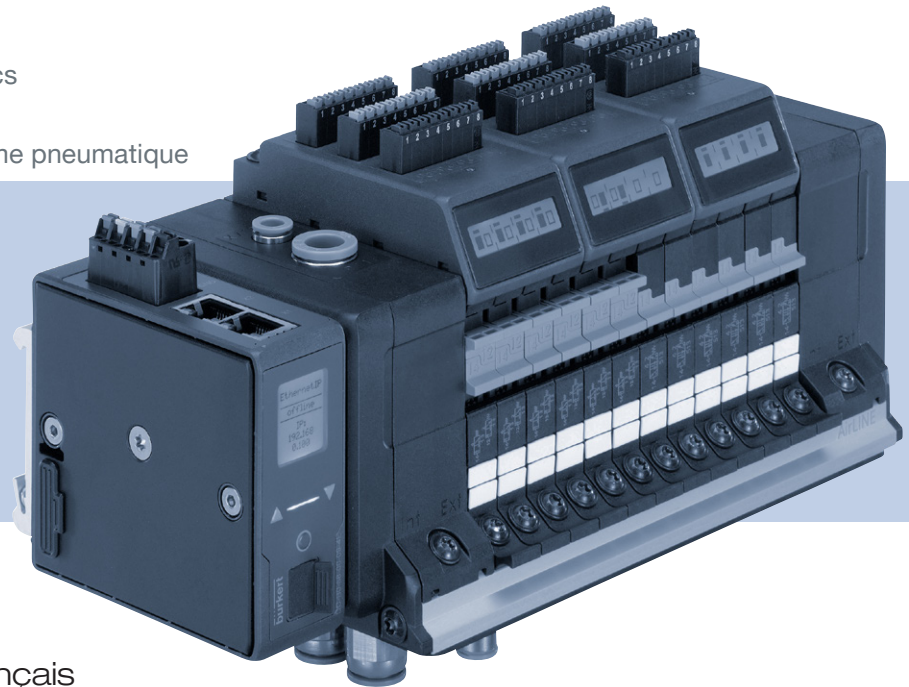


Type 8652 AirLINE

Modular valve terminal for pneumatics
Modulare Ventilinsel für Pneumatik
Îlot de vannes modulaire pour système pneumatique



Quickstart

English Deutsch Français

We reserve the right to make technical changes without notice.
Technische Änderungen vorbehalten.
Sous réserve de modifications techniques.

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Operating Instructions 1709/01_EU-ML_00810542 / Original DE

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1 THE QUICKSTART

The Quickstart contains the most important information and notes regarding the use of the device. A detailed description can be found in the operating instructions for Type 8652.

Keep the Quickstart in an easily accessible location for each user. The Quickstart must be available to each new owner of the device.

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.



The operating instructions and data sheets for Bürkert devices can be found on the Internet at:
www.burkert.com

1.1 Definitions of terms

Term	Is used in these instructions in substitution for
Device, valve terminal	Valve terminal AirLINE Type 8652
Valve	Pneumatic slide valve that can be integrated in the valve block
Actuator, process valve, pneumatic cylinder, pneumatic actuator, pneumatic components	Pneumatic consumer activated by the valve terminal

1.2 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 in a fatal or serious injury.



CAUTION

Warns of a possible danger.

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

NOTE

Warns of damage to property.



Important tips and recommendations.



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

- ▶ Designates an instruction which you must follow to prevent a hazard.
- Designates a procedure which you must carry out.

2 INTENDED USE

The valve terminal AirLINE Type 8652 is designed for controlling and recording the switching statuses of pneumatically operated process 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. For use in areas at risk of explosion, observe the information provided on the separate Ex type label and the additional explosion-related information included in the scope of supply.
- ▶ Correct transportation, correct storage as well as correct assembly, installation, start-up, operation and maintenance are essential for reliable and problem-free operation.
- ▶ 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 with a minimum degree of protection of IP 65.
- ▶ In indoor areas, make sure the device is installed in a control cabinet with a minimum degree of protection of IP 20.
- ▶ Do not operate the device unless it is in perfect working order.



The valve terminal is only intended for use in industrial environments.

The valve terminal is not suitable for use in applications that pose 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 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.

Risk of injury due to 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 hot device components.

- ▶ 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.
- ▶ 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.

General hazardous situations.

To prevent injury, ensure the following:

- ▶ Install the device according to the regulations applicable in the country.
- ▶ Do not supply the medium connectors of the device with aggressive or flammable media.
- ▶ Do not supply the medium connectors of the device with liquids.
- ▶ After an interruption, ensure that the process is restarted in a controlled manner.
Observe sequence:
 1. Connect power supply.
 2. Connect the pneumatic supply (with an external pressure supply, connect the external auxiliary pilot air [X / 12/14] first and then the medium pressure [P / 1]).
- ▶ Do not make any changes to the device
- ▶ Do not subject the device to mechanical loading.
- ▶ Observe the general rules of technology.

NOTE

Electrostatic sensitive components and modules.

The device contains electronic components which react sensitively to electrostatic discharge (ESD). Contact with electrostatically charged persons or objects are hazardous to these components. In the worst case scenario, these components will be destroyed immediately or will fail after starting up.

