type: none"> • Open main menu (double-click) • Confirm inputs
 Arrow keys	<ul style="list-style-type: none"> • Scroll in menu • Change values

Table 9: Function of the keys



14.2 Selecting the protocol

With PROFIBUS DPV1 and CC-Link, the protocol does not have to be selected. It is pre-set by the manufacturer.

For all other protocols:

-  Press menu button twice.
- **Parameter** > **Ind. Comm.** > **Protocol**
- Select and confirm desired protocol.
- Enable settings with **Maintenance** > **Reboot** > **Yes**.

14.3 Enter PROFIBUS address or CC-Link address


-  Press menu button twice.
- Select **Parameter** > **Ind. Comm.** > **Address**.
- Use  menu button to enable processing.
- Set, confirm and save the address with the arrow keys.



The **Address** menu is only available for PROFIBUS or CC-Link devices.


14.4 Setting compatibility mode

For information on compatibility mode, see chapter [“10” on page 44](#).


-  Press menu button twice.
- Select **Parameter** > **Ind. Comm.** > **Comp. Mode**.
- **Specific** or **V2.0** or **Comp. Select V1.0** and confirm.

14.5 Valve configuration

The valve configuration is performed if pneumatic valves are later used on valve slots occupied by blind valves. Or when valves of different types are alternated.




-  Press menu button twice.
- Select **Parameter** > **AirLINE** > **Valve cnf** > **Module 1/2/...** > **Slot 1/2/...**.
- Select new valve type.
- If necessary, configure other slots of this module.
- Scroll down within this module, select **Save**.
- If necessary, select other modules and configure valve slots.
- Use **Back** to navigate to the highest menu level.
- Enable settings with **Maintenance** > **Reboot** > **Yes**.

14.6 Configure pressure sensor(s)

-  Press menu button twice.
- Select **Parameter** > **AirLINE** > **P. sens. cnf** > **Left**, **Right** or **Middle**⁹ > **Inactive** or **Active**.
- Use **Back** to navigate to the highest menu level.
- Enable settings with **Maintenance** > **Reboot** > **Yes**.

⁹⁾ Pressure sensor “Middle” is only available starting at configuration level ≥16 valve slots


14.7 Display: contrast, brightness, installation position, language

-  Press menu button twice.
- **Parameter** > **Display**
- Select value that is to be changed.
- Use  menu button to enable processing.
- Set the desired value with the arrow keys.
- Confirm the value with the  menu button.
- Use **Back** to navigate to the highest menu level.
- Enable settings with **Maintenance** > **Reboot** > **Yes**.


14.8 Configuration provider

Specify whether the valve island will compile the configuration from other devices in the bÜS network (config clients) and saves it on the SD card.

This function is only possible if an SD card is present in the device (see chapter [“25 Accessories” on page 89](#) for information on SD cards)

-  Press menu button twice.
- Select **Parameter** > **CfgProvid.** > **Off** or **On** , confirm.

14.9 Error diagnostics

-  Press menu button twice.
- Select **Diagnostics** , confirm.

The error type and error code are displayed. See chapter [23.7 on page 85](#) for the description of error codes.

14.10 Rebooting the valve island

Some settings require a reboot of the valve island.

- **Maintenance** > **Reboot** > **Yes**


14.11 Factory reset

- **Maintenance** > **Factory reset** > **Yes**


✓ The factory reset starts, and can take a few seconds.

14.12 Reset the switching cycle counters

The switching cycle counters can be reset for the complete valve island (all switching cycle counters of the pilot valves) or for each valve unit (modules).

-  Press menu button twice.
- Select **Maintenance** > **Reset SSC** .
- Select **All SCC** or **Modules 1/2/...** > **Yes**.

14.13 Replacing devices (config clients)

-  Press menu button twice.
- Select **Maintenance** > **DevReplace** .
- Select serial number of original device.
- Select Serial number of replacement device.
- **Do Replace**

15 MENU STRUCTURE FIELDBUS GATEWAY

ro = read only, rw = read/write

Parameter				
	Ind. Comm			
	IP set (for Industrial Ethernet)			
		Address		rw
		Network		rw
		Gateway		rw
	Address (for PROFIBUS DPV1 and CC-Link)			
		Profibus address/CC-Link address		rw
	Protocol (preset at factory for PROFIBUS and CC-Link)			rw
		Profibus		
		CC-Link		
		EtherCAT		
		Profinet		
		EthIP		
		Modbus		
		CC-LinkIE		
	Comp. Mode			rw
		Specific		
		V2.0		
		Comp. V1.0		
	BueS			
	Baudrate			
		500 kbit/s (can be set via PLC or Communicator)		ro
	NodeID			
		Static (can be set via PLC or Communicator)		rw
		Used		
	AirLINE			
	Valve cnf			
		Module 1		
		Slot 1		
			Dummy valve	rw
			2x3/2 C	rw
			2x3/2 C SIA	rw
			2x3/2 D	rw
			5/2 H	rw
			5/2 H SIA	rw
			5/2 Z	rw
			5/2 Z*	rw
			5/3 M	rw
			5/3 L	rw
			5/3 L SIA	rw
			5/3 N	rw
		Slot 2		
			see Slot 1	
		Slot 3		
			see Slot 1	
		Slot 4		
			see Slot 1	
	P.Sens.konf			
		Left		
			Inactiv	rw
			Activ	rw
		Middle		
			Inactiv	rw

			Activ		rw
			Right		
			Inactiv		rw
			Activ		rw
	Display				
		Contrast			rw
		Brightness			rw
		Mounting			
			Rotated		rw
			Normal		rw
			Auto		rw
		Language			
			German		rw
			English		rw
	CfgProvid.				
		Off			rw
		On			rw
Diagnosis					
	Type Code	Error code is displayed with type "Warning". Description of the error code: Page 93			ro
Maintenance					
	Restart				
		No			rw
		Yes			rw
	Fact. reset				
		No			rw
		Yes			rw
	Reset SSC				
		All SSC			rw
		Modul 1			rw
	Ident no.				ro
	Serial no.				ro
	SW version				ro
	HW version				ro
	bùS version				ro
	IComm vers.				ro
	DevReplace				
		Choose S/N of Origin Dev			rw
		X Devices			rw
		Choose S/N of Replac Dev			rw
		X devices			rw
		Do Replace			rw

16 DISPLAY ELEMENTS OF THE FIELDBUS GATEWAY

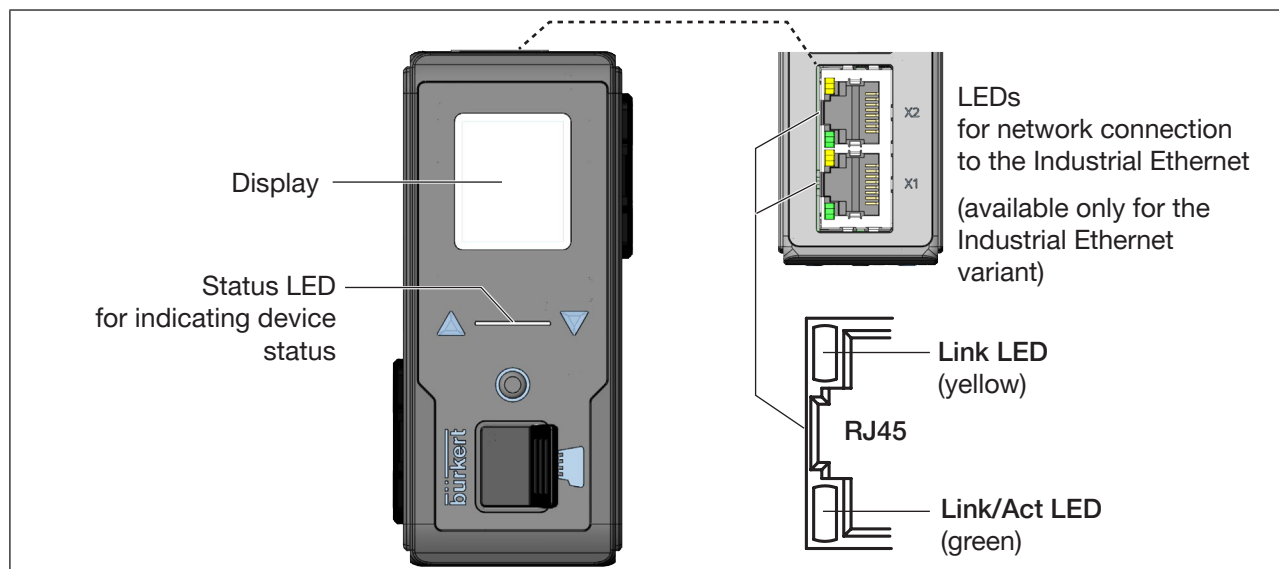


Figure 29: Overview of display elements

16.1 LEDs for displaying the network connection to the industrial Ethernet



The PROFIBUS variant does not have a status display for the connection to the network.
Connection to the network is via a D-Sub, 9-pole push-in connector.

Description:

LED state		Description and cause of error	Action
Link LED (yellow)	Active	Connection to network available.	-
	Not active	No connection to network available.	Check cable.
Link/Act LED (green)	Active	Fast flashing: Connection established to superordinate protocol layer (PROFINET, EtherNet/IP or Modbus-TCP). Data are transferred. Slow flashing, approx. 20 seconds after restart. No connection to protocol layer available.	
	Not active	No connection to network available.	Check cable.

Table 10: Description: LEDs for the network connection

16.1.1 LED for displaying the device status

The LED for displaying the device status changes color and status similar to NAMUR NE 107.

If various alerts are present, the LED always shines in the colour of the highest prioritised alert (red = outage = highest priority).

Displays in NAMUR mode:

Status display similar to NE 107, issue 2006-06-12			
Color	Color code	Description	Meaning
red	5	Outage, error or malfunction	Standard operation is not possible due to malfunctioning in the device or peripheral devices.
orange	4	Function check	The device searches for a bÜS participant, this status is exited after a few seconds.
yellow	3	Out of specification	Ambient conditions or process conditions for the device are outside the specified area. Device internal diagnostics indicate problems in the device or the process characteristics. Data sheet values cannot be observed.
blue	2	Maintenance required	Due to ongoing diagnostics the device has detected a deviation and has carried out a correction. Device functions restricted. The device is in standard operation, but a function is presently restricted. → Perform device maintenance.
green	1	Diagnostics active	Device is operating perfectly. Status changes are indicated in different colors. Messages are transmitted via a fieldbus if connected.
white	0	Diagnostics inactive	Device is switched on. Status conditions are not displayed. Messages are not displayed in the message list or transmitted via a potentially connected fieldbus. Device operates within its specifications.

Table 11: Display of the device status in NAMUR mode



The LED flashes while settings are made with Bürkert Communicator.

17 BÜRKERT COMMUNICATOR BASICS

The Bürkert Communicator software allows the comfortable configuration and monitoring of application-specific parameters.

