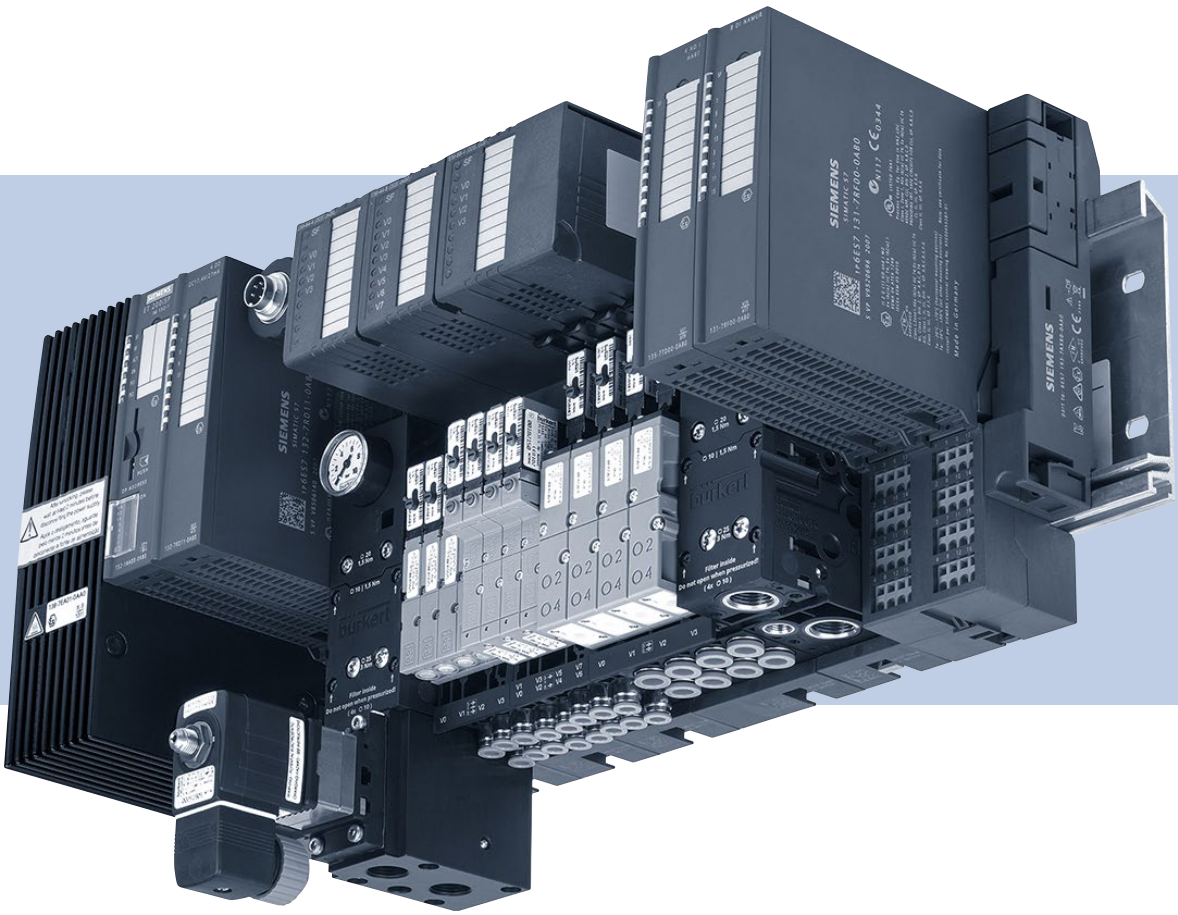
bürkert
FLUID CONTROL SYSTEMS

Type 8650 REV.2

Valve block AirLINE Ex

Valve block AirLINE Ex with interface to decentral peripheral system SIMATIC ET 200iSP for use in explosive applications



Operating Instructions

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These operating instructions apply to device variant REV.2

You can find information on differentiating characteristics between device variants REV.1 and REV.2 in chapter „6.3 Information on revision status and compatibility“ on page 17.

The operating instructions for device variant REV.1 can be found online at:
country.burkert.com

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We reserve the right to make technical changes without notice.

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Operating Instructions 2112/00_ENen_00815360 / Original DE

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1 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!

- ▸ Read these instructions carefully.
- ▸ 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 will result in death or serious injuries.

WARNING

Warns of a potentially hazardous situation.

- ▸ Failure to observe these instructions may result in serious injuries or death.

CAUTION

Warns of a potential danger.

- ▸ Failure to observe may result in moderate or minor injuries.

CAUTION

Warns of damage.

- ▸ Failure to observe may result in damage to the device or the system.

Indicates important additional information, tips and recommendations.

Refers to information in these instructions or in other documentation.

▸ Designates instructions to avoid danger.

→ Designates a procedure which you must carry out.

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1.2 Definition of terms

Term	in these instructions stands for
Device, valve block	Valve block AirLINE Ex Type 8650
Valve island	Valve block AirLINE Ex Type 8650 in with modules from the decentral periphery systems Siemens SIMATIC ET 200iSP
I/O system, ET 200iSP	Decentral periphery system Siemens SIMATIC ET 200iSP
Ex area	Potentially explosive atmosphere
Explosion protection approval	Approval(s) for operating the device in ex area
Valve, pilot valve	Solenoid valve for pneumatics can be integrated in valve block
Actuator, process valve, pneumatic cylinder, pneumatic actuator, pneumatic components	Pneumatic consumer controlled by the valve island
System	Machine with pneumatic consumers actuated by valve block
Pilot auxiliary air	Additional supply for auxiliary pilot air variant pilot valves
Pilot exhaust air	Pilot valve internal exhaust air

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2 INTENDED USE

The device is designed for use in ex areas (see chapter "7 Technical data" for specific classification). It may be used to control pneumatically operated devices.

- Device must not be used outdoors unprotected.
- When using the device, observe the authorised data, operating conditions and deployment conditions specified in the contract documents and in the operating instructions. These are described in chapters "4 Notes for use in potentially explosive areas", "6 Product description" and "7 Technical data".
- Prerequisites for safe and error-free operation include correct transportation, correct storage, installation, start-up, operation and maintenance.
- To use the device, observe the permitted data, operating conditions and application conditions. These specifications can be found in the contract documents, the operating instructions and on the type label.
- Use the device only in conjunction with third-party devices and components recommended or approved by Bürkert.
- Use the device only as intended. Non-intended use of the device may be dangerous to people, nearby equipment and the environment.

2.2.1 Ex approvals

The ex approvals are only valid if you use the modules and components authorised by Bürkert as described in these operating instructions.

The electronic modules may only be used in combination with the pilot valve types approved by Bürkert, otherwise the ex approvals are void.

The ex approvals are also void for impermissible changes to the system, modules or components.

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3 BASIC SAFETY INSTRUCTIONS

These safety instructions do not take into account any unforeseen circumstances or events occurring during installation, operation and maintenance. The operator is responsible for observing the location-specific safety regulations, also with reference to personnel.

Risk of injury due to high pressure and escaping medium.

- Switch off the pressure before working on the device or system. Vent or empty the lines.

Risk of injury from electric shock.

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

Risk of burns or fire from hot device surfaces due to longer duty cycles.

- Keep the device away from highly flammable substances and media.
- Do not touch the device with your bare hands.

General hazardous situations.

To prevent injuries, observe the following:

- Do not feed any aggressive or combustible media into the media connections of the device.
- Do not feed any liquids into the device's media connections.
- For underpressure applications, make sure that the device does not intake any flammable or explosive media.
- Do not place the device under mechanical stress (e.g. by placing objects on it or standing on it).
- Do not cover the ventilation slots of the body.
- Do not modify the device.
- Heavy equipment must only be transported, assembled and disassembled with the help of a second person as appropriate and using suitable apparatus.
- Secure the device or system to prevent unintentional activation.
- Following interruption of the process, ensure that the process is restarted in a controlled manner. Observe the sequence:
  1. Apply electrical or pneumatic supply.
  2. Charge with medium.
- Installation, operation and maintenance may only be performed by qualified personnel with an appropriate tool.
- Operate the device only when it is in perfect condition and in accordance with the operating instructions.
- Observe applicable safety regulations (also national safety regulations) as well as the general rules for the technology during setup and operation.
- Install the device according to the regulations applicable in the respective country.

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NOTE

Only provide the device with electricity via SIMATIC ET 200iSP.

- In order to prevent damage to the device, the device must solely obtain its power supply via the I/O system SIMATIC ET 200iSP.

Avoid pressure drops.

- To avoid a pressure drop, provide the device's pressure supply to the greatest extent possible.

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.

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4 NOTES FOR USE IN POTENTIALLY EXPLOSIVE AREAS

4.1 Safety instructions

Risk of injury due to electrical voltage.

- Turn off the power before performing actions within the device (e.g. disconnecting terminal modules) or system. Secure it against reactivation.
  The valves and electronic modules are excluded from this. These may also be plugged and unplugged under voltage in an explosive atmosphere.
- Observe any applicable accident prevention and safety regulations for electrical devices.

Risk of explosion.

- Only install and operate the device in accordance with the permissible usage conditions.
- The device must only be powered via the system SIMATIC ET 200iSP.

Risk of explosion due to electrostatic charge

If there is a sudden discharge of electrostatically charged devices or persons, there is a risk of explosion in the potentially explosive atmosphere.

- Use suitable measures to ensure that electrostatic charges cannot occur in the potentially explosive atmosphere.
- Clean the device surface by gently wiping it with a damp or anti-static cloth only.

Risk of burns/fire due to hot device surface if device operated continuously.

- Keep the device away from highly flammable substances and media.
- Do not touch the device with your bare hands.

General hazardous situations.

- Installation, operation and maintenance may only be performed by qualified personnel with an appropriate tool.
- Operate the device only when it is in perfect condition and in accordance with the operating instructions.
- Observe applicable safety regulations (also national safety regulations) as well as the general rules for the technology during setup and operation.
- Do not feed any flammable media into the media connections of the system.
- Do not repair the device, but replace it with an equivalent device. Repairs may be carried out by the manufacturer only.
- Do not place the device under mechanical stress (e.g. by placing objects on it or standing on it).
- Do not subject the device to mechanical and/or thermal stresses/influences which exceed the limits described in the operating instructions.
- Do not cover the ventilation slots of the body.

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4.2 Intended use

This device is an electrical and pneumatic automation system optimised for use in the control cabinet or switch box. It is used to control pneumatic systems with the specified fieldbus system. It consists of electrical and pneumatic components.

All electrical data are designed to operate with the I/O system SIMATIC ET 200iSP from Siemens. The operator must ensure that the rated voltage does not exceed the permissible limit values of the SIMATIC ET 200iSP system.

▸ No other equipment other than the valves approved by Bürkert may be electrically connected to the device.

The valve block is provided with the ATEX marking.

4.3 Special conditions

The device may only be installed in a control cabinet with degree of protection Ex e (increased safety) that ensures at least IP54 ingress protection.

For systems in the potentially explosive atmosphere, which are installed in a control cabinet (degree of protection at least IP 54), ensure the following:

- The control cabinet must be approved for use in the potentially explosive atmosphere.
- The control cabinet must be dimensioned in such a way that the resulting heat loss can be discharged to the outside using suitable means.
- The internal temperature of the control cabinet must not exceed the maximum permitted ambient temperature for the device.

Installation instructions

- The earth connection of the mounting rail shall be connected to the potential equalization system per applicable installation standard.

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4.4 Usage conditions

Rated voltage:	according to specification of the system SIMATIC ET 200iSP
Ambient temperature range:	0–60 °C for horizontal installation position 0–50 °C for all other installation positions
Solenoid valve types used:	intrinsically safe variants of the Types 6144 or 6106 (pilot controls of pneumatic valves, Types 6524– 6527)
Max. number of valve functions	96

If device structures have fewer than 96 valve functions, less power is converted, so that the considered and measured maximum temperatures are the same or lower.

Device variants with the following characteristics are permissible:

- up to 96 valve functions
- Combination of pneumatic valves of Types 6524 – 6527
  (the maximum number of 96 valve functions must not be exceeded)
- Structures with additional pneumatic connection segments “Middle”

4.5 Backwards compatibility and spare parts

On a valve block of Type 8650 Revision 1 (REV.1), electronic modules may be exchanged for electronic modules of Type 8650 Revision 2 (REV.2) (i.e. terminal module and valves of the valve segment concerned remain).

Valve blocks of Type 8650 REV.1 can be expanded with components of Type 8650 REV.2. See chapter “6.3 Information on revision status and compatibility” for compatibility restrictions.

4.6 Conformity

The unit conforms to the following standards:

- IEC 60079-0:2017
- IEC 60079-7:2015/A1:2017
- IEC 60079-11:2011
- EN IEC 60079-0:2018
- EN IEC 60079-7:2015/A1:2018
- EN 60079-11:2012

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5 GENERAL NOTES

5.1 Contact addresses

Germany

Bürkert Fluid Control Systems
Sales Centre
Christian-Bürkert-Str. 13-17
D-74653 Ingelfingen
Tel. +49 (0) 7940 - 10-91 111
Fax +49 (0) 7940 - 10-91 448
E-mail: info@burkert.com

International

The contact addresses can be found on the back pages of the printed Quickstart. They are also available online at country.burkert.com.

5.2 Warranty

A precondition for the warranty is that the device is used as intended and that the specified usage conditions are taken into account.

5.3 Information on the Internet

Operating instructions and data sheets for Bürkert products can be found on the Internet at: country.burkert.com

Information on the distributed Siemens I/O systems can be found online.

Operating instructions SIMATIC ET 200iSP

5.4 Conformity

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

5.5 Standards

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

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6 PRODUCT DESCRIPTION

Valve block AirLINE Ex Type 8650 (hereafter also AirLINE Ex) is a modular, electric and pneumatic automation system with degree of protection IP30. The device is intended for use with the decentral I/O system SIMATIC ET 200iSP from Siemens and is designed for use in potentially explosive environments.

AirLINE Ex was developed in close cooperation with Siemens. In combination with ET 200iSP modules, this results in a continuous system of electronic and pneumatic components. With adherence to simple rules, pneumatic, electric and electronic modules of various functionalities can be combined with each other to suit the specific application.

The AirLINE Ex system modules function as digital outputs with integrated valves.

The components are connected to each other via screws or locks. Both the electric and pneumatic connections are formed in this manner.

Due to the assemblies' design as linearly arranged "segments" ("valve segments", "connection segments"), future expansions or revisions of the AirLINE Ex are possible (e.g. for an expansion of the system actuated by AirLINE Ex).

The integration in ET 200iSP is practically seamless, including with regard to the projection in SIMATIC STEP 7 and PCS7.

The pilot valves integrated in AirLINE Ex allow the actuation of pneumatic actuators in the field, such as process valves or pneumatic cylinders.

The Revision 2 (REV.2) of Type 8650 AirLINE Ex is primarily depicted in this document. See chapter "6.3 Information on revision status and compatibility" on page 17 for the differences between REV.1 and REV.2.

The connection segments of AirLINE Ex REV.2 can optionally be equipped with a pressure switch or pressure sensor. This simplifies the automated monitoring of the supply pressure.

An on/off valve can be attached to AirLINE Ex REV.2 connection segments as well.

AirLINE Ex can also be used in this manner for other applications in which safety requirements must be ensured (see chapter "14 On/off valve" on page 54).

Fig. 1: View of valve island (Siemens SIMATIC ET 200iSP and Bürkert AirLINE Ex)

Fig. 2: View of valve block (Bürkert AirLINE Ex)

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6.1 Characteristics of AirLINE Ex

- Easy to use.
- Automatic formation of supply circuits and data circuits.
- Open, flexible and modular structure.
- Combination of various valve segments and electric I/O functions for station assembly optimised for space and application.
- Seamless integration in Siemens SIMATIC ET 200iSP.
- Seamless integration in Siemens SIMATIC STEP 7, SIMATIC TIA portal and SIMATIC PCS7.
- Operation possible with oiled or unoiled compressed air and with neutral, non-flammable gases.

6.2 Advantages of AirLINE Ex

- Power-optimised valve assembly.
  Pressure range of vacuum up to 8 bar (depending on valve designs used).
  Flow rate of approx. 300 l/min or 700 l/min per valve with valve width per valve of 11 mm or 16.5 mm.
- Long service life for oiled and unoiled air due to low-wear valve function.
- Centrally captured exhaust air.
- Replacement of valves and electronic modules during operation possible due to Ex degree of protection “intrinsic safety”.
- Operation with auxiliary pilot air possible for expanded pressure range (see chapter “13 Description of the valves” on page 47).
- Simple combination of various functions, configuration and expansion due to high modularity.
- Numerous valve functions: 3/2-, 2 x 3/2- and 5/2-way with various circuit functions.
- Integration of pneumatic options possible (e.g. P shutoff, check valves).
- Manual override of the valves possible.
- Various pressure levels or media possible in 1 chain (segmenting).
- Integration of pressure gauges for displaying operating pressure.
- Central compressed air supply.

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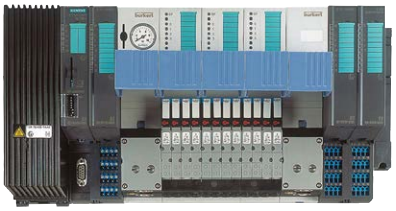
6.3 Information on revision status and compatibility

6.3.1 Overview of revision status

Date of manufacture before 02/2022

REV.1

- Terminal modules and electronic modules light grey
- Labelling of the electronic modules: EM-44-4/EM-44-8/EM-66-4
- Pneumatic base modules and connection modules REV.1
- Flange image of double valve Type 6524 different from flange image of single valve Types 6524 and 6525



Date of manufacture from 02/2022 onward

REV.2

- Terminal modules and electronic modules dark grey
- Labelling of the electronic modules: 4DO 11 mm/8DO 11 mm/4DO 16.5 mm
- Pneumatic base modules and connection modules REV.2
  – optimised P shutoff and check valves
  – uniform flange images of valves (see below)
- Flange image of single valves Types 6524 and 6525, made compatible with flange image of double valve Type 6524
- Maximum permissible ambient temperature during operation increased to 60 °C
- Connection segments:
  – integrated filter for compressed air supply
  – integrated connection for pressure sensor/ pressure switch
  – integrated interface for on/off valve

Fig. 3: Overview of revision status REV.1 and REV.2

6.3.2 Information on Revision 2 (REV.2)

Type 8650 REV.2 devices are a development of Type 8650 REV.1 and offer the following additional characteristics, among others:

- Integrated connections for pressure sensors/pressure switches for monitoring supply pressure
- Integrated filters for compressed air supply.
- Standard equipment with pressure gauge; pressure gauges can be aligned according to the installation position.
- Connection segments can (also belatedly) be equipped with an electrically actuated on/off valve.

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The electronic modules, pneumatic base modules and connection modules, as well as the single valves of Types 6524, 6525, 6526 and 6527, were revised for Type 8650 REV.2 to implement various optimisations.

The interfaces (mechanical, electric, software) of the electronic modules and terminal modules were unchanged.

6.3.3 Compatibility

Compatibility must be ensured in the following instances:

- Replacement of single valves with 11 mm width per valve (see chapter "16.13 replace valve" on page 80).
- Expansion, repair or renovation of valve blocks (see chapter "16.9 Assembling, renovating and expanding a device (valve block) with individual segments")
- The pneumatic modules (base modules and connection modules) of REV.1 and REV.2 are **not** compatible with each other.

Differences remain in

- the electrical data (electronic modules of REV.2 have slightly more output)
- the Ex approvals
- the permissible ambient temperature range during operation (expanded to 60 °C for REV.2)
- the external dimensions
- the housing colour of the terminal and electronic modules
- Omission of blue cover flaps in REV.2

In the projection there is no difference between REV.1 and REV.2 devices.

Revision 2 (REV.2) is mainly described and presented in this document.

The documentation of Revision 1 (REV.1) is still available at: country.burkert.com

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6.4 Application range

Valve block AirLINE Ex Type 8650 is designed for decentralised use in industrial environments. Electronics assemblies and armatures can be easily and efficiently combined due to the modular assembly. The device is compliant with degree of protection IP30.

DANGER

Risk of injury due to electrical voltage.

The terminal modules (with standing system wiring) are listed in the Ex degree of protection “Ex e” (increased safety).

- ▸ You must disable the system’s operating voltage before working on the terminal modules. Additional information can be found in the SIMATIC ET 200iSP handbook.

Risk of explosion.

For systems in the potentially explosive atmosphere, which are installed in a control cabinet, ensure the following:

- The control cabinet must be approved for use in the potentially explosive atmosphere.
- The control cabinet must be dimensioned in such a way that the resulting heat loss can be discharged to the outside using suitable means.
- The internal temperature of the control cabinet must not exceed the maximum permitted ambient temperature for the device.

6.5 Labelling

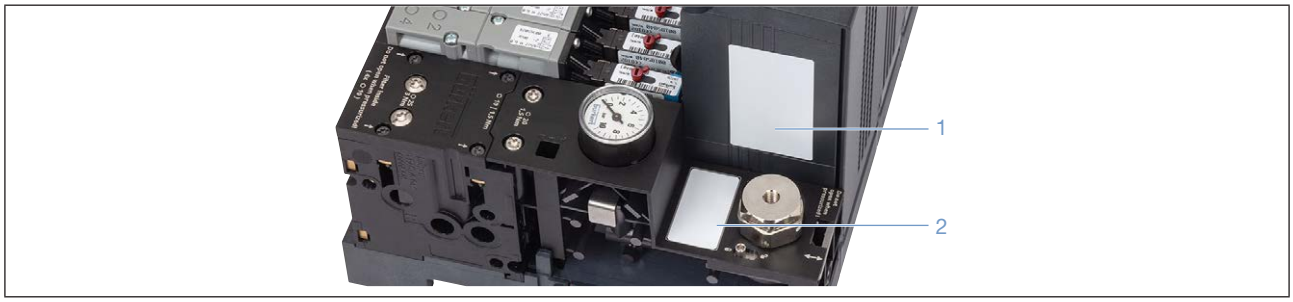

Fig. 4: Position of the type labels

Item	
1	Type label for general data
2	Type label for unit-specific data

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6.5.1 Type label for general data

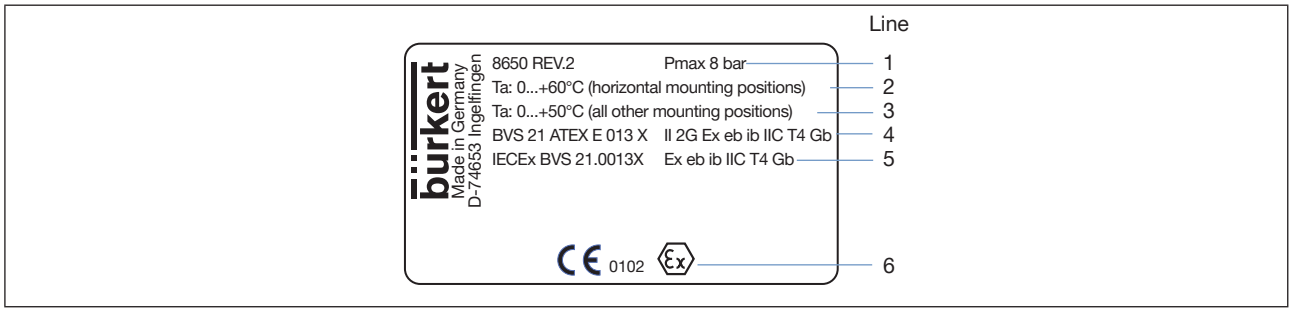

Fig. 5: Example of a type label for general data

Line	Description	Specification
1	Device type	8650 REV.2
1	Maximum operating pressure	Pmax 8 bar
2	Permitted ambient temperature range	Ta: 0...+60°C (horizontal mounting positions)
3		Ta: 0...+50°C (all other mounting positions)
4	ATEX approval number	BVS 21 ATEX E 013 X
4	Identification of the Ex protection ATEX	II 2G Ex eb ib IIC T4 Gb
5	Approval number IECEx	IECEx BVS 21.0013X
5	Identification of the Ex protection IECEx	Ex eb ib IIC T4 Gb
6	Number of the approving body auditing the production	0102

6.5.2 Type label for unit-specific data

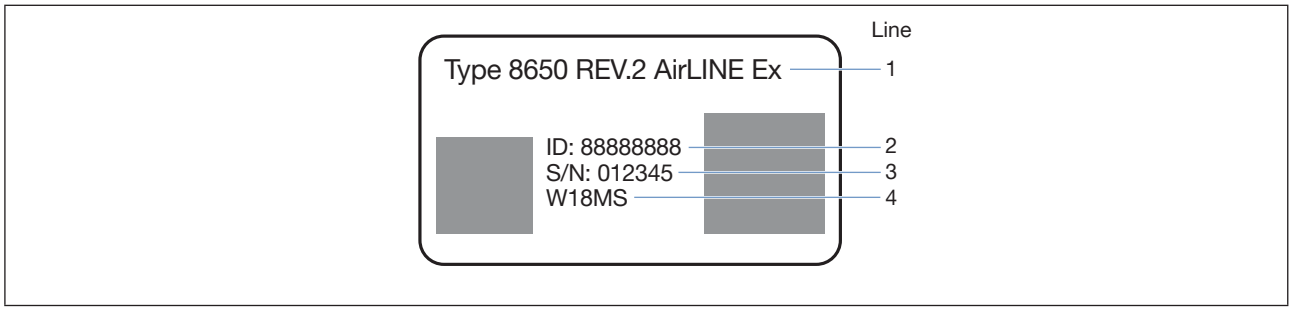

Fig. 6: Example of a type label for unit-specific data

Line	Description	Specification
1	Device type	Type 8650 REV.2
1	Device Name	AirLINE Ex
2	Order number of the device	ID: 88888888
3	Device serial number	S/N: 012345
4	Manufacture code	W18MS

Information on labelling the electronics modules can be found in the chapter “12 Description of the electronic module”.

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7 TECHNICAL DATA

7.1 Operating conditions and ambient conditions

Type of condition	Permissible range
Ambient temperature during operation	Horizontal installation position: 0 – +50/55 °C (Type 8650 REV.1) 0 – +60[1)] °C (Type 8650 REV.2) all other installation positions: 0 – +50 °C (Type 8650 REV.1 and REV.2)
Storage temperature	-40 – +70 °C
Relative air humidity	5– 95 %, without condensation
Usage height during operation	max. 2000 m above sea level
Pollution degree	2
Vibrations during operation	5 ≤ f ≤ 9 Hz max. 1.75 mm amplitude 9 ≤ f ≤ 150 Hz max. 0.5 g acceleration
Nominal operating mode	100 % duty cycle (continuous operation)

Type 8650 REV.2 meets the required limit values for electrostatic discharge according to EN 61000-4-2.

Type 8650 REV.2 doesn‘t reach the increased limit value of 6 kV for contact discharges specified for SIMATIC ET 200iSP.

7.2 General technical data

Dimensions	max. 660 mm x 194.3 mm x 164 mm (depending on design, valve variants, module variants; without optional components)
Weight	max. 10 kg (depending on design; without optional components)
Body materials	Pneumatic modules and valves: PA, PPS Terminal and electronic modules: PC
Seal materials	Valve block AirLINE Ex REV.2: NBR valves: NBR and other materials (see chapter “13 Description of the valves” on page 47)
Degree of protection	IP30
Protection class	III as per VDE 0580

1) *The valve series (Type 6524–6527) used in Type 8650 are nominally only specified for ambient temperatures up to 55 °C. Due to the relatively low self-heating of the intrinsically safe product variants used, however, operation is possible in ambient temperatures up to 60 °C. But permanent temperatures close to 60 °C or frequent changes in temperature near 60 °C can accelerate the aging of the valves and deteriorate the tightness. The functional reliability of the valves is not affected, however.*

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7.3 Pneumatic data

Medium	dry air oiled or oil-free, neutral gases (hereafter referred to as “compressed air”)
Compressed air quality	ISO 8573-1:2010, class 7.4.4[2)]
Operating pressure	up to 8 bar (bottom and upper limit dependent on valves used)

See chapters “10 Description of connection segments” on page 31, “11 Description of the valve segments” on page 37 and “13 Description of the valves” on page 47 for more pneumatic data.

7.4 Electrical data

Communication	The terminal modules automatically contact the back wall bus of ET 200iSP during the appositioning.	
Operating voltage	Supply via PowerSupply module of SIMATIC ET 200iSP (see documentation for SIMATIC ET 200iSP for details)	
Power consumption: (only the electronic modules with connected valves consume power)		
Module type (electronic module)	**Order no.**	**Power consumption incl. the respective valves**
4DO 11 mm (4 channels, for 11 mm single valves)	171 941	max. 3.2 W
8DO 11mm (8 channels, for 11 mm double valves)	171 942	max. 3.95 W
4DO 16.5 mm (4 channels, for 16.5 mm single valves)	171 943	max. 3.2 W

The values listed refer tot he electronic modules of REV.2. The values of the power consumption for REV.1 electronic modules are somewhat lower.

See chapter “11 Description of the valve segments” for current consumption values.

7.5 Approvals

Approvals	Usage of the valve island compliant with the approval requires installation in a suitable, certified housing (see also documentation for SIMATIC ET 200iSP): For zone 1: Housing with degree of protection Ex e or For zone 21: Dust-tight (certified) housing with degree of protection IP 6x (as per Directive 2014/34/EU for Category 2D) Type 8650 REV.1: see operating instructions for REV.1 at: country.burkert.com **TYPE 8650 REV.2:** Type of protection: II 2G Ex eb ib IIC T4 Approval no. (ATEX): BVS 21 ATEX E 013 X Approval no. (IEC-Ex): IECEx BVS 21.0013X

2) *To prevent the expanded compressed air from freezing, its pressure dew point must be at least 10 K less than the medium temperature.*

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7.6 Full system dimensions

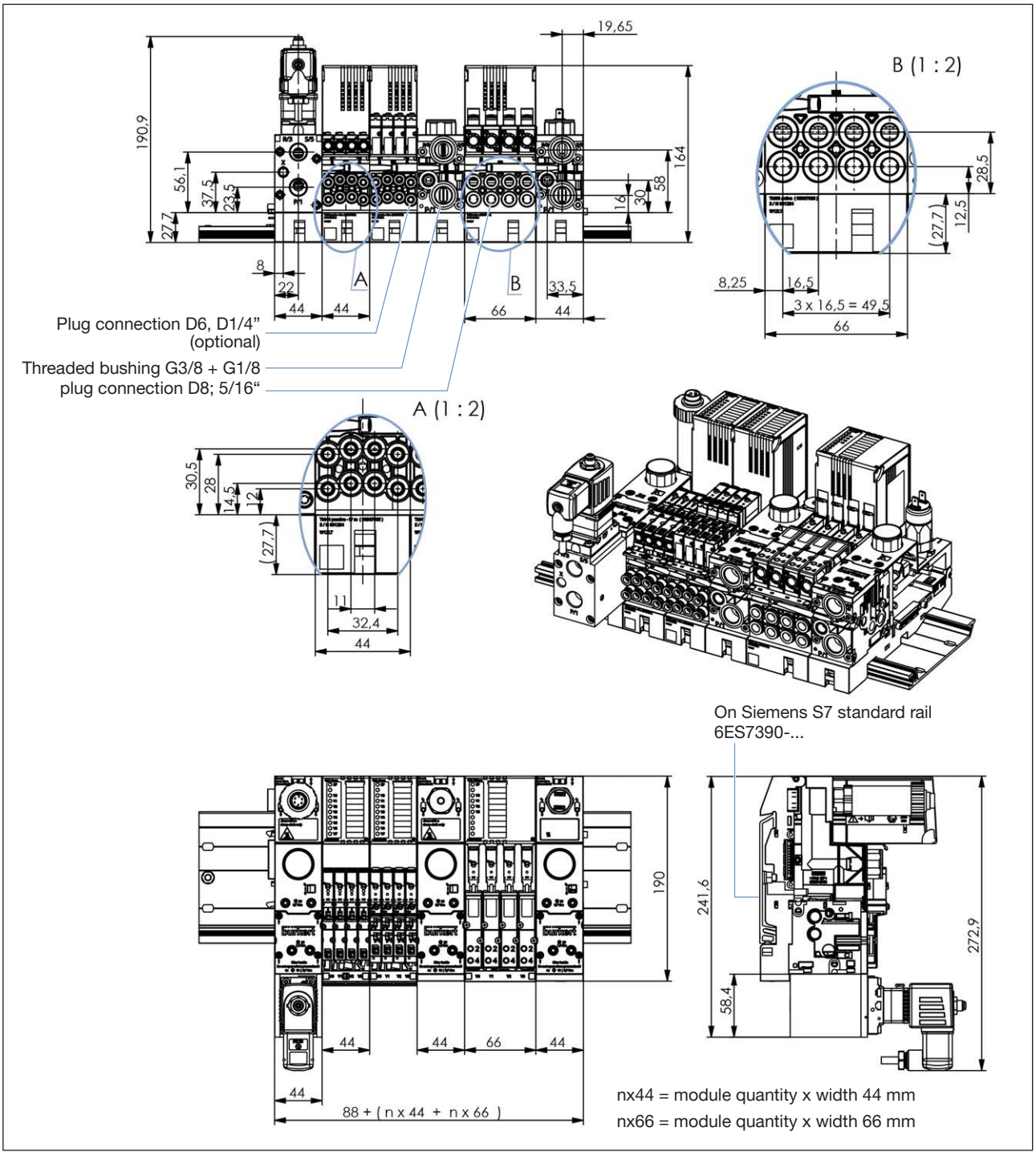

Fig. 7: Dimensions [mm] full system Type 8650 REV.2

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8 ASSEMBLY OF FULL SYSTEM AND VALVE BLOCK AIRLINE EX

8.1 Maximum system expansion

Number of modules	up to 32 electronic modules in the complete system Siemens SIMATIC ET 200iSP/ Bürkert AirLINE Ex Each at least 1 interface module and 1 PowerSupply module; these can be double (redundantly) assembled as needed. See SIMATIC ET 200iSP operating instructions for details
Valve slots	Maximum width of the valve block AirLINE EX: 660 mm When using 1 “connection segment centre” this equals • 48 valve spots for 11 mm valves of Types 6524/6525 or • 32 valve spots for 16.5 mm valves of Types 6526/6527 A mixed assembly of valve segments 44/66 mm is possible. Multiple AirLINE Ex valve blocks can also be installed in an ET 200iSP system as long as the permissible parameters (width of ET 200iSP, sum of current consumption of all electronic modules) are adhered to.
For max. width of full system	see SIMATIC ET 200iSP operating instructions
The installation position and output restrictions may pose further limitations; see SIMATIC ET 200iSP operating instructions.	