To minimize or eliminate the risk of damage resulting from sudden electrostatic discharges, ensure compliance with the requirements of EN 61340-5-1. Do not touch electronic components while the supply voltage is switched on!

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

Contact addresses can be found on the final 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 TECHNICAL DATA

5.1 Conformity

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

5.2 Standards

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

5.3 Operating conditions

NOTE

- Use safety-low voltage according to protection class 3 VDE 0580.

Type of condition	Permissible range
Ambient temperature	-10...+55 °C
Storage temperature	-10...+60 °C
Nominal operating mode	Continuous operation (100% duty cycle)
Operating voltage	24 V DC ± 10%, residual ripple for fieldbus interface 1 Vss
Protection class	3 in accordance with VDE 0580

Type of condition	Permissible range
Power consumption	<p>Power consumption is dependent on the configuration of the valve terminal.</p> <p>For the fieldbus interface, the total current is calculated using the formula:</p> $I_{\text{total}} = I_{\text{background}} + (n \times I_{\text{valve}}) + (m \times I_{\text{feedb.}}) + (k \times I_{\text{dis. mod.}})$ <p>I_{total}: Total current</p> <p>$I_{\text{back-ground}}$: Background current depending on the fieldbus system</p> <p>PROFINET IO: 135 mA</p> <p>EtherNet/IP: 135 mA</p> <p>Modbus TCP: 135 mA</p> <p>PROFIBUS DPV1: 100 mA</p> <p>DeviceNet: 35 mA</p> <p>CANopen: 35 mA</p> <p>n: No. of valves</p> <p>I_{valve}: Nominal current of the valve (35 mA)</p> <p>m: Number of position feedbacks</p> <p>$I_{\text{feedb.}}$: Power consumption position feedback (max. 22 mA)</p> <p>k: Number of display modules</p> <p>$I_{\text{dis. mod.}}$: Power consumption display modules (10 mA)</p>

5.4 General technical data

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

5.4.1 Pneumatic slide valve Type 6534

Circuit function (CF)	2 x C NC (normally closed) 2 x 3/2-way 2 x D NO (normally open) 2 x 3/2-way	H 5/2-way monostable Z 5/2-way bistable	L 5/3-way blocked M 5/3-way pressurized N 5/3-way vented
Flow rate Q_{Nn}	up to 300 l_N/min (for exact flow values for the various circuit functions, see the data sheet)		
Medium pressure	0*...10 bar		
Pilot pressure**	3...8 bar		
Electr. power before/after power reduction	2 x 0.7 W / 2 x 0.1 W	0.7 W / 0.1 W	0.7 W / 0.1 W
Current before/after power reduction	2 x 29 mA / 2 x ≤ 10 mA	29 mA / ≤ 10 mA	

*) With vacuum versions, use the variant with external auxiliary pilot air.

**) With the external auxiliary pilot air variant, select the pilot pressure according to the pilot pressure diagram.

Pilot pressure diagram

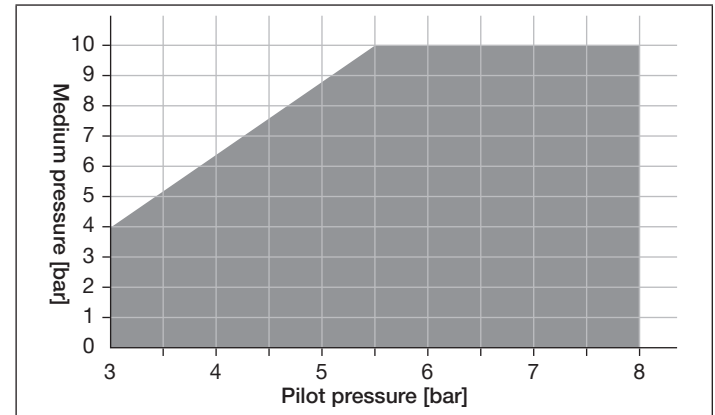


Fig. 1: Pilot pressure diagram pneumatic slide valve Type 6534

5.5 Type label (example)



Fig. 2: Type label for valve terminal Type 8652 (example)

5.6 Specifications Industrial Ethernet

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
Additional supported features	DCP, VLAN priority tagging, Shared Device
Transmission speed	100 MBit/s
Data transport layer	Ethernet II, IEEE 802.3
PROFINET IO specification	V2.3
AR (Application Relations)	The device can simultaneously process up to 2 IO-ARs, 1 Supervisor AR and 1 Supervisor DA AR.

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 transmission	Half Duplex, full Duplex, autonegotiation
MDI modes	MDI, MDI-X, Auto-MDIX
Data transport layer	Ethernet II, IEEE 802.3
Address Conflict Detection (ACD)	supported
DLR (ring topology)	supported
Integrated switch	supported
CIP Reset services	Identity Object Reset Service of Type 0 and Type 1

Modbus TCP

Modbus Function Codes	1, 2, 3, 4, 6, 15, 16, 23
Mode	Message Mode: Server
Transmission speed	10 and 100 MBit/s
Data transport layer	Ethernet II, IEEE 802.3

EtherCAT

Maximum number of cyclic input and output data	512 bytes in sum
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 (depending on master capability)
Type	Complex slave
FMMUs	8
Sync managers	4
Distributed clocks	supported with 32-bit timestamps
Transmission speed	100 MBit/s
Data transport layer	Ethernet II, IEEE 802.3

5.7 Specifications PROFIBUS DPV1


Acyclic communication	DP V1 Class 1 Read/Write DP V1 Class 1 Alarm DP V1 Class 2 Read/Write/Data Transport
Transmission speed	Fixed values from 9.6 kBit/s to 12 MBit/s Autodetect mode is supported

6 ASSEMBLY

WARNING

Risk of injury from improper assembly.