! The Bürkert Communicator software can be downloaded free of charge from the Bürkert website. In addition to the software, the USB-büS-interface (available as an accessory) is required (see chapter “27 Accessories”).

i The operating instructions for the basic functions of the Bürkert Communicator software can be found on the Bürkert website: www.burkert.com → Type 8920

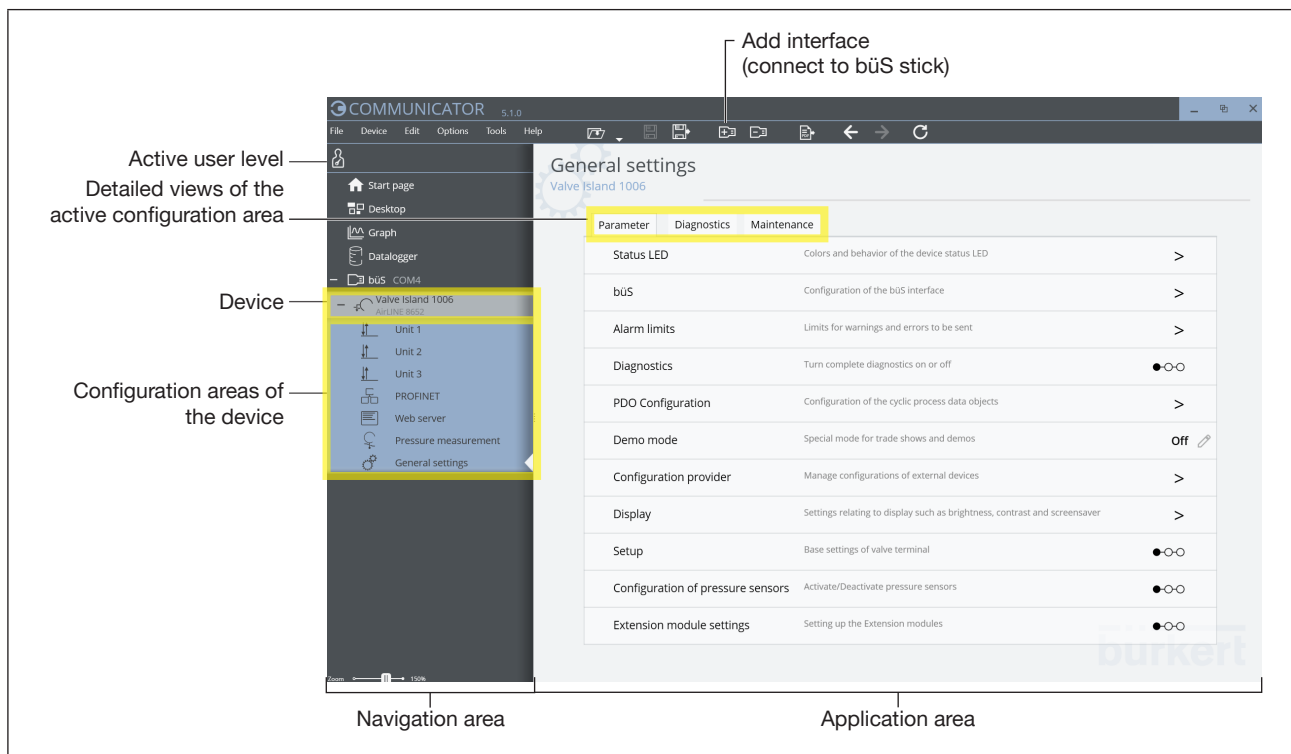


Figure 30: User interface Bürkert Communicator (Example)

When a device is connected to the Bürkert Communicator, it is displayed in the navigation area of the Communicator. Each device has configuration areas that are used to configure the device.

An overview of the menu structure can be found in chapter “[menu structure Bürkert Communicator](#)” on page 69.

Configuration section “Unit”

In the Communicator, a valve unit is referred to as a “unit” (1 valve unit = 1 electronic module with 4 valve slots).

The navigation area of the Communicator lists as many units as there are valve units in the valve island. The units are numbered consecutively, this corresponds to the sequence from left to right within the valve island.

17.1 User levels

Bürkert Communicator is operated within user levels. There are 3 user levels, and each one has certain reading rights and writing rights.

The active user level is indicated by an icon on the upper left margin of the program window.




Icon	User level	Description	Standard password
	User	<ul style="list-style-type: none"> Standard user often only reading right, can change a few values not all menus/values are displayed 	no password
	Advanced user	<ul style="list-style-type: none"> can change certain values can perform simple calibrations not all menus/values are displayed 	5678
	Installer	<ul style="list-style-type: none"> has all rights to operate the Communicator all menus/values are displayed 	1946

Table 12: User levels in ascending order from top to bottom

17.1.1 Change user level

→ Click on the user levels icon on the upper left margin of the program window.
The **User password** window appears.

→ Enter the password for the desired user level in the input field.
The standard passwords are listed in [Table 12](#).

17.1.2 Changing user password

Required user level: "Installer"

Options > **Password manager ...**

→ If necessary, enter the installer password.
The **Change user password** window appears.

→ Enter desired password.

With the **Password manager**, passwords can also be reset to the standard settings.

17.1.3 Disabling user password

Required user level: "Installer"


Options > **Password manager ...**

→ If necessary, enter the installer password.
The **Change user password** window appears.

→ **Disable** the password at the desired user level.

User password	Active user level during program start
No user password disabled	User
"Advanced user" disabled	Advanced user
"Installer" disabled	Installer

17.2 Establishing a connection between the device and the Bürkert Communicator

- Install the Bürkert Communicator software on the PC.
- Set the terminating resistor (at the büS stick, at the device or external terminating resistor).
- Use the büS stick to establish a connection between the device and the PC.
- Open the Bürkert Communicator.
- In the menu bar, click the symbol  for **Add interface**.
- Select **büS stick**
- **Finish**
- ✓ You have established a connection between the device or network and the Bürkert Communicator. The device or devices in the network are displayed in the navigation area.



The LED for indicating the device status on the fieldbus gateway display flashes while settings are made with Bürkert Communicator.

18 CONFIGURATION WITH BÜRKERT COMMUNICATOR



If a menu is not visible, check the active user level (see chapter “17.1 User levels” on page 61). Some menus are only visible in the “Installer” user level.

18.1 Base valve island settings

Settings for the valve islands such as valve configuration, troubleshooting or feedback source are made in this menu via a wizard.

General settings > **Parameter** > **Setup**

✓ A wizard guides you through the base device settings.

18.2 Base Industrial communicator settings

The protocol **(Protocol name)** used is indicated in the configuration area of the Communicator. The protocol-specific settings on parameters, diagnostics and maintenance can be entered in this menu.

18.2.1 Start Setup Wizard

Protocol-specific settings can be managed and checked for correctness via the setup wizard. The setup wizard is only available for Industrial Ethernet protocols.

(Protocol name) > **Parameter** > **(Protocol name) settings** > **Start setup wizard**

18.2.2 Change protocol

For devices with an Industrial Ethernet interface, the protocol can be changed. If devices feature a PROFIBUS interface or CC-Link interface, the fieldbus protocol has been preset at the factory and cannot be changed.

(Protocol name) > **Parameter** > **Change protocol**

→ In the drop-down menu on the right, select the protocol.

→ Restart the device.

18.2.3 Configuring the fieldbus gateway

The device description file must first be loaded in the corresponding projection tool (e.g. TIA portal, RSLogix) for the fieldbus configuration. The corresponding protocol-specific settings can then be made in the configuration area **(protocol name)**.



Description of the gateway configuration can be found in the fieldbus gateway Type ME43 operating instructions at: www.burkert.com.

If additional bÜS devices are connected to the valve island and are to be connected to a controller through them, the valve island can also be configured as a gateway.

Note! This generates a new description file, and functions such as PROFINET alarms or generally acyclic data of the valve island are no longer accessible to the controller. That is why this function is only conditionally recommended.

18.2.4 Enter PROFIBUS address

PROFIBUS > **Parameter** > **PROFIBUS settings** > **PROFIBUS address**

→ Enter address. Valid addresses: 0–126 (factory setting value: 3)

If an address outside the valid range has been set, the device will issue an error message.

18.2.5 Enter CC-Link address

CC-Link > **Parameter** > **CC-Link settings** > **CC-Link address**

→ Enter address. Valid addresses: 1–64 (factory setting value: 64)

18.2.6 Converting compatibility mode

For information on compatibility mode, see chapter “10” on page 44.

(Protocol name) > **Parameter** > **PLC connection compatibility**

→ Use the wizard in the drop-down menu to select the required version of the start-up data for the device.

18.2.7 Read current IP address

If the IP address has been changed to an unknown value, the current IP address can be read in Bürkert Communicator.

(Protocol name) > **Parameter** > **(Protocol name) settings**

18.2.8 Industrial Ethernet settings

(Protocol name) > **Parameter** > **(Protocol name) settings**

Protocol	EtherCAT	PROFINET	EtherNet/IP	Modbus TCP
Fixed IP address	–	X	X	X
Network interface	–	X	X	X
Standard gateway	–	X	X	X
Temporary IP address	–	X	X	–
DNS-compatible name (no special characters _ () / \ * are allowed in the name)	–	X	–	–

Factory settings:

Protocol	EtherCAT	PROFINET	EtherNet/IP	Modbus TCP
Default IP address	–	000.000.0.000	192.168.0.100	192.168.0.100
Default name		AirLINE-8652	–	–

18.3 Base settings CANopen/büS

If devices feature CANopen/büS communication, the “CANopen” bus operation mode has been preset at the factory.

18.3.1 Switching over bus operation mode

Bus operation mode can be switched over to “büS” using Bürkert Communicator.

General settings > **Parameter** > **büS** > **Advanced** > **Bus mode**

→ Select the bus operation mode in the drop-down menu on the right.

18.4 Reset to factory settings

General settings > **Maintenance** > **Reset device** > **Reset to factory settings**

18.5 Restarting the device

Some settings require a reboot of the valve island.

General settings > **Maintenance** > **Reset device** > **Restart**

18.6 Using external position feedback sensors

Any DI modules with an 8-bit output can be used as external position feedback sensors (check other variants if necessary).

Type ME64 or ME44

If the valve island with a DI module Type ME64 or ME44 is used, wire break or short circuit alerts can be indicated on the valve unit display as though it were an internal module.

To do so, make the following settings:

General settings > **Parameter** > **büS** > **Advanced** > **Show errors from büS partners**

→ On the drop-down menu on the right, select **All partners** or **Only producers**.

Errors from external consumers are ignored in the setting **None (default)**.

18.7 Start switching time monitoring

Monitoring the switching time duration of process valves. For further information see chapter [“12.2 Function Switching time monitoring”](#) on page 47.

Unit X > **Switching time monitoring** > **Measurement**

✓ A wizard starts measuring the actuator run time.

18.8 Disabling access to web server

The valve island has an integrated web server via which the device can be configured. The web server is enabled upon delivery. Web server access can be disabled via the Bürkert Communicator software.

Web server > **Parameter** > **Activate web server**

See also chapter [“13”](#) on page 48.

18.9 Using extension modules (EM)



This function is available for backward compatibility purposes and does not contain any of the new functions.

Description of how to connect other devices with the controller can be found in the fieldbus gateway Type ME43 operating instructions at: www.burkert.com.

Extension modules are installed on a valve island with a fieldbus connection. As a result, further valve islands can be activated via this valve island without a fieldbus connection.



1 extension module corresponds to 1 valve unit (4 valves and 1 electronic module).