8.2 Siemens SIMATIC ET 200iSP – system components

For information see SIMATIC ET 200iSP operating instructions

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8.3 Valve block AirLINE Ex – components

8.3.1 Labelling of modules

The AirLINE Ex Type 8650 valve block consists of various modules. These are consolidated in assemblies ("segments") in favour of simple, use-oriented operation. The assembly of the valve block is schematically presented below and the individual modules are labelled.

The components highlighted in grey can optionally be installed (only REV.2), but by default are not part of the valve block nor part of the approvals of AirLINE Ex.

The texts in parentheses are the brief descriptions of the modules. These vary between REV.1 and REV.2 in the last item.

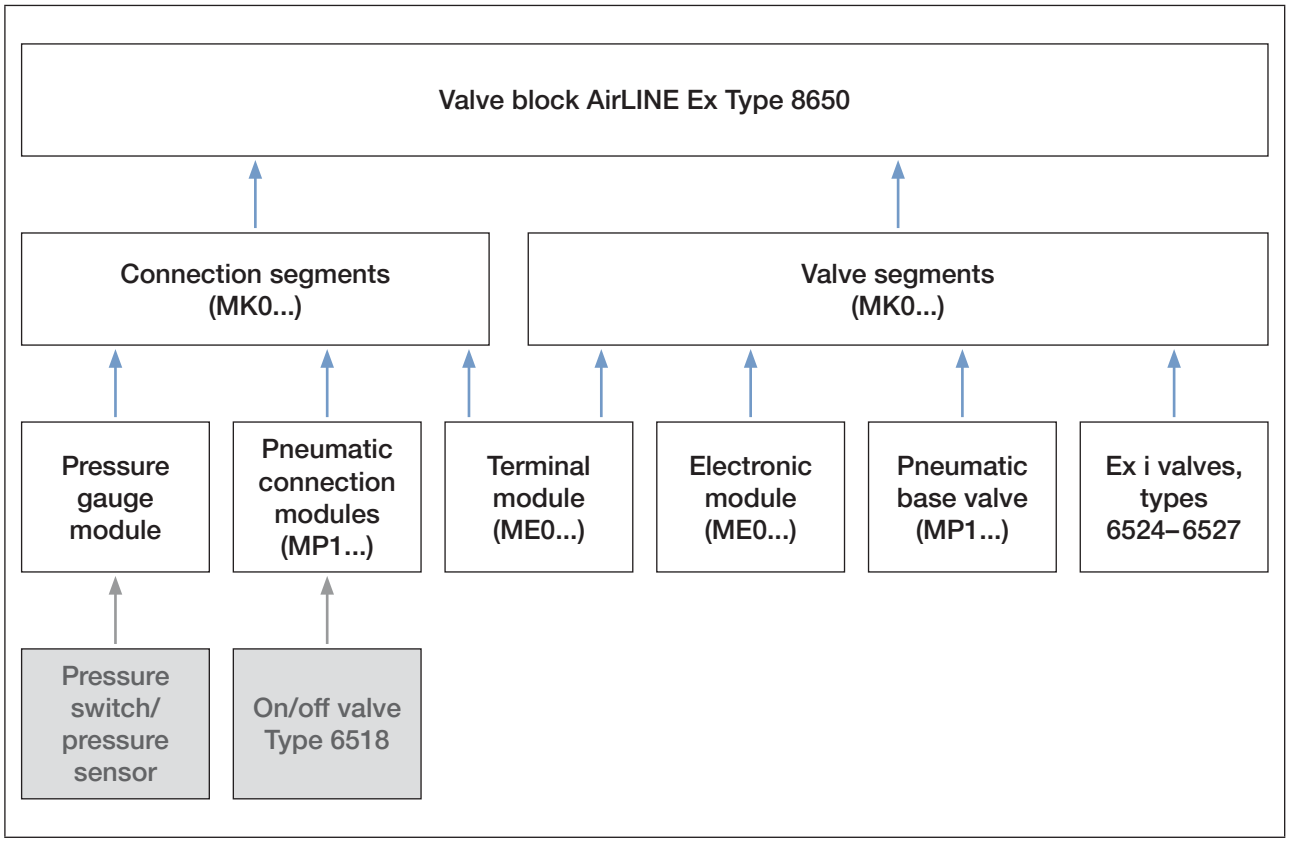

Fig. 8: Structural assembly valve block AirLINE Ex from modules and "segments"

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8.3.2 Assembly of a complete AirLINE Ex system (example)

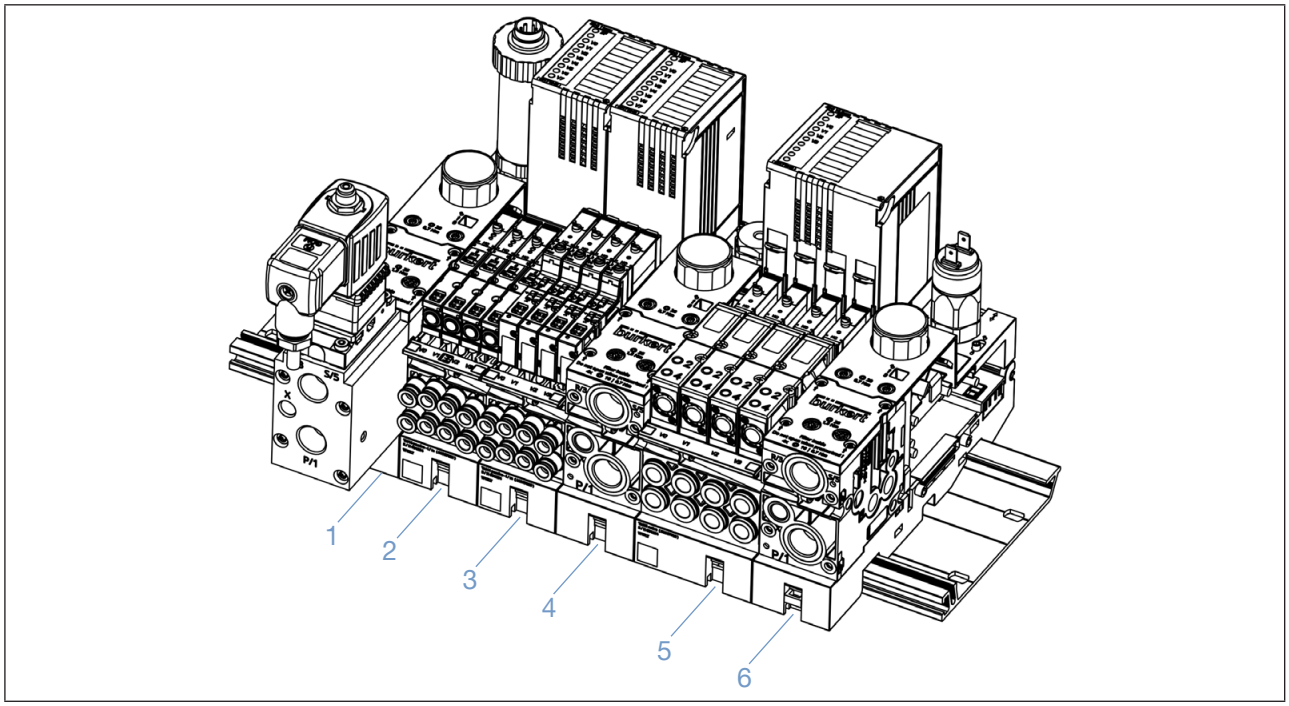

Fig. 9: Assembly of a complete valve block AirLINE Ex, REV.2 (example)

Item		Item	
1	Connection segment left, equipped with on/ off valve and pressure sensor	4	Connection segment centre (interim input)
2	Valve segment 44 mm, 4 valve functions	5	Valve segment 66 mm, 4 valve functions
3	Valve segment 44 mm, 8 valve functions	6	Connection segment right, equipped with pressure switch

8.3.3 Valve segments and connection segments – Type MK0... (module combination)

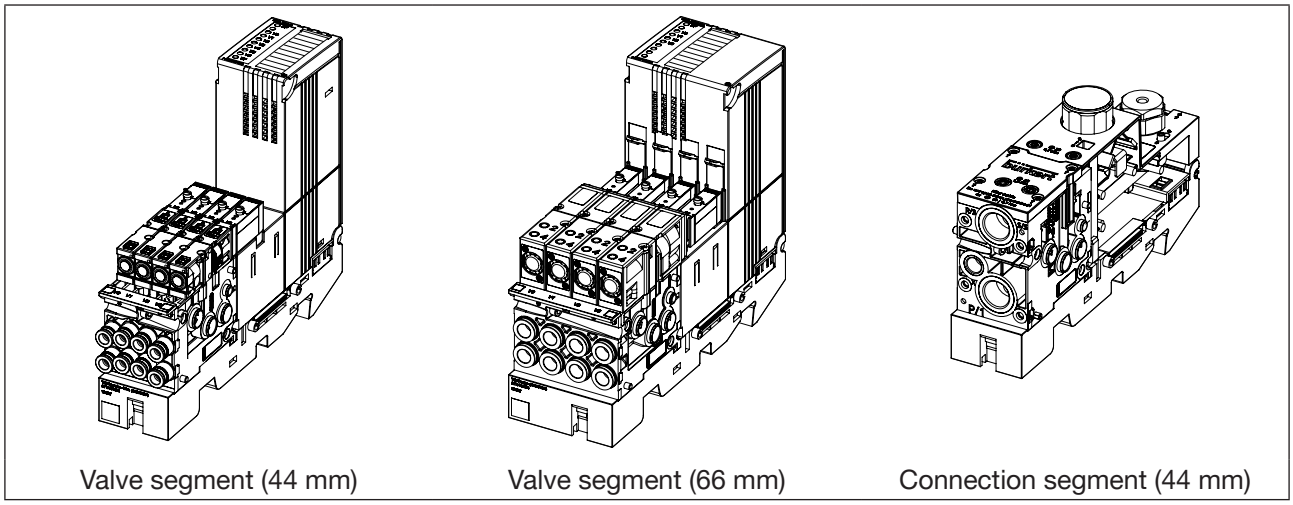

Fig. 10: Valve segments and connection segments valve block AirLINE Ex, REV.2, Type MK0... (module combination)

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8.3.4 Electronics assembly – Type ME0... (modular electronics assembly)

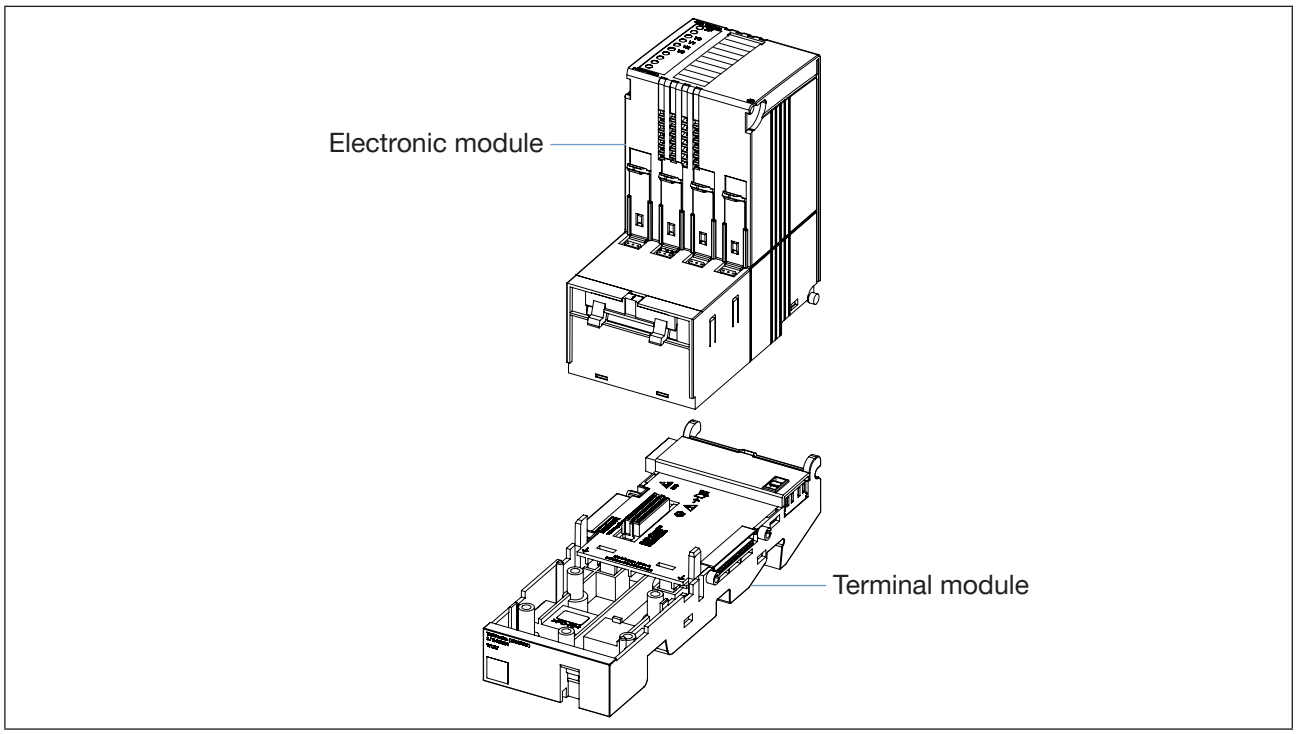

Fig. 11: Electronics assembly valve block AirLINE Ex, REV.2, Type ME0... (modular electronics assembly)

8.3.5 Pneumatics – Type MP1... (modular pneumatics)

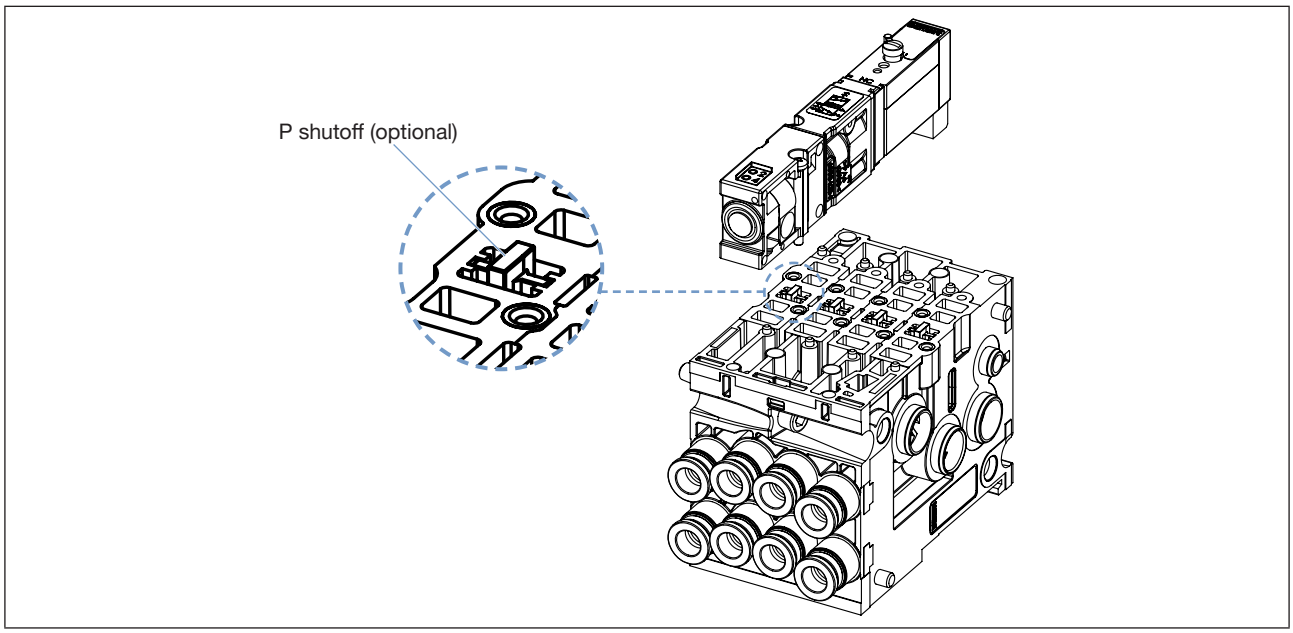

Fig. 12: Pneumatics valve block AirLINE Ex, REV.2, Type MP1... (modular pneumatics)

The detailed descriptions of the individual modules can be found in the modules' chapters.

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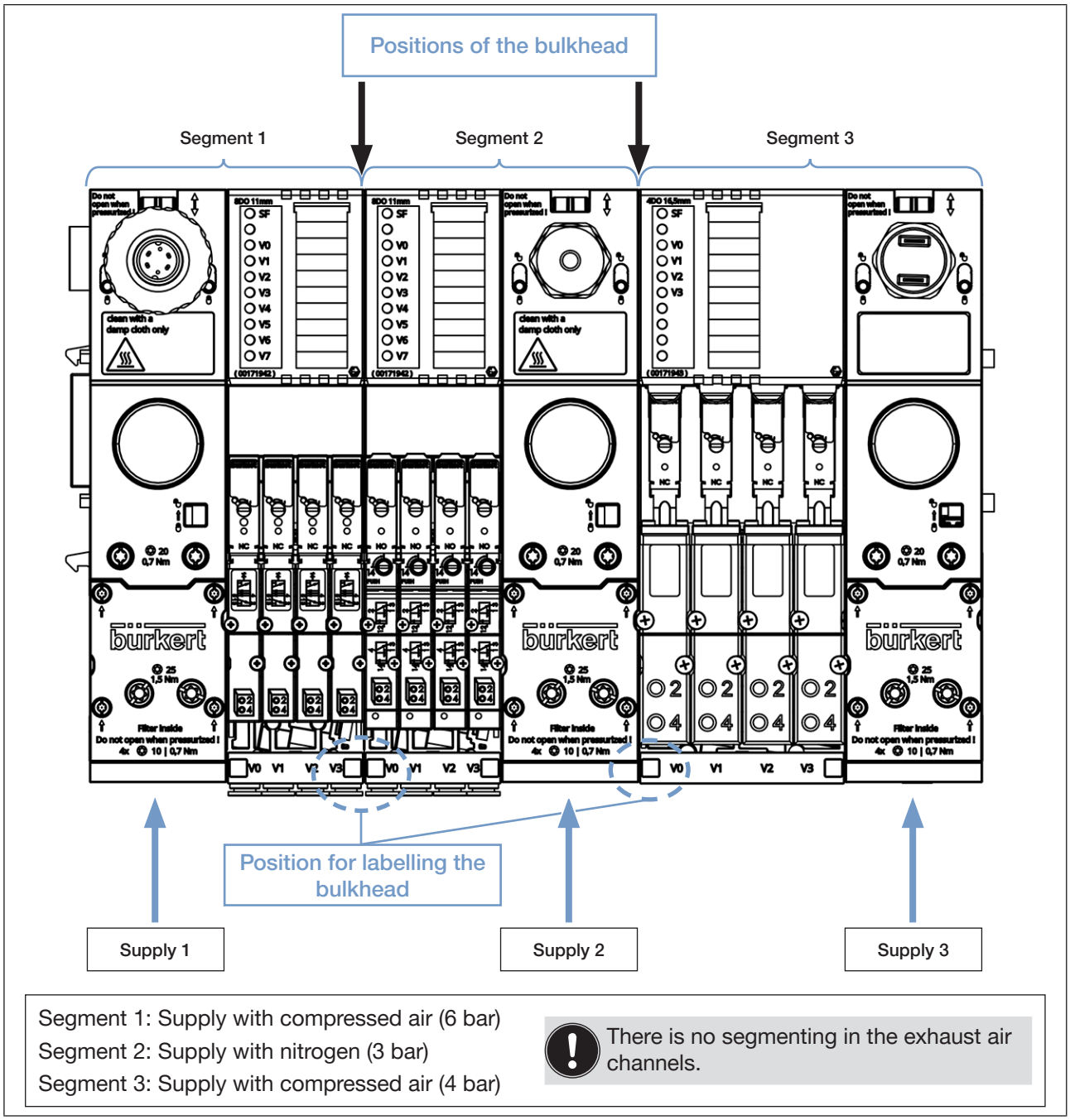
8.4 Segmenting the pressure supply

The system's pressure supply can be segmented by bulkheads in the central P channel between the pneumatic modules. Various pressure levels and/or media can be used in 1 system for this purpose.

Segments can be formed in combination with the on/off valve, the pressure supply of which can be disrupted independently of each other.

For pre-installed systems, the positions of the bulkheads on the respective pneumatic module are labelled. Belated installation of bulkheads is also possible.



Segment 1: Supply with compressed air (6 bar)
Segment 2: Supply with nitrogen (3 bar)
Segment 3: Supply with compressed air (4 bar)

There is no segmenting in the exhaust air channels.

Fig. 13: AirLINE Ex REV.2 with segmented pressure supply (P bulkhead, example)

9 FUNCTION VALVE BLOCK AIRLINE EX

Valve block AirLINE Ex Type 8650 has fluidic connections in addition to the electric contacts to the ET 200iSP connection

- for central compressed air supply (or other neutral gases),
- for connecting pneumatic actuators, and
- for consolidated exhaust air disposal.

The valve block is electrically supplied by the ET 200iSP (its PowerSupply module), while actuation occurs via the interface module of ET 200iSP.

The electronic module of the valve block control the valves of the valve block like digital outputs, and transmit data (diagnostics, etc.) to the interface module of ET 200iSP. The valves then vent and drain the connected pneumatic actuators via the work connections.

The connection segments of the valve block (REV.2) can optionally be equipped with a pressure switch or pressure sensor. This simplifies the automated monitoring of the supply pressure.

An on/off valve can optionally be flanged onto the connection segments of the valve block (REV.2).

This solution provides a very compact means to disrupt the valve block's central compressed air supply and to ventilate the valve block, including all connected pneumatic actuators. In this manner the device can also be used for applications in which security requirements must be ensured. The integratable pressure sensors/pressure switches can increase the achievable level of security (degree of diagnostics coverage).

For details, see chapter "14 On/off valve" on page 54

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9.1 Functional integration of the valve block in ET 200iSP

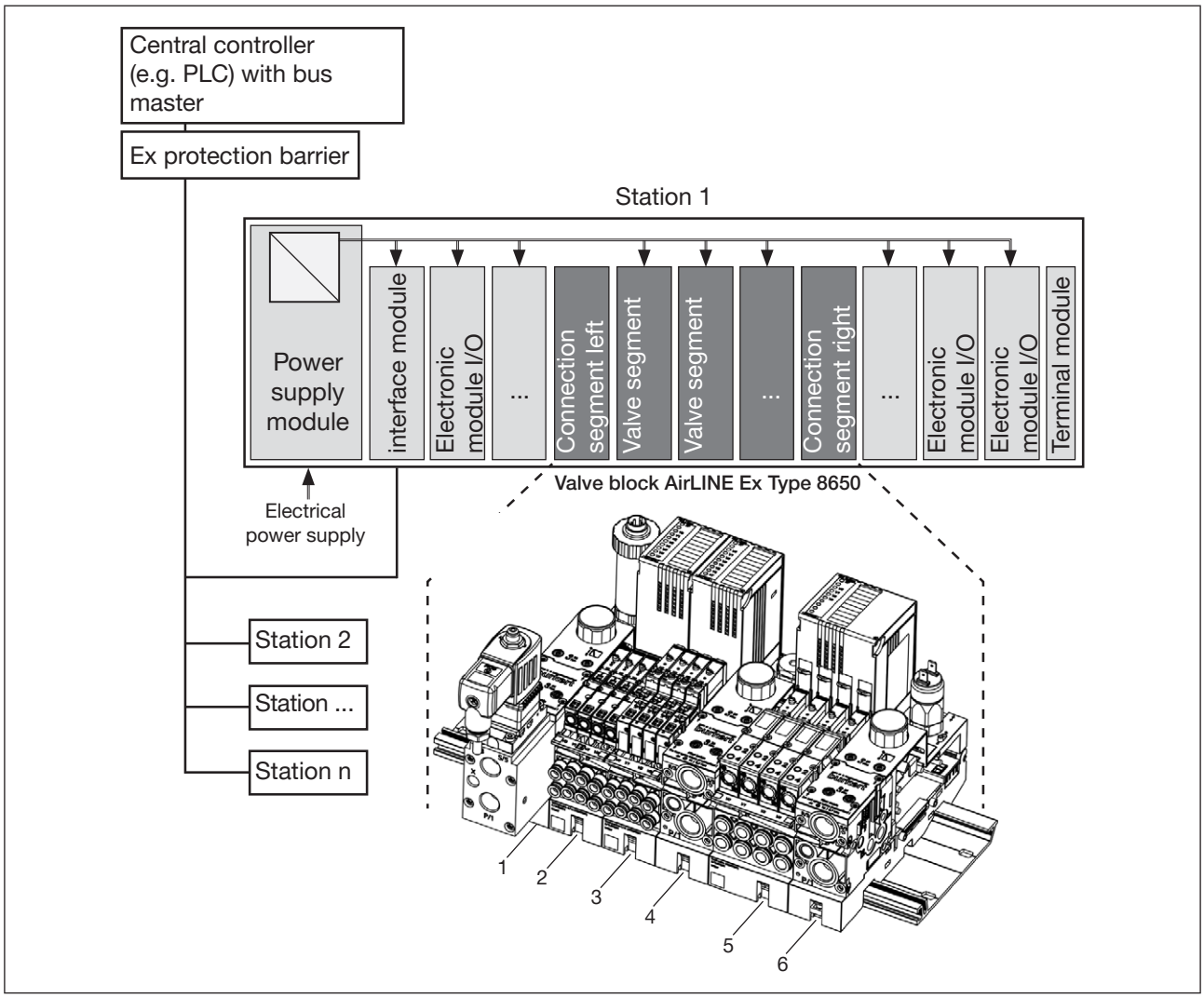

Fig. 14: Functional integration of the valve block in ET 200iSP (example)

Item		Item	
1	Connection segment left, equipped with on/ off valve and pressure sensor	4	Connection segment centre (interim input)
2	Valve segment 44 mm, 4 valve functions	5	Valve segment 66 mm, 4 valve functions
3	Valve segment 44 mm, 8 valve functions	6	Connection segment right, equipped with pressure switch

Bürkert components
Valve block AirLINE Ex

Siemens components
SIMATIC ET200iSP

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10 DESCRIPTION OF CONNECTION SEGMENTS

10.1 Structure and function

Connection segments consist of a terminal module and a pneumatic connection module as well as a pressure gauge module (standard for REV.2, optional for REV.1).

The valve block's fluid supply and disposal occur via the connection segments. The connection segments continue to serve to fasten the valve block on the standard rail.

Additional characteristics of REV.2 connection segments:

- With integrated, replaceable filter for fluid supply (in pneumatic connection module).
- With pluggable connection with G¼" thread for a pressure switch or pressure sensor.
- The pressure gauge can then be aligned in any way desired (for adjusting the installation position of the valve block).

Connection segments are electrically passive (all lines are looped through 1:1).

They are not projected in the hardware configuration programs (e.g. SIMATIC STEP 7).