- ▶ Only trained technicians may perform assembly work.
- ▶ Perform assembly work with suitable tools only.


 Valve terminal AirLINE Type 8652 is supplied as a fully assembled device. Any modifications should only be carried out by Bürkert.

The valves are an exception to this rule and may be replaced with identical valves by the user.

6.1 Assembly on standard rail in a control cabinet

NOTE

- ▶ Ground the standard rail with low impedance to guarantee the best possible EMC protection.

 The valve terminal must be freely accessible from above. Ensure good heat dissipation!

- Fasten 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 terminal onto the upper guide of the standard rail.
- Secure with fastening screws (tightening torque 1.5 Nm).

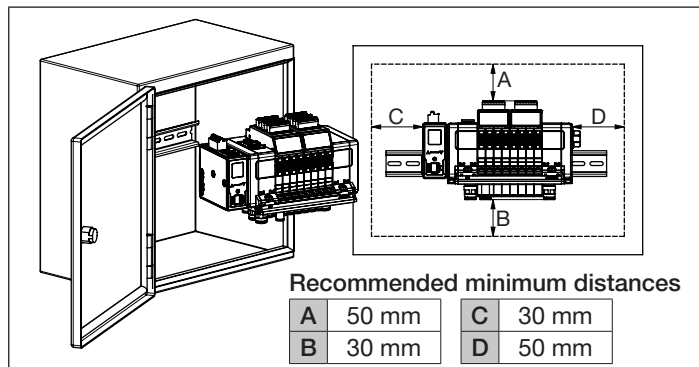


Fig. 3: Recommended minimum distances for assembly on standard rail in the control cabinet

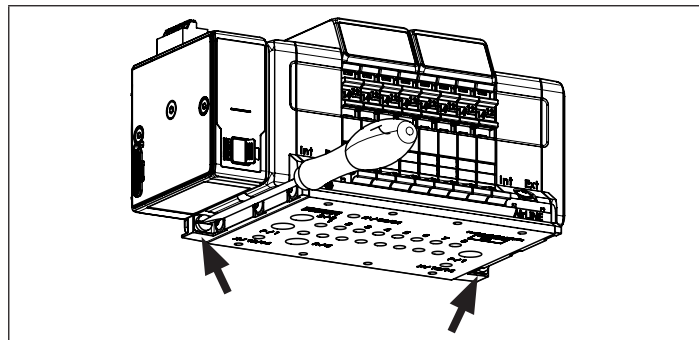


Fig. 4: Use the two fastening screws to fasten the valve terminal to the standard rail

6.2 Assembly on the base of the control cabinet or the wall of the control cabinet with AirLINE Quick

For assembly, initially prepare a cut-out on the base or the wall of the control cabinet and drill the holes for the fastening screws. The cut-out can be created, e.g., through laser-cutting or punching.

For the dimensions of the flange interface, see “Fig. 6”, page 14.

The distances to the left, right, front and top depend on the selected valve terminal configuration.

Recommended minimum distances [mm]

Assembly in:	front	left	right	top	bottom
Base of control cabinet	65	30	50	50	-
Control cabinet wall on right	65	50	-	50	30
Control cabinet wall on left	65	-	50	30	50

Tab. 1: Recommended minimum distances for assembly with AirLINE Quick

NOTE

The cut-out on the control cabinet must be burr-free for the seal not to become damaged between AirLINE Quick and the control cabinet.

→ Make sure the seal between AirLINE Quick and the control cabinet is undamaged.

- Place the valve terminal in the control cabinet on the prepared cut-out.
- Fix from the outside using M5x10 screws (tightening torque 2.5 Nm).

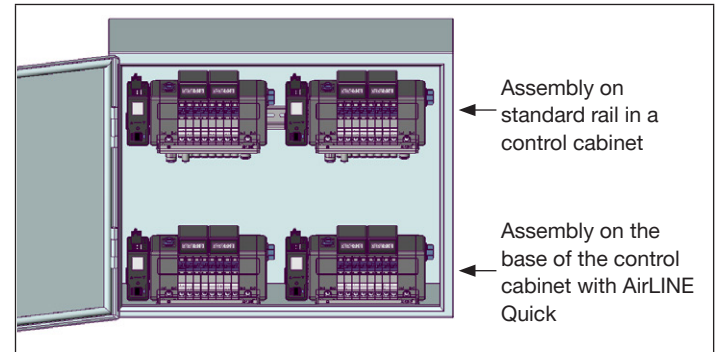


Fig. 5: Placing the valve terminal in the control cabinet

6.2.1 Assignment of the pneumatic connections for AirLINE Quick

Valve type	Pneumatic connection	
	Valve output	AirLINE Quick
2x3/2-way	Position of valve outputs 	
5/2-way		
5/3-way		