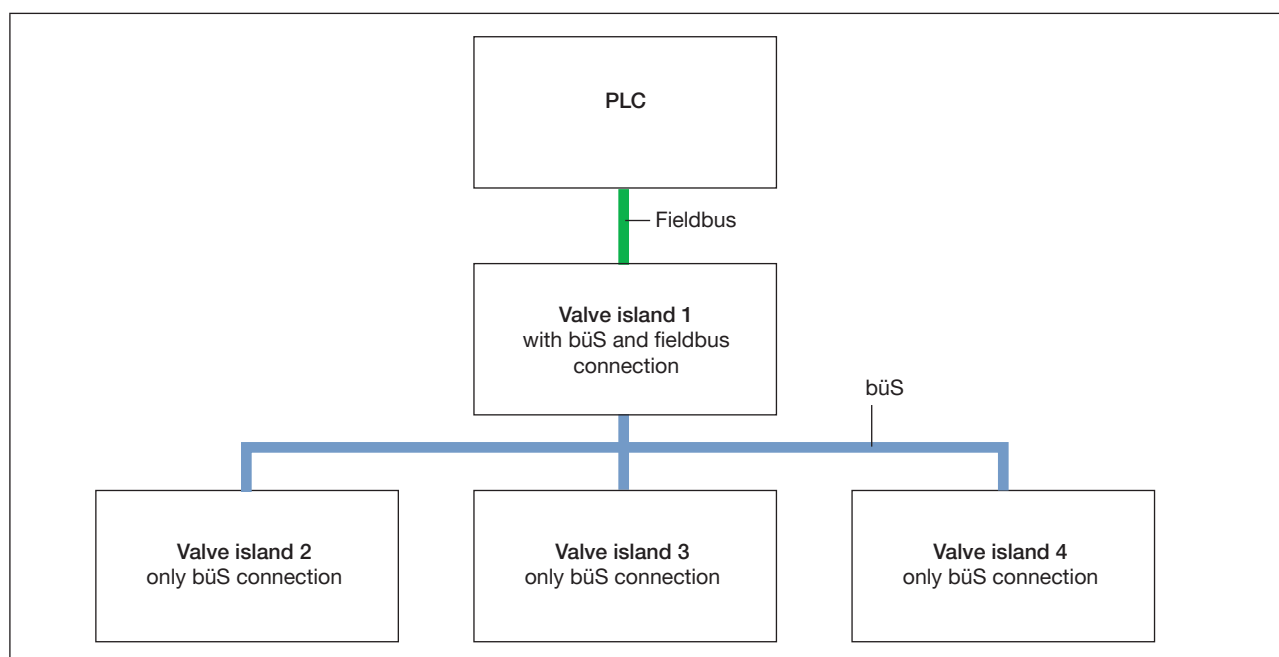


Figure 31: Schematic layout of a bus system with extension modules

18.9.1 Configuration of the fieldbus

If the valve island is operated with extension modules, the respective start-up files must be applied. These start-up files do not contain acyclic objects. The configuration of valve islands with extension modules must be carried out using the Bürkert Communicator.

The start-up files, such as the EDS, GSD, and GSDML file, required by the respective design software are available online.



Download the start-up files from:
www.burkert.com → Type 8652




Two variants of the start-up files are available for download for each protocol. The variants differ according to whether the valve island is operated with extension modules or not.

Start-up files for valve islands with extension modules have the letters “EM” in the file name.

For instructions on installation of the start-up files, please refer to the documentation of the design software being used.

18.9.2 Configuring the valve island with extension modules

→ Open the Bürkert Communicator.

→ In the menu bar, click the symbol  for **Add interface**.

→ Select **büS stick** and **Finish**

✓ The devices in the network are displayed in the navigation area.

→ Click on the  before the valve island with fieldbus connection.

→ Select **General settings**.

→ In detailed view **Parameter** select the menu **Extension module settings**.

A wizard guides you through the settings. When the wizard has finished, a restart is initiated.

✓ 9 extension modules are available.

18.9.3 Configuring the büS network

→ Select  **büS** in the navigation area.

→ Select the detailed view **Network Configuration**.

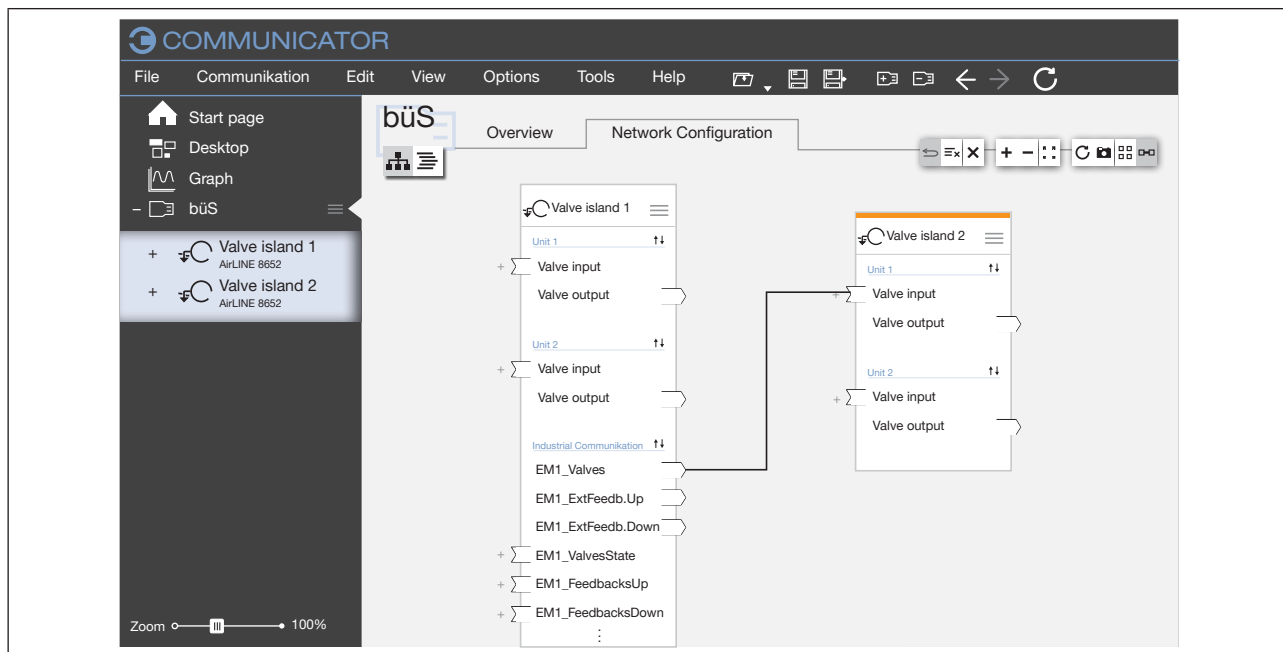


Figure 32: Configuring the büS network in the detailed view "Network Configuration"

There are 2 methods of configuring the network:


1. Using drag-and-drop

→ Use drag-and-drop to parameterize the inputs and outputs.

(Dashed connections do not yet represent an active connection between devices.

Compatible connection points are highlighted in blue).

2. Using list box

- Click on the  before the respective input.
Possible connections are offered as a list box.
- Click on desired connection. The connection is automatically generated.

For both methods:

- When all connections have been generated, select **Apply changes.**

All the configured devices are restarted.

- ✓ You have configured the büS network.




19 MENU STRUCTURE BÜRKERT COMMUNICATOR






Bürkert Communicator is operated within user levels. There are 3 user levels, and each one has certain reading rights and writing rights.













See also chapter “17.1 User levels” on page 61.




ro = read only, rw = read/write




Configuration section “Unit”					
Parameter					
Valve configuration			rw	rw	rw
Fault handling			rw	rw	rw
Diagnostics			rw	rw	rw
Position feedback sensor			rw	rw	rw
Switching time monitoring					
	Measurement		rw	rw	rw
	Settings		rw	rw	rw
Diagnostics					
Channel maintenance			ro	ro	ro
Channel fault			ro	ro	ro
Maintenance					
Actuator			rw	rw	rw
Pilot valve			rw	rw	rw
Routine maintenance			rw	rw	rw

Configuration section “Protocol name”					
Parameter					
Protocol			rw	ro	ro
“Protocol name” settings*					
(PROFIBUS DPV1)	PROFIBUS address		rw	ro	ro
	Set baud rate		rw	ro	ro
	Advanced settings				
		Internal cycle time	rw	ro	ro
		Control mode settings	rw	–	–
		Protocol firmware update	rw	–	–
(CC-Link)	CC-Link settings		rw	ro	ro
	address		ro	ro	ro
	bit rate		ro	ro	ro
	Number of stations		ro	–	–
	Number of cycles		ro	–	–
	CC-Link version		ro	–	–
	Advanced settings				
		Internal cycle time	rw	ro	ro
		Control mode settings	rw	–	–
		Firmware update protocol	rw	–	–
(EtherCAT)	Wizard		rw	–	–
	Station alias		rw	ro	ro
	MAC address		ro	ro	ro
	Advanced settings				
		Internal cycle time	rw	ro	ro
		Control mode settings	rw	–	–
		Firmware update protocol	rw	–	–
(PROFINET)	Start setup Wizard		rw	–	–

Configuration section "Protocol name"						
		IP parameter settings		rw	–	–
		DNS compatible name		rw	ro	ro
		Static IP address		rw	ro	ro
		Network mask		rw	ro	ro
		Default gateway		rw	ro	ro
		Temporary IP address		rw	ro	ro
		MAC address		ro	ro	ro
		Advanced settings				
			Alarm settings	rw	ro	ro
			Internal cycle time	rw	ro	ro
			Control mode settings	rw	–	–
			Protocol firmware update	rw	–	–
(EtherNet/IP)		IP parameter settings		rw	–	–
		IP settings		rw	ro	ro
		Static IP address		rw	ro	ro
		Network mask		rw	ro	ro
		Default gateway		rw	ro	ro
		Temporary IP address		rw	ro	ro
		MAC address		ro	ro	ro
		Advanced settings				
			Internal cycle time	rw	ro	ro
			Control mode settings	rw	–	–
			Protocol firmware update	rw	–	–
(Modbus TCP)		Start setup wizard		rw	–	–
		IP parameter settings		rw	–	–
		Static IP address		rw	ro	ro
		Network mask		rw	ro	ro
		Default gateway		rw	ro	ro
		MAC address		ro	ro	ro
		Advanced settings				
			Internal cycle time	rw	ro	ro
			Communication Timeout	rw	ro	ro
			Control mode settings	rw	–	–
			Protocol firmware update	rw	–	–
(CC-Link IE field basic)		Start setup wizard		rw	–	–
		IP parameter settings		rw	–	–
		Static IP address		rw	ro	ro
		Network mask		rw	ro	ro
		Default gateway		rw	ro	ro
		MAC address		ro	ro	ro
		Advanced settings				
			Internal cycle time	rw	ro	ro
			Control mode settings	rw	–	–
			Protocol firmware update	rw	–	–
Gateway configuration						
		Download a gateway configuration file		rw	–	–
		Create a gateway configuration		rw	–	–
Hide process values						
		Edit hide objects		rw	–	–
		Reset hidd objects		rw	–	–
Change protocol				rw	–	–
		Protocol		rw	–	–
PLC connection compatibility						
		To choose: Start-up file Version V01 or Version V02		rw	ro	ro