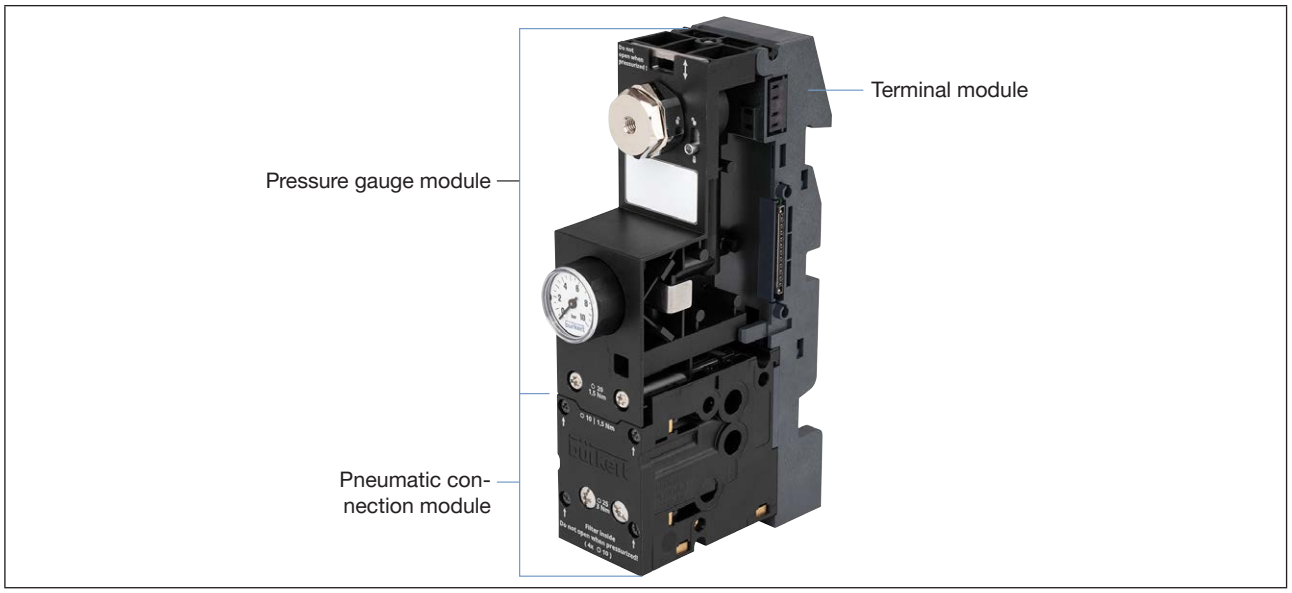

Fig. 15: Connection segment valve block AirLINE Ex REV.2

10.2 Technical data

Power consumption	0 W (module is electrically passive)
Pneumatic connections	G3/8 (P/1 for intake air and R/3/S/5 for exhaust air) G1/4 (X; depends on valves used: pre-pilot exhaust or pre-auxiliary pilot air) G1/8 (for pressure switch/pressure sensor, pluggable)
Dimensions	approx. 52 (width per valve 44) x 190 x 113 mm (without pressure switch/pressure sensor)
Material	PA, PC Brass/nickel-plated brass, stainless steel
Weight	approx. 500 g

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10.3 Overview

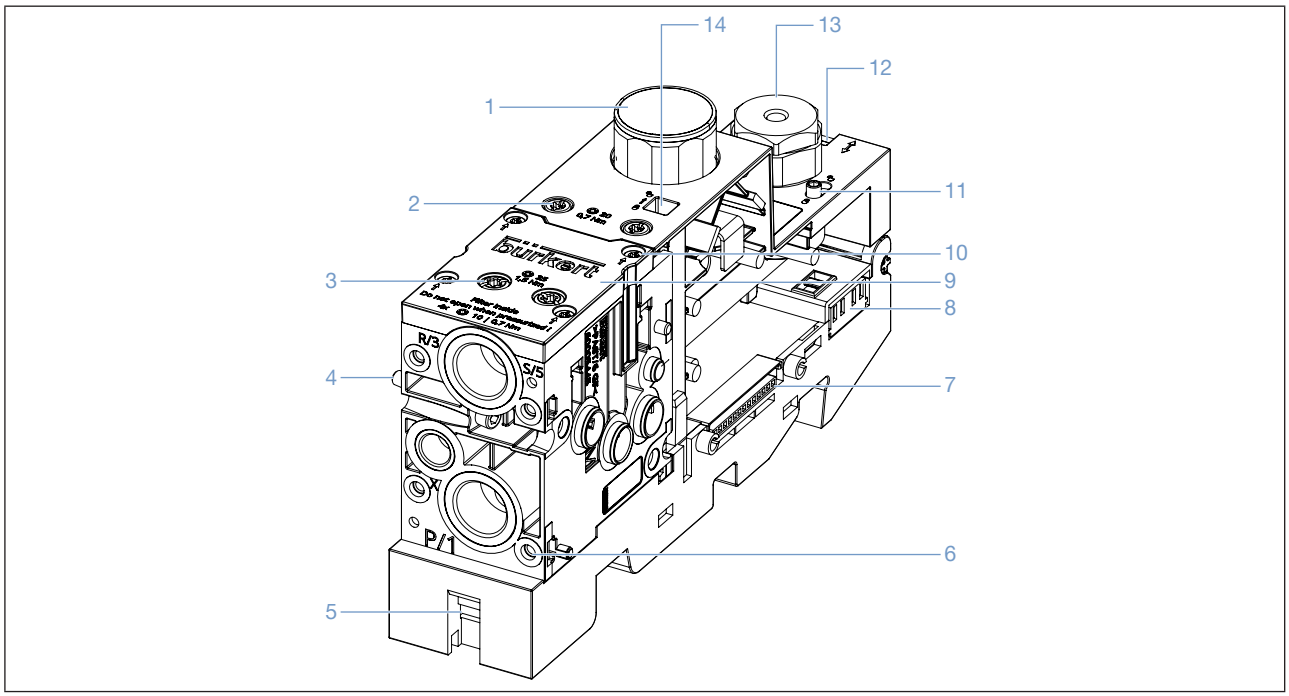

Fig. 16: Overview of connection segment valve block AirLINE Ex REV.2

Item		Item	
1	Pressure gauge for operating pressure display	8	Plug for power bus
2	Screws (2x) for fastening the pressure gauge module	9	Protective cover for filter
3	Clamping bolts (2x) for fastening the valve block on the standard rail	10	Screws (4x) for protective cover
4	Inclined tie rods (2x); not assembled for left connection segments	11	Position indicator for item 12
5	Unlocking slider; only assembled for right connection segments	12	Clamp for pressure sensor adaptor
6	Screwing point (4x) for on/off valve	13	Pressure sensor adaptor (here sealed with dummy plugs)
7	Plug for communication bus	14	Aperture for alternative operation of the unlocking slider (item 5)

Pneumatic connections: See chapter “10.4 Dimensions” on page 33

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10.4 Dimensions

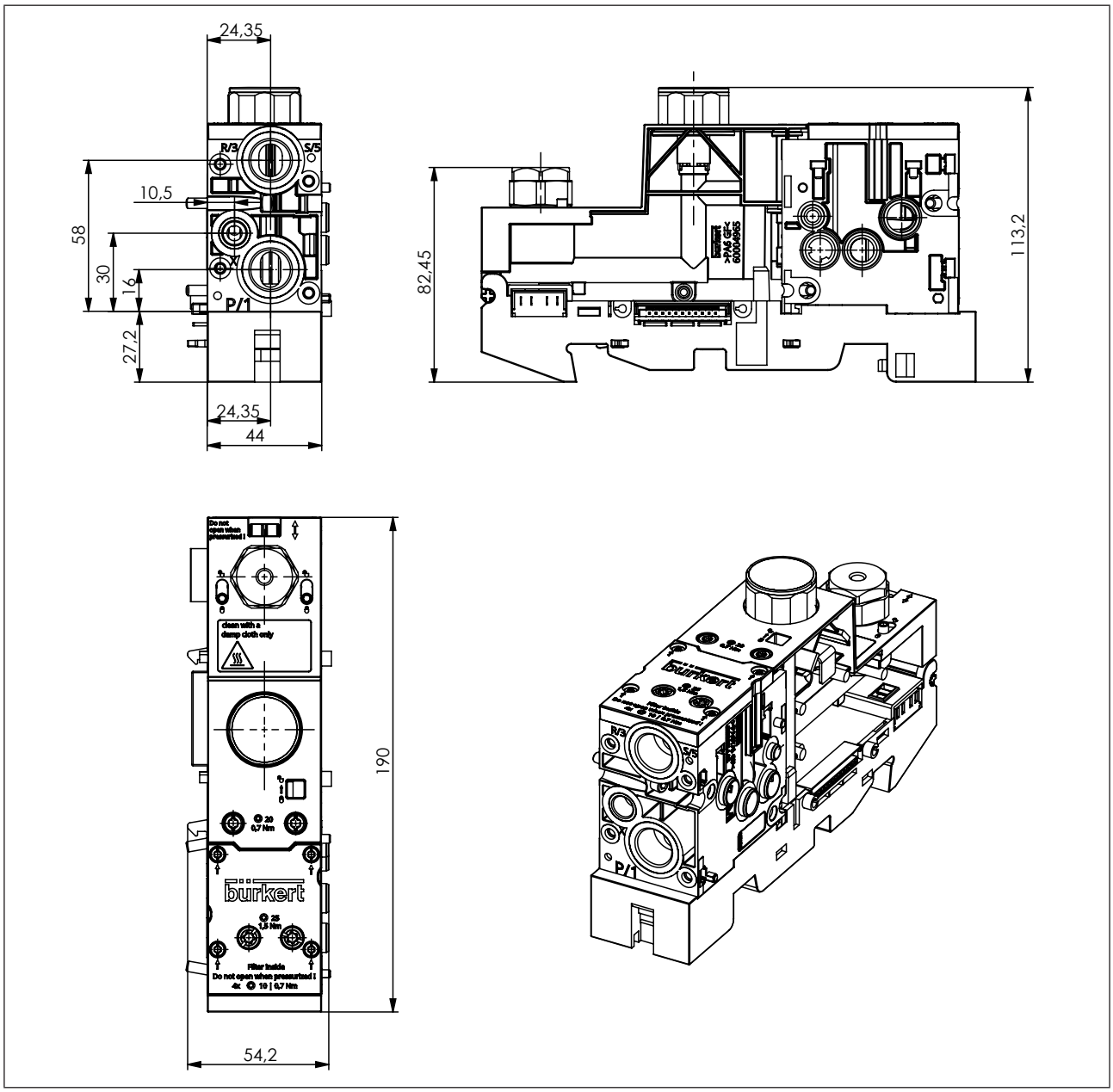

Fig. 17: Dimensions [mm] connection segment valve block AirLINE Ex REV.2

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10.5 Pneumatic connections

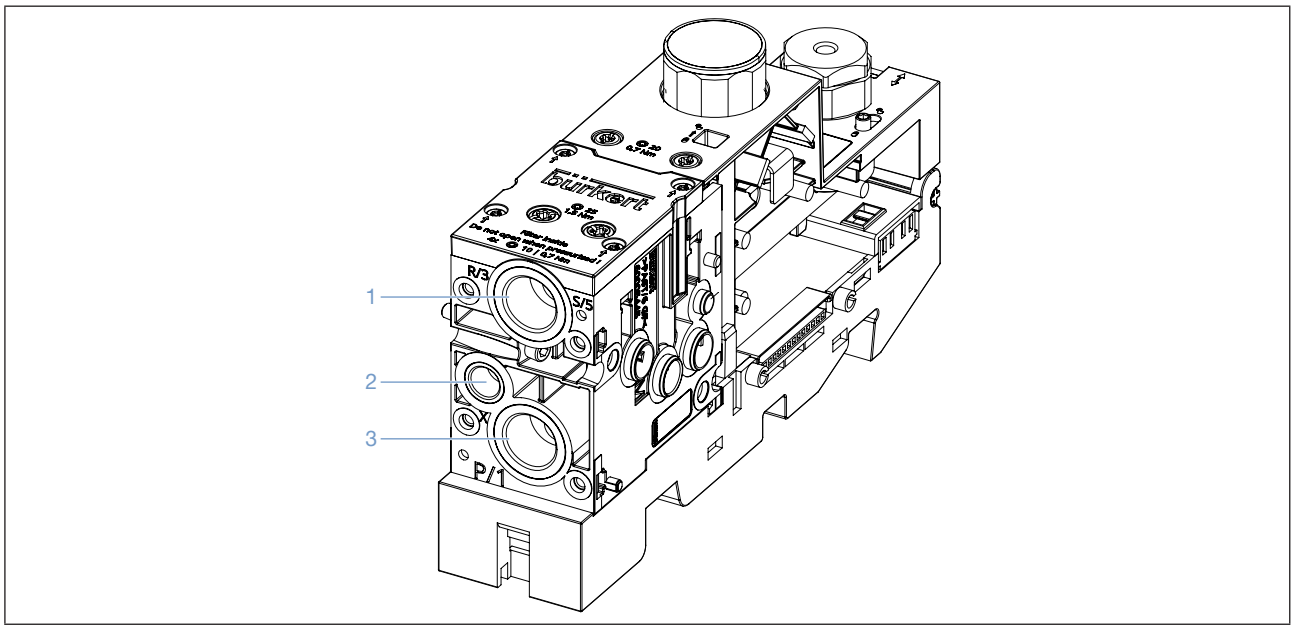

Fig. 18: Pneumatic connections connection segment valve block AirLINE Ex REV.2

Item	Labelling	Function	Port size
1	R/3 / S/5	Exhaust air	G3/8
2	X	Pre-pilot exhaust air or pre-auxiliary pilot air	G1/8
3	P/1	Supply air	G3/8

10.6 Displays

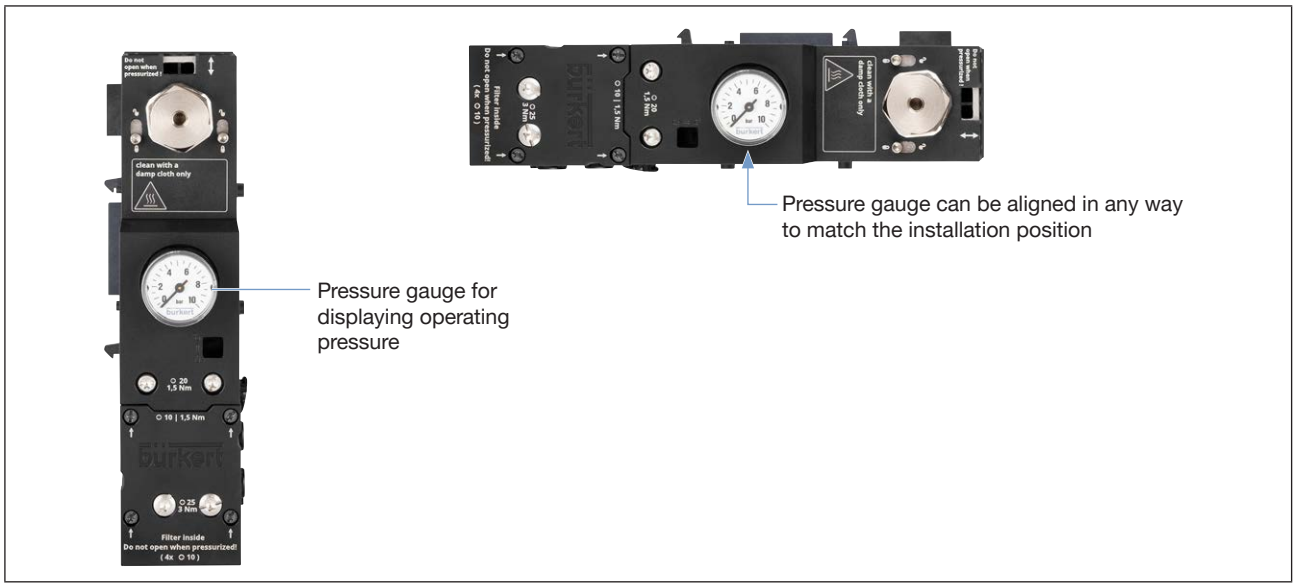

Fig. 19: Pressure gauge for indicating operating pressure on the connection segment of valve block AirLINE Ex REV.2

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10.7 Filter

In the pneumatic connection module of each connection segment, a filter is integrated in the input air channel P/1. See chapter “16.10.1 Connection segments” on page 73 for information on maintenance and replacement

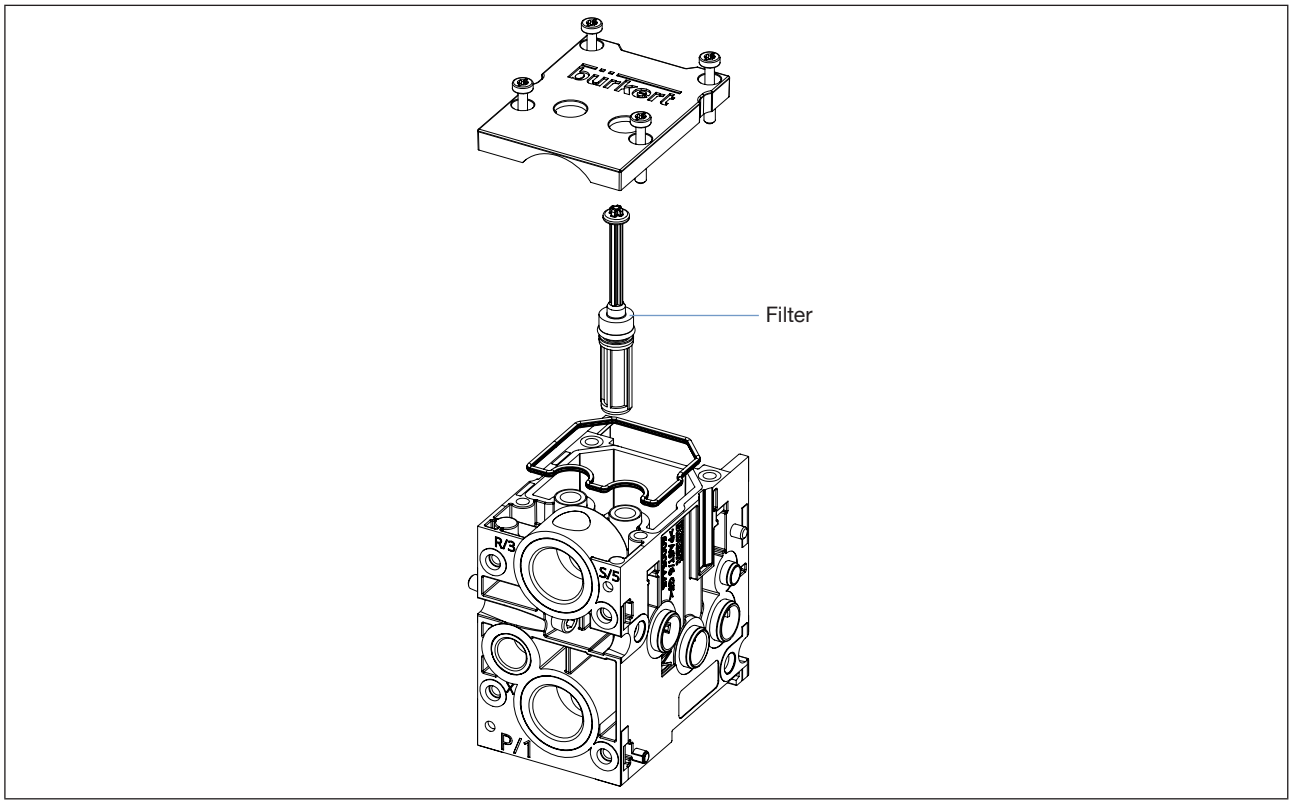

Fig. 20: Filter in a pneumatic connection module

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10.8 Pressure gauge module

Each connection segment of valve block AirLINE Ex REV.2 contains a pressure gauge module.

In addition to the pressure gauge installed by default, a pressure switch or pressure sensor can also be installed. This makes automated monitoring of the pressure in the input air channel P/1 possible.

This option is especially interesting when using an on/off valve upstream of AirLINE Ex.

The pressure switch or pressure sensor is installed with a pluggable adaptor with G¼" connection.

See chapter "16.12 Installing/uninstalling pressure switch/pressure sensor" for information on installation.

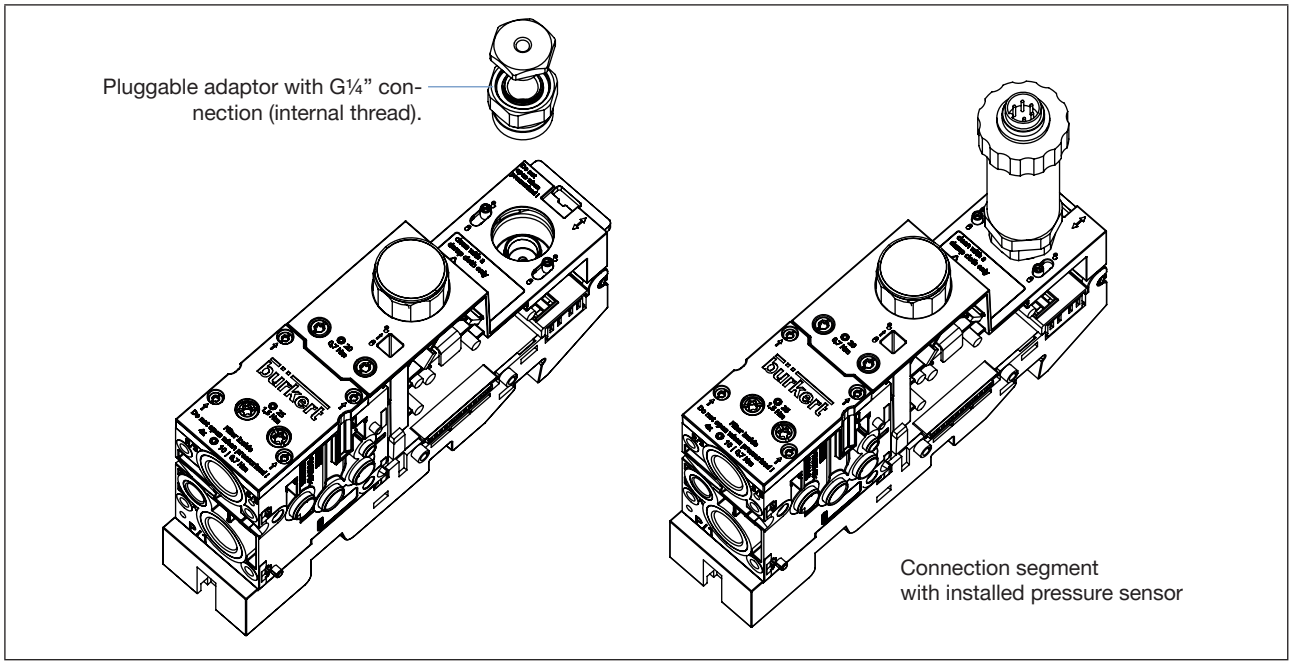

Fig. 21: Connection of a pressure switch or pressure sensor on the pressure gauge module

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11 DESCRIPTION OF THE VALVE SEGMENTS

11.1 Structure and function

Valve segments consist of a terminal module, pneumatic base module and electronic module.

Valve segments can be assembled with up to 4 valves. 2 variants (44/66mm width) are available for valves with varying widths per valve and air flow rate. The various valve functions can be freely combined.

The actuators are connected to the valve segments.

The electronic module actuates the valves, monitors their function and provides diagnostic information via ET 200iSP.

The pneumatic base modules can optionally be equipped with

- P shutoff (allows valve replacement under pressure)

and

- check valves (prevent accidental activation of valves through back pressure in the system).

For details, see chapter “11.6 Pneumatic options”.

Valve segments are electrically active. They (or the electronic modules) must be projected in the hardware configuration programs (e.g. SIMATIC STEP 7).

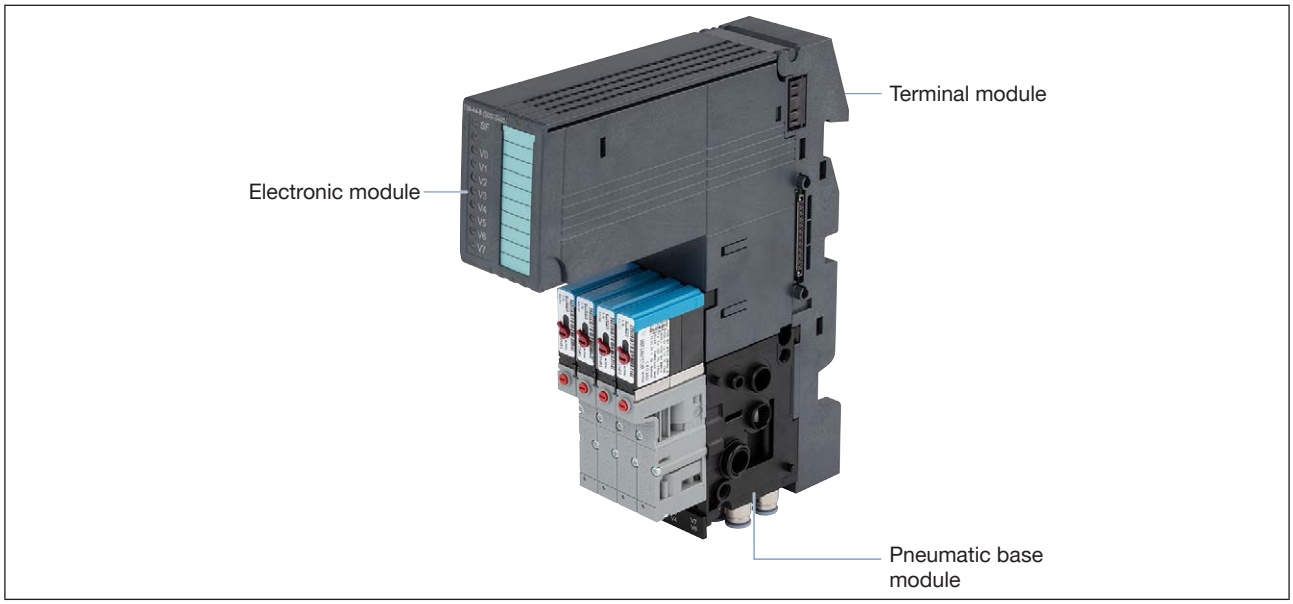

Fig. 22: Valve segment valve block AirLINE Ex REV.2

More information is available in chapter “12 Description of the electronic module”.

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11.2 Technical data

	Valve segment for 11 mm valves		Valve segment for 16.5 mm valves
Number of valve outlets	4	8	4
Dimensions [mm]	44 x 194.3 x 163.5		66 x 190.5 x 163.5
Weight with valves [g]	540	630	740
Material Housing Pneumatic modules	PC PA		
Electronic module data:			
Current consumption [mA]	275[3)]	340[3)]	275[3)]
Module power consumption (incl. valve units) [W]	max. 3.2	max. 3.95	max. 3.2
Status indicator	1 LED (red) for module status 1 LED (green) per channel (valve function)		

Pneumatic connections	Push-in connection D6 or D1/4" (chosen by user)	Push-in connection D8, 5/16"

Valve data (see chapter "13 Description of the valves" for more information)					
Valve type	6524 3/2-way	6525 5/2-way	6524 2x 3/2-way	6526 3/2-way	6527 5/2-way
Circuit function[4)]	C/D	H	2xC	C/D	H
Width per valve [mm]	11			16.5	
QNn[5)] [l/min]	300			700	

3) *These values are considered in the calculation of the maximum total power consumption of the station (see also table 3–4 in the handbook for ET 200iSP)*

4) *C = NC (normally closed), D = NO (normally open)*

5) *Flow rate QNn value air [l/min]: measured at +20 °C, pressure 6 bar at valve inlet and 1 bar pressure difference*

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11.3 Overview valve segments, widths per valve 44 mm and 66 mm

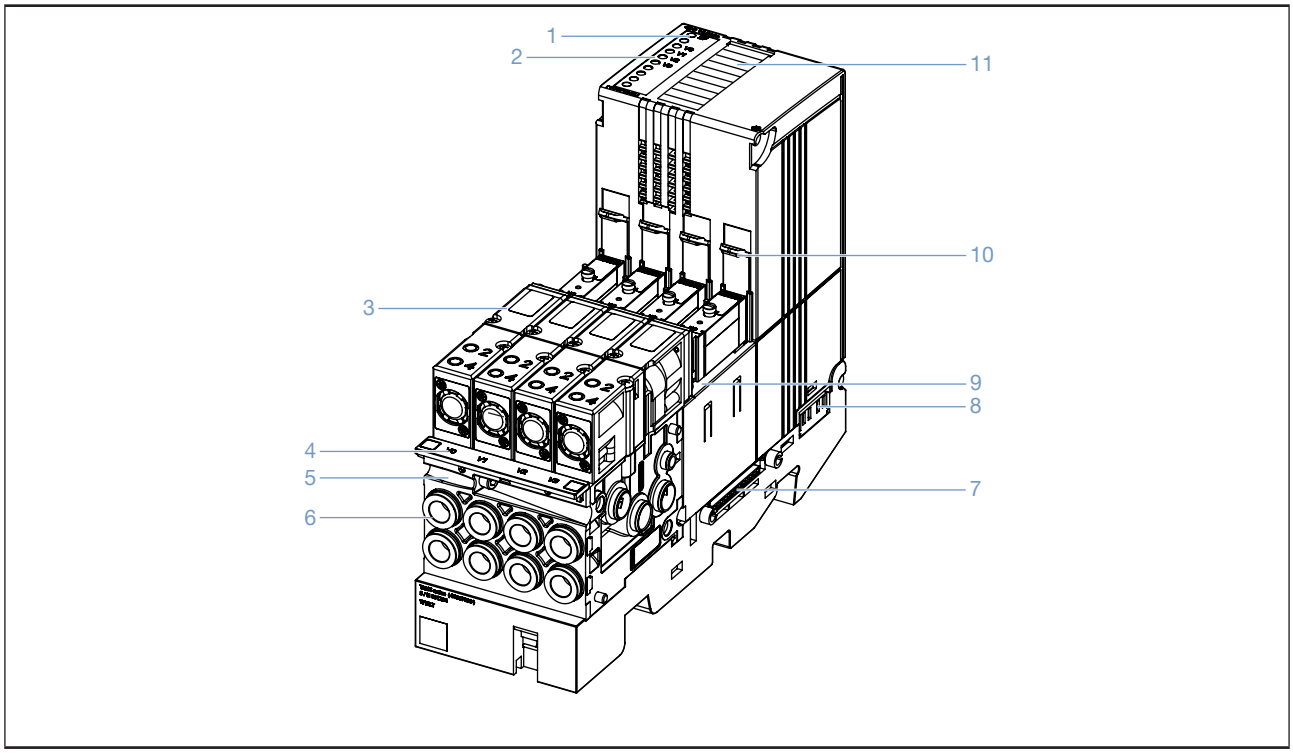

Fig. 23: Overview valve segment (example: width per valve 66 mm)

Item		Item	
1	LED (red) to indicate module status	7	Plug for communication bus
2	LEDs (green) to indicate channel status	8	Plug for power bus
3	Valves	9	Lock slider (below the valves)
4	Label of valve spots and pneumatic options (P shutoff, check valves, P bulkhead)	10	Valve extractor (only for width per valve 66 mm)
5	Inclined tie rods (2x)	11	Slip-in label strip[6)]
6	Pneumatic working ports		

6) *The slip-in label strips are identical with those used for SIMATIC ET 200iSP.*

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11.4 Dimensions

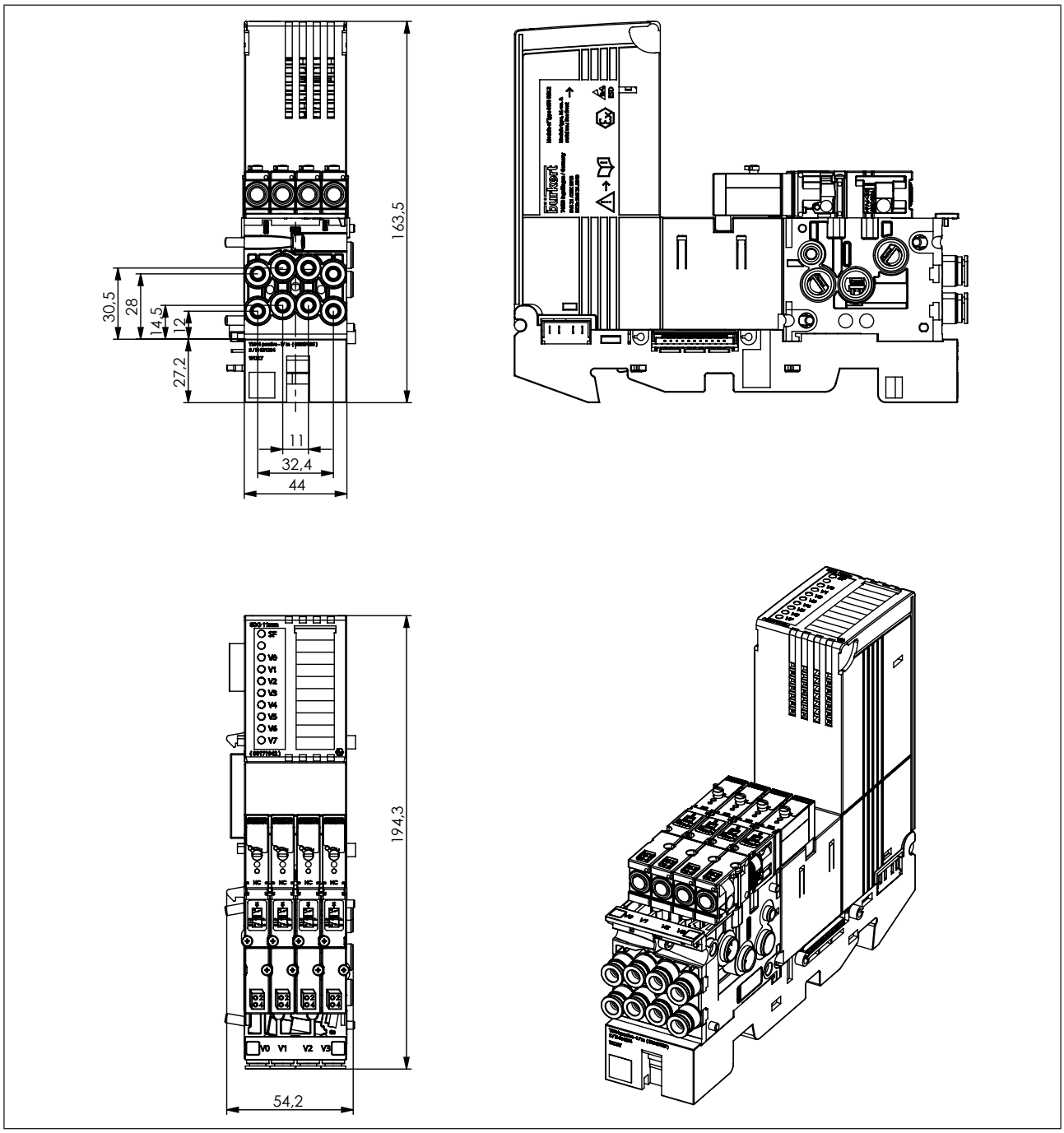

Fig. 24: Valve segment dimensions [mm]
(example: width per valve 44 mm, this varies for valve segments with width per valve 66 mm, see chapter "7.6 Full system dimensions" on page 23)

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11.5 Pneumatic connections

DANGER

Risk of injury from high pressure, escaping medium and uncontrolled movement of the actuators.