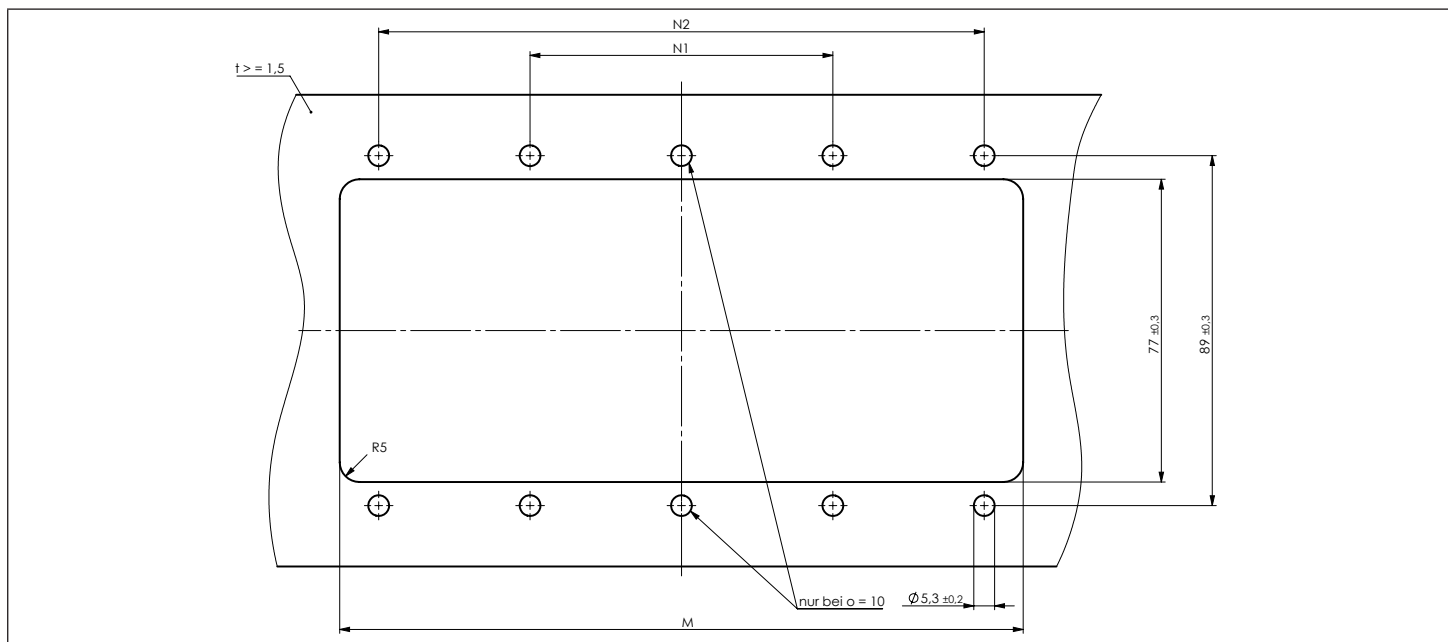


Fig. 6: Flange interface AirLINE Quick

Design	Special feature	M [mm]	N1 [mm]	N2 [mm]	o [Number of boreholes]
with 8 valves	–	129.8 ± 0.4	37 ± 0.3	111 ± 0.4	8
with 12 valves	–	173.8 ± 0.4	77 ± 0.3	154 ± 0.4	10
with 24 valves	on request	332.25 ± 0.4	156 ± 0.3	312 ± 0.4	10

Tab. 2: Dimensions flange interface AirLINE Quick

7 INSTALLATION

DANGER

Risk of injury from high pressure.

Actuators may change their position when the pressure changes.

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

Suddenly escaping pressure medium can quickly accelerate device components (hoses, small parts, ...) resulting in injuries and/or damage.

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

WARNING

Risk of injury due to 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 from improper installation.

- ▶ Only trained technicians may perform installation work.
- ▶ Perform installation work 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.

CAUTION

Risk of injury due to discharge of medium and malfunctioning.

Medium may escape if the seals are not seated correctly. The function of the device may be restricted by pressure losses.

- ▶ Ensure that all the seals are seated correctly.

Risk of injury from damaged contacts.

Damaged contacts may result in a short circuit and malfunctioning.

- ▶ Do not bend contacts.
- ▶ If contacts are damaged or bent, replace the affected components.
- ▶ Do not switch on the device unless the components are in perfect condition.

7.1 Electrical connection gateway

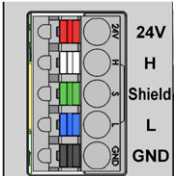
Possible cable cross-section: $\leq 1.5 \text{ mm}^2$

NOTE

To ensure electromagnetic compatibility:

- ▶ Only use shielded cables.
- ▶ Connect the cables of all devices to the standard rail to ground the cable shielding.

- Connect the spring-type terminal according to the configuration (see “Tab. 3”)
- Establish Ethernet or PROFIBUS DPV1 connection according to the assignment (see “Tab. 4” and “Tab. 5”).
- Apply supply voltage.