Configuration section "Protocol name"						
Diagnostics						
	Protocol			ro	ro	ro
	Communication status			ro	ro	ro
	Control mode settings			ro	ro	ro
	Connections to PLC			ro	ro	ro
	Used internal cycle time			ro	ro	ro
	Advanced					
		Last status code		ro	–	–
Maintenance						
	Version numbers					
		Stack Name		ro	ro	ro
		Stack Version		ro	ro	ro
		Stack Build		ro	ro	ro
		Stack Revision		ro	ro	ro
		Stack Date		ro	ro	ro
		ICom version		ro	ro	ro
	Hardware reset			rw	–	–
Configuration section „Web server“						
Parameter						
	Activate web server			ro	–	–
Configuration section „Pressure measurement“						
Parameter						
	Left/middle/right pressure sensor					
		Alarm limits				
		Maximum pressure		ro	ro	ro
		Error high		rw	ro	ro
		Error low		rw	ro	ro
		Warning high		rw	ro	ro
		Warning low		rw	ro	ro
		Hysteresis		rw	ro	ro
		Enter fault state		rw	ro	ro
		Presentation				
		Display number		rw	rw	rw
		Unit		rw	rw	rw
		Cyclic output active		rw	ro	ro
Diagnostics						
	Left/middle/right pressure sensor					
		Status of pressure infeed		ro	ro	ro
		Pressure		ro	ro	ro
		Maximum pressure		ro	ro	ro
		Minimal pressure		ro	ro	ro
		Reset min/max values		rw	rw	ro
Configuration section "General settings"						
Parameter						
	Status LED					
		Operation mode		rw	ro	ro
		Colour (menu only appears when the "Fixed colour" operation mode is activated)		rw	ro	ro
	büS					
		Displayed name		rw	rw	ro
		Location		rw	ro	ro

Configuration section "General settings"						
	Description			rw	ro	ro
	Advanced					
		Unique device name		rw	ro	ro
		Baud rate		rw	ro	ro
		Fixed CANopen address		rw	ro	ro
		CANopen address		ro	ro	ro
		Bus mode		rw	ro	ro
	Menu only appears when "CANopen" is selected as the bus operation mode.	CANopen status		rw	ro	ro
	Menu only appears when "bÜS" is selected as the bus operation mode.	Show errors from bÜS partners		rw	ro	ro
		Deallocation delay		rw	ro	ro
Alarm limits						
	Supply voltage					
		Error low		ro	ro	ro
		Error high		ro	ro	ro
		Hysteresis		ro	ro	ro
	Device temperature					
		Error low		ro	ro	ro
		Error high		ro	ro	ro
		Hysteresis		ro	ro	ro
	Warning battery voltage below			ro	ro	ro
Diagnostics				rw	ro	ro
PDO configuration				rw	rw	rw
Demo mode				rw	–	–
Configuration provider						
	Status			rw	ro	ro
	Remove client configurations			rw	ro	ro
	Reconfiguration of all clients			rw	ro	ro
	Ignore offline clients			rw	ro	ro
Display						
	Brightness			rw	rw	rw
	Contrast			rw	rw	rw
	Fieldbus gateway installation position			rw	rw	rw
	Screensaver			rw	rw	rw
		Delay		rw	rw	rw
		Brightness		rw	rw	rw
	Reinitialization			rw	rw	rw
Setup				rw	rw	rw
Configuration of pressure sensors				rw		
Extension module settings				rw	rw	rw
Diagnostics						
Device status						
	Operating duration			ro	ro	ro
	Operating duration since last boot			ro	ro	ro
	Device temperature			ro	ro	ro
	Supply voltage			ro	ro	ro
	Voltage drops			ro	ro	ro
	Min./Max. values			ro	ro	ro
		Min. temperature		ro	ro	ro
		Max. temperature		ro	ro	ro
		Min. supply voltage		ro	ro	ro
		Max. supply voltage		ro	ro	ro
	Device boot counter			ro	ro	ro
	Transferable memory status			ro	ro	ro
	Current system time			ro	ro	ro

Configuration section "General settings"						
		Battery voltage		ro	ro	ro
	büS status					
		Receive errors		ro	ro	ro
		Receive errors max.		ro	ro	ro
		Transmit errors		ro	ro	ro
		Transmit errors max.		ro	ro	ro
		Reset error counter		rw	ro	ro
		CANopen status		ro	ro	ro
	Logbook			ro	ro	ro
	Configuration provider					
		Status		ro	ro	ro
		Managed clients		ro	ro	ro
		- Thereof number of offline configurations		rw	rw	rw
		- Thereof number of forced reconfigurations		rw	rw	rw
		Reconfigured clients		rw	rw	ro
		Loaded client configurations		rw	rw	ro
		Missing clients		rw	rw	ro
		Failed configuration loads		rw	rw	ro
		Failed reconfigurations		rw	rw	ro
		Managed clients		ro	ro	ro
	Maintenance					
	Device information					
		Displayed name		ro	ro	ro
		Ident. number		ro	ro	ro
		Serial number		ro	ro	ro
		Software ident. number		ro	ro	ro
		Software version		ro	ro	ro
		büS version		ro	ro	ro
		Hardware version		ro	ro	ro
		Product type number		ro	ro	ro
		Manufacture date		ro	ro	ro
		eds version		ro	ro	ro
		Device driver				
			Driver version	ro	ro	ro
			Firmware group	ro	ro	ro
			DLL version	ro	ro	ro
			Origin	ro	ro	ro
	Reset device					
		Restart		rw	ro	ro
		Reset to factory settings		rw	ro	ro

20 START-UP

20.1 Safety instructions



WARNING

Risk of injury from improper operation.

Improper operation may result in injuries as well as damage to the device and its environment.

- ▶ Before start-up, ensure that the operating personnel are familiar with and completely understand the contents of the operating instructions.
- ▶ Observe safety instructions and information on intended use.
- ▶ Only adequately trained personnel may start up the device.

NOTE

Internal short circuit between the auxiliary pilot air and the pilot pressure.

To avoid an internal short circuit, the seals of the connection modules must be positioned the same (external or internal supply of auxiliary pilot air). Mixing the external or internal supply is not permitted.

- ▶ Prior to start-up, make sure all the seals of the connection modules are positioned the same (external or internal, see “Figure 25”).

20.2 Starting up via manual override

The manual override is ideal for starting up the device and system. The manual override operates without the valve island being connected to the power supply and enables manual switching of the valves.

The manual overrides are marked differently depending on the circuit function (CF) of the valves.

CFC, CFZ, CFH (with CFH only 1 manual override):

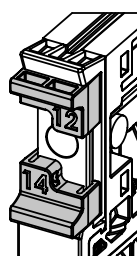
Marking	Impact of the switched manual override
12	Supply duct 1 connected to working port 2
14	Supply duct 1 connected to working port 4

CFD:

Marking	Impact of the switched manual override
10 (12)	Connection from supply duct 1 to working port 2 interrupted
10 (14)	Connection from supply duct 1 to working port 4 interrupted



Manual override
not switched



Manual override
switched

Figure 33: Manual override of valves

Manual override provides both spring-return and latching action as standard.

Spring return:

If the slide mechanism is moved to an initial resistor, the manual override returns to the unswitched state once it is released.

Latching:

If the resistor is exceeded, the manual override remains in the switched state after being released. Manually push the slide mechanism back over the locking point to reset the manual override to the unswitched state.

20.2.1 Additional element “MO locking”

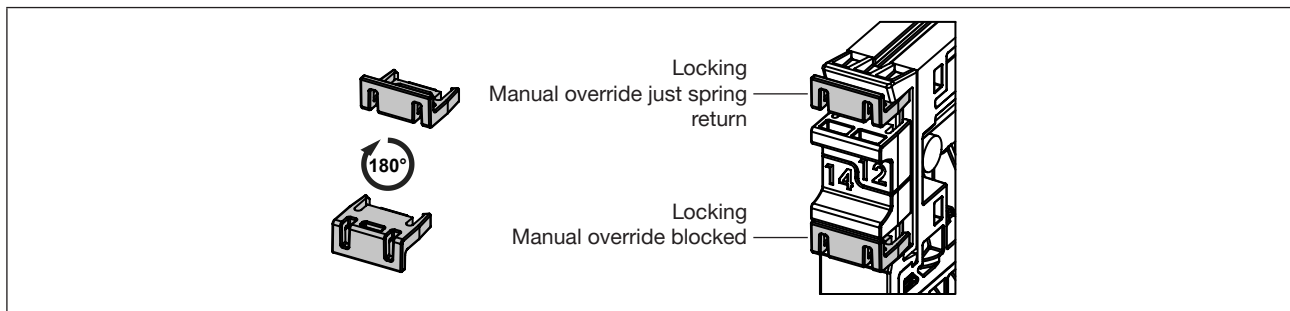


Figure 34: Additional element “MO locking”

The additional element “MO locking” helps to restrict manual override.

Depending on the position (rotated 0° or 180°) of the clipped-on additional element, the manual override is just spring return or blocked.

20.3 Marking the valve slots

The valve island is supplied with MultiCard format device markers:

Device marker ESG 5/10 MC NE WS

The individual device markers are fixed to a sprue and can be printed in this form using standardized industrial printers (e.g. from Weidmüller). After printing, remove the device markers from the sprue and clip them onto the valve.

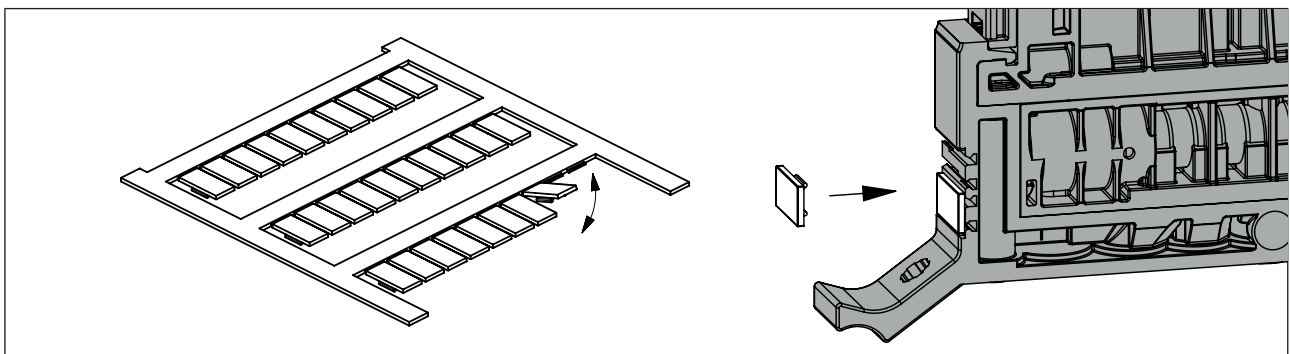


Figure 35: Marking the valve slots using MultiCard format device markers: After printing, remove the device markers from the sprue and clip them onto the valve.

21 DISPLAY ELEMENTS

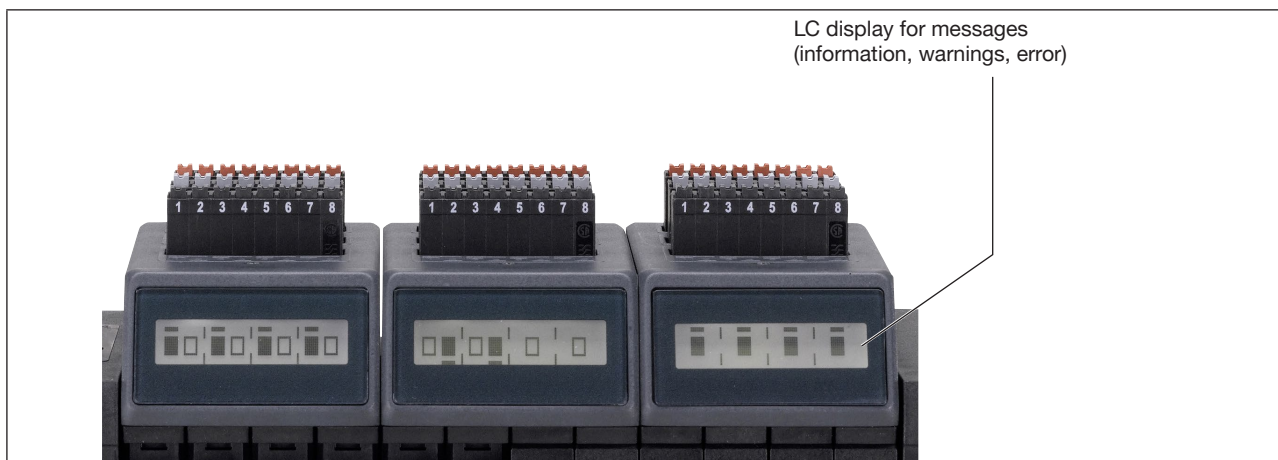


Figure 36: Display elements at the electronic module






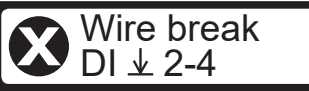



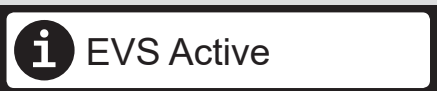


The electronic modules are equipped with an LC status display. The switching position and potential error states of the output are displayed graphically on the display. Further information can be displayed depending on the configuration of the module, e.g.