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

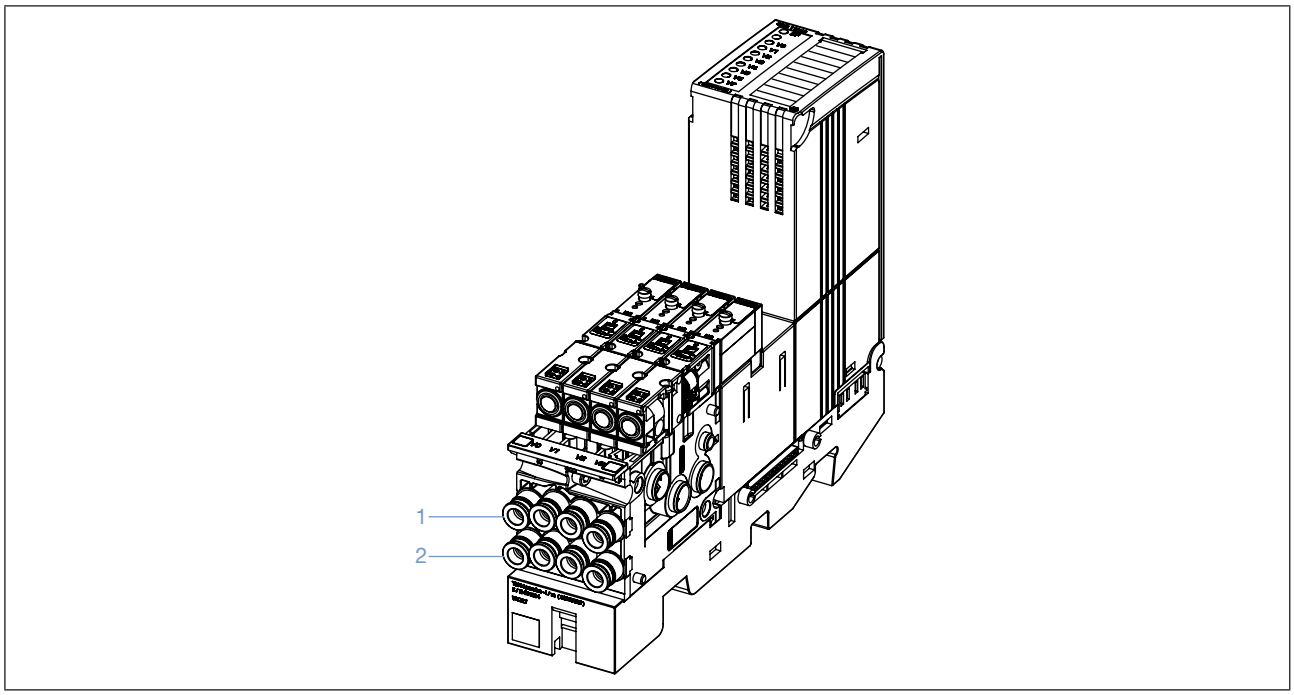

Fig. 25: Possible variants of the work ports (example: width per valve 44 mm)

Assignment of work ports

Item	3/2-way valves (Types 6524/6526)	5/2-way valves (Types 6525/6527)	2x3/2-way valves (Type 6524)
1	unused	2	2 (valve 12)
2	2	4	4 (valve 14)

11.6 Pneumatic options

The following equipment options are available for the pneumatic base modules:

	Valve segments 44 mm	Valve segments 66 mm
Check valves (optional)	Check valve in R channel and R channel	
P shutoff (optional)	P shutoff[7)]	not available

7) *Not available for valves/valve blocks that use external auxiliary pilot air*

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Check valves for ventilation channels

Check valves in the ventilation channels prevent unintended activation of valves and actuators due to back pressure.

The check valves are not suitable for under-pressure applications.

P shutoff

For pneumatic base modules equipped with a P shutoff (marked on the module, see below), a valve can also be replaced if supply pressure is available.

The P shutoff reduces the flow rate by about 25 % for the AirLINE Ex REV.2 (stronger reduction for AirLINE Ex REV.1).

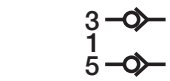
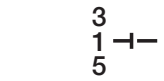
Operating pressure range:
The P shutoff from AirLINE Ex REV.2 can be used from 0 bar to the permissible maximum operating pressure of REV.2 (smaller pressure range for AirLINE Ex REV.1). The P shutoff is not suitable for under-pressure applications.

P bulkhead

A bulkhead can be inserted into the P channel between valve segments. This allows the creation of multiple pressure levels or media loops within an AirLINE Ex system (see chapter “8.4 Segmenting the pressure supply” on page 28 for details).

Labelling the options

The lower edge of the base modules contains symbols indicating which options the base modules are equipped with.

Option	with check valves	with P shutoff and check valves	with P bulkhead[8)]
Icon			

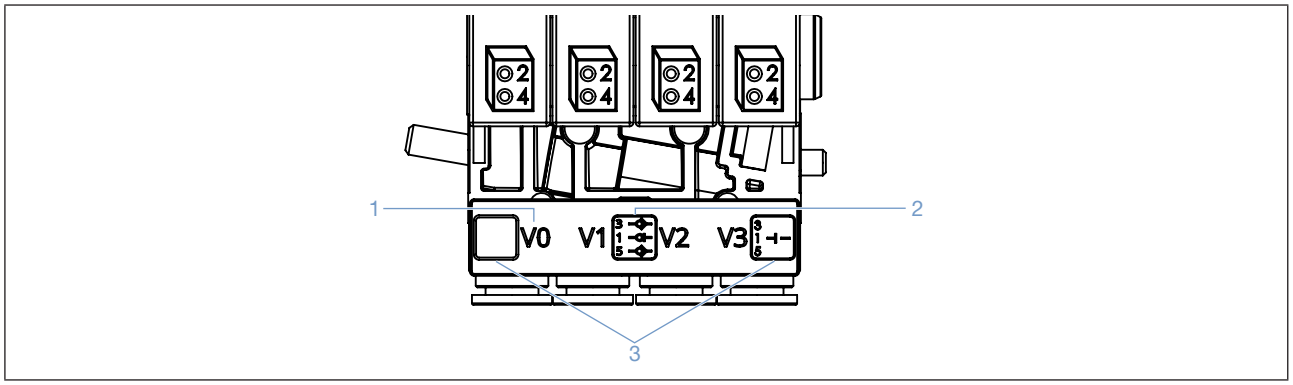


Fig. 26: Labelling on lower edge of pneumatic base modules

Item		Item	
1	Labelling of valve position	3	Labelling of P bulkhead (here at the interface with the right adjacent module)
2	Labelling “P shutoff” and “check valve”		

8) *If a bulkhead is installed in the P channel between pneumatic modules (base modules or connection modules), the corresponding interface is labelled with this symbol.*

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11.7 Displays

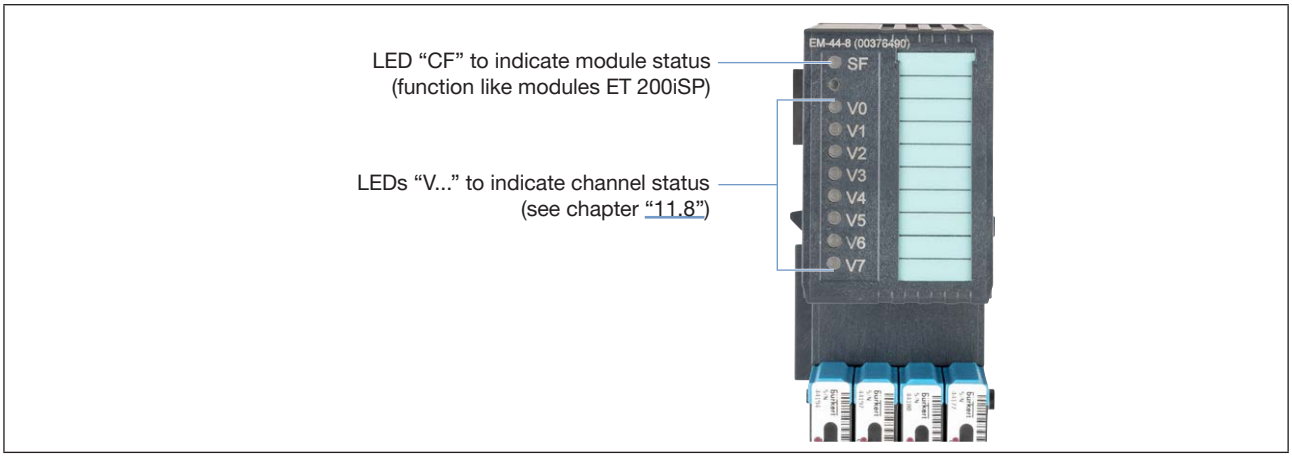

Fig. 27: Display elements of valve segment

11.8 Channel assignment

2 bytes must be projected per valve segment/electronic module. These are occupied and assigned to the channels/valves as follows:

	Byte	High-byte			Low-byte							
	Bit	7	...	0	7	6	5	4	3	2	1	0
4-channel module	Channel no.	–	–	–	–	–	–	–	3	2	1	0
	LED								V3	V2	V1	V0
8-channel module	Channel no.	–	–	–	7	6	5	4	3	2	1	0
	LED				V7	V6	V5	V4	V3	V2	V1	V0

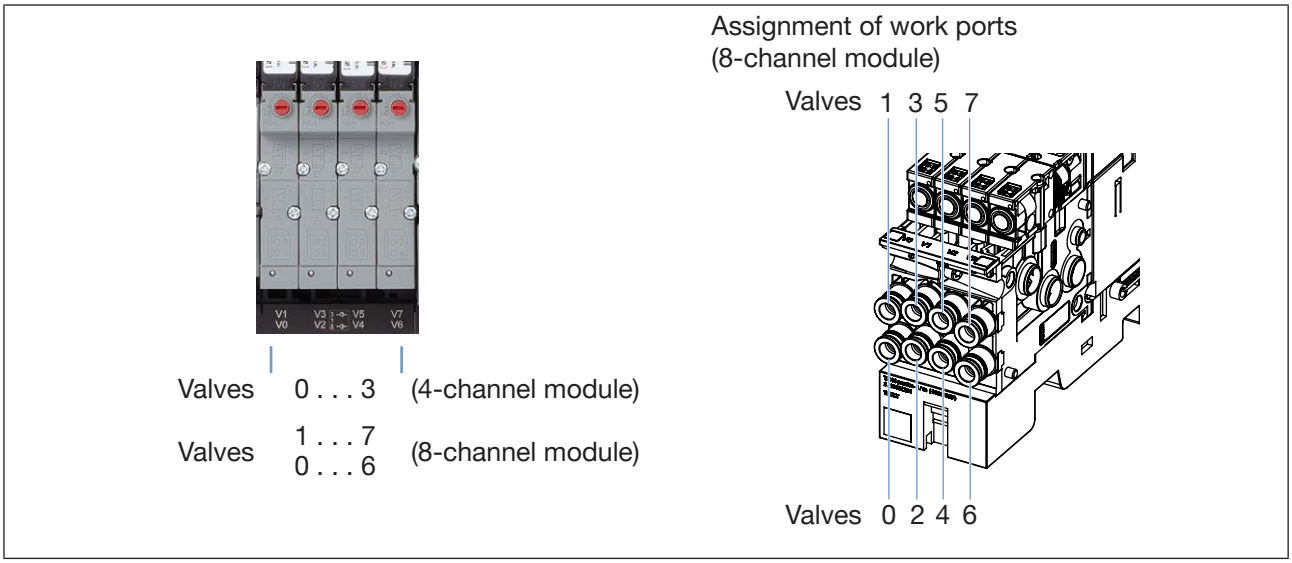

Fig. 28: Assignment of work connections to the valves

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11.9 Diagnostics (electronic module)

Consolidated error notification: Yes, locally on electronic module (red LED “CF”)

Diagnostics function (readable via bus interface of ET 200iSP):

- Channel status diagnostics (channel open, channel short circuited)
- Switching cycle counter separate from channel with warning parameters for both pilot valve and connected actuator

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12 DESCRIPTION OF THE ELECTRONIC MODULE

12.1 Structure and function

The electronic module is part of the valve segment. It contains the push-in connections for the valves as well as the electronics assembly required to control the valves.

It is electrically active (function: digital output module) and **must** be **projected accordingly** in the programs for hardware configuration (e.g., Siemens Step 7).

Electronic modules can be individually alternated (i.e., not multiple at a time; see documentation for SIMATIC ET 200iSP for details).

Refer to chapter “17.5.3 Parameter functions” for the 8-channel modules.

12.2 Labelling

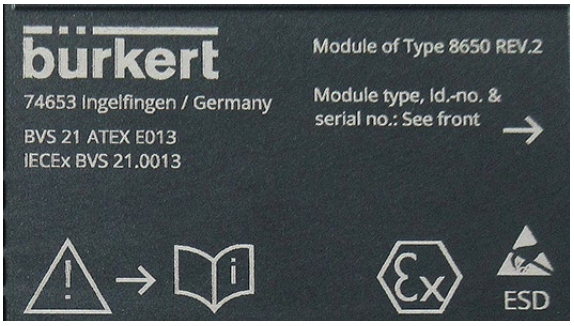

Fig. 29: General labelling (see side surface)

Fig. 30: Identification and serial number (front)

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12.3 Technical data

Electrical data and status indicators: see chapter “11.2 Technical data” on page 38

Identification number of the module	171 941	171 942	171 943
Number of valve outlets	4	8	4

12.4 Overview

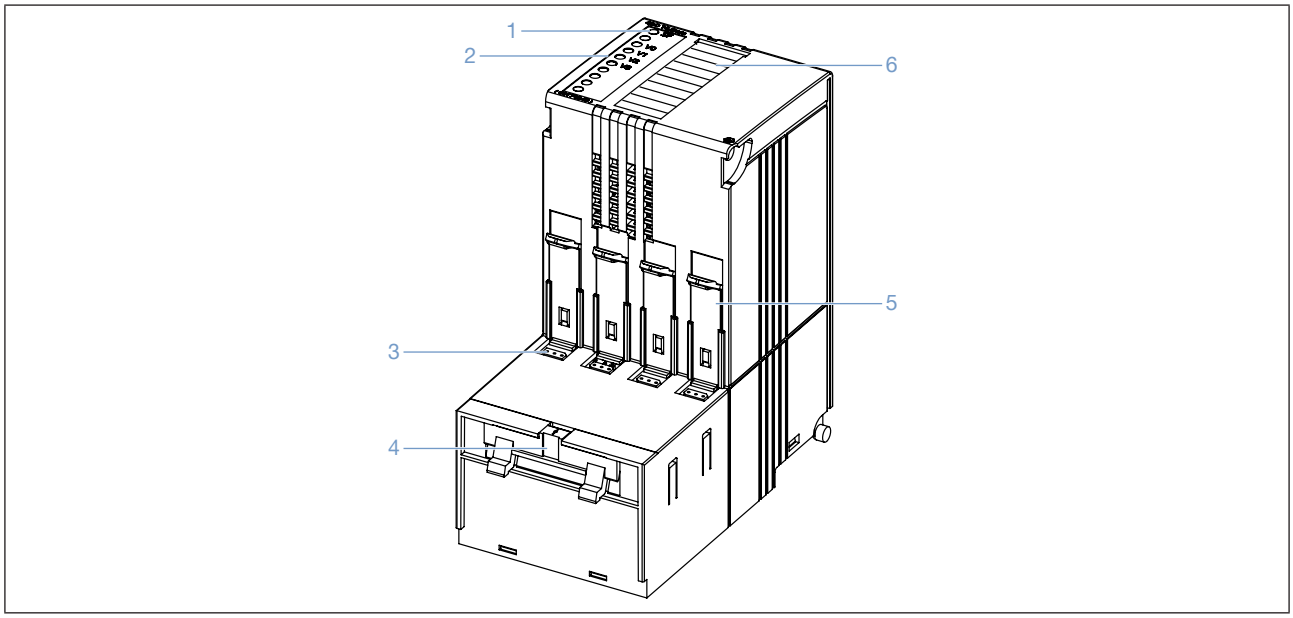

Fig. 31: Overview of connection segment valve block AirLINE Ex REV.2

Item		Item	
1	LED (red) to indicate module status	4	Lock slider (below the valves)
2	LEDs (green) to indicate channel status	5	Valve extractor (only for width per valve 66 mm)
3	Plug for connecting the valves	6	Slip-in label strip[9)]

12.5 Displays

For status indicators see chapter “11.7 Displays” on page 43.

12.6 Diagnostics

See chapter“11.9 Diagnostics (electronic module)” on page 44.

9) *The slip-in label strips are identical with those used for SIMATIC ET 200iSP.*

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13 DESCRIPTION OF THE VALVES

Pilot control

The valves used in the AirLINE Ex system largely consist of 2 components:

- Component 1: the pilot control with degree of protection Ex-i.
  The pilot control converts the received electrical energy into a pneumatic switch signal.

The pilot controls are components with Ex approvals.
The electronic modules from AirLINE Ex are designed to operate with these pilot controls.

- Component 2: the strengthener
  The strengthener is a purely pneumatic element that raises the relatively low flow rate of the pilot control to the level required for the application.

Because only the pilot control is important from an electrical perspective, some information specially refers to this (e.g., boost time or approval-related information).

Valves of the variant “auxiliary pilot air”

Valves of the variant “auxiliary pilot air” make it possible to switch to <2.5 bar pressure on the work ports. For reliable operation you require the “auxiliary pilot air” with a pressure of >2.5 bar. This is fed to the connection segments of the valve block via the connection “X”.

The pilot valve exhaust air escapes into the surrounding area when using “auxiliary pilot air” valves.

“Auxiliary pilot air” valves cannot be combined with standard valves on the valve block (internal auxiliary pilot air), as the connection X of the valve block is used differently.

The option “P shutoff” of the pneumatic base modules cannot be used in combination with “auxiliary pilot air” valves.

“Auxiliary pilot air” valves can essentially be used in combination with the on/off valve. However, the on/off valve only serves to vent the strengtheners, while the pilot valves must be pressurised, as the auxiliary pilot air is not deactivated by the on/off valve.

Further information on the valves can be found under the respective type number at country.burkert.com.

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13.1 Pneumatic valve Types 6524/6525 (width per valve 11 mm)

13.1.1 Structure and function

The pneumatic valves Types 6524 and 6525 consist of an Ex-i pilot solenoid valve (Type 6144) and a pneumatic seat valve as a strengthener.

The action principle allows the switching of high pressures combined with low power consumption and short switching times. The valves are equipped with a manual override for manual operation (alternatively: variant without manual override).

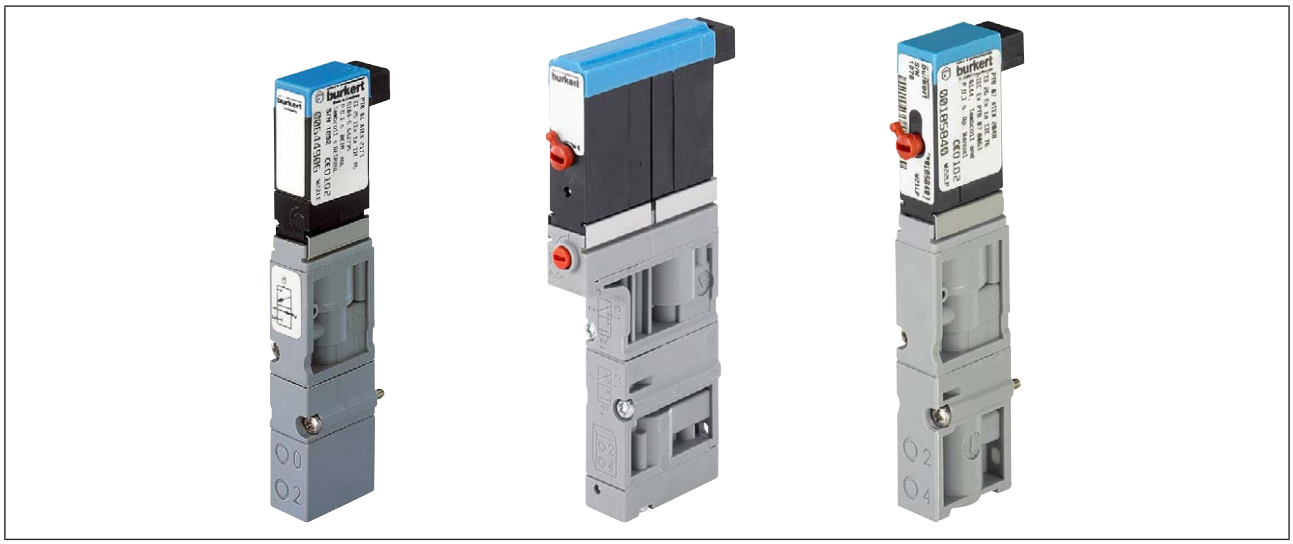

Fig. 32: Pneumatic valves Type 6524 and Type 6525

Various flange profiles of single valves 6524 and 6525 for REV.1 and REV.2!

The single valves (3/2-way valve Type 6524 and 5/2-way valve Type 6525) were optimised for REV.2. The channel cross-sections and flange profile of these valves were revised, among other things. REV.1 and REV.2 valves thus differ from each other.

When replacing single valves, consider:

- The different design of the mechanical interface eliminates the accidental installation of incompatible valves.
- It is not possible to switch between REV.1 and REV.2 single valves (Type 6524/6525).
- With regard to spare parts, it must be ensured that the matching variant of the valve is being used.

This does not apply to the double valve (2x 3/2-way valve Type 6524).

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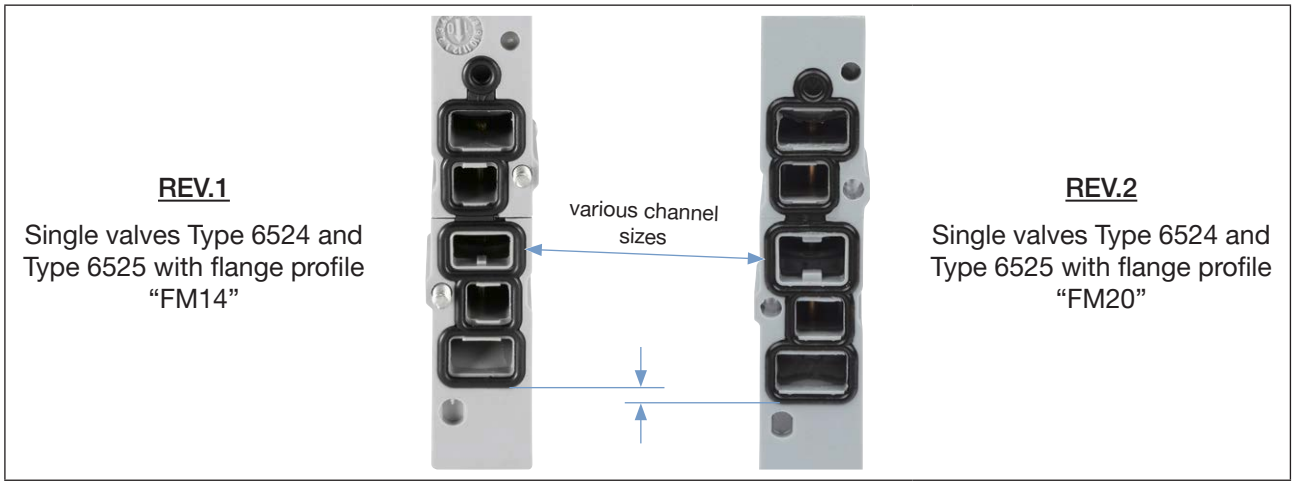

Fig. 33: Variations in flange profiles of single valves Type 6524 and Type 6525

13.1.2 Technical data

Body material	PA, PPS
Seal material	NBR, FKM, FPM
Manual override	yes (alternatively, variants without)
Nominal operating mode	100 % duty cycle (continuous operation)
Electrical valve connection	Rectangular plug RM 2.54 mm
Installation	with 2 screws M2

For further information see chapter “13.1.3 Order table” and the data sheet of Types 6524 and 6525.

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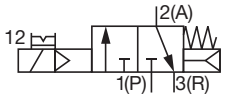
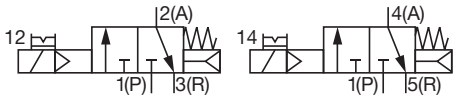
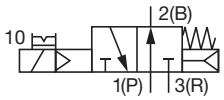
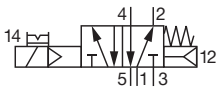
13.1.3 Order table

Description	DN	QNn value air [l/min]	Nominal power [W]	Pressure range [bar]	Switching times Opening [ms]	Switching times Close [ms]	Ident. No.
C = NC (normally closed)  3/2-way valve, servo-assisted, voltage-free outlet 2 unloaded	4	300	0.3	2.5– 7	35	45	365 620
							on request[11]
			0.3	1– 8[10]	35	45	on request[10]
							[11] [12]on request
			0.3	1– 7	35	45	366 796[10]
2 x C = NC (normally closed)  2 x 3/2-way valve, servo-assisted, voltage-free outlet 2/4 unloaded	4	300	2 x 0.3	2.5– 7	20[12]	25	182 086
			2 x 0.3	1– 8[10]	20[12]	25	182 088[10]
D = NO (normally open)  3/2-way valve, servo-assisted, voltage-free outlet 2 pressurised	4	300	0.3	2.5– 7	35	45	365 624
							on request[11]
H  5/2-way valve, servo-assisted, voltage-free outlet 1 with outlet 2, outlet 4 vented	4	300	0.3	2.5– 7	35	45	365 625
							on request[11]
			0.3	1– 7	35	45	366 797[10]

[10] *Variant with auxiliary pilot air*

[11] *Without manual override*

[12] *Please observe the information about 8-channel modules' behaviour in chapter "17.5 Acyclical parameters of AirLINE Ex modules" on page 95!*

13.1.4 5/3-way function with locking mechanism:

This function can be realised with the unlockable double check valve Type 0498. It is available as an accessory and is not part of the valve block. It is actuated by 2x 3/2-way valves of the valve block.

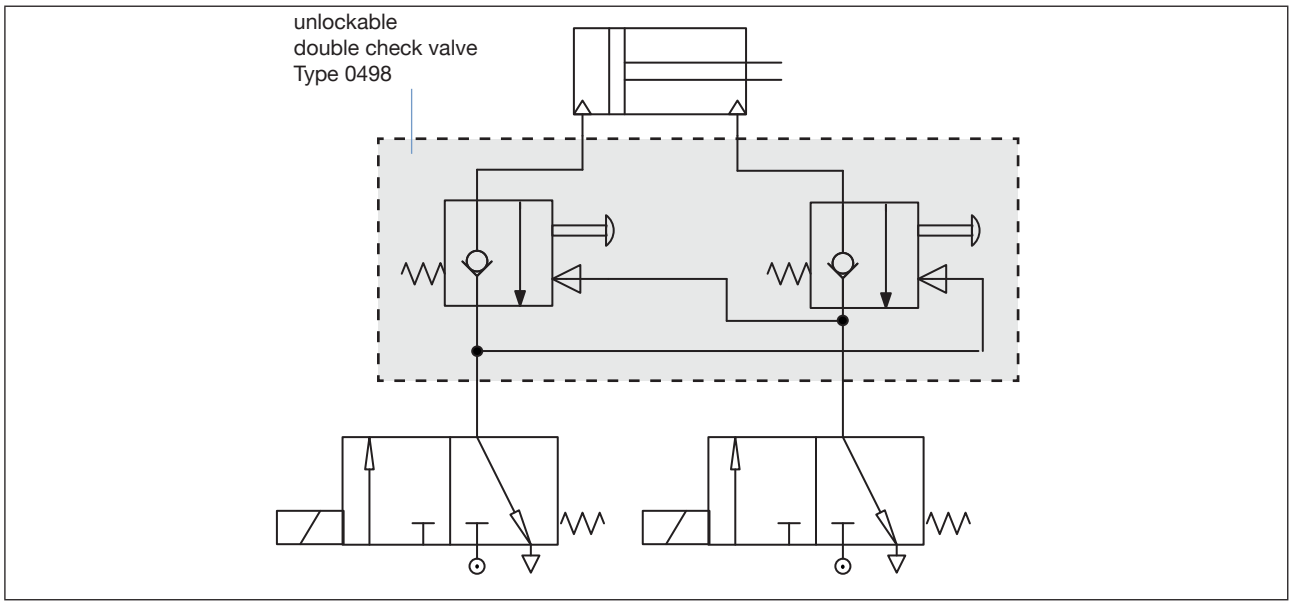


Fig. 34: Realisation of a 5/3-way function with valve Type 0498 and 2x 3/2-way valves of the valve block

You can find further information and data sheets for the unlockable double check valve Type 0498 by entering the type number at country.burkert.com.

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13.2 Pneumatic valve Types 6526/6527 (width per valve 16.5 mm)

13.2.1 Structure and function

The valves of Types 6526 and 6527 consist of an Ex-i pilot solenoid valve (Type 6106/6144) and a pneumatic seat valve as a strengthener.

The action principle allows the switching of high pressures combined with low power consumption and short switching times. The valves are equipped with a manual override for manual operation (alternatively: variant without manual override).

Fig. 35: Pneumatic valves Type 6526 and Type 6527

13.2.2 Technical data

Body material	PA, PPS
Seal material	NBR, FKM, FPM
Manual override	yes (alternatively, variants without)
Nominal operating mode	100 % duty cycle (continuous operation)
Electrical valve connection	Rectangular plug RM 5.08 mm
Installation	with 2 screws M3 x 30

For further information see chapter “13.2.3 Order table” and the data sheet of Types 6526 and 6527.

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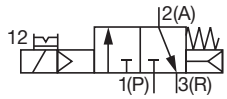
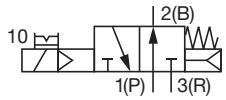
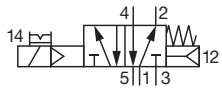
13.2.3 Order table

Description	DN	QNn value air [l/min]	Nominal power [W]	Pressure range [bar]	Switching times Opening [ms]	Switching times Close [ms]	Ident. No.
C = NC (normally closed)  3/2-way valve, servo-assisted, voltage-free outlet 2 unloaded	6	700	0.3	2– 8	80	90	263 932
							175 674[14)]
			0.3	-0.9– 8	80	90	175 673[13)]
							175 723[13, 14)]
			0.3	1– 8	80	90	366 798
D = NO (normally open)  3/2-way valve, servo-assisted, voltage-free outlet 2 pressurised	6	700	0.3	2– 8	80	90	175 725
							175 726[14)]
H  5/2-way valve, servo-assisted, voltage-free outlet 1 with outlet 2, outlet 4 vented	6	700	0.3	2– 8	80	90	365 024
							175 728[14)]
			0.3	1– 8	80	90	366 799

13) *Variant with auxiliary pilot air*

14) *Without manual override*

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14 ON/OFF VALVE

14.1 Safety instructions

DANGER

Risk of injury due to uncontrolled movement of the actuators.

Actuators connected to the valve block are vented when the on/off valve is disabled.

- Before disabling the on/off valve, prevent the actuators from moving or make sure that the actuators do not pose a hazard.

WARNING

Risk of injury due to uncontrolled movement of the actuators.

The valve block's venting function cannot be guaranteed if the on/off valve is used improperly.

- Reset the manual override of the on/off valve to the base position after use. Prevent the manual override from unintended activation (e.g. with a lockable control cabinet).

14.2 Structure and function

The on/off valve (variant of Type 6518) is an electrically activated pneumatic valve that is closed in rest mode. It is an optional component that can be directly flanged onto the connection segments of the valve block (also belatedly).

The on/off valve serves to disrupt the central compressed air supply to the valve block and to vent the valve block, including all pneumatic actuators connected to it. The state of the electrical outlets of the electronic modules and the position of the switch positions of the valve block valves are not relevant.

In combination with the option "P bulkhead", an individual pneumatic segment of the valve block (with connected actuators) can be directly vented via the on/off valve, while the remaining segments of the valve block continue to be supplied with compressed air.

In this manner the valve block can also be used in applications where security requirements must be met. The pressure switches/pressure sensors that can be integrated into connection segments can increase the achievable level of safety (level of diagnostics coverage).

The electrical control unit of the on/off valve is independent of the valve block. For example, it can occur via a suitable ET 200iSP electric output module (including in error-proof variant) or via a suitably configured emergency-off circuit.

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14.3 Technical data

The on/off valve can be used in a pressure range from 2 to 8 bar.

"Auxiliary pilot air" valves can essentially be used in combination with the on/off valve. However, the on/off valve only serves to vent the strengtheners, while the pilot valves must be pressurised, as the auxiliary pilot air is not deactivated by the on/off valve.

The on/off valve can be equipped with different variants of the Type AC10 solenoid.