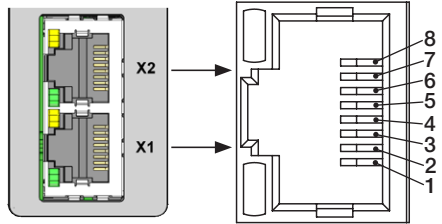
Configuration of 5-pin spring-type terminal		
Connector view	Terminal	Description
	Red	Supply voltage 24 V DC
	White	CAN H (bùS connection) ¹
	Green	Shielding
	Blue	CAN L (bùS connection) ¹
	Black	GND

Tab. 3: Configuration of 5-pin spring-type terminal

1) In the case of Industrial Ethernet and Profibus DPV1 the terminals are assigned only when using several Bürkert devices (EDIP) or in combination with the Communicator.

7.1.1 Industrial Ethernet

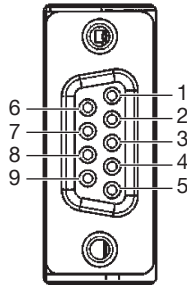
The X1 and X2 interfaces for RJ45 plug-in connectors are equivalent.

Configuration Plug-in connector RJ45								
								
Pin	1	2	3	4	5	6	7	8
Plug configuration	TX+	TX-	RX+	Not assigned	Not assigned	RX-	Not assigned	Not assigned

Tab. 4: Plug-in connector RJ45, interfaces X1 and X2

7.1.2 PROFIBUS DPV1

Configuration Plug-in connector D-Sub, 9-pin



Pin	Signal	Function	Connection
1	Shielding	Protective earth	Not recommended
2	M24	Ground for 24 V voltage	Optional
3	RxD/TxD-P	Data line plus (B conductor)	Mandatory
4	CNTR-P	Repeater directional control	Optional
5	DGND	Data ground	Mandatory
6	VP	+5 V supply for bus termination	Mandatory
7	P24	+24 V supply	Optional
8	RxD/TxD-N	Data line minus (A conductor)	Mandatory
9	CNTR-N	Repeater directional control	Optional

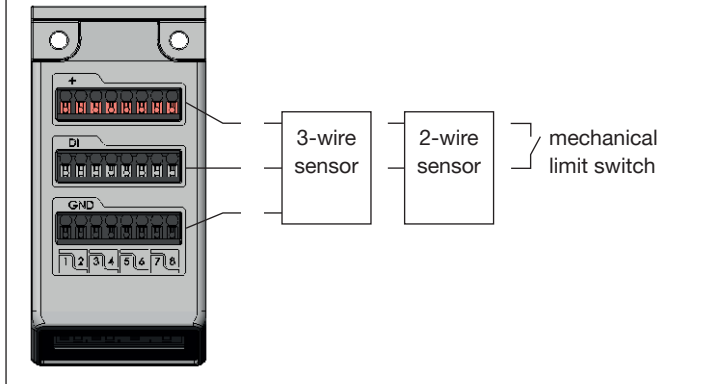
Tab. 5: Plug-in connector D-Sub, 9-pin

7.2 Electrical connection electronics module with digital inputs

Possible cable cross-section: $\leq 1.5 \text{ mm}^2$

→ Connect position feedback sensors according to the assignment on the electronics module.

Assignment of the digital inputs electronics module



Tab. 6: Assignment of the digital inputs electronics module

The position feedback sensors are supplied (24 V) by the electronics module. The current is limited to maximum 30 mA.

Standard 3-wire sensors, 2-wire sensors (also Namur), as well as mechanical limit switches with voltages between 10...30 V, 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	X	–

7.3 Pneumatic connection

DANGER

Risk of injury from 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.

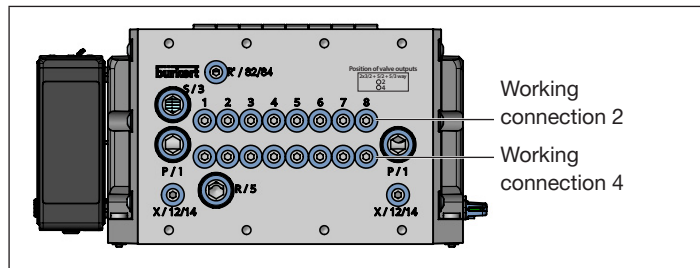


Fig. 7: Pneumatic connections valve terminal

Connection	Assignment
1...8	Valve slots
P / 1	Supply connection
X / 12/14	Supply connection for auxiliary pilot air
R / 5	Air discharge connections
S / 3	
R' / 82/84	Air discharge connection for auxiliary pilot air

Fig. 8: Pin assignment valve terminal

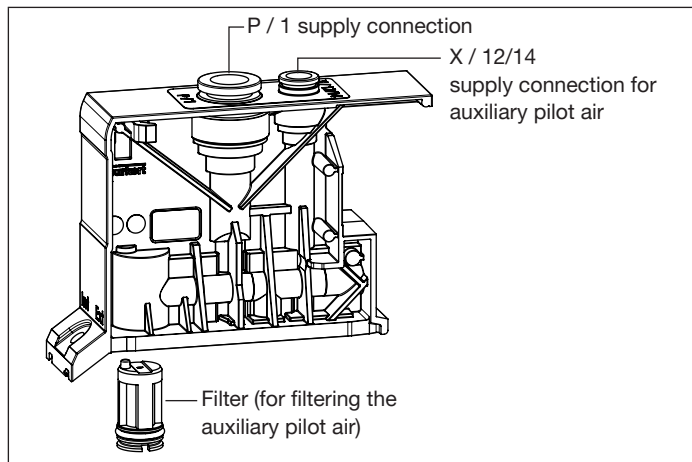


Fig. 9: Pneumatic connections connection module

7.3.1 External and internal auxiliary pilot air

NOTE

Internal short circuit between auxiliary pilot air and pilot pressure.