- position of the actuator allocated to the output.

Messages (information, warnings, error) appear as text on the LC display. The text message display alternates cyclically with the graphical display of the channel status.

21.1 Display views

	Display view with 4 valve slots (e.g. 5/2-way valves)
	Display view with 4 valve slots (double valves, e.g. 2X3/2-way valves)
	Mixed display view (double and single valves)
	Valve 1 actuated
	Valve 1 actuated, feedback: "Upper end position reached"
	Valve 1 actuated, feedback: "Lower end position reached"
	Valve 1 + 2 each have 1 valve slot Valve 3 + 4 each have 1 empty slot (blind valve)

<p>Alternating message 1 / message 2:</p>  <p>Message 1</p>  <p>Message 2</p>	<p><i>Short circuit at input 2 of the upper position feedback unit</i></p>	<p>Example of other possible messages:</p>  <p><i>Short circuit at inputs 2–4 of the lower position feedback unit</i></p>
<p>Alternating message 1 / message 2:</p>  <p>Message 1</p>  <p>Message 2</p>	<p><i>Wire break at input 2 of the upper position feedback unit</i></p>	<p>Example of other possible messages:</p>  <p><i>Wire break at inputs 2–4 of the lower position feedback unit</i></p>
<p>Alternating message 1 / message 2:</p>  <p>Message 1</p>  <p>Message 2</p>	<p><i>Maintenance limit for pilot valve 1 reached</i></p>	<p>Example of other possible messages:</p> <p>Act. SCC Limit Ch. 1</p> <p><i>Maintenance limit for actuator 1 reached</i></p>
<p>Alternating message 1 / message 2:</p>  <p>Message 1</p>  <p>Message 2</p>	<p><i>EVS has been implemented for this valve unit. Logic, display and diagnostics continue to operate unaffected and remain available.</i></p>	
<p>Alternating message 1 / message 2:</p>  <p>Message 1</p>  <p>Message 2</p>	<p><i>If connection modules are equipped with an integrated pressure sensor, the current medium pressure can be indicated on the display (can be activated via the web server or the Bürkert Communicator software).</i></p>	

22 MICRO SD CARD

The microSD card can be used to save device-specific values and user settings and to transfer them to another device.



The microSD card is not suitable for back-ups. If the microSD card of the device is re-inserted at a later date, the data saved last are not restored. The microSD card is only used to exchange data.

Please note:

Resetting the device to the factory settings also resets the data stored on the SD card.

A newly inserted microSD card is checked for existing data when restarting the device. Based on this, these data are accepted or overwritten:

- **The microSD card does not receive data.**
The existing device-specific values and user settings are saved on the microSD card.
- **The microSD card receives data which are compatible with the device.**
The data of the microSD card are accepted by the device. The existing device-specific values and user settings are overwritten.
- **The microSD card receives data which are not compatible with the device.**
The device overwrites the data of the microSD card with the unique, device-specific values and user settings.

NOTE

The applied microSD card is a special industry version that is particularly durable and temperature resistant.

- Do not use a standard microSD card for the device. Only acquire the microSD card for the device from your Bürkert sales department.

Changing the microSD card

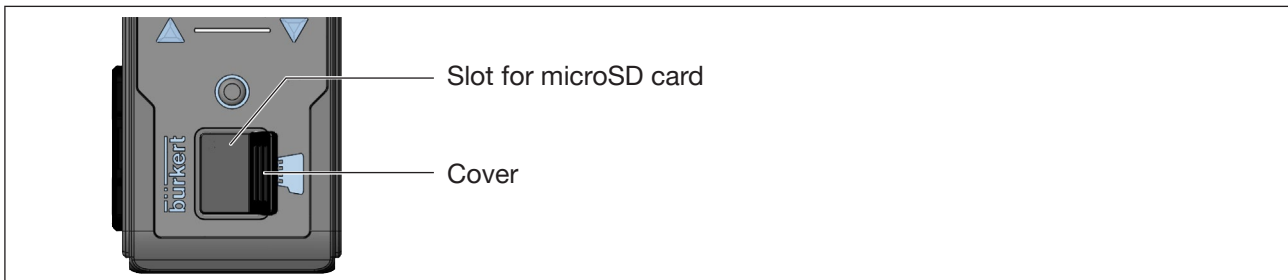


Figure 37: Changing the microSD card

NOTE!

Do not remove the SD card while the supply voltage is applied.
If the SD card is removed while the supply voltage is applied, data may be lost and the SD card may be damaged.



The SD card can be inserted while the supply voltage is applied.
A restart is required to ensure that the device detects the SD card.

Removing the microSD card:

- Extract the cover from the recess and turn it to the top left.
- Gently press the edge of the microSD card to eject it.

Inserting the microSD card in the replacement device:

 **Make sure the card is inserted in the correct direction.**

- Push the microSD card into the card slot. Make sure the microSD card engages properly.
- Use the cover to seal the card slot.

23 REPLACING SPARE PARTS



WARNING

Risk of injury due to improper installation work.

- ▶ Only trained technicians may perform installation work.
- ▶ Perform installation work using suitable tools only.

The following modules are available as spare part kits for the valve island AirLINE Type 8652

- Connection module
- Electronic module
- Pneumatic valves

If modules with modified functions are used, the modifications must be adapted accordingly in the device configuration. This can be achieved via the Bürkert Communicator software or via the web server, in some cases also via the display of the fieldbus gateway ME43 (pressure sensor and valve configuration).

23.1 Connection module without pressure sensor

Connection modules without pressure sensor can be equipped with an additional port for the compressed air supply. This additional port is advantageous, e.g., for easier tubing when the compressed air source is located in the control cabinet.

Variant	Port size	Order no.
With an additional port for the compressed air supply	Plug-in coupling Ø 6 mm and Ø 10 mm	384863
	Plug-in coupling Ø 1/4" and Ø 3/8"	384864
Without an additional port for the compressed air supply		384866

Table 13: Overview of the "connection module without pressure sensor" variants

23.1.1 Replacing the connection module



DANGER

Danger due to high pressure, escaping medium and uncontrolled movement of the actuators.

- ▶ Secure the actuators against shifting before working on the device or plant.
- ▶ Switch off the pressure before working on the device or plant. Vent or empty the lines.

NOTE

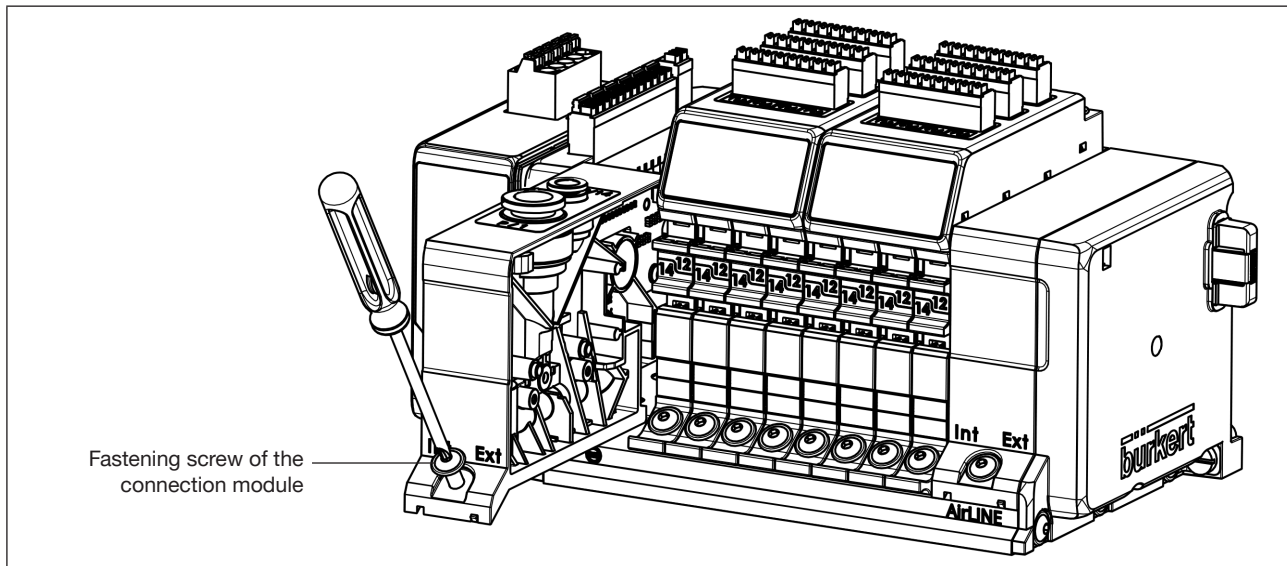
Internal short circuit between the auxiliary pilot air and the pilot pressure.


To avoid an internal short circuit, the seals of the connection modules must be positioned the same (external or internal supply of auxiliary pilot air). Mixing the external or internal supply is not permitted.

- ▶ Never mix the external or internal supply.
- ▶ Note chapter "9.1.2 External and internal auxiliary pilot air" on page 43.



The X port always has to be connected for an external supply.



-  Observe the safety instructions.
- Use a screwdriver (TX 20) to undo the fastening screw of the connection module.
- Extract the connection module from the front.
- Insert the new connection module and screw it into position (tightening torque 2 Nm).

23.2 Connection module with pressure sensor

Connection modules with pressure sensor are always equipped with an additional port for the compressed air supply. They are available in the following variants:

Variants	Order no.
Port for the compressed air supply: Plug-in coupling Ø 6 mm and Ø 10 mm	384867
Port for the compressed air supply: Plug-in coupling Ø 1/4" and Ø 3/8"	384868

Table 14: Overview of the "connection module with pressure sensor" variants



Due to technical reasons, a connection module with pressure sensor cannot be used with devices purchased before 1 July 2020.

23.2.1 Replacing the connection module



DANGER

Danger due to high pressure, escaping medium and uncontrolled movement of the actuators.

- ▶ Secure the actuators against shifting before working on the device or plant.
- ▶ Switch off the pressure before working on the device or plant. Vent or empty the lines.



CAUTION

Risk of injury due to electrical voltage.

- ▶ Switch off the power supply before working on the device or plant. Secure against reactivation.
- ▶ Observe the applicable accident prevention and safety regulations for electrical devices.

CAUTION

Electrostatically sensitive components and assemblies.