- Ex degrees of protection Ex-i, Ex-m
- Different variants ("coil size" 5 or 6) for the Ex coils

Body materials	Aluminium, stainless steel, epoxy, PA
Seal materials	NBR, PUR
Media	like valve block REV.2 (see chapter "7.3 Pneumatic data" on page 22)
Operating pressure range	2–8 bar
Manual override	Yes
Coil resistance R20[15)]	310 Ohm
Nominal power[15)]	0.3 W (Ex-i variant of solenoid)
Nominal operating mode	100 % duty cycle (continuous operation)
Electrical valve connection[15)]	Plug profile "A" (connection e.g. via cable plug Type 2518)
Approvals[15)]	Type of protection: II 2G/D Ex ia IIC T4 Permitted ambient temperature -40 – +75 °C Approval no. (ATEX): EPS 18 ATEX 1088 X Approval no. (IEC-Ex): IECEx EPS 18.0038 X See solenoid Type AC10 operating instructions for details
Weight[15)]	approx. 810 g
Installation	with 4 M4 screws (hexalobular internal, size T20)

15) *This information may differ for variants of the on/off valve equipped with a different solenoid*

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14.4 On/off valve variants

Product	Order no.
On/off valve with soleniod degree of protection Ex-i, coil size 5	20002450
On/off valve with soleniod degree of protection Ex-i, coil size 6	on request
On/off valve with soleniod degree of protection Ex-m	on request

14.5 Overview

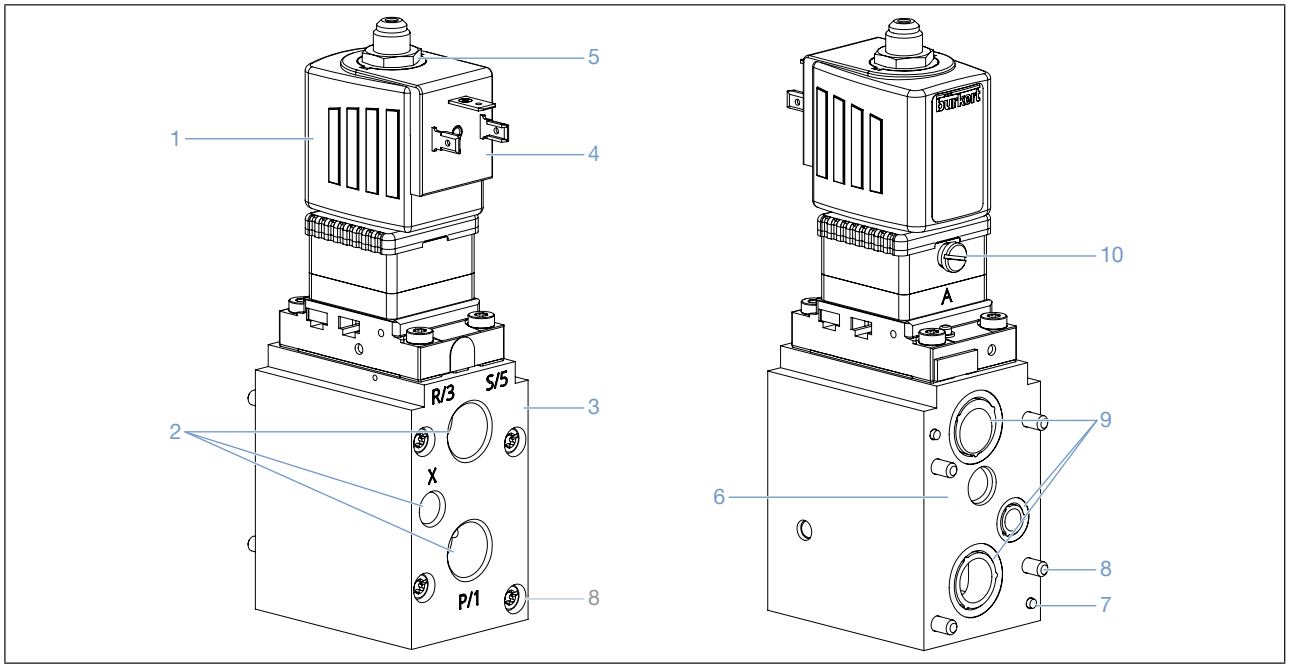

Fig. 36: Overview on/off valve block AirLINE Ex REV.2

Item		Item	
1	Solenoid with Ex approval	6	Interface to connection segment REV.2 with
2	Pneumatic connections (see chapter “14.7” on page 58 for details)	7	Spigot
3	Armature	8	Screw (4x)
4	Plug (for alternative coil variants: cast-on cable)	9	Pneumatic channels each with 1 O-ring
5	Nut (AF 14)	10	Manual override

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14.6 Dimensions

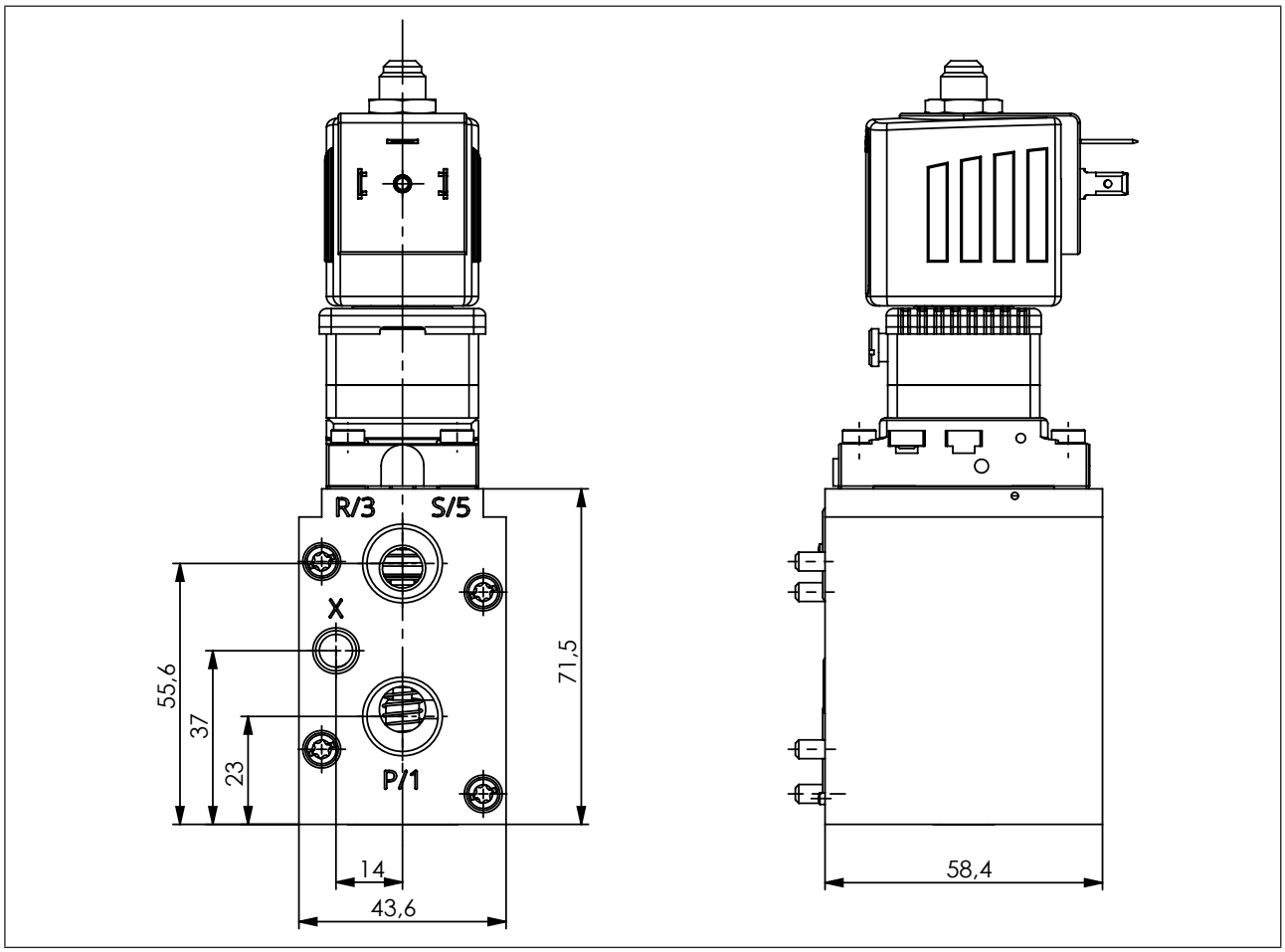

Fig. 37: Dimensions on/off valve [mm]

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14.7 Pneumatic connections

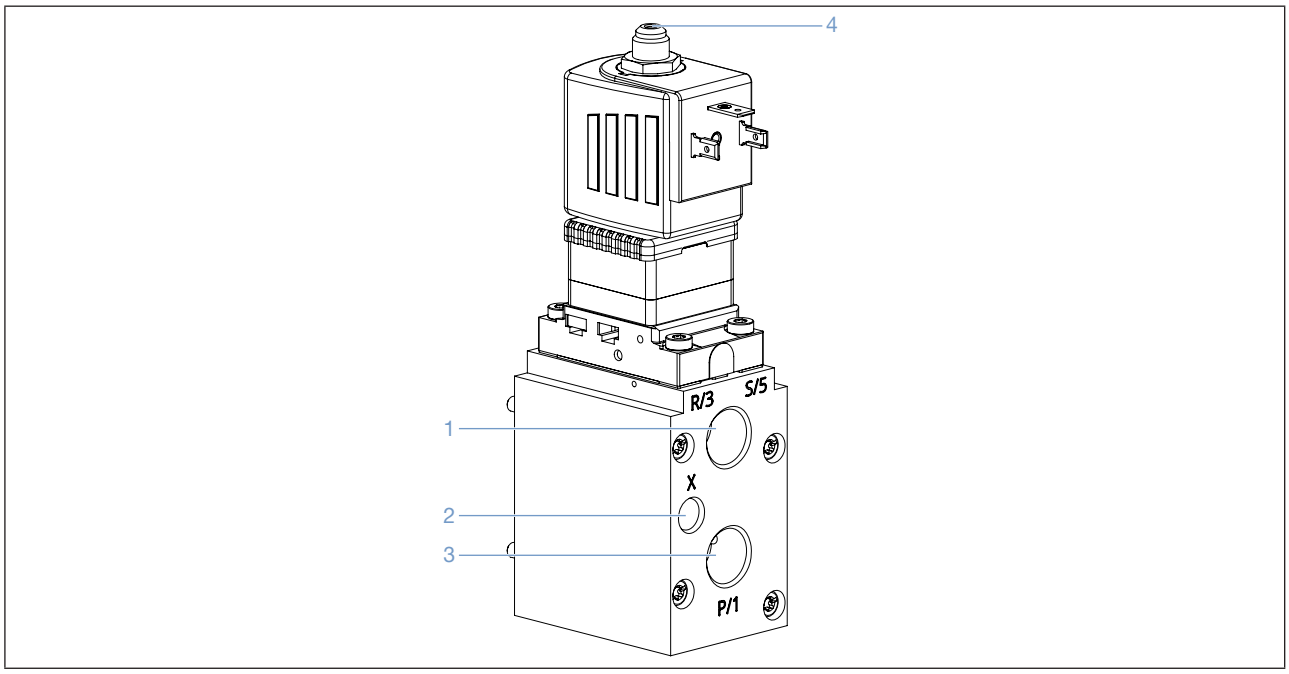

Fig. 38: Pneumatic connections on/off valve block AirLINE Ex REV.2

Item	Labelling	Function	Port size
1	R/3 / S/5	Exhaust air valve block AirLINE Ex	G3/8
2	X	Pre-pilot exhaust air or pre-auxiliary pilot air	G1/8
3	P/1	Supply air	G3/8
4	–	Exhaust hole of on/off valve	

The exhaust hole of the on/off valve must not be sealed. The amount of escaping air (only at the moment the valve is deactivated) is very low, meaning no deviation is required in most cases.

The connection “X” is only made via the on/off valve to the X connection of the connection segment. It is not of any importance to the on/off valve.

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15 PRESSURE SENSOR/PRESSURE SWITCH

15.1 Safety instructions

DANGER

Risk of explosion.

▸ Only use pressure sensors/pressure switches approved for use in potentially explosive environments.

DANGER

Risk of injury due to high pressure and escaping medium.

▸ Switch off the pressure before working on the device or system. Vent or empty the lines.

The signal from the pressure sensor/pressure switch should be filtered on the processing unit (e.g. PLC). This prevents misdiagnoses that can otherwise by caused by short-term pressure drops.

15.2 Description and function

The connection segments of the valve block AirLINE Ex REV.2 can optionally be equipped with a pressure switch or pressure sensor. This simplifies the automated monitoring of the supply pressure.

If the valve block is used for applications in which safety requirements must be met, usage of a pressure switch or pressure sensor in combination with an on/off valve may increase the achievable level of safety (level of diagnostic coverage).

The pressure switch/pressure sensor is installed in a connection with G¼ internal thread. The connection is part of the pressure gauge module. It is equipped with a push-in connection and thus allows easy installation of the pressure sensor/pressure switch, including in compact installation areas.

The electrical connection of the pressure switch/pressure sensor is independent from the valve block. For example, it can be made in a suitable ET 200iSP input module (including error-proof variant).

15.3 Recommended pressure switches/pressure sensors

Product		Order no.
Pressure switch, Type TCD001 • Switch point mechanically configurable 1–10 bar • Electrical connection: Plug tabs, 6.3 mm • Degree of protection: IP00 (with protective cap: IP20) For further information see country.burkert.com → Type TCD001	Pressure switch (normally open contact function)	780 496
	Pressure switch (changeover contact function)	772 515
	Protective cap (IP20) for pressure switch, Type TCD001	780 497

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Product	Order no.
Pressure sensor, WIKA Type IS-3 • Measurement range 0–10 bar • Electrical connection: Circular plug-in connector M16 x 0.75 • Outlet 4–20 mA (2-conductor, supply voltage 10–30 V) • Types of protection: Among other things, ATEX/IECEx II 1/2G Ex ia IIC T4/T5/T6 Ga/Gb • Functional safety: SIL 2 • Permissible temperature range during operation: -20 – +80 °C • Degree of protection: IP67 For further information see wika.com → Type IS-3	774 891

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15.4 Overview

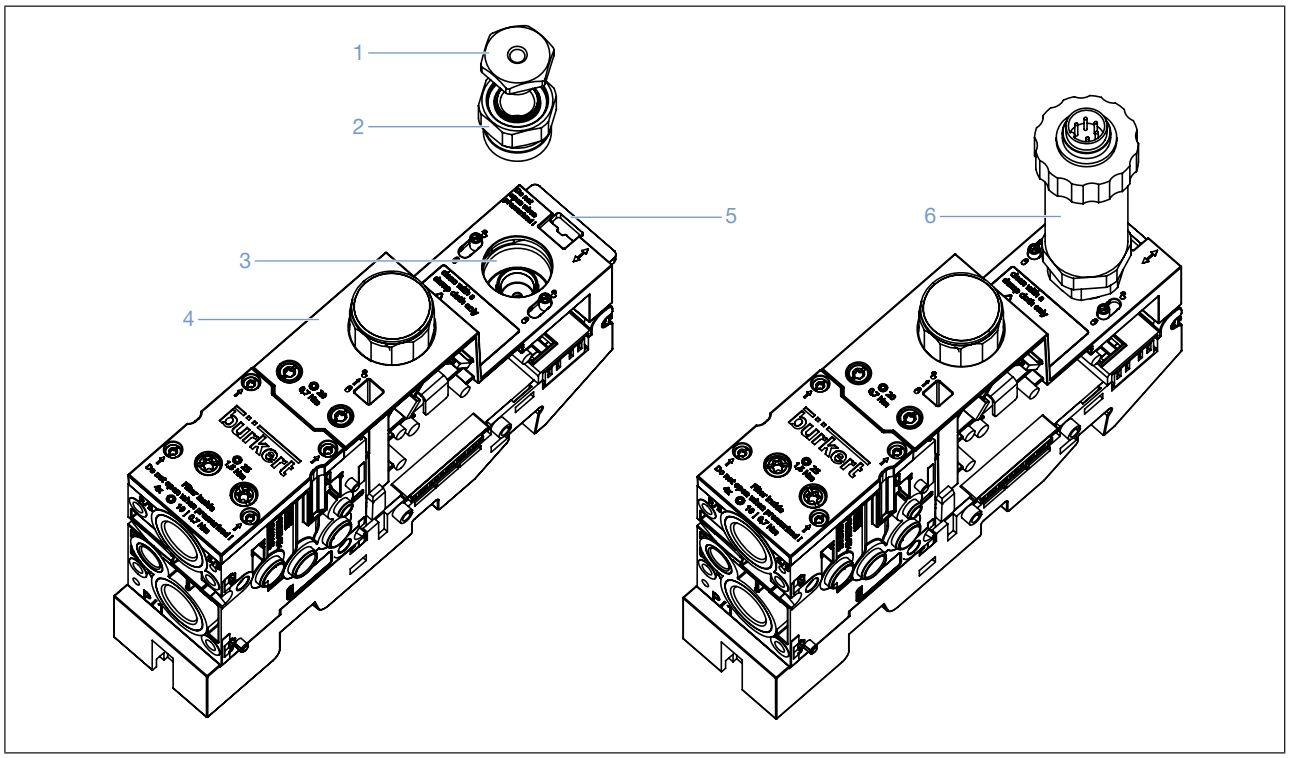

Fig. 39: Overview of connection segment valve block AirLINE Ex REV.2 with and without pressure sensor

Item		Item	
1	Locking screw	4	Pressure gauge module
2	Insertable adaptor	5	Safety clamp
3	Interface for adaptor	6	Pressure sensor/pressure switch

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16 INSTALLATION

16.1 Safety instructions

DANGER

Risk of injury due to high pressure and escaping medium.

- Switch off the pressure before working on the device or system. Vent or empty the lines.

Risk of explosion.

- To prevent explosion hazards, the power supply for the device must solely be provided via the I/O system SIMATIC ET 200iSP.

Risk of injury from electric shock.

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

Valves and electronic modules can be replaced under voltage.

WARNING

Risk of injury due to improper installation.

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

Risk of injury due to unintentional activation of the system and uncontrolled restart.

- Secure the device or system to prevent unintentional activation.
- Ensure a controlled restart after maintenance is completed.

CAUTION

Medium escape and malfunction.

If seals are not properly positioned, leaks and functional impairments may arise due to pressure loss.

- Ensure the seals are properly positioned in the electronics assemblies and pneumatics.

Short circuit, loss of function

The electrical connection requires precise contacting.

- Do not bend the contacts.
- Replace the affected components if connections are damaged or bent.
- Only activate the system when the components are in perfect condition.

Risk of injury due to sharp edges

Sharp edges can cause cuts.

- Wear suitable protective gloves.

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NOTE

Only provide the device with electricity via SIMATIC ET 200iSP

- In order to prevent damage to the device, the device must solely obtain its power supply via the I/O system SIMATIC ET 200iSP.

Preventing pressure drop

- To avoid a pressure drop, provide the device's pressure supply to the greatest extent possible.

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.

Restrictions

The applicable restrictions must be observed for the renovation/expansion of systems.

- Learn more about this in chapter "8.1 Maximum system expansion").

These operating instructions describe the installation and deinstallation of Type 8650 REV.2. These differ in some aspects from Type 8650 REV.1.

For installation and deinstallation of Type 8650 REV.1 see the operating instructions of this variant at: country.burkert.com.

16.2 Installation instructions

NOTE

Improperly installed systems (e.g., inclined tie rods not properly tightened) might not be properly sealed.

- Firmly close all opened fastenings and locks before start-up.
- To prevent condensation: When moving from a cold to a warm environment, wait until the system has adjusted to the ambient temperature before installation.

16.3 Removing pre-installed systems

NOTE

Important: Properly remove the assembly from the packaging.

Note the following to ensure that the pre-installed system is not damaged while being removed from the packaging:

- Grab the system by the pneumatic connection modules and remove it from the packaging (see image "Grabbing points").

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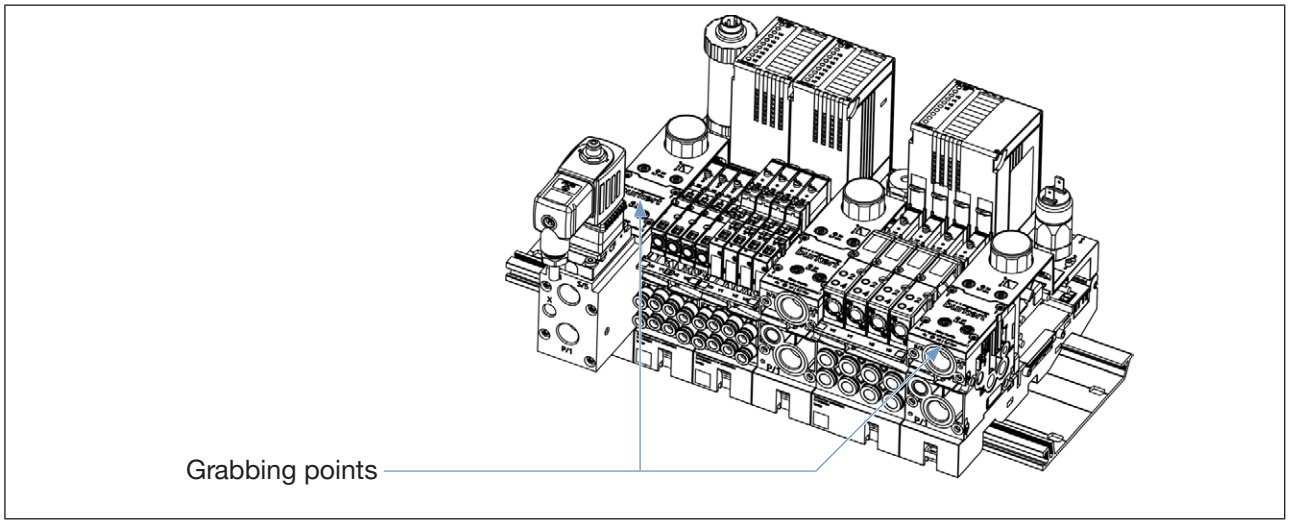

Fig. 40: Grabbing points for removing pre-installed systems

16.4 Installation tools and tightening torques

Usage	Type and size of the tool	Tightening torque
Operating the locking elements	Slot screwdriver size 5	-
Fitting the clamping bolts on the connection modules	Key for hexalobular-internal screw size T25	1.5 Nm
Installation/deinstallation of valves with 11 mm width per valve	Cross-tip screwdriver size 0	0.2 Nm
Installation/deinstallation of valves with 16.5 mm width per valve	Cross-tip screwdriver size 1	0.3 Nm
Fitting valve segments/connection segments to each other (inclined tie rods)	Allen key 3 mm	0.7 Nm
Fitting the protective cover for filters	Key for hexalobular-internal screw size T10	0.7 Nm
Fitting the pressure gauge module	Key for hexalobular-internal screw size T20	0.7 Nm
Fitting on/off valve	Key for hexalobular-internal screw size T20	0.7 Nm

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16.5 Position of the fittings and operation elements

Fig. 41: Position of fittings and operation elements

Fig. 42: Position of the inclined tie rods on the installed system

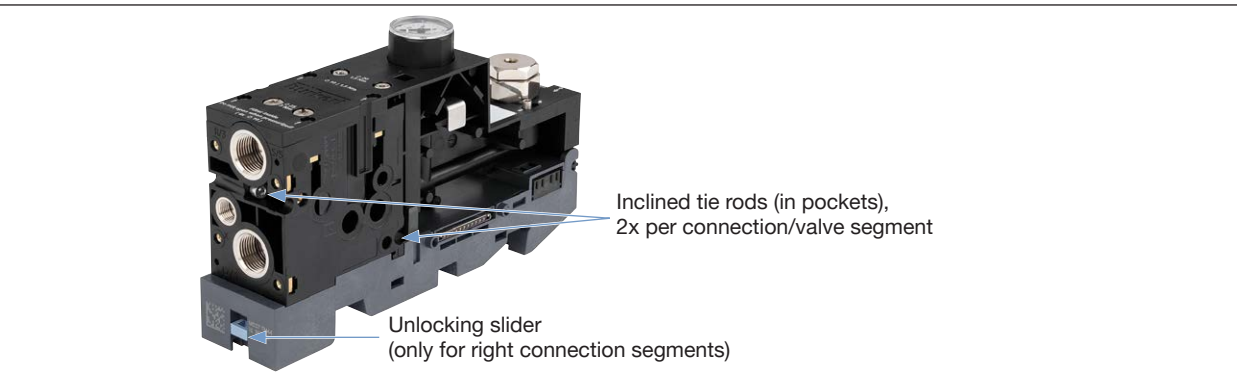

Fig. 43: Inclined tie rods of a segment and unlocking slider

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16.6 Installing/uninstalling on S7 standard rail (pre-installed system)

WARNING

Risk of injuries and property damage.

In a non-horizontal installation position, the device is only securely fastened once all clamping bolts are applied as stipulated.

- During installation, hold the device in the desired position until all clamping bolts have been applied.
- Hold tightly onto the device during deinstallation until all clamping bolts have been loosened and the device can be removed from the standard rail.

16.6.1 Installing the system on a standard rail

→ Carefully turn all clamping bolts (see “Fig. 45”) on the connection segments counterclockwise until they stop.

→ Suspend the system in the desired position from the upper edge of the standard rail and tilt it up.

→ Tighten all clamping bolts clockwise (see chapter “16.4” on page 64 for required tightening torque).

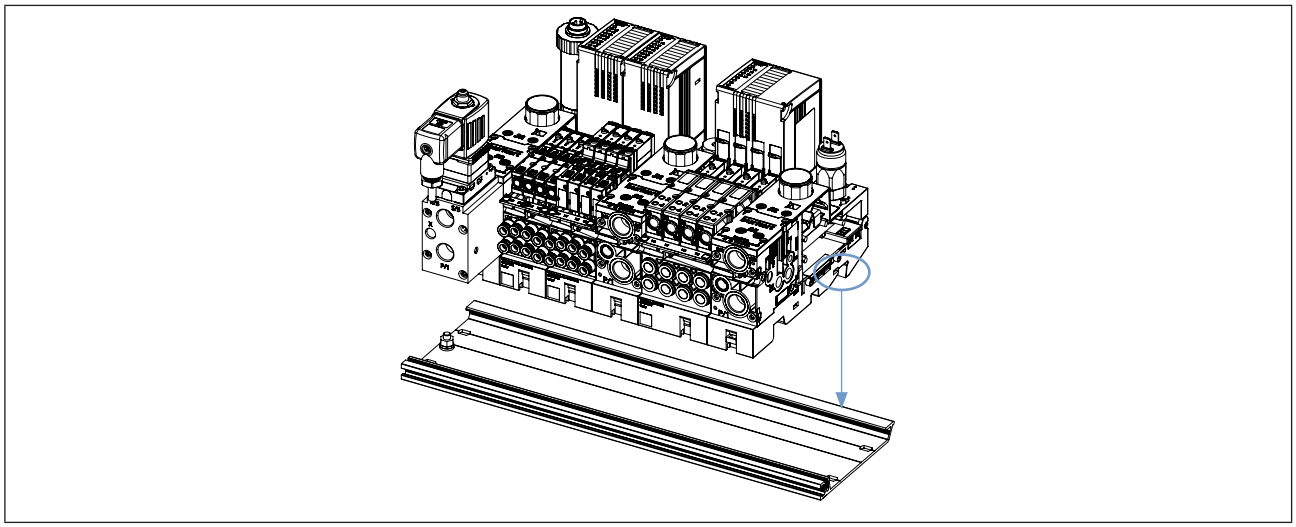

Fig. 44: Suspending from the standard rail

16.6.2 Removing the system from a standard rail

→ Loosen all clamping bolts (see “Fig. 45”) on the connection segments (carefully turn the clamping bolts counterclockwise until they stop).

→ Tilt the system from the standard rail and lift it up.

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16.7 Installing/uninstalling ET 200iSP modules

Installation

→ Place ET 200iSP modules (terminal modules) on the standard rail and lock onto the AirLINE Ex system. ET 200iSP modules that are attached to the right connection segment lock with the connection segment.

Disassembly

→ Insert a slot screwdriver into the unlocking slider on the right connection segment (see "Fig. 45" and "Fig. 46") (I) and tilt (II) the slider out approx. 2 to 3 mm. This opens up the terminal module locked to the right.

→ Only REV.2 devices: If the accessibility of the unlocking slider is impeded by an on/off valve, the unlocking slider can also be operated from the front side (see "Fig. 46"). Insert a thin slot screwdriver (shaft with a length of at least 85 mm and a diameter of max. 4 mm) into the opening in the pressure gauge module (I) until it stops and then tilt it slightly upwards (II).

→ Push the adjacent terminal module away to the right.

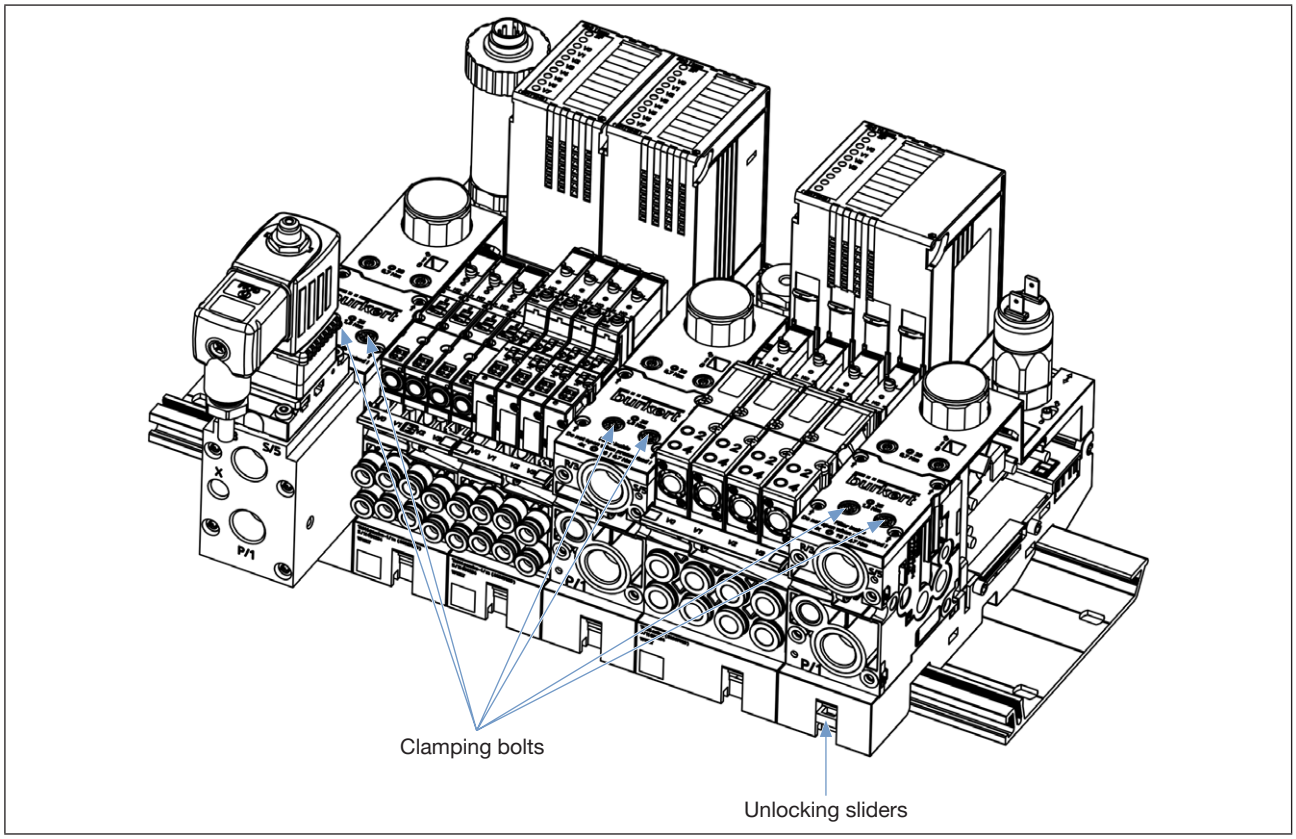

Fig. 45: Clamping bolts, unlocking sliders; means for operating the unlocking slider

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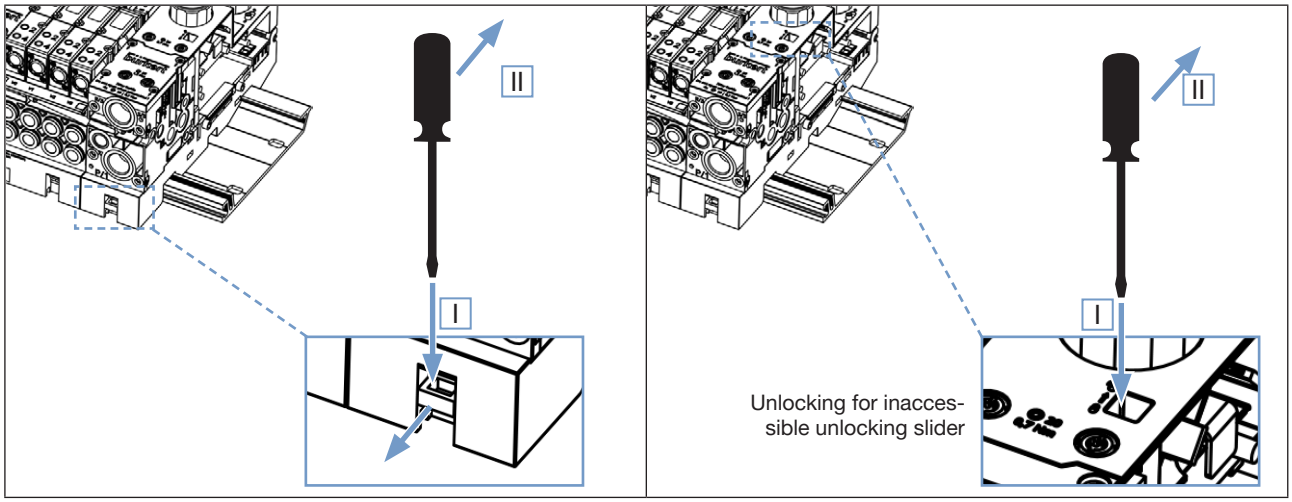

Fig. 46: Operating unlocking slider

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16.8 Control cabinet installation

The distances that must be adhered to when installing in a control cabinet can be found in the SIMATIC ET 200iSP handbook.