To avoid an internal short circuit, the seals of the connection modules must be positioned equally (external or internal auxiliary pilot air supply).

- ▶ Never mix the external or the internal supply.

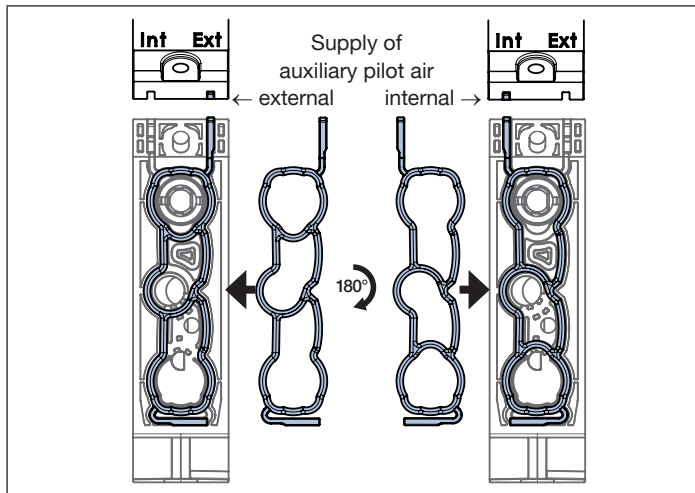


Fig. 10: By rotating the seal 180°, it is set whether the auxiliary pilot air supply occurs internally or externally.

8 START-UP

WARNING

Risk of injury from improper operation.

- ▶ Before start-up, it must be ensured that the operating personnel are aware of and fully understand the contents of the operating instructions.
- ▶ Observe safety instructions and intended use.
- ▶ Only trained and qualified personnel may start up the device or system.

NOTE

Internal short circuit between auxiliary pilot air and pilot pressure.

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

- ▶ Prior to start-up, make sure all the seals of the connection modules are positioned equally (external or internal, see “Fig. 10”).

8.1 Start-up files

The start-up files, such as EDS file, GSD file and GSDML file, required by the particular project planning software, are available on the Internet.



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

Instructions on installing the start-up files can be found in the documentation of the project planning software which you are using.

8.2 Selecting protocol at fieldbus gateway ME43

! With devices of the PROFIBUS DPV1 version, the protocol has been preset at the factory.

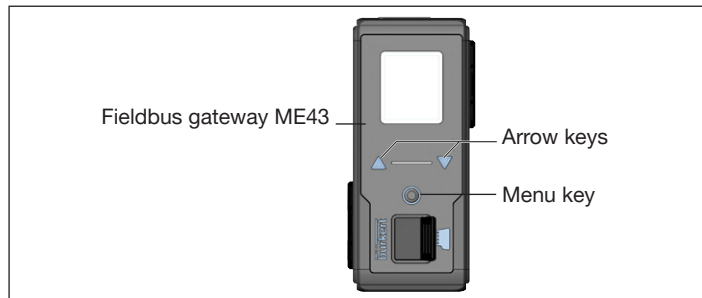







Fig. 11: Fieldbus gateway ME43

- Press the menu key  twice.
First the start screen appears, then the main menu with the detailed views **Parameter**, **Diagnostics** and **Maintenance**.
- Navigate with  , and confirm with :
Parameter → **Protocol**
- Highlight the desired protocol, confirm with .

8.3 Starting up via manual override

Manual override lends itself to start-up the device and system. Manual override functions without a voltage supply to the valve terminal and enables manual switching of the valves.

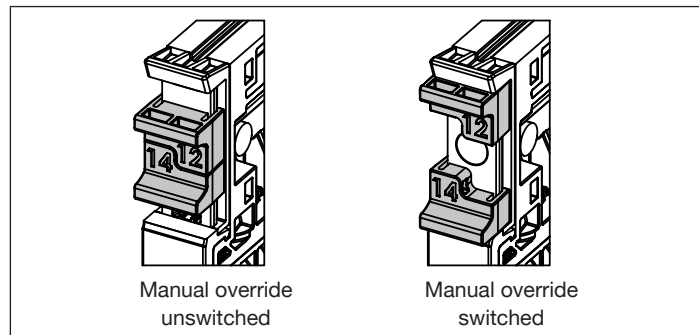


Fig. 12: Manual override of the valves

Manual override comes with spring return and latching as standard.

Spring return:

If the slide mechanism is pushed to an initial resistor, the manual override returns to the unswitched status after being released.

Latching:

If the resistor is exceeded, the manual override remains switched after being released. To return to the unswitched status, the manual override needs to be pushed back manually over the latching point.