The device contains electronic components that are susceptible to the effects of electrostatic discharging (ESD). Components that come into contact with electrostatically charged persons or objects are at risk. In the worst case scenario, these components will be destroyed immediately or fail after start-up.

- ▶ Meet the requirements specified by EN 61340-5-1 to minimise or avoid the possibility of damage caused by a sudden electrostatic discharge.
- ▶ Do not touch electronic components when the supply voltage is connected.

NOTE

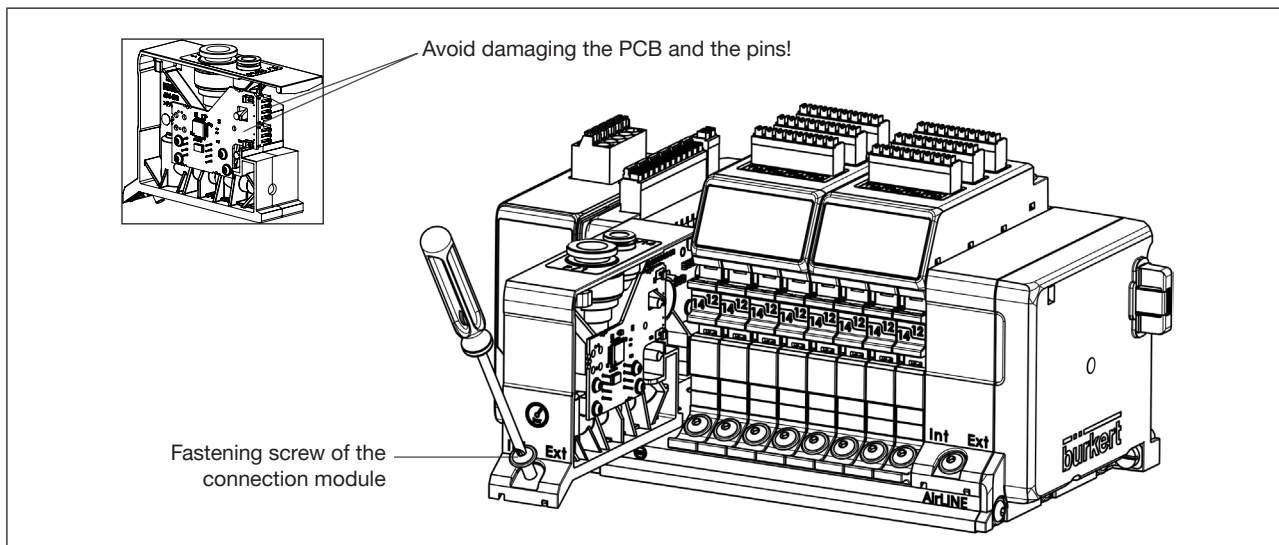
Internal short circuit between the auxiliary pilot air and the pilot pressure.

To avoid an internal short circuit, the seals of the connection modules must be positioned the same (external or internal supply of auxiliary pilot air). Mixing the external or internal supply is not permitted.

- ▶ Never mix the external or internal supply.
- ▶ Note chapter "9.1.2 External and internal auxiliary pilot air" on page 43.



The X port always has to be connected for an external supply.



- **!** Observe the safety instructions.
- Ensure the PCB and the pins of the new connection module are not damaged during all stages of the assembly process.
- Use a screwdriver (TX 20) to undo the fastening screw of the connection module.
- Extract the connection module from the front.
- Insert the new connection module into a free slot and screw it into position (tightening torque 2 Nm).
- Adapt the modified device configuration (pressure sensor), if necessary (via Bürkert Communicator software, ME43 display or web server).

23.3 Electronic module

The electronic module is available in the following variants:

Variants	Order no.
Electronic module with digital inputs	384872
Electronic module without digital inputs	384873

Table 15: Overview of "electronic module" variants

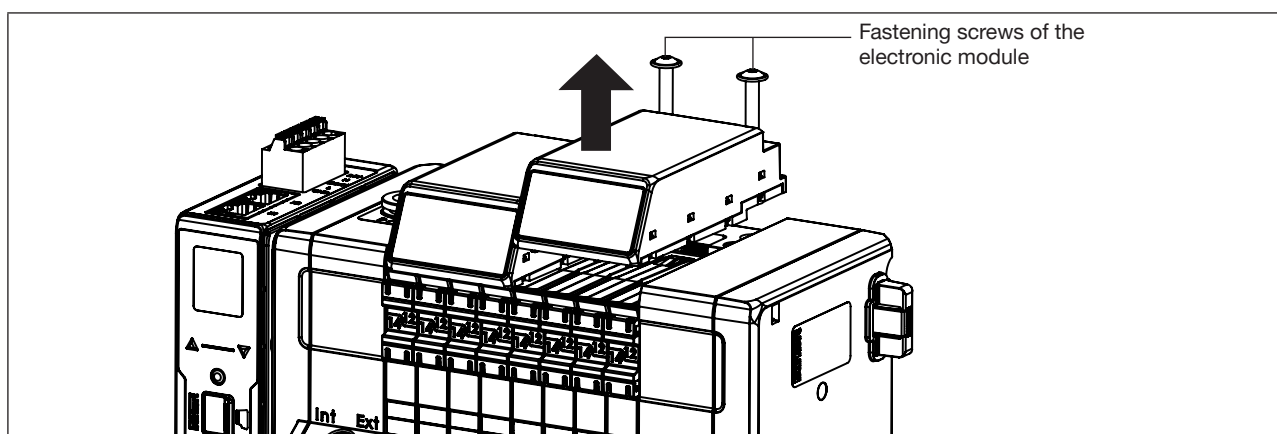
23.3.1 Replacing the electronic module


CAUTION

Irreparable damage to the fieldbus gateway.

If an electronic module is detached from an energised valve island, the electronics of the fieldbus gateway may be destroyed.

- Therefore, always switch off the voltage before unscrewing the electronic module from the valve island. Secure against reactivation.



-  Observe the safety instructions.
- Use a screwdriver (TX 20) to undo the fastening screws of the electronic module.
- Extract the electronic module from the top.
- Insert the new electronic module into a free slot and screw it into position (tightening torque 2 Nm).
- Adapt the modified device configuration (digital inputs), if necessary (via Bürkert Communicator software or web server).

23.4 Pneumatic valves

Pneumatic valves are available in the following variants:

Variants	Order no.
2x CFC (2x 3/2-way normally closed)	301374
2x CFD (2x 3/2-way normally open)	301375
CFH (5/2-way monostable)	301376
CFZ (5/2-way bistable)	301377
CFM (5/3-way pressurised)	301379
CFL (5/3-way blocked)	301380
CFN (5/3-way vented)	301381
Blind valve	335779
2x CFC SIA (2x 3/2-way normally closed)	338802
CFH SIA (5/2-way monostable)	338805
CFL SIA (5/3-way blocked)	346830

Table 16: Overview of "pneumatic valve" variants

23.4.1 Replacing a pneumatic valve



DANGER

Risk of injury due to high pressure and escaping medium at valve islands without hot swap function.

- At valve islands without hot swap function, secure the actuators against shifting before working on the device or plant.
- At valve islands without hot swap function, switch off the pressure before working on the device or plant. Vent or empty the lines.

Risk of injury due to high pressure and escaping medium at valve islands with hot swap function.

When dismantling a valve, lines and actuators may still be pressurised, which can cause uncontrolled movement of the actuator.

- At valve islands with hot swap function, secure the actuators against shifting before working on the device or plant.

At valve islands with hot swap function, the valves can be replaced under pressure.



To ensure safe dismantling of the valve from the valve island, there must be sufficient space to extract the valve from the front. In this case, the minimum distance between the valve island and the front edge of the control cabinet must be taken into account (see chapter "7.1" on page 26).

If there is not sufficient space to the front edge of the control cabinet, proceed as specified in chapter "23.4.2 Replacing a pneumatic valve (without minimum distance)" on page 87 when replacing a valve. In this case, the hot swap function is disabled!

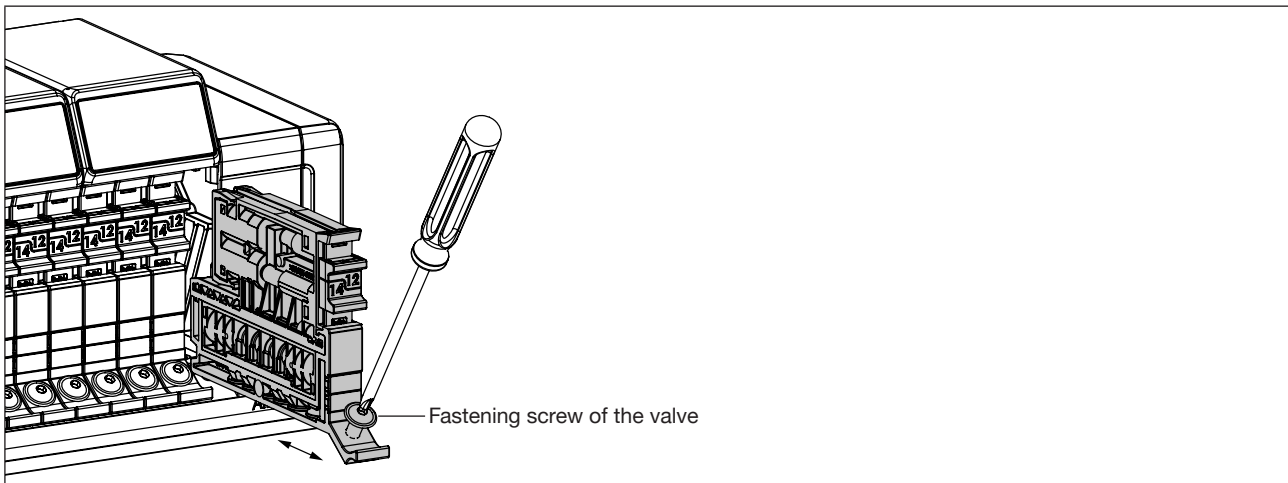



Figure 38: Replacing a valve.

-  Observe the safety instructions.
- Use a screwdriver to undo the fastening screw of the valve.
- Extract the valve from the valve island.



If the device is used for a longer period of time, the seal of the valves may stick to the supply manifold. An increased amount of force may, therefore, be required to release the valves from the valve island.

- Insert a new valve into the valve slot.
- Tighten the fastening screw (tightening torque 2 Nm).
- Adapt the valve configuration, if necessary (via Bürkert Communicator software, ME43 display or web server).

23.4.2 Replacing a pneumatic valve (without minimum distance)

DANGER

Danger due to high pressure, escaping medium and uncontrolled movement of the actuators.

- ▶ Secure the actuators against shifting before working on the device or plant.
- ▶ Switch off the pressure before working on the device or plant. Vent or empty the lines.

CAUTION

Irreparable damage to the fieldbus gateway.

If an electronic module is detached from an energised valve island, the electronics of the fieldbus gateway may be destroyed.

- ▶ Therefore, always switch off the voltage before unscrewing the electronic module from the valve island. Secure against reactivation.