The minimum distance specified in “Fig. 47” is recommended for easy replacement of an electronic module.

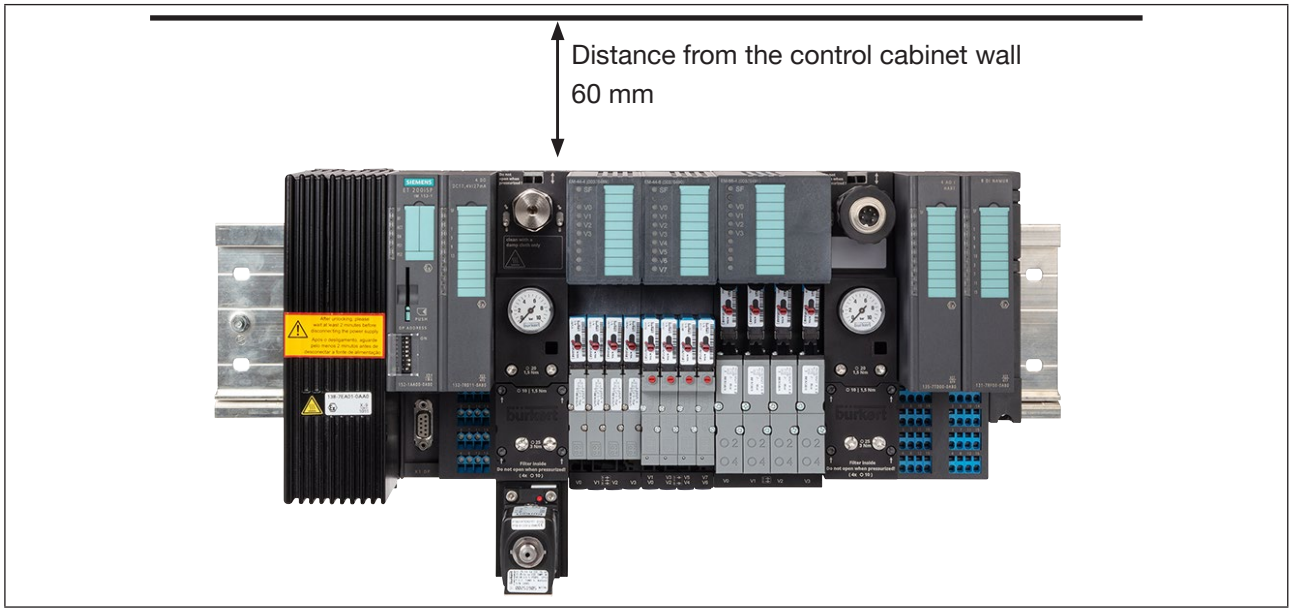

Fig. 47: Distance from top control cabinet wall

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16.9 Assembling, renovating and expanding a device (valve block) with individual segments

NOTE

- Observe the compatibility requirements (REV.1 <> REV.2); see chapter "6.3 Information on revision status and compatibility".

Renovating or expanding a device

- Observe the permissible parameters for the maximum expansion of the system (see chapter "8.1"). Please contact your Bürkert representative if you have any questions.

Lubricating pneumatic module seal rings

Lubricated seal rings of pneumatic modules make installation easier and protect the device against damage.

- Lubricate seal rings before installation, e.g., with Centoplex 2 from Klüber Lubrication.

The device's serial and identification number lose their validity

This device's serial and identification number are no longer valid upon renovation or expansion.

- Remove the description label and label the device accordingly.

16.9.1 Assembling the device

The segments (or pneumatic modules) are each connected to each other by 2 inclined tie rods. Assembly is always conducted from left to right.

→ Ensure that the O-rings are correctly positioned in the segment to be attached on the right.

→ For assembly, place 2 segments on the standard rail (I) and slide them against each other (II).

→ Make sure that all clamping bolts on the connection modules are turned counterclockwise until they stop.

→ Fasten the right segment on the left segment with 2 inclined tie rods (III).
(Allen key 3 mm, for tightening torque see chapter "16.4").

→ Install other segments in the same manner on the right if necessary.

→ Slide the device to the desired position on the standard rail if necessary.

→ Then tighten all clamping bolts by turning them clockwise (for tightening torque see chapter "16.4").

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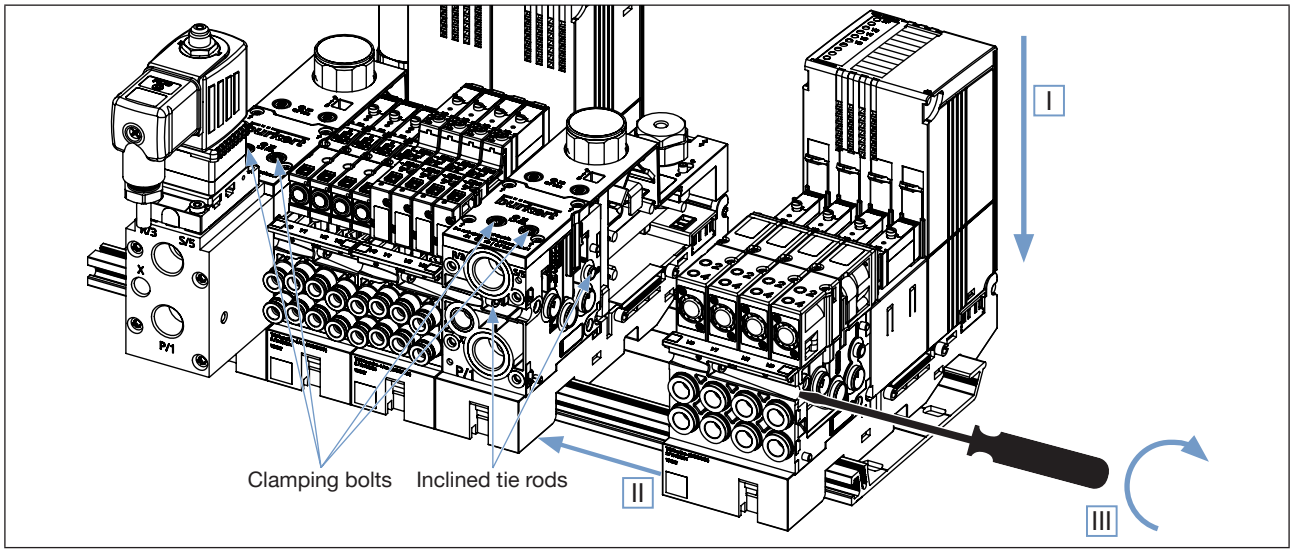

Fig. 48: Adding segments

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16.9.2 Renovating and expanding the system

→ Loosen the clamping bolts of the right connection segment (carefully turn the clamping bolts counter-clockwise until they stop).

→ Loosen the 2 inclined tie rods of the right connection segment.

→ Slide the connection segment to the right.

→ Slide other segments in the same manner until the position where the system is to be altered has been reached.

→ A segment that is to be added is first suspended on the upper edge of the standard rail.

→ Tilt the segment in and slide it left against the sub-system present there.

16.9.3 Assembling the system

→ Assemble the system in reverse order (see chapter “16.9.1”).

→ Ensure that the O-rings are correctly positioned in the segment to be attached on the right.

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16.10 Installing/uninstalling individual segments

DANGER

Risk of injury due to high pressure and escaping medium.

▸ Switch off the pressure before working on the device or system. Vent or empty the lines.

16.10.1 Connection segments

Uninstalling the pressure gauge module

→ Loosen both screws on the pressure gauge module.

→ Tilt the pressure gauge module up out of the terminal module (I) and remove it (II).

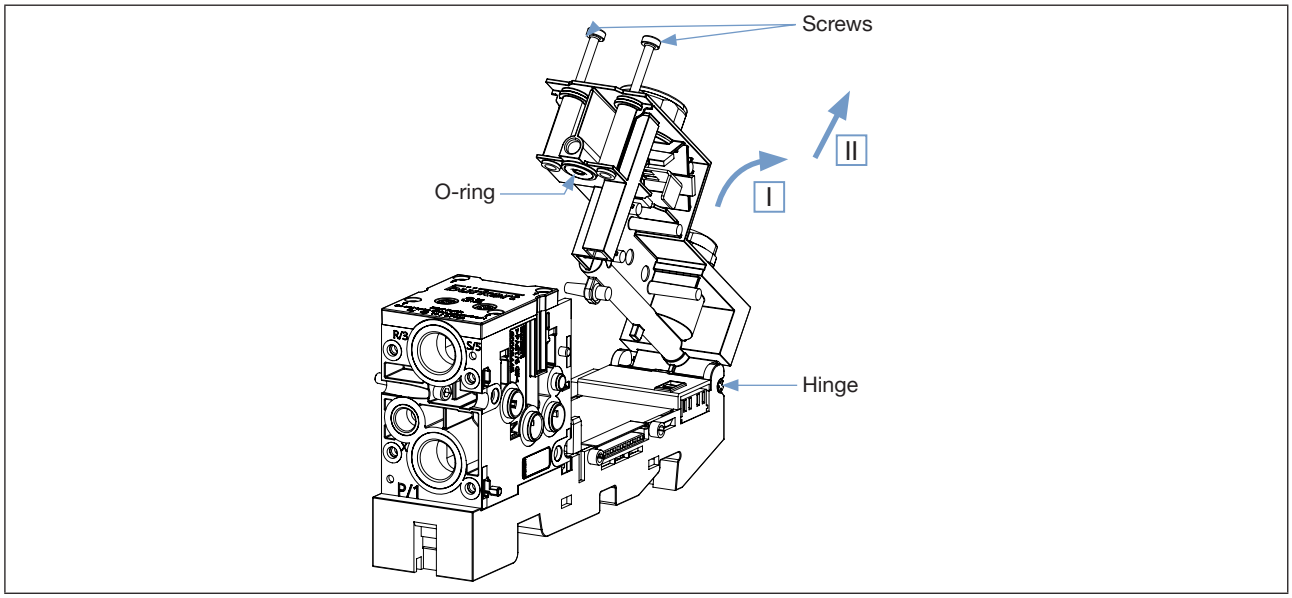

Fig. 49: Installing/uninstalling the pressure gauge module

Installing the pressure gauge module

→ Ensure that the O-ring is correctly positioned in the pressure gauge module.

→ Suspend the pressure gauge from the hinge on the upper edge of the terminal module, tilt it in and fasten it with both screws (for tightening torque see chapter “16.4”).

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Uninstalling the filter

→ Loosen the 4 screws.

→ Remove the protective cover for the filter (I).

→ Pull out the filter (II).

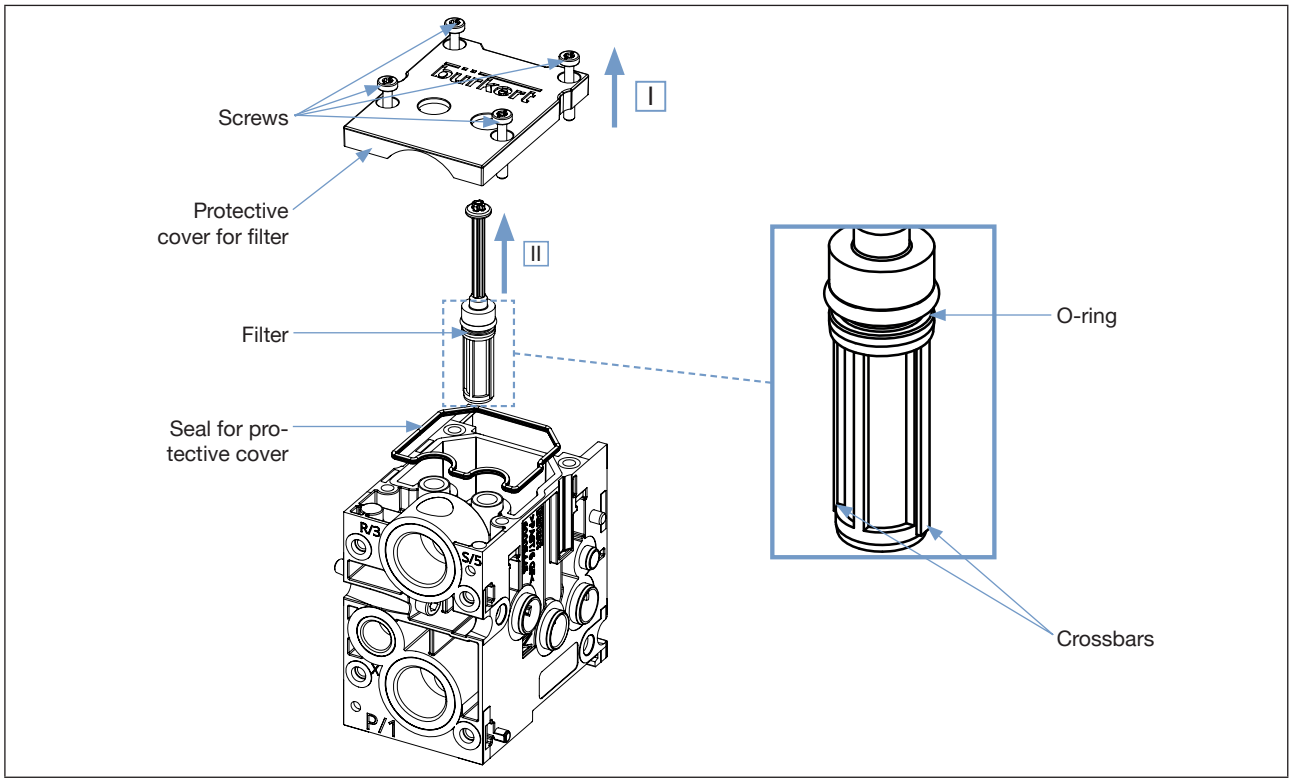

Fig. 50: Installing/uninstalling the filter

Installing the filter

→ Ensure that the filter is clean and undamaged.

→ Insert the filter into the opening in the connection module and turn it so that the crossbars lock into the opening.

→ Press the filter into the connection module until it stops (lightly lubricate the O-ring before inserting if necessary).

→ Ensure that the seal for the protective cover is correctly positioned.

→ Place the protective cover on top and tighten the 4 screws cross-wise (for tightening torque see chapter “16.4 Installation tools and tightening torques”).

A leak from P → R/S occurs if the filter is defective, damaged or incorrectly installed.

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16.10.2 Valve segments

Uninstalling the electronic module

→ Remove valves and any protective caps from the plug contacts.

→ Move the locking element on the electronic module in the direction of the arrow (I), tilt the module out (II) and remove it (III).

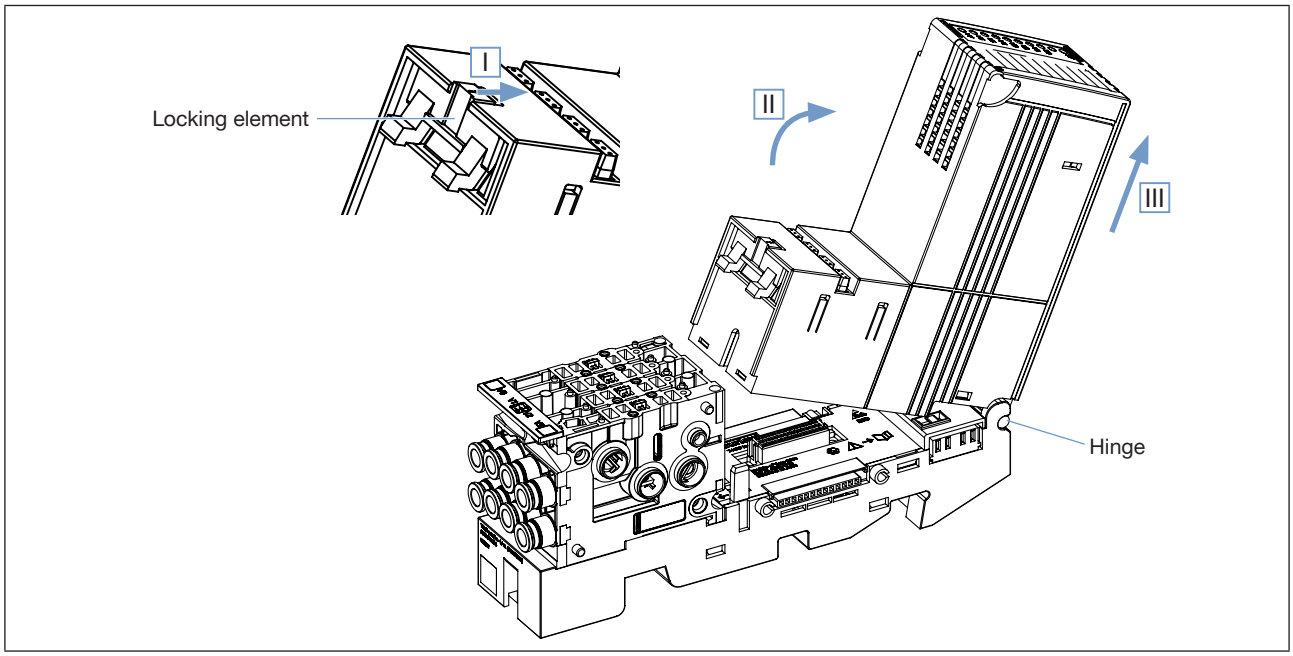

Fig. 51: Installation/deinstallation of a valve segment

Installing the electronic module

→ Suspend the electronic module from the hinge on the upper edge of the terminal module.

→ Move the locking element in the direction of the arrow while fully tilting the module in.

→ Screw the valves in place. Cover the plug contacts of unoccupied valve seats with protective caps.

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16.11 Installing/uninstalling the on/off valve

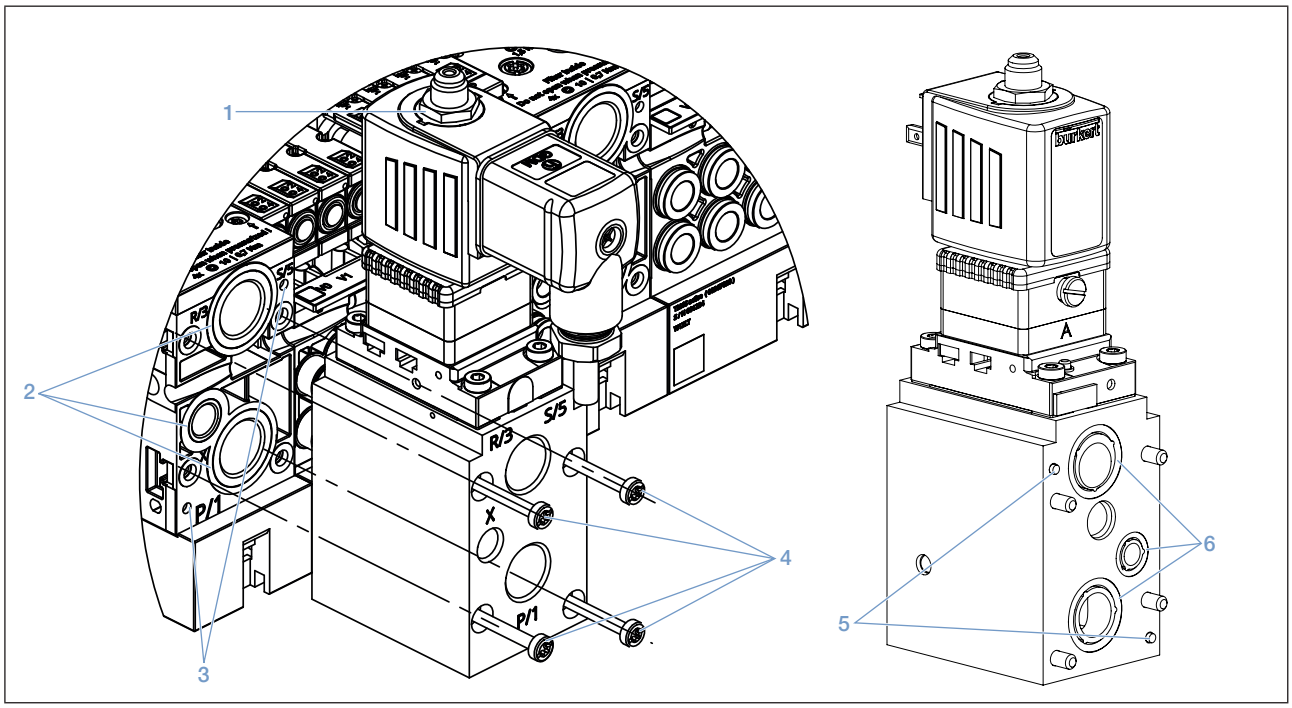

Fig. 52: Installing/uninstalling the on/off valve

Item		Item	
1	Nut	4	Screws (4x)
2	Seal surfaces	5	Spigot
3	Centring holes	6	O-rings

Installing the on/off valve on a connection segment

Required tool: Key for hexalobular-internal screw size T20

→ Ensure that the seal surfaces of the connection segment are not dirty or damaged.

→ Check that the O-rings at the interface to the connection segment on the on/off valve are inserted and undamaged.

→ Place the on/off valve with the spigots on the connection segment such that the spigots lock into the centring holes (see image), then tighten the 4 screws crosswise (tightening torque 0.7 Nm).

Uninstalling the on/off valve from the connection segment

→ Loosen the 4 screws.

→ Remove the on/off valve.

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Electrically connecting the on/off valve

→ Connect the valve's solenoid according to the specifications in the valve documentation.

- Variants with Ex-i coil: with cable plug (e.g. Type 2518)
- Variants with Ex-m coil are equipped with a cast-on cable

The on/off valve has no electrical connection to the valve block.

Note the polarity specified on the coil for variants with Ex-i coil.

The plug/cable outlet of the solenoid can be aligned in various ways to facilitate optimal laying of the connection cable.

Procedure:

→ Loosen nut by approx. 3 turns.

→ Lift the coil somewhat, turn it in the desired position and press it back down.

→ Refasten nut (max. 5 Nm)

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16.12 Installing/uninstalling pressure switch/pressure sensor

Installing the pressure switch/pressure sensor

The following method facilitates installation of a pressure sensor, even in limited installation conditions.
If the adaptor is easily accessible, it can also remain in the pressure gauge module to install the pressure switch/pressure sensor.

→ Place a slot screwdriver in the opening of the clamp (I) and use a tilt motion (II) to bring the clamp to the upper end position (position indicator is on the symbol “Unlocked”).

→ Pull out the adaptor from the front (III).
If needed, an M6 screw can be used to pull on the adaptor or dummy plug.

→ Removing dummy plugs from the adaptor

→ Screw the pressure switch / pressure sensor into the adaptor (thread G¼)
The adaptor is equipped with an axial seal. If the pressure switch / pressure sensor used does not offer a suitable seal surface, secure the seal by other means (e.g., with PTFE seal band on the thread).

→ Insert assembly consisting of adaptor and pressure switch/pressure sensor into pressure gauge module and press until it stops.

→ Press the clamp into the lower end position (IV, position indicator is on the symbol “Locked”).

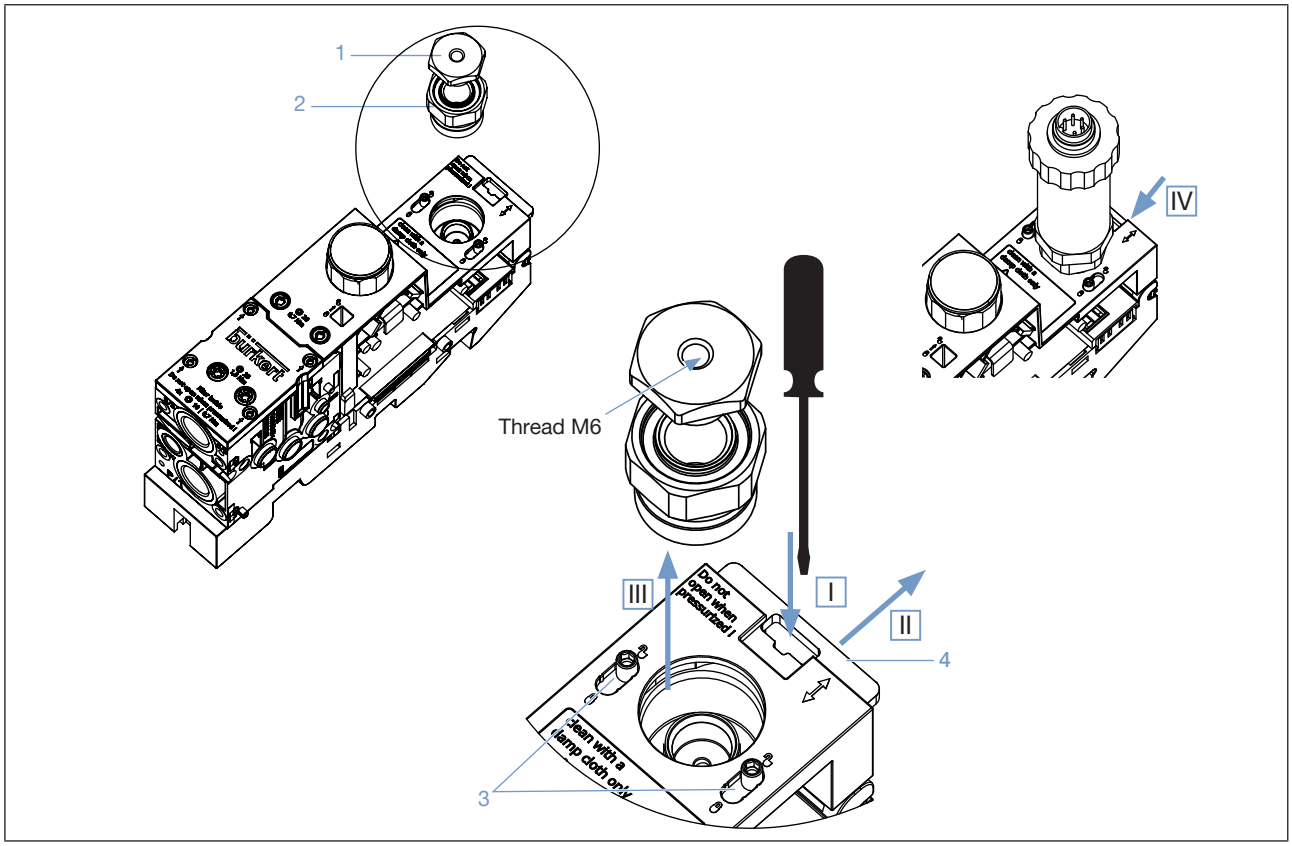

Fig. 53: Installing/uninstalling the pressure switch/pressure sensor on a connection segment

Item		Item	
1	Dummy plugs with thread M6	3	Position indicator
2	Pressure sensor adaptor	4	Clamp for pressure sensor adaptor

Uninstalling the pressure switch/pressure sensor

→ Perform the steps listed in “Installing the pressure switch/pressure sensor” in reverse order.

The assembly consisting of pressure switch/pressure sensor and adaptor can be arranged in any manner in the pressure gauge module (twisted) so that the connected cable can be laid in the best position.

→ Only set up the assembly when it is not connected to power.

→ Turn it clockwise so that the fitting between the pressure switch/pressure sensor and adaptor does not loosen.

Electrical connection

→ Connect the pressure switch/pressure sensor according to the manufacturer’s specifications.

The pressure switch/pressure sensor has no electrical connection to the valve block.

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16.13 Replace valve

DANGER

Risk of injury due to pressure change.

Only the P channel is blocked during deinstallation of a valve from a base module with P shutoff. The pressure at work outlets A or B is reduced. Any connected actuator is thus also depressurised, which can cause movement.

- In the event of a potential hazard, mechanically secure the position of the actuator or apply a block to the work connections in order to prevent the actuator from moving.

16.13.1 Installation instructions

Put the system in a secure state before replacing the valve. If the respective valve position is not equipped with a P shutoff, depressurise the system first.

Base module with P shutoff:

If valves are switched under pressure, only a maximum of 4 valves can be uninstalled at the same time. Otherwise the pressure may drastically decrease in the other valves.

When the valve is being uninstalled, a lot of air is emitted at first until the valve is completely loosened. However, an automatic block reduces the air loss so that there is only a minor residual leak when the P shutoff is closed.

16.13.2 Installing

DANGER

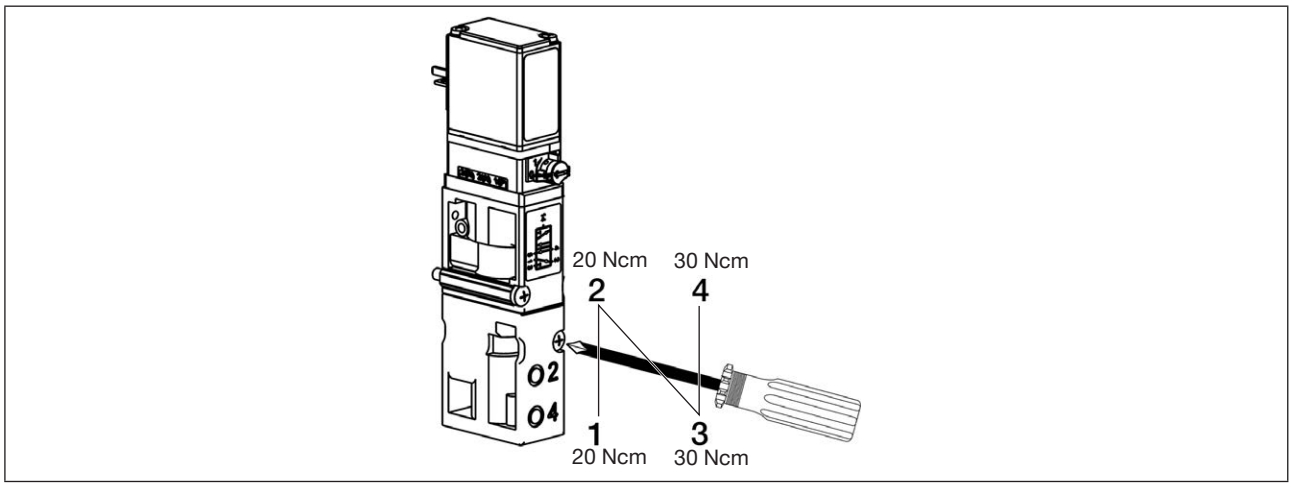
Risk of injury due to pressure change.

When installing the valve, make sure that the work connections in the corresponding rest position of the valve are also pressurised until it is switched. A connected actuator can thus move depending on the pressurisation.

→ Ensure that the actuator's movements cannot damage the system or cause it to perform any undesired actions.

→ Before installation, make sure that the seal on the bottom of the valve is correctly positioned.

→ Install the valve as shown in the following image, while observing the specified tightening torques and sequence.



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16.14 Connecting input air lines and exhaust air lines

Note the following when using one or more on/off valves:

WARNING

Risk of injury due to uncontrolled movement of the actuators.

The valve block's venting function cannot be guaranteed if the on/off valve is used improperly.

Note the following so that the valve block and the actuators connected to it are securely vented:

- Form pneumatic segments (option "P bulkhead") if necessary in order to vent just a part of the work connections (valve segments) of the valve block via on/off valve.
- Either supply each P connection of a pneumatic segment of the valve block with pressure via an on/off valve or seal it with a dummy plug.
- Feed compressed air directly at the P connection of a connection segment if an on/off valve is being used in the same pneumatic segment.
- Ensure quick and secure venting. Use all available exhaust connections of the valve block and on/off valve and ensure that pressure cannot build up in the exhaust channels.

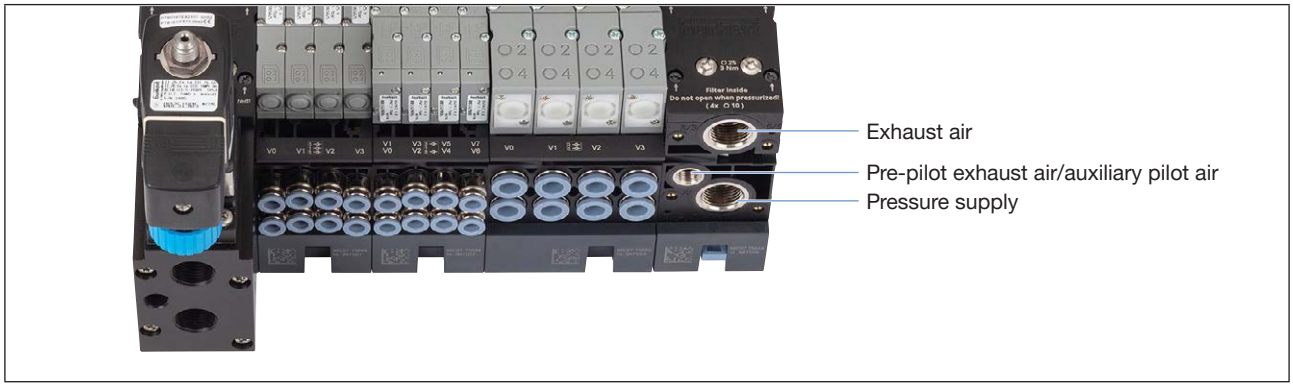

Fig. 54: Connection to input and exhaust air lines

16.14.1 Connecting pressure supply

NOTE

Avoid drops in pressure.