8.3.1 Additional element “Lock Manual Override”

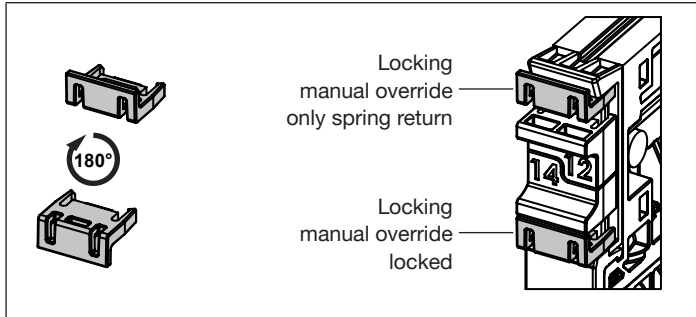


Fig. 13: Additional element “Lock Manual Override”

The additional element “Lock Manual Override” enables restriction of the manual override.

The manual override offers only spring return or locked depending on the rotational position (0° or rotated 180°) of the clipped-on additional element.

9 OPERATION

WARNING




Danger due to improper operation.




- ▶ The operating personnel must be aware of and have understood the contents of the operating instructions.
- ▶ Observe the safety instructions and intended use.
- ▶ Only adequately trained personnel may operate the system or device.

9.1 Operating via manual override

See chapter “[8.3 Starting up via manual override](#)”.

9.2 Operating via the fieldbus gateway ME43

Operation at the fieldbus gateway occurs via the arrow keys   and the round menu key .

Element	Functions
	Open the main menu (double click)
	Confirm selection/input
 	Page down / up through menu
	Change the numerical values. Hold down the arrow key to run through quickly.

9.3 Operating via Bürkert Communicator



The Bürkert Communicator software can be downloaded free of charge from the Bürkert website. In addition to the software, the USB bus interface set, available as an accessory, is required.



Operation of the valve terminal AirLINE Type 8652 using the Bürkert Communicator software is described in the operating instructions: www.burkert.com

9.4 Display elements fieldbus gateway ME43

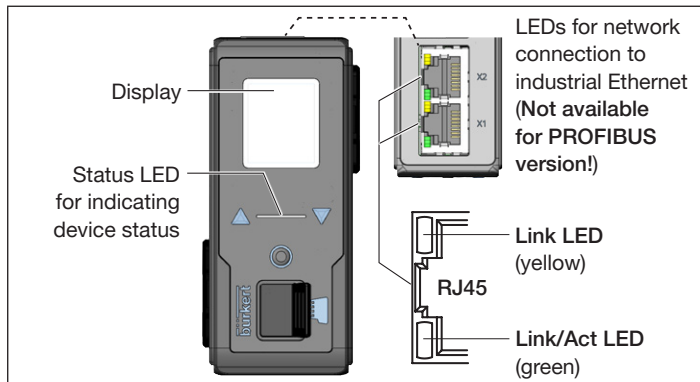


Fig. 14: Overview of the display elements

LED status	Description
Link LED (yellow) lights up	Connection to the network has been established.
Link/Act LED (green) flashes quickly	Connection to the higher-level protocol layer (EtherNet/IP, PROFINET, Modbus-TCP or EtherCAT) established. Data is being transmitted.
Link/Act LED (green) flashes slowly	Approx. 20 seconds after restart: No connection to the protocol layer.

Tab. 7: Description of LEDs for network connection

9.5 Display elements electronics module

The electronics modules are equipped with an LC display for displaying the status. The switching position of the valve and actuator and possible fault states of the outputs are graphically presented on the display.

	Display view with 4 valve slots (e.g. 5/2-way valves)
	Display view with 4 valve slots (double valve, e.g. 2x3/2-way valves)
	Mixed display view (double and single valves)
	Valve 1 activated
	Valve 1 activated, feedback: "Upper position reached"
	Valve 1 activated, feedback: "Lower position reached"
Message 1 / Message 2 alternating: Message 1 Message 2	Short circuit at input 2 of the upper position feedback unit Example of other possible messages: Short circuit at inputs 2-4 of the lower position feedback unit

Message 1 / Message 2 alternating: Message 1 Message 2	Wire break at input 2 of the upper position feedback unit	Example of other possible messages: Wire break at inputs 2-4 of the lower position feedback unit
Message 1 / Message 2 alternating: Message 1 Message 2	Maintenance limit for pilot valve 1 reached	Example of other possible messages: Act. SCC Limit Ch. 1 Maintenance limit for actuator 1 reached

10 MAINTENANCE, TROUBLESHOOTING

! WARNING

Risk of injury from improper maintenance work.

- ▶ Maintenance may be carried out only by trained technicians and with the appropriate tools.
- ▶ Secure system against unintentional activation.
- ▶ Following maintenance, ensure a controlled restart.

10.1 Replacing the valve

! DANGER

Risk of injury from high pressure and discharge of medium at valves without HotSwap function.

- ▶ Before working on the device or system, secure the actuators against moving at valves without HotSwap function.
- ▶ Before working on the device or system, switch off the pressure at valves without HotSwap function. Vent or drain lines.

Risk of injury from high pressure and discharge of medium at valves with HotSwap function.

When disassembling a valve, lines and actuators may still be pressurized and can lead to uncontrolled movement of the actuator.

- ▶ Before working on the device or system, secure the actuators against moving at valves with HotSwap function.

Valves with HotSwap function can be replaced when pressurized.