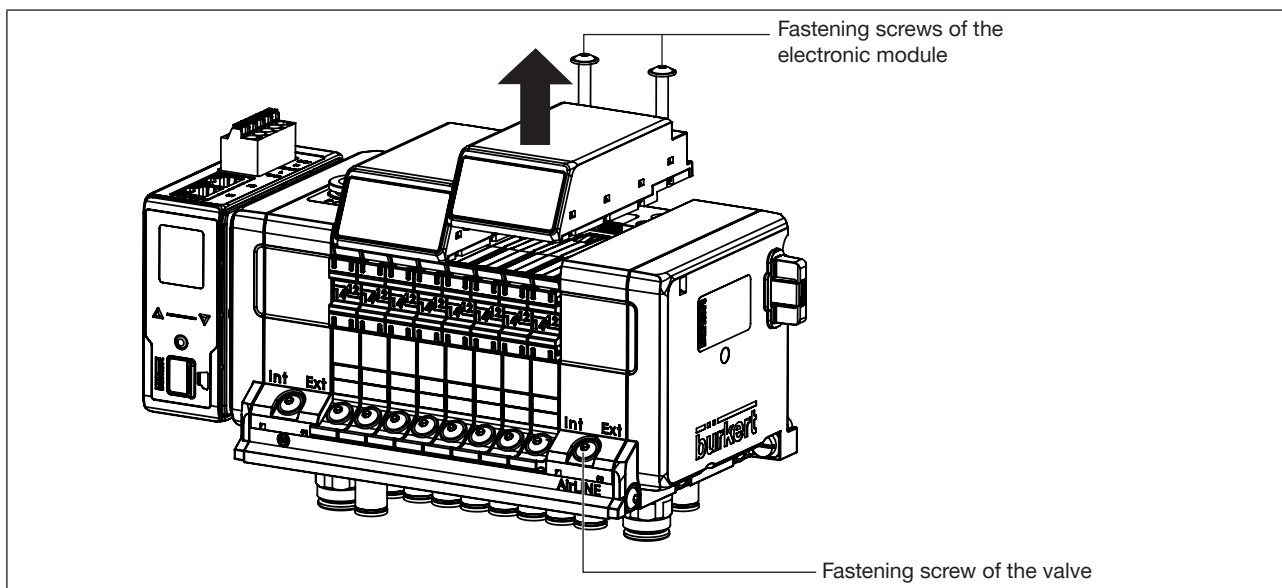



Figure 39: Replacing a valve without minimum distance to the front edge of the control cabinet

If the minimum distance to the front edge of the control cabinet is too small to extract a pneumatic valve from the front of the valve island, a pneumatic valve can also be extracted from the top of the valve island if the electronic module has been dismantled in advance. **In this case, the hot swap function is disabled.**

-  Observe the safety instructions.
- Use a screwdriver to undo the fastening screws of the electronic module and the valve.
- Extract the electronic module from the top.
- Extract the valve from the top of the valve island.
- Insert a new valve into the valve slot.
- Re-insert the electronic module into the valve island.
- Tighten the fastening screws of the electronic module and the valve (tightening torque 2 Nm).
- Adapt the valve configuration, if necessary (via Bürkert Communicator software, ME43 display or web server).

23.4.3 Replacing valves CFZ or CFZ*



WARNING

Danger due to uncontrolled movement of the actuators.

→ For valves with hot swap function, secure the actuators against shifting before working on the device or plant.

For valves with circuit function Z and circuit function Z*, depending on the switch position, either

Output 2 is aerated and Output 4 is vented

or

Output 2 is vented and Output 4 is aerated.

Valves with circuit function Z*

The valve island software ensures that the newly installed valve adopts the switch setting of the original valve in the event that a valve is replaced (hot swap).

For valves with circuit function Z*, manual override is disabled after initial electrical activation.

Valve with circuit function Z

Replaced valves with circuit function Z take on an undefined switch position.

24 REPLACING THE FIELDBUS GATEWAY ME43

WARNING

Risk of injury due to uncontrolled movement of the actuators.

- ▶ Before working on the device or system, secure the actuators against moving.
- ▶ Before working on the device or system, switch off the pressure. Vent or drain lines.
- ▶ Before working on the device or system, switch off the power supply. Secure against reactivation.

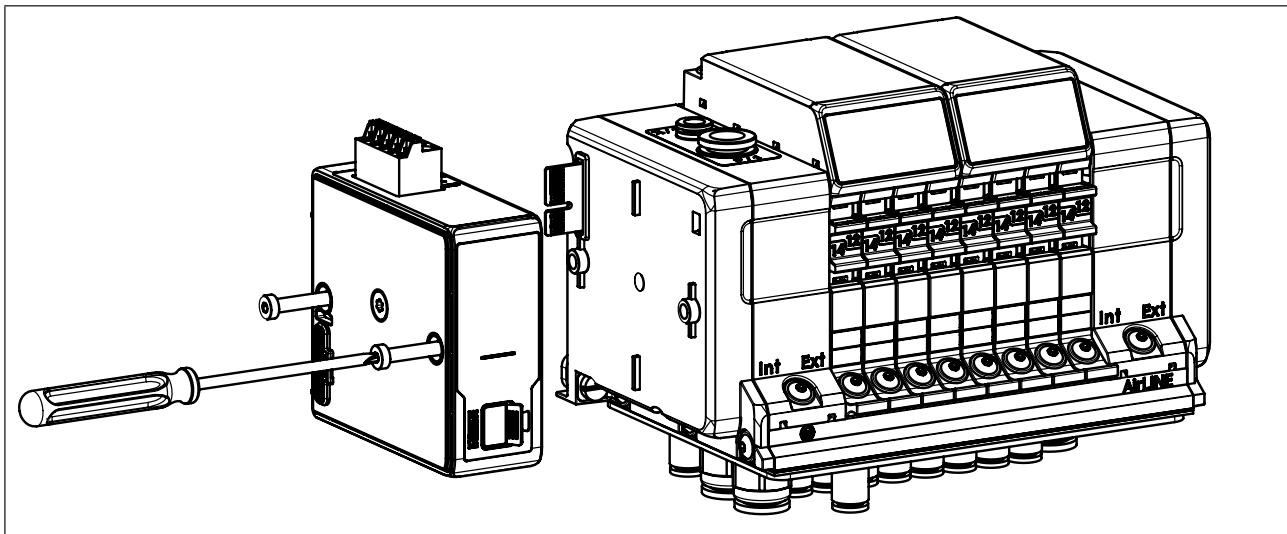


Figure 40: Replacing the fieldbus gateway

- Switch off the supply voltage.
- Loosen the electrical connections
- Use a screwdriver to undo the fastening screws on the gateway.
- Detach gateway to the left from the valve island.
- Remove Micro SD card.
- Insert Micro SD card into new gateway (observe insertion direction!).
- Place new gateway on top hat rail and push onto valve island to connect the gateway to the valve island.
- Tighten fastening screws (tightening torque 1 Nm).
- Connect gateway electrically.

25 MAINTENANCE, TROUBLESHOOTING

25.1 Safety instructions



WARNING

Risk of injury due to incorrect maintenance work.

- Maintenance work should be performed only by authorized and trained personnel using suitable tools!

Risk of injury due to unintentional switching on of the plant and uncontrolled start-up.

- Secure the device against accidental activation.
- Ensure controlled start-up after maintenance.

25.2 Replace filter for auxiliary pilot air



DANGER

Risk of injury from high pressure and discharge of medium.

- Before working on the device or system, secure the actuators against moving.
- Before working on the device or system, switch off the pressure. Vent or drain lines.



The filter is available as an accessory from Bürkert (see chapter [“Accessories”](#) on page 97).

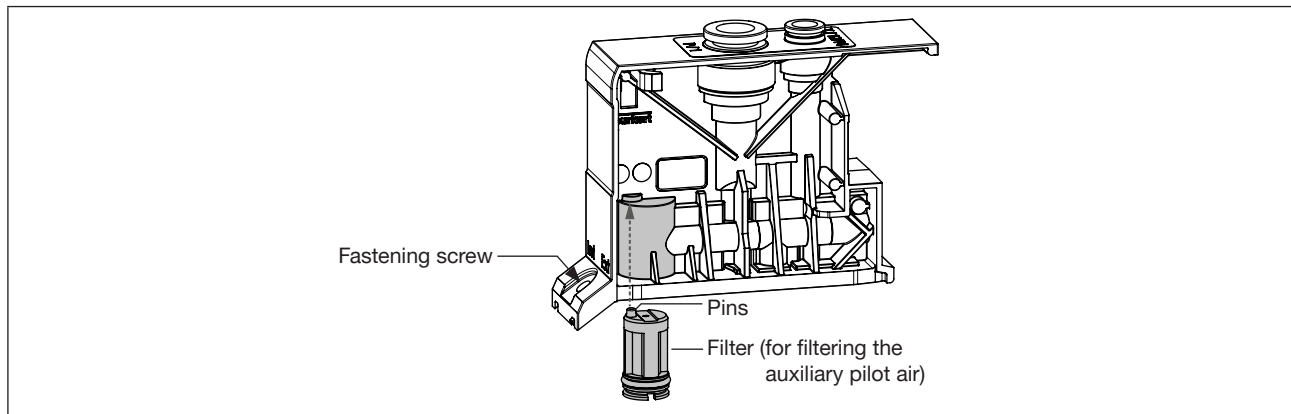


Figure 41: Replacing the filter

- Pay attention to the safety instructions.
- Use a screwdriver to undo the fastening screw of the connection module.
- Extract the connection module from the front.
- Use a slotted screwdriver to lift out the filter.
- Insert a new filter. Make sure the pin of the filter is inserted into the intended hole.
- Insert the connection module and tighten the screws (tightening torque 2 Nm).

25.3 Troubleshooting

Fault	Possible cause	Remedy
Valves do not switch	No or insufficient load voltage	Check electrical connection
		Ensure correct load voltage
	Manual override of the valves not in the neutral position	Move the manual override to the neutral position
	Pressure supply insufficient or not available	Ensure a sufficient pressure supply (also for upstream devices such as pressure controllers, maintenance units, shut-off valves, etc.)
		At valves without auxiliary pilot air: Guarantee minimum operating pressure of 3.0 bar and pay attention to the ratio of pilot pressure to medium pressure in accordance with the pilot pressure diagram (see chapter "6.7.1" on page 19)
	Incorrect design	Design the system according to the hardware design
	Channel not released for operation	Change the parameter setting (Communicator)
Valves switching delayed or blow off at the exhaust ports	24 V supply not connected or incorrectly contacted	Make sure the 24 V supply is connected correctly
	For SIA variant: Connection terminal with bridge or connected cable not connected	Connect connection terminal with bridge or connected cable
	Pressure supply insufficient or not available	Ensure a sufficient pressure supply (also for upstream devices such as pressure controllers, maintenance units, shut-off valves, etc.)
		At valves without auxiliary pilot air: Guarantee minimum operating pressure of 3.0 bar and pay attention to the ratio of pilot pressure to medium pressure in accordance with the pilot pressure diagram (see chapter "6.7.1" on page 19)
	Insufficient pilot pressure build-up	With 5/2-way valves (Circuit function H) and 2x3/2-way valves (Circuit function D, normally open), operate the valve island with an external pilot pressure supply
	Valves are not in the base setting when building up pressure (de-energized)	Pressurize the valve block before switching the valves
	Insufficient venting of the exhaust air channels due to insufficiently dimensioned or soiled sound absorbers (back pressures)	Use sufficiently sized sound absorbers or expansion tanks Clean soiled sound absorbers
	Soiling or foreign particles in the pilot valve	Replace the valve
	Soiling or foreign particles in the filter	Clean the filter using compressed air or replace the filter

25.4 Error messages on the LC display of the electronic modules

An overview of the possible display contents can be found in chapter [“21.1 Display views”](#) on page 76.

Message	Possible cause	Remedy
No message, LC display off	No or insufficient load voltage	Check electrical connection Ensure correct load voltage
	Voltage interrupted during firmware update	Update firmware again
Pilot SCC Limit Ch. x or Act. SCC Limit Ch. x	Maintenance limit for pilot valve / actuator channel X reached	Replace the pilot valve or maintain the actuator and reset the switching cycle counter or deactivate the switching cycle counter or increase the warning limit of the switching cycle counter
Short Circuit Ch. x	Short circuit at input x of the position feedback unit (position feedback or push-in connection faulty)	Check the position feedback/push-in connection or replace the position feedback
Wire Break Ch. x	Wire break at input x of the position feedback unit (position feedback or push-in connection faulty)	Check the position feedback/push-in connection or replace the position feedback
EVS Active	24 V supply not connected or incorrectly contacted	Check correct connection
	Electric circuit of a valve unit interrupted due to the shutdown function “Module-based safety shutdown”	

25.5 Description of the error codes

Error code	Description
1/3	Overload detected.
2/1	Overvoltage detected.
2/2	Undervoltage detected.
2/3	Voltage is above the warning limit.
2/4	Voltage is below the warning limit.
2/5	Battery voltage is below the warning limit.
2/6	Voltage drop detected.
3/1	Overtemperature detected.
3/2	Undertemperature detected.
3/3	Temperature is above the warning limit.
3/4	Temperature is below the warning limit.
18/4	SD card is defective.
18/7	Transferable memory is available.
18/8	Transferable memory is not accessible.
18/9	Configuration is successfully managed by another device.
18/10	Configuration isn't successfully managed by another device.
18/11	Configuration of the device could not be loaded by the configuration provider.
18/12	At least 1 device is missing.
18/13	Bürkert Communicator is required.
18/14	Device replacement necessary.
18/15	Replacement can not be performed because there are too many options. Reduce suitable clients.
18/16	Problems during device replacement.
18/17	Problems during device replacement. At least 1 object could not be written.
18/18	Device replacement failed.
18/19	Device replacement successful.
18/20	Configuration provider is not active because no memory card is available.
18/21	More than 1 configuration provider is active! Switch off the other provider functions.
19/1 ... 19/6	Unit 1 ... Unit 6: Switching cycle counter limit reached for pilot valve. Replace pilot valve.
19/7 ... 19/12	Unit 1 ... Unit 6: Reached maintenance limit for actuator.
19/13 ... 19/18	Unit 1 ... Unit 6: Short circuit on an input of upper position feedback unit.
19/19 ... 19/24	Unit 1 ... Unit 6: Short circuit on an input of lower position feedback unit.
19/25 ... 19/30	Unit 1 ... Unit 6: Wire break on an input of upper position feedback unit.
19/31 ... 19/36	Unit 1 ... Unit 6: Wire break on an input of lower position feedback unit.
19/37 ... 19/42	Unit 1 ... Unit 6: Maintenance required for actuator (Routine maintenance).
31/1 ... 31/6	Unit 1 ... Unit 6: Overload detected.
31/7 ... 31/8	Electronic module defective.
31/9	Valve control defective.
31/10 ... 31/15	Unit 1 ... Unit 6: Internal connection to digital inputs of electronic module interrupted.
31/16 ... 31/21	Unit 1 ... Unit 6: Internal connection to display of electronic module interrupted.
31/28	Internal connection to display of fieldbus gateway interrupted

Error code	Description
31/29	Not possible to read the EVS status
32/1	The capacity of the internal message memory has been exceeded.
32/130	Initialization of the device.
33/1	Switch to state „operation“.
33/2	Switch to state „diagnostics active“.
33/3	Switch to state „maintenance“.
33/4	Switch to state „out of specification“.
33/5	Switch to state „check function“.
33/6	Switch to state „error“.
33/7	Switch to AUTOMATIC operating state.
33/8	Switch to MANUAL operating state.
33/9	Switch to special mode: LED flashing.
33/11	Switch to state „off“.
33/12	Input value simulation for at least 1 value active.
33/13	Output value simulation for at least one value active.
33/14	Demo mode activated.
33/32768	1 Status message is pending.
35/1	EERPRO error has been detected.
35/2	At least 1 persistent memory cannot be used.
40/996	Error on 1 or more partner device(s).
45/256	büS event: büS is NOT operational.
45/257	büS event: initialize communication.
45/512	büS event: localization.
45/768	büS event: a device uses the same NodeID.
45/1024	büS event: bus connection lost / not available.
45/1792	büS event: partner allocation active.
45/1793	büS event: producer(s) not found.
45/1794	büS event: manual set device without NodeID. Search can take up to 1 minute.
45/1795	büS event: allocation of producer failed.
45/1796	büS event: deallocation of producer failed.
45/1797	büS event: invalid mapping for CANopen device.
45/1798	büS event: GCV value is mapped on both büS interfaces.
45/1799	büS event: cyclic communication of producer not active.
45/2048	büS event: save persistent büS data (don't turn off the device).
45/2049	büS event: delete persistent büS data (don't turn off the device).
45/2304	büS event: router for acyclic data active.
45/2560	büS event: invalid serial number.
45/2561	büS event: invalid receive value configuration (not enough filter).
45/2562	büS event: invalid configuration of cyclic values.
45/2816	büS event: manager active.
45/3072	büS event: observed device failed.
45/3584	Waiting for addressing.

Error code	Description
45/4096	Error during device parameter initialization.
45/4097	Configured address already in use.
51/1	No proper connection to the process control system.
51/2	Cyclic data transfer has been slower than configured timeout.
51/10	Initialization of industrial communication.
51/101	Error while NetX configuration e.g. downloading firmware to NetX.
51/102	Industrial communication is powered Off.
51/103	No or incorrect mapping file available.
51/104	No protocol firmware available.
51/105	Please select a protocol and restart the device.
51/201	Protocol stack initialization error.
51/202	Protocol stack configuration error.
51/203	Error while sending MAC-address.
51/204	Error while register objects.
51/205	Error while config connections, more than 5 connections.
51/206	Wrong PROFIBUS address, valid addresses are 1 - 126.
51/207	Wrong CC-Link address, valid addresses are 1 - 64.
51/208	Wrong CC-Link baud rate.
51/300	Fieldbus master is running in stop mode.
51/303	Cyclic data exchange failed.
51/400	Master tried to plug wrong module or submodule.
63/1	Firmware update in progress
63/2 ... 63/7	Unit 1 ... Unit 6: Error on electronic module.

Table 17: Description of the error codes

26 DISASSEMBLY

26.1 Safety instructions



DANGER

Risk of injury from high pressure and discharge of medium.

- ▶ Before working on the device or system, secure the actuators against moving.

Before working on the device or system, switch off the pressure. Vent or drain lines.



WARNING

Risk of injury from electric shock.

- ▶ Before working on the device or system, switch off the power supply. Secure against reactivation.
- ▶ Observe applicable accident prevention and safety regulations for electrical equipment.

Risk of injury due to incorrect disassembly!

- ▶ Disassembly should be performed only by trained personnel using suitable tools!

→ Undo the pneumatic connection.

→ Undo the electrical connection.

27 ACCESSORIES



CAUTION

Risk of injury, property damage due to incorrect parts!

Incorrect accessories and unsuitable spare parts may cause injuries and damage the device and its environment.

► Use original accessories and original spare parts from Bürkert only.

büS accessories

Article	Quantity	Order no.
USB-büS-Interface set 1 (including power supply unit, büS stick, terminating resistor, Y-distributor, 0.7 m cable with M12 plug)		772426
USB-büS-Interface set 2 (including büS stick, terminating resistor, Y-distributor, 0.7 m cable with M12 plug)		772551
büS cable, angled M12 (stranded wire to female connector)	0.7 m	772626
büS cable (stranded wire to M12 female connector)	1.0 m	772409
	3.0 m	772410
	5.0 m	772411
	10.0 m	772412
büS cable drum	50.0 m	772413
	100.0 m	772414
büS extension cable	0.1 m	772492
	0.2 m	772402
	0.5 m	772403
	1.0 m	772404
	3.0 m	772405
	5.0 m	772406
	10.0 m	772407
	20.0 m	772408
büS service cable M12 to micro USB		773254

Electrical accessories

Article	Quantity [unit]	Order no.
Termination resistor, M12 male	1	772424
Termination resistor, M12 female	1	772425
Gender changer, M12, male-male	1	772867
Y-distributor	1	772420
Y-distributor with interrupt	1	772421

Attachment accessories

Article		Quantity [unit]	Order no.
Screw set M5x10 A2 DIN 6912 (for attaching the valve island to the base of the control cabinet)		10	308661
Holding plate (for control cabinet exterior)	4x	1	60005571
	8x	1	60005566
	12x	1	60005567
	16x	1	60005568
	20x	1	60005569
	24x	1	60005570

Pneumatic accessories

Article				Quantity	Order no.
Filter set for auxiliary pilot air				2	368590
Push-in connector, straight	Brass, nickel-plated	M7	Ø 6 mm	1	773459
		M7	Ø 1/4"		773460
		G1/4"	Ø 10mm		773461
		G1/4"	Ø 3/8"		773462
	Stainless steel	M7	Ø 6 mm	1	773463
		M7	Ø 1/4"		773464
		G1/4"	Ø 10 mm		773465
		G1/4"	Ø 3/8"		773466
Plastic hoses for pneumatic system, polyamide (PA)	Ø 6/4 mm	Blue		50 m	780643
		Black			780644
		Natural			780645
	Ø 8/6 mm	Blue			780646
		Black			780647
		Natural			780648
	Ø 10/8 mm	Blue			780649
		Black			780650
		Natural			780651
	Ø 6/4 mm	Blue		100 m	771868
		Black			771295
		Natural			771296
	Ø 8/6 mm	Blue			771869
		Black			771873
		Natural			771297
	Ø 10/8 mm	Blue			771870
		Black			771877
		Natural			771874

Article			Quantity	Order no.
Push-in silencer	Ø 6 mm	Sintered bronze, brass nickel-plated body	1	784306
	Ø 8 mm			784304
	Ø 10 mm			784305
	Ø 6 mm	Polyethylene (PE)		772571
	Ø 8 mm			773231
	Ø 10 mm			773522
	1/4"			773545
	3/8"			773546
Sealing plug	Brass, nickel-plated	08/06-08/06	1	781666
		10/08-10/08		781667
	POM	06/04-06/04		782399
		08/06-08/06		782400
		10/08-10/08, red		782401
	PBTP	6 mm		771605
		8 mm		771606
		10 mm		771607

Other accessories

Article	Quantity [unit]	Order no.
Device marker set	10 (1 screen)	368588
Interlocking set MO (manual override)	8	328082
Micro SD card		on request

28 PACKAGING, TRANSPORT



CAUTION

Risk of injury due to heavy device.

A heavy device can fall down and cause injury during transport or assembly work.

- ▶ Only transport, assemble, disassemble a heavy device with the aid of a second person.
- ▶ Use suitable auxiliary tools.

NOTE

Damage in transit due to inadequately protected devices.

- ▶ Protect the device against moisture and dirt in shock-resistant packaging during transportation.
- ▶ Observe permitted storage temperature.

29 STORAGE

NOTE

Incorrect storage may damage the device.

- ▶ Store the device in a dry and dust-free location.
- ▶ Storage temperature $-10...+60\text{ }^{\circ}\text{C}$.

30 DISPOSAL

NOTE

Damage to the environment caused by device components contaminated with media.

- ▶ Dispose of the device and packaging in an environmentally friendly manner.
- ▶ Observe applicable disposal and environmental regulations.



- ▶ Observe national regulations on the disposal of waste.