- Ensure a comprehensive pressure supply (minimum hose diameter 8/6 mm), especially for base modules with P shutoff.
- For larger AirLINE Ex systems and heavily used applications, connect the pressure supply to all P/1 connections (right, left, and if applicable middle connection segments).

→ Connect the pressure supply to the P/1 connections of the connection segments.

→ Seal unused P/1 connections with a stopper.

→ Tightening torque on the threaded connections: maximum 20 Nm

→ When using one or more on/off valves, observe the warning notice in chapter "16.14".

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16.14.2 Connecting exhaust air

→ Connect the exhaust air to connections R/3 / S/5 of the connection modules.

This should be done with the largest possible lines, and a silencer if applicable, with high flow rate values to prevent back pressure.
The exhaust air should be connected to the right and left connection segment, as well as the middle connection segments (if present).

16.14.3 Connecting the pre-pilot exhaust air/auxiliary pilot air

Depending on which valves are present on the AirLINE Ex system, the connection X is used as follows:

Standard valves

In this case the exhaust air of the pilot controls is located at connection X, separate from the R/3 / S/5 connection. This prevents problems in the event that there is high back pressure in the channels R/3 / S/5.

The connection should be made with the largest possible lines, and a silencer if applicable, with high flow rate values to prevent back pressure.

Valves with auxiliary pilot air

For valves which are to be used in an expanded pressure range, the pilot control is supplied via its own pressure port. This must be connected to connection X.

Tightening torque on the threaded connections: max. 8 Nm

16.14.4 Bulkhead

Optionally, the system's pressure supply can be segmented by a bulkhead in the central P channel between 2 pneumatic modules (see chapter "8.4" on page 28).

→ When connecting the pressure supply, make sure that each segment is suitably supplied.

16.14.5 REV.2 with on/off valve

If a connection segment is equipped with an on/off valve, the external connections for P, R/S and X are made as described above, but on the on/off valve.

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17 INITIAL START-UP AND PROJECT PLANNING

17.1 Safety instructions

DANGER

Risk of injury due to high pressure and escaping medium.

- Switch off the pressure before working on the device or system. Vent or empty the lines.

Risk of injury from electric shock.

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

Valves and electronic modules can be replaced under voltage.

WARNING

Risk of injury due to improper operation.

Improper operation may result in injuries as well as damage to the device and the surrounding area.

- Before start-up, ensure that the operating personnel are aware of and have completely understood the contents of the operating instructions.
- Observe the safety instructions and information on intended use.
- Only adequately trained specialists are allowed to put the device into operation.

Risk of injury due to system malfunction.

The system must be tested to ensure it functions properly before start-up. This prevents persons or systems from being put in danger during operation.

- Conduct a full function test and the necessary safety tests before the initial start-up.
- Plan foreseeable errors in the tests.

NOTE

Only provide the device with electricity via SIMATIC ET 200iSP

- In order to prevent damage to the device, the device must solely obtain its power supply via the Power-Supply module of the ET 200iSP.

Preventing pressure drop

- To avoid a pressure drop, provide the device's pressure supply to the greatest extent possible.

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.

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17.2 Communication connection/projecting

The valve segments communicate with the interface module via the rear wall bus system of the ET 200iSP. This exchanges the input data, output data, parameter data, configuration data and diagnostics data via the overriding bus system with a central master (PLC).

Many masters (PLCs) require a program that describes the hardware configuration (e.g. Siemens Step 7 for S7 PLCs). These programs require the device master data file (DMD file) that contains device-specific information.

An EDD file is also required to use acyclical data. Programs such as Siemens PDM grant access to extensive additional information (I&M data, switching cycle counters, etc.).

Both files are available online.

As these files are managed to communicate with Siemens, the Bürkert homepage does not contain the files, but rather a link through which the respectively current versions are available.

The EDD file is currently only offered in conjunction with the PCS7.

SIMATIC TIA Portal, STEP 7 and PCS7:

When using Siemens STEP 7, there is also the option to integrate AirLINE Ex via a hardware support package (HSP) or, in Siemens PCS7, via a hardware update package (HUP).

The use of a Hardware Support Package or a Hardware Update Package offers, among other things, the following advantages:

- comfortable projecting
- automatic assessment of assembly rules
- use of the valve block in configurations of the SIMATIC ET 200iSP that cannot be projected via DMD (e.g., redundant IM, F modules)

HSP and HUP are available on the Bürkert homepage:
country.burkert.com → 8650 → Downloads: Software

Connection segments are electrically passive (logically transparent) and are not considered in the configuration tools.

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17.3 Configuring hardware with the DMD, with SIMATIC TIA Portal as an example

A software such as SIMATIC TIA Portal from Siemens is required to configure the bus master.

Use the following program versions to ensure the hardware's compatibility:
- SIMATIC Step 7 version 5.3 or higher

or
- SIMATIC TIA Portal version 11 or higher.

Configuration:

→ Before accessing the AirLINE Ex system, the corresponding DMD (file package) must be imported in the program's hardware catalogue.

→ Select the desired interface module in the hardware catalogue of the TIA Portal and drag it into the work area via drag-and-drop.

The active AirLINE Ex modules are in the same branch of the hardware catalogue. They are treated like a digital, electrical output module.

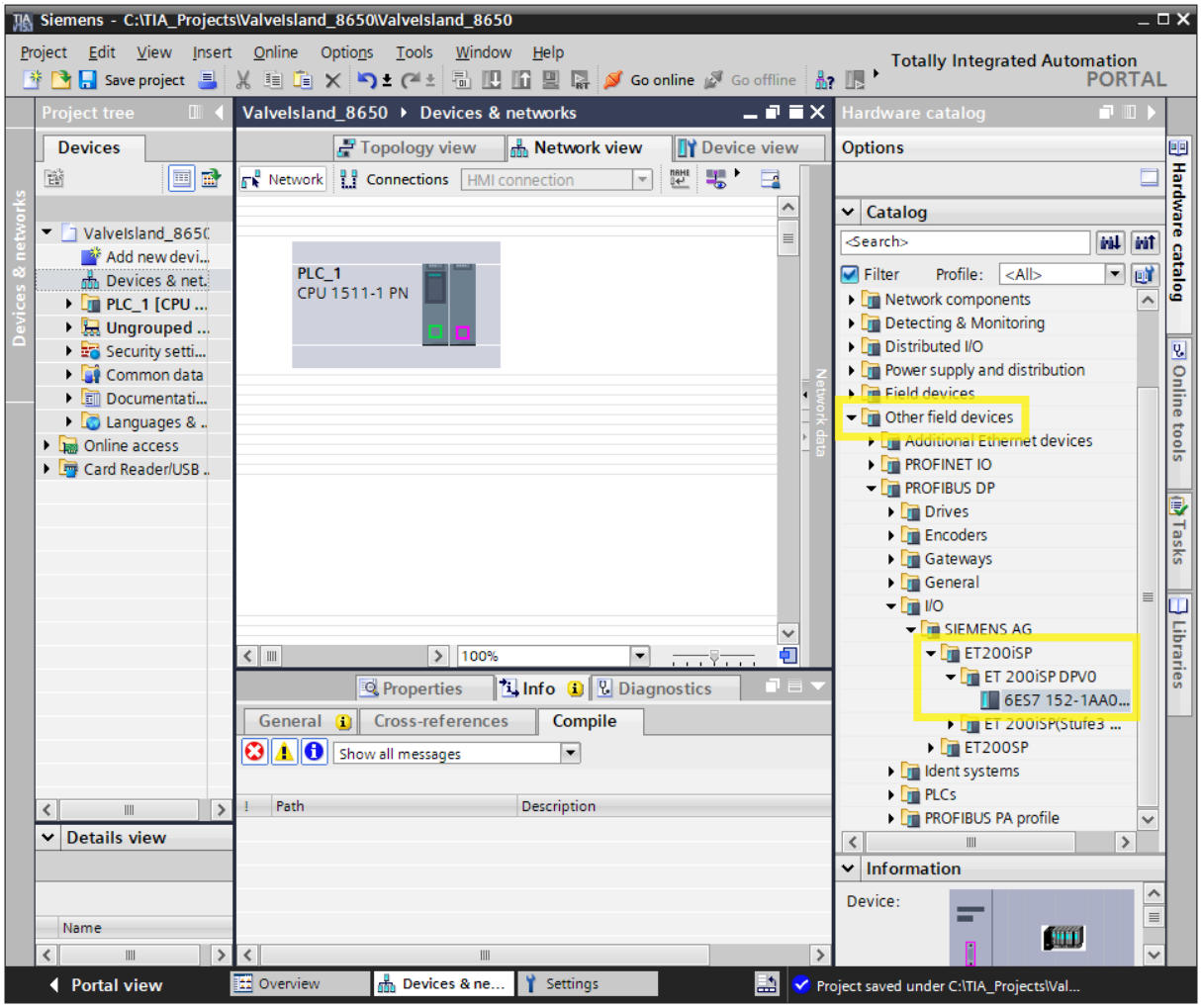

Fig. 55: Select ET 200iSP from the branch "Additional field devices"

Connection segments are passive and are not projected (see also chapter “10.1” on page 31).

→ Select the desired modules from the ET 200iSP catalogue branch and drag them to the respective slot of the ET 200iSP station via drag-and-drop. While doing so, display the real station assembly from left to right.

The respective identification number is specified on the front of the electronic module (e.g., “00171941”), and the module function as well for electronic modules REV.2 (e.g., 8 DO).

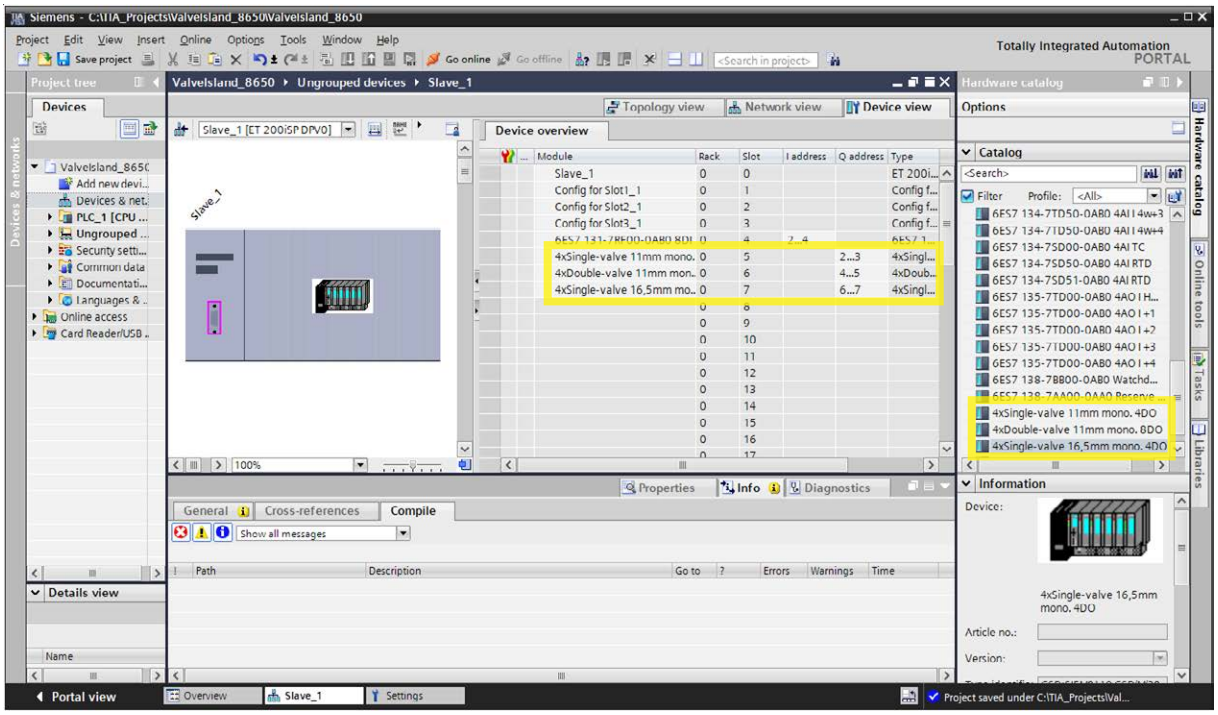

Fig. 56: Select the modules and assign the ET 200iSP station slots.

17.4 Accessing the acyclical parameters, with SIMATIC PDM as an example

A program such as Siemens Process Device Manager (PDM) is required to access the acyclical parameters of the modules.

The respective EDD (file package) must be imported into the program device catalogue before the AirLINE Ex module can be accessed.

Use the Siemens PDM program version 6.0 or higher to ensure compatibility with the hardware.

The EDD is currently only offered in conjunction with SIMATIC PCS7.

New versions of SIMATIC PCS7 offer an integrated version of PDM. The advantage of these versions is that they prevent uncoordinated access to parameters.

→ After starting the S7 manager, select "*Extras/SIMATIC PDM/Manage device catalogue"* via the menu list.

→ Via "*Search"* enter the source index in which the EDD file is saved. Then select device type ET 200iSP and confirm with "OK".

The ET 200iSP system data are now entered into the device catalogue.

The following images show how a new station is assembled in PDM.

→ Select the object type to add a new object.

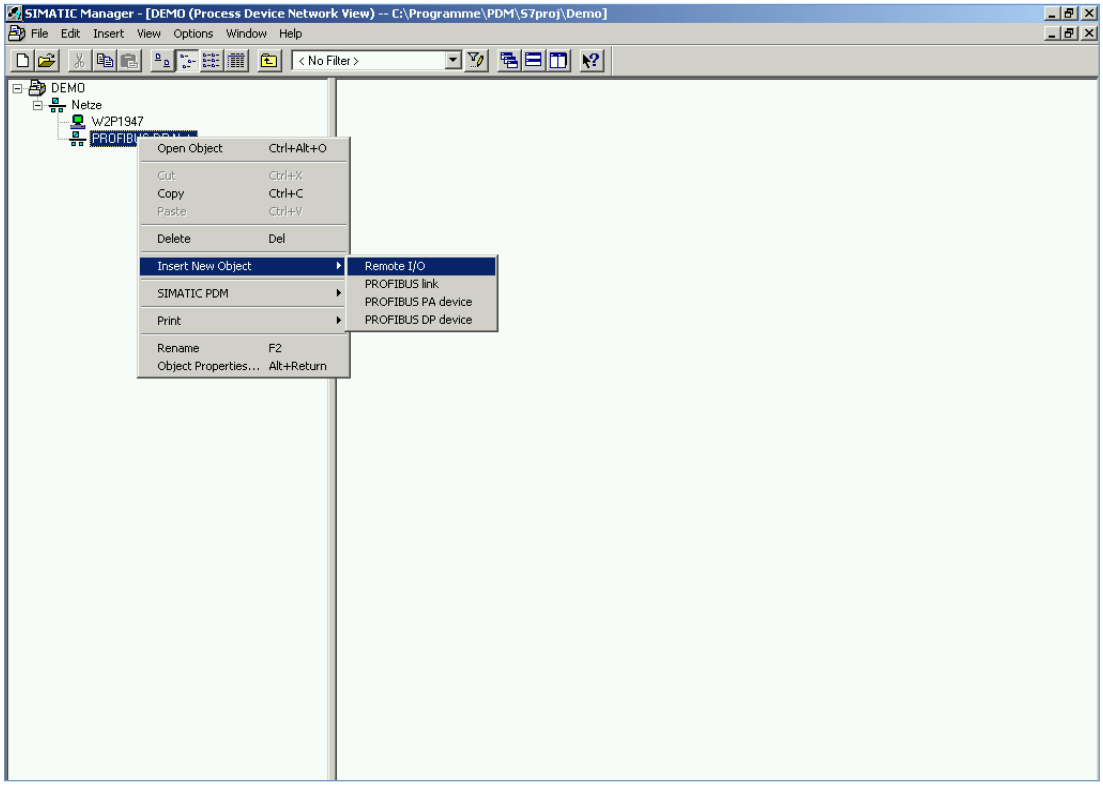

Fig. 57: Selecting the object type

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→ Add the new object.

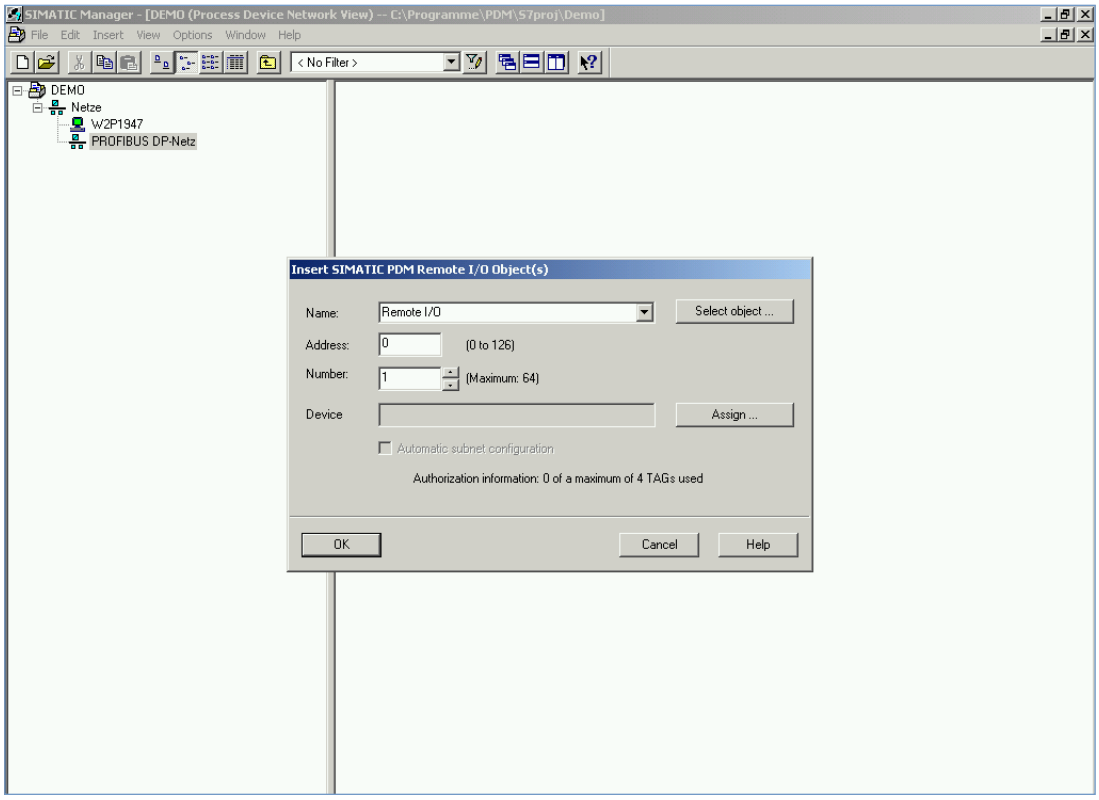

Fig. 58: Adding the new object

→ Select the device type to ad a new device.

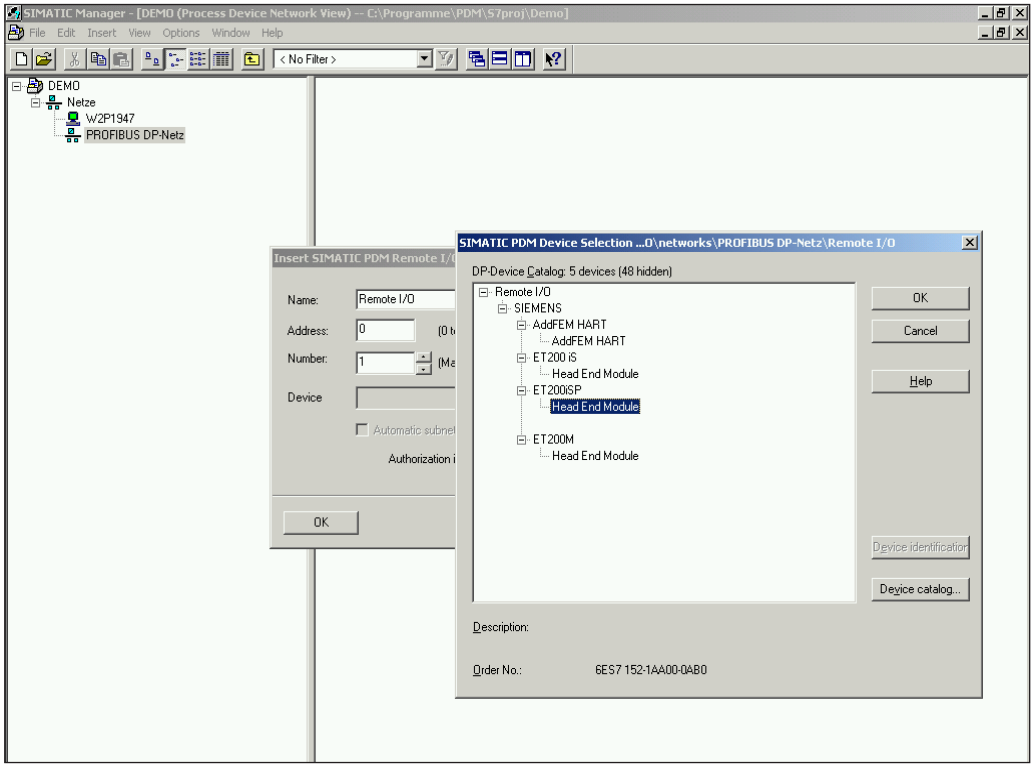

Fig. 59: Selecting the device type

→ Define the station name and bus address.

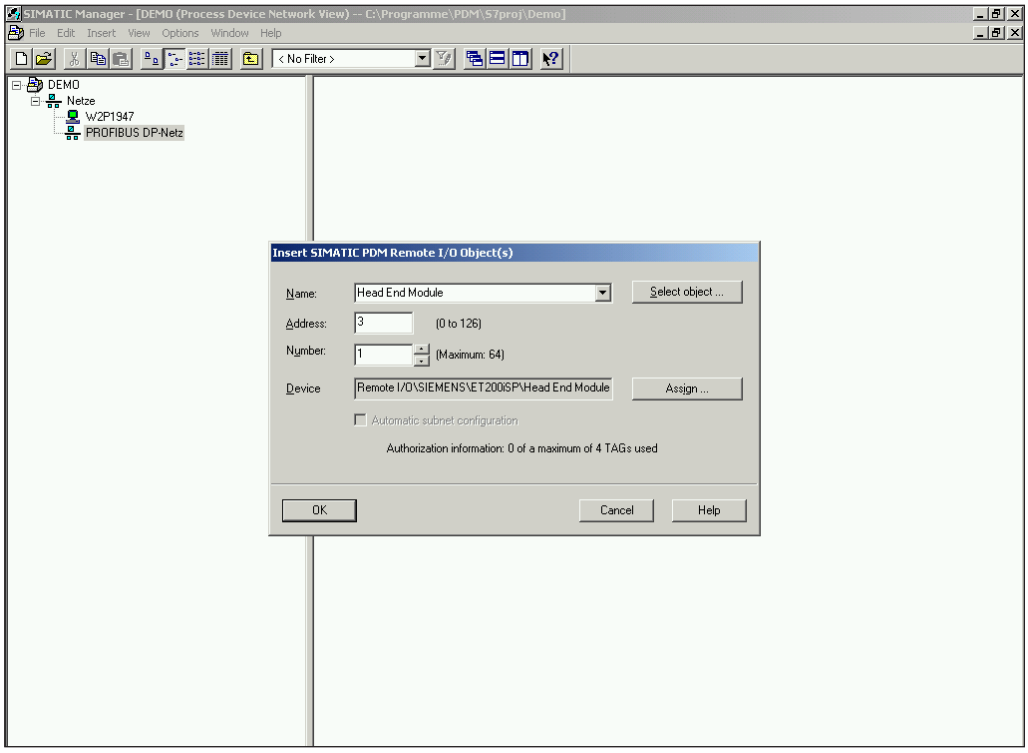

Fig. 60: Defining the station name and bus address

→ Add the function modules.

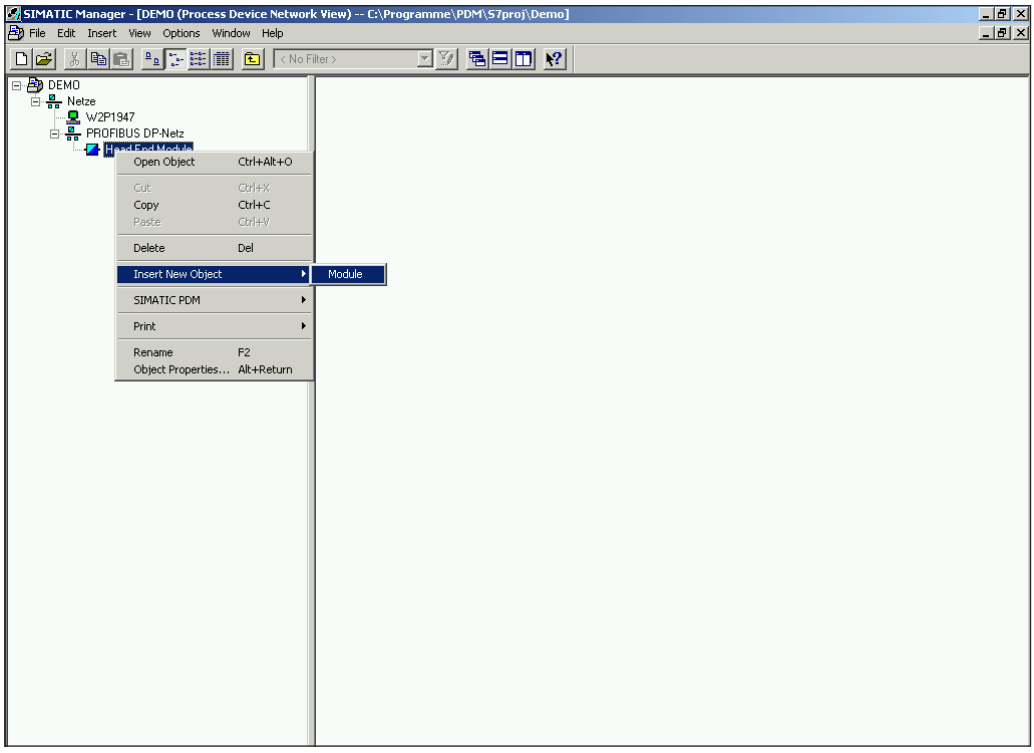

Fig. 61: Adding the function modules

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→ Set the desired number of equivalent modules.

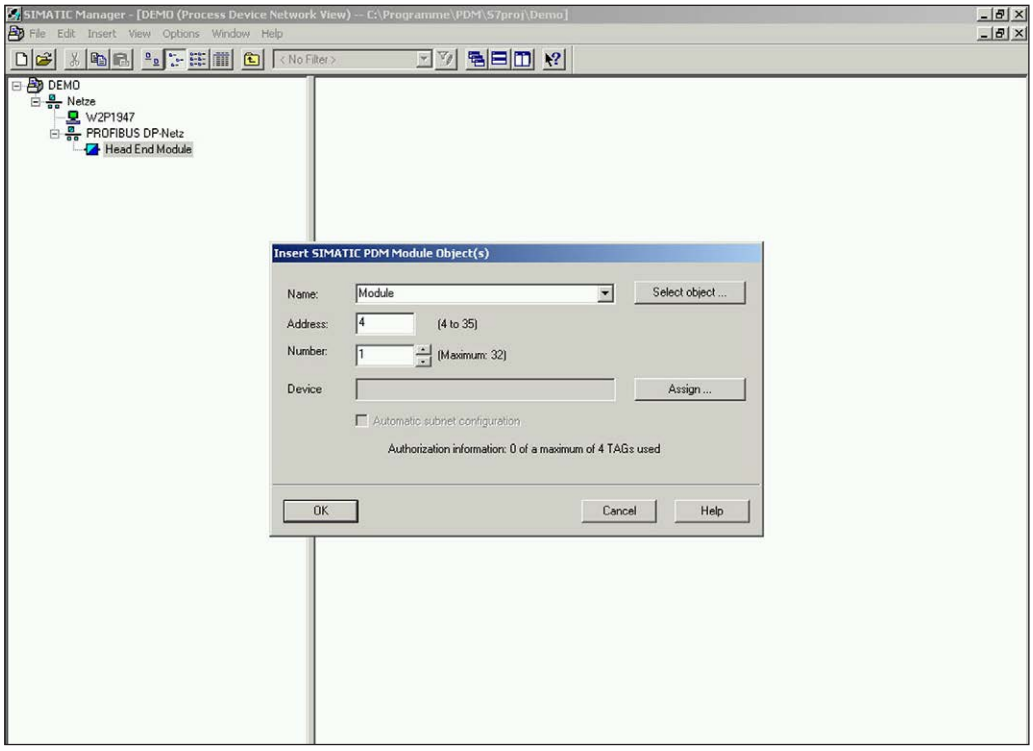

Fig. 62: Setting the number of equivalent modules

→ Select the module type via the menu "*Assign*".

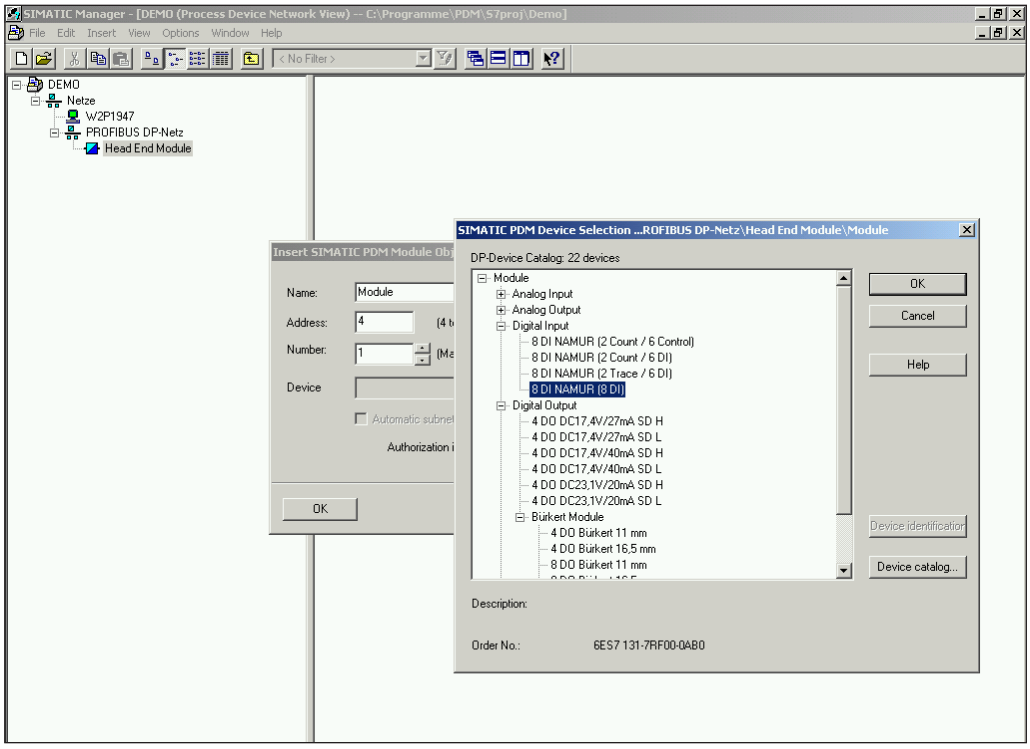

Fig. 63: Selecting the module type

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→ Confirm the module selection with “OK”.

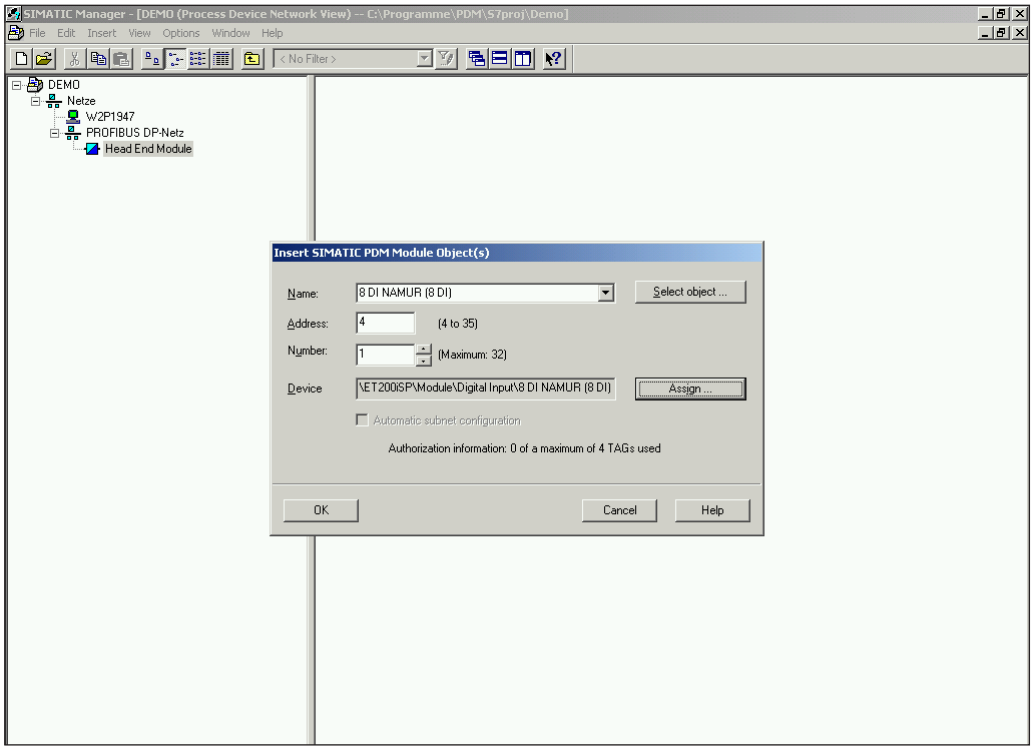

Fig. 64: Confirming the module selection

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17.4.1 Example with 2 different function modules

→ Select the head station.

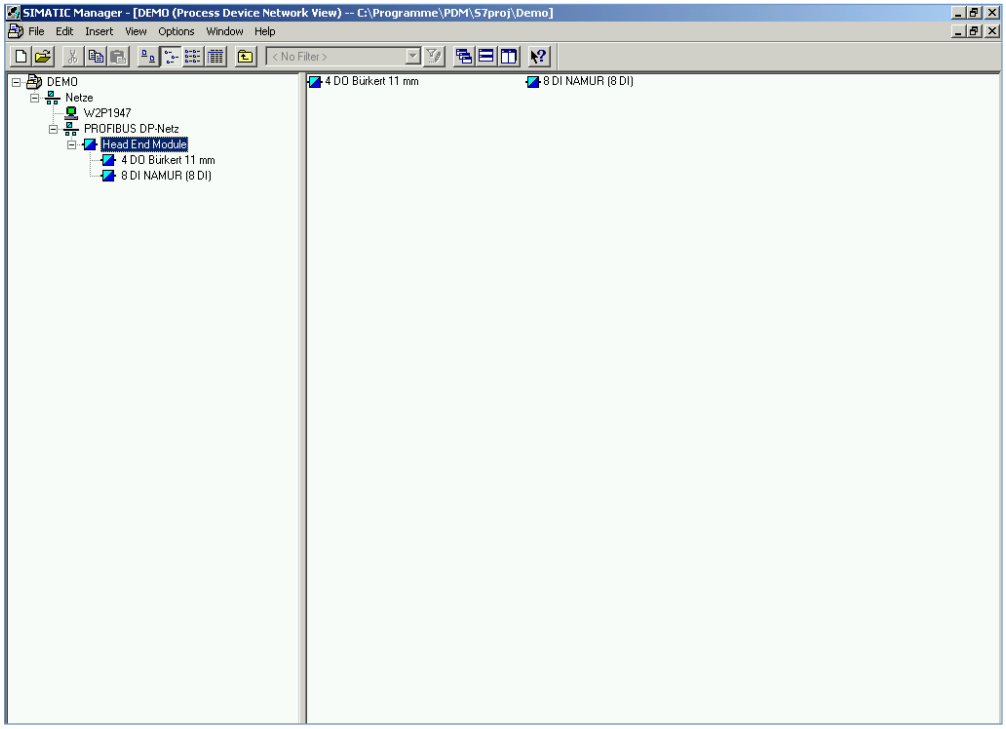

Fig. 65: Selecting the head station

→ Open station to access acyclical functions.

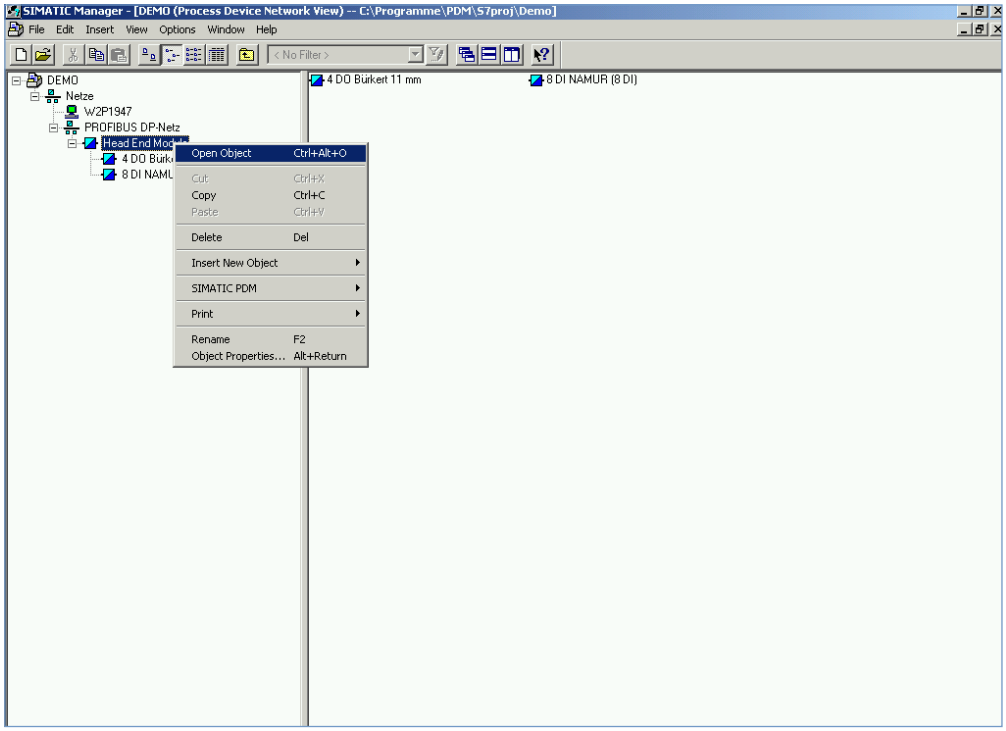

Fig. 66: Opening the station

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→ Select access type (specialist: full access; maintenance: limited access).

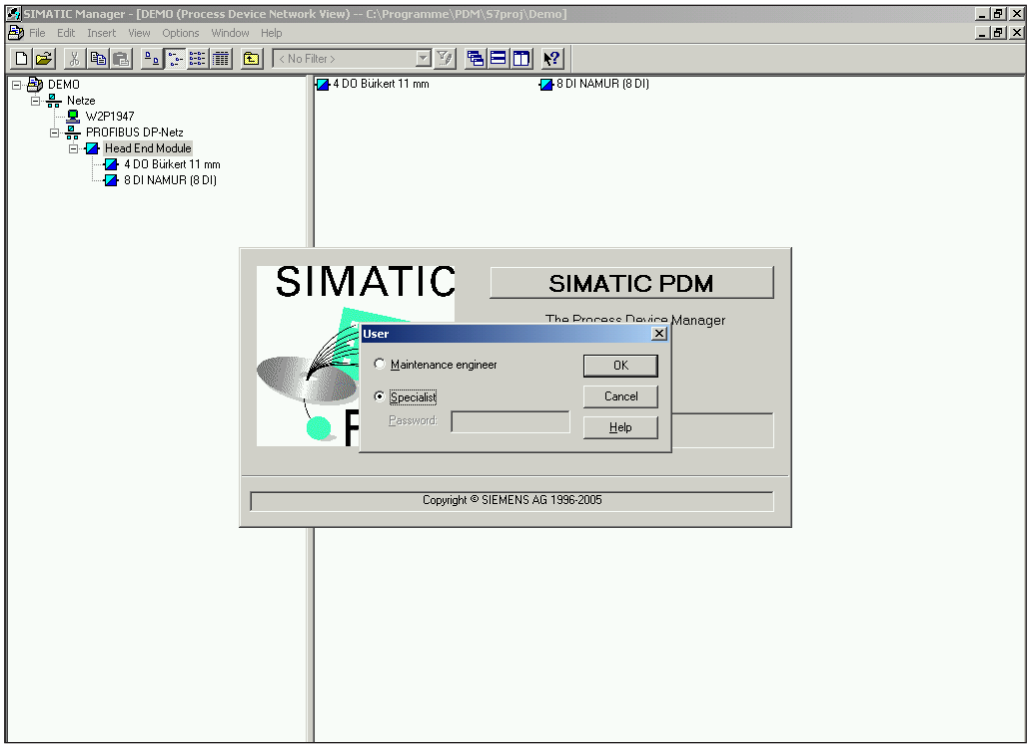
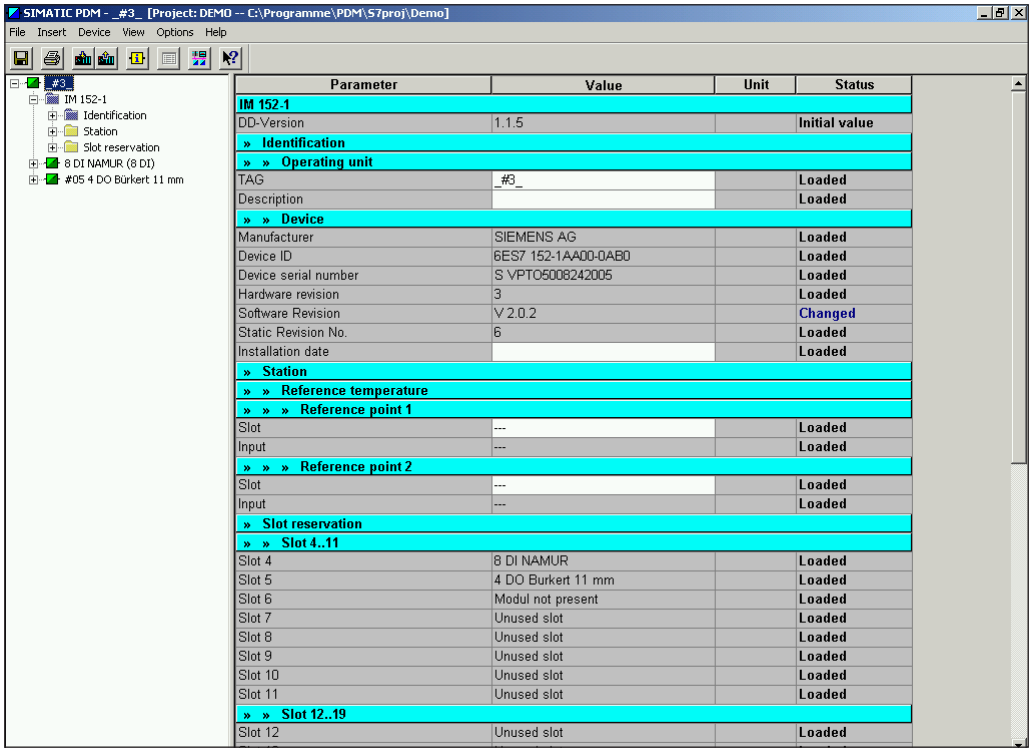


Fig. 67: Selecting the access type

→ Select head station to obtain parameters of interface module and overview of station assembly.



Parameter	Value	Unit	Status
IM 152-1			
DD-Version	1.1.5		Initial value
» Identification			
» » Operating unit			
TAG	_#3_		Loaded
Description			Loaded
» » Device			
Manufacturer	SIEMENS AG		Loaded
Device ID	6ES7 152-1AA00-0AB0		Loaded
Device serial number	S VPTO5008242005		Loaded
Hardware revision	3		Loaded
Software Revision	V 2.0.2		Changed
Static Revision No.	6		Loaded
Installation date			Loaded
» Station			
» » Reference temperature			
» » » Reference point 1			
Slot	---		Loaded
Input	---		Loaded
» » » Reference point 2			
Slot	---		Loaded
Input	---		Loaded
» Slot reservation			
» » Slot 4..11			
Slot 4	8 DI NAMUR		Loaded
Slot 5	4 DO Burkert 11 mm		Loaded
Slot 6	Modul not present		Loaded
Slot 7	Unused slot		Loaded
Slot 8	Unused slot		Loaded
Slot 9	Unused slot		Loaded
Slot 10	Unused slot		Loaded
Slot 11	Unused slot		Loaded
» » Slot 12..19			
Slot 12	Unused slot		Loaded

Fig. 68: Parameters of interface module and overview of station assembly

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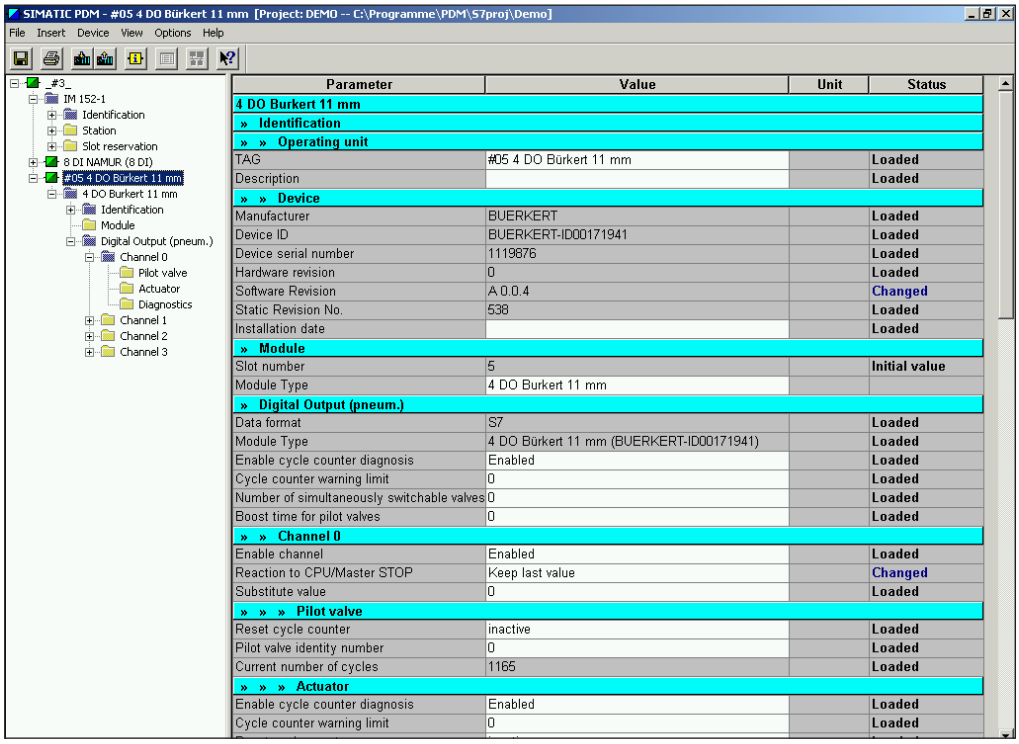

Parameter	Value	Unit	Status
4 DO Burkert 11 mm			
» Identification			
» » Operating unit			
TAG	#05 4 DO Bürkert 11 mm		Loaded
Description			Loaded
» » Device			
Manufacturer	BUERKERT		Loaded
Device ID	BUERKERT-ID00171941		Loaded
Device serial number	1119876		Loaded
Hardware revision	0		Loaded
Software Revision	A 0.0.4		Changed
Static Revision No.	538		Loaded
Installation date			Loaded
» Module			
Slot number	5		Initial value
Module Type	4 DO Burkert 11 mm		
» Digital Output (pneum.)			
Data format	S7		Loaded
Module Type	4 DO Bürkert 11 mm (BUERKERT-ID00171941)		Loaded
Enable cycle counter diagnosis	Enabled		Loaded
Cycle counter warning limit	0		Loaded
Number of simultaneously switchable valves	0		Loaded
Boost time for pilot valves	0		Loaded
» » Channel 0			
Enable channel	Enabled		Loaded
Reaction to CPU/Master STOP	Keep last value		Changed
Substitute value	0		Loaded
» » » Pilot valve			
Reset cycle counter	inactive		Loaded
Pilot valve identity number	0		Loaded
Current number of cycles	1165		Loaded
» » » Actuator			
Enable cycle counter diagnosis	Enabled		Loaded
Cycle counter warning limit	0		Loaded

Fig. 69: Parameters of an AirLINE Ex pneumatic module

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17.5 Acyclical parameters of AirLINE Ex modules

17.5.1 Parameters that are modularly displayed or can be modularly changed

Name	Value	Unit	Status
4 DO Bürkert 11 mm			
PDM_ConfigurationTool	1: PDM	-	Initial value
# Identification			
# # Operating unit			
DAY	4 DO Bürkert 11 mm	-	-
Description			Initial value
# # Device			
Manufacturer	BUERKERT	-	-
Device designation	BUERKERT-ID00171941		
Device serial number	00001234		
Hardware revision	0		
Software revision	A 0.0.4		
Static revision no.	3		
Installation date	-		Initial value
# Module			
Slot number	14	-	-
Module type	4 DO Bürkert 11 mm		
# 4 DO Bürkert 11 mm			
Data format	S7	-	Initial value
Module type	4 DO Bürkert 11 mm (BUERKERT-ID00171941)		-
Switching cycle counter diagnostics approval	enabled		Initial value
Switching cycle counter warning limit	1000000		-
Number of simultaneously switchable pilot valves	4		
Boost time for the pilot valves	300		

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17.5.2 Access rights maintenance/specialist

Some of the parameters described below can only be changed if PDM access is set to SPECIALIST. You can learn more about reading and writing rights in the online help for the SIMATIC PDM program.

17.5.3 Parameter functions

- **Switching cycle counter diagnostics approval for pilot valves (read/write)**
  Defines whether a diagnostics alert will be generated when the warning parameter of a pilot valve switching cycle counter is exceeded.
- **Warning parameter switching cycle counter (read/write)**
  Defines the pilot valve switching cycle counter value at which a diagnostics warning is generated.
- **Number of simultaneously switchable pilot valves – only relevant for 8-channel modules (read)**
  States how many pilot valves can be switched on simultaneously (see also boost time).
  (Depending on the type and number of pilot valves, the total current during activation would exceed the maximum current that the electronic module can provide).

  In the 8-channel modules, the valves 0– 3 or 4– 7 each form one group.
  In the event that more than 4 valves are to be switched on simultaneously (including the valves already switched on), the following may occur:
  - Case 1: In group 0– 3, no more valves are switched on.
    Then the valves of group 4– 7 yet to be activated are immediately switched on.
  - Case 2: In group 0– 3, additional valves are switched on.
    Then the valves of group 4– 7 are switched on only after the “boost time” has ended.

- **Boost time for pilot valves (read/write)**
  When being switched on, the pilot valves receive an increased current. The current is reduced after the boost time to minimise power consumption and optimise the power balance in the electronic module.

Module	Value “boost time”
00171941 (4 channels 11 mm)	500
00171942 (8 channels 11 mm)	300
00171943 (4 channels 16.5 mm)	800
00171944 (8 channels 16.5 mm)	300

- **Date of the most recent switching cycle counter reset (read-only)**
  States when the actuator’s switching cycle counter was most recently reset.
- **Switching cycle counter diagnostics approval for actuators (read/write)**
  Defines whether a diagnostics alert will be generated when the warning parameter of an actuator switching cycle counter is exceeded.

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17.5.4 Parameters displayed by channel or which can be altered by channel

Name	Value	Unit	Status
Channel 0			
Channel enable	enabled	-	Initial value
Behaviour for CPU/Master-STOP	Switching replacement value		
Forced value	0		
# # # Pilot valve			
Switching cycle counter reset	inactive	-	Initial value
Identification number of pilot valve	0		Initial value
Current number of switching cycles	74766		-
# # Actuator			
Switching cycle counter diagnostics approval	enabled	-	Initial value
Switching cycle counter warning limit	0		
Switching cycle counter reset	inactive		
Date of most recent switching cycle counter reset	-		
Current number of switching cycles	74766		-
# # # Diagnostics			
Compound diagnostics	blocked	-	-
Wire break			
Short circuit			

17.5.5 Functions of the channel parameter (general)

- **Channel enable (read/write)**
  Defines whether the channel is cleared for use or not.
- **Behaviour for CPU/Master-STOP (read/write)**
  Defines which value the channel takes on when the master is set to STOP.
- **Substitute value (read/write)**
  Defines the substitute value in the case “Switch substitute value for Master-STOP”.

17.5.6 Functions of the pilot valve parameter (of this channel)

- **Switching cycle counter reset**
  Triggers a reset of the respective switching cycle counter.
- **Identification number of the pilot valve (read/write)**
  Here you can enter the identification number of the pilot valve being used. It is quickly available in the event of an upcoming replacement or preventive maintenance.
- **Current number of switching cycles (read-only)**
  States how many switching cycles the pilot valve has performed since the last counter reset.

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17.5.7 Functions of the actuator parameter (that is connected to this channel's pilot valve)

- **Switching cycle counter diagnostics approval (read/write)**
  Defines whether a diagnostics alert will be generated when the warning parameter of the switching cycle counter is exceeded.
- **Switching cycle counter warning parameter (read/write)**
  Defines the switching cycle counter value at which a diagnostics warning is generated.
- **Switching cycle counter reset**
  Triggers a reset of the respective switching cycle counter.
- **Date of the most recent switching cycle counter reset (read-only)**
  States when the actuator's switching cycle counter was most recently reset.
- **Current number of switching cycles (read-only)**
  States how many switching cycles the actuator has performed since the last counter reset.

17.5.8 Functions of the diagnostics parameter

- **Compound diagnostics (read/write)**
  States whether compound diagnostics will be generated.
- **Wire break (read/write)**
  States whether a diagnostics alert is generated when the outlet is open.
- **Short circuit (read/write)**
  States whether a diagnostics alert is generated when there is a short circuit in the outlet.

17.5.9 Why separate switching cycle counters for pilot valve and actuator?

Each electronic module provides 2 separate switching cycle counters per channel (1x for pilot valve, 1x for actuator), as the 2 devices (pilot valve on the island, actuator in the field) can also be maintained or replaced independently of each other.

Example:

Wear parts are being replaced for a process valve in the field for preventive maintenance purposes.

- The actuator switching cycle counter can be reset,
- while the pilot valve and its current number of switching cycles remain unaffected.

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17.6 Using HSP with SIMATIC STEP 7/TIA Portal

17.6.1 Hardware support packages (HSP) for STEP 7

An HSP for the hardware catalogue can be installed after the fact for SIMATIC STEP 7 V5.3 SP2 or TIA Portal V11 or higher. The HSP supplements the decentralised peripheral system Siemens SIMATIC ET 200iSP with the AirLINE Ex modules.

Depending on the version of SIMATIC STEP 7 being used, various HSP versions are required.

- The “HSP2033 for SIMATIC STEP 7 V 5.x” is suitable for SIMATIC STEP 7 V 5.3 or higher.
- The “HSP0020” is required for SIMATIC STEP 7 TIA Portal.

17.6.2 Installation of the HSP

The hardware support package can be downloaded from the Bürkert homepage:
country.burkert.com → 8650 → Downloads: Software

→ Save and unzip the file “hspXXXX.zip” in an index of your choosing.

→ In the menu “*Extras*” in SIMATIC STEP 7 select the command *“Support packages”*.

→ In the subsequent dialogue select “*Add from the file system*”, and mark and install “HSPXXXX...”.

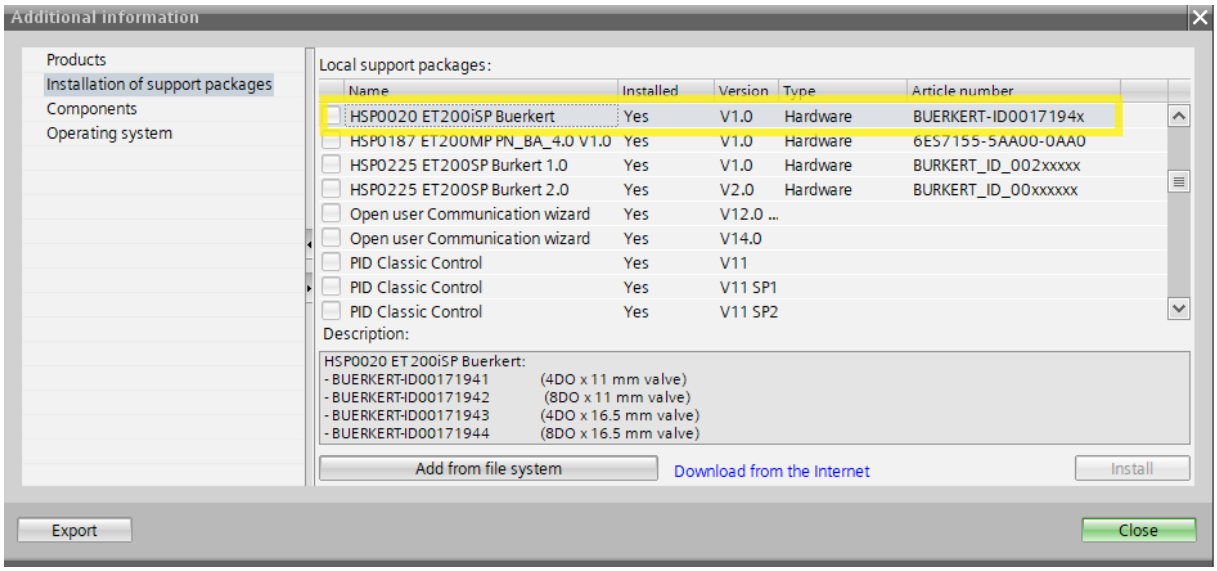

Fig. 70: Install HSP

After installation is complete, the valve modules AirLINE Ex 8650 are integrated in the hardware catalogue.

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17.6.3 Using the HSP

→ Select ET 200iSP from the branch “Decentral periphery”.

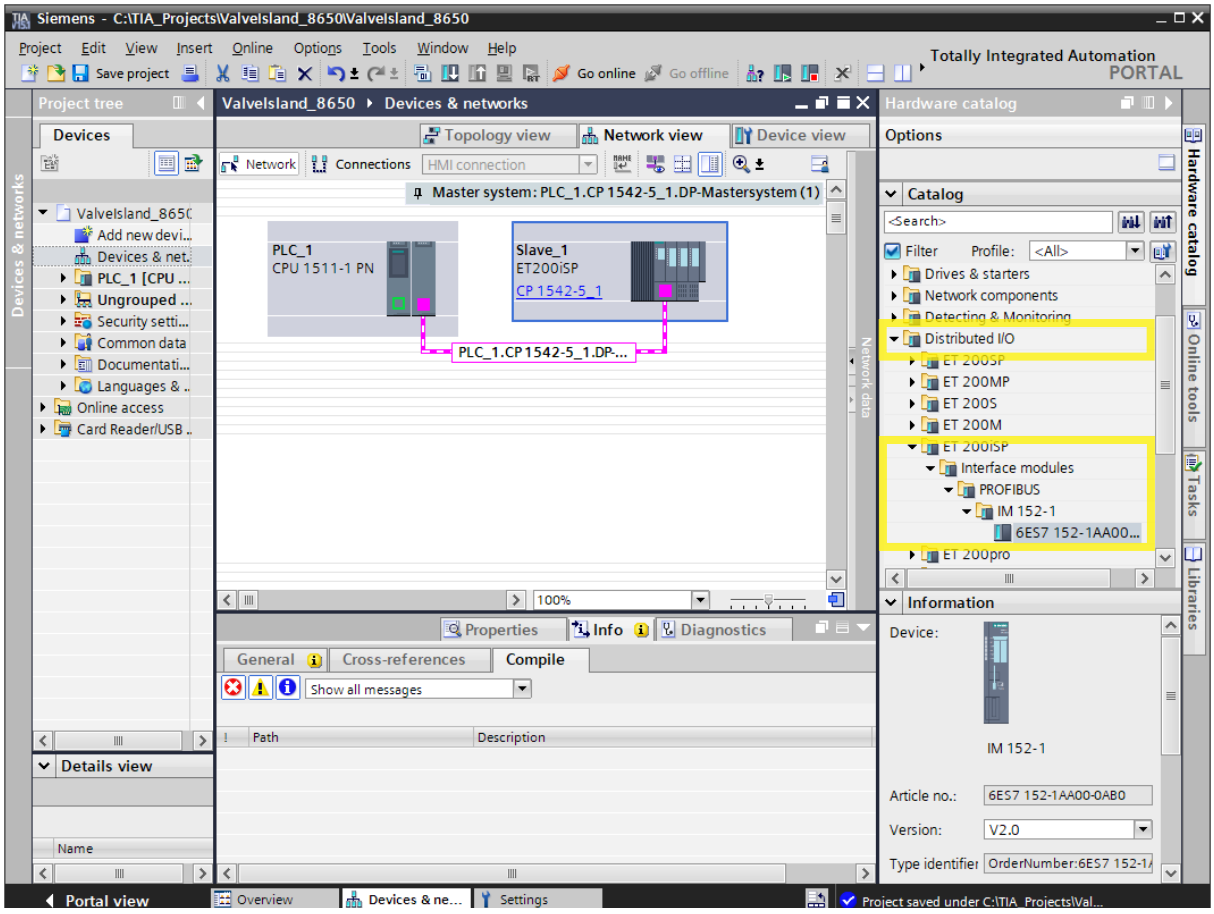

Fig. 71: Selecting the interface module

→ Select AirLINE Ex modules from the branch “Pneumatic modules” and assign the plugs of the ET 200iSP station.

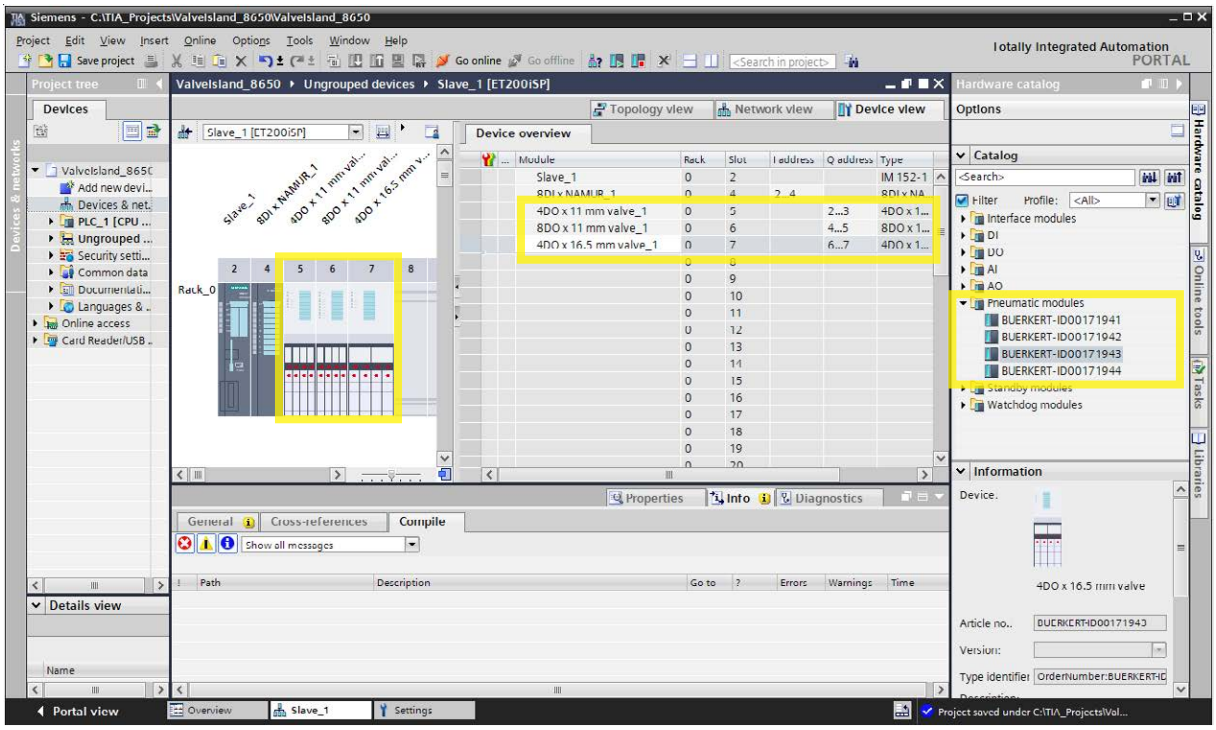

Fig