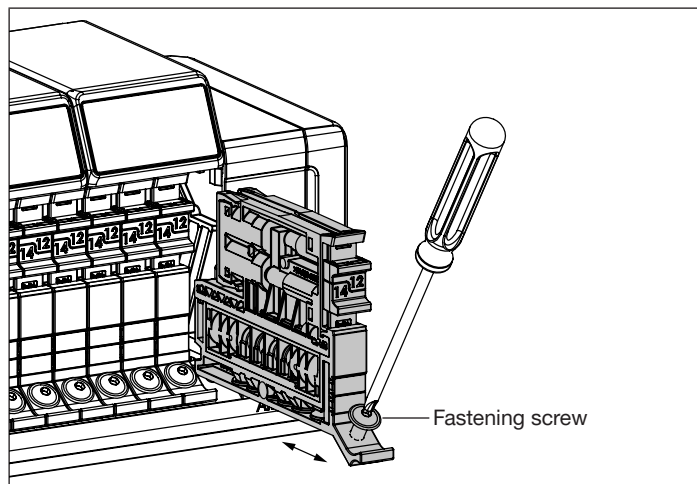


Fig. 15: Replacing the valve

- Observe safety instructions.
- Using a screwdriver, loosen the fastening screws of the valve.
- Remove valve from the valve terminal.
- Insert new valve into the valve slot.
- Tighten the fastening screw (tightening torque 2 Nm).

10.2 Replacing the filter

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.

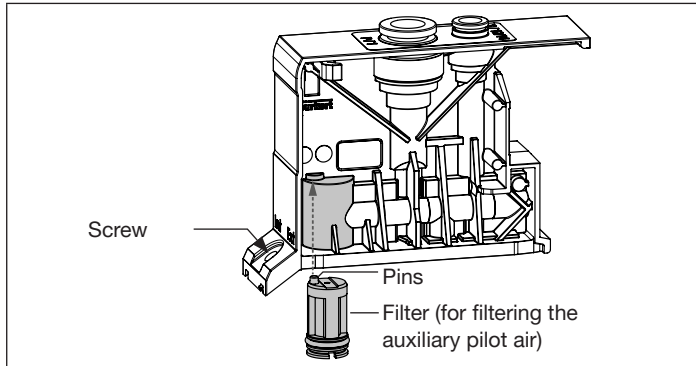


Fig. 16: Replacing the filter

- Observe safety instructions.
- Loosen the screw, extract the connection module from the front.
- Use a flat-blade screwdriver to extract the filter.
- Insert a new filter. Make sure to insert the pins of the filter into the intended holes.
- Slide in the connection module and screw tight (tightening torque 2 Nm).

10.3 Troubleshooting

Malfunction	Possible cause	Corrective action
Valves do not switch	No or insufficient load voltage	Check the electrical connection Ensure correct load voltage
	Manual override of the valves not in neutral position	Bring manual override into neutral position
	Inadequate or no pressure supply	Design the pressure supply with the largest possible volume (even for upstream devices such as pressure controllers, maintenance units, shut-off valves, etc.) For valves without auxiliary pilot air, ensure a minimum operating pressure of 3.0 bar
	Incorrect configuration	Configure the system according to the hardware set-up
	Channel not released for use	Change adjustment of the parameters (Communicator)

Malfunction	Possible cause	Corrective action
Valves switch with a delay or blow off at the deaeration connections	Inadequate or no pressure supply	Design the pressure supply with the largest possible volume (even for upstream devices such as pressure controllers, maintenance units, shut-off valves, etc.)
		For valves without auxiliary pilot air: Ensure minimum operating pressure of 3.0 bar
	Valves are not in home position (de-energized) during pressure build-up	Before switching the valves, pressurize the valve block
	Deaeration of the exhaust air ducts inadequate due to too small or dirty silencers (back pressures)	Use appropriately sized silencers or expansion tanks
		Clean dirty silencers
	Impurities or foreign objects in the pilot valve	Replace valve
Impurities or foreign objects in the filter	Clean the filter with compressed air or replace the filter	

10.4 LC display of electronics module

An overview of the possible display contents is provided in chapter “9.5 Display elements electronics module”, page 23.

Message	Possible cause	Corrective action
No message, LC display off	No or insufficient load voltage	Check the electrical connection Ensure correct load voltage
	Voltage interruption during firmware update	Execute firmware update again
Pilot SCC Limit Ch. x or Act. SCC Limit Ch. x	Maintenance limit for pilot valve / actuator channel X reached	Replace pilot valve or maintain actuator and reset switching cycle counter or deactivate switching cycle counter or increase warning limit switching cycle counter
Short Circuit Ch. x	Short circuit at input x of the position feedback unit (position feedback or plug-in connection defective)	Check position feedback/ plug-in connection or replace position feedback

Message	Possible cause	Corrective action
Wire Break Ch. x	Wire break at input x of the position feedback unit (position feedback or plug-in connection defective)	Check position feedback/plug-in connection or replace position feedback

11 DISASSEMBLY

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 due to 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 improper disassembly!

- ▶ Disassembly may be carried out only by trained technicians and with the appropriate tools!

→ Loosen the pneumatic connection.

→ Loosen the electrical connection.

12 TRANSPORTATION, STORAGE, DISPOSAL

NOTE

Transport damage due to inadequately protected devices.

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

Incorrect storage may damage the device.

- ▶ Store the device in a dry and dust-free location.
- ▶ Storage temperature -10...+60 °C.

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.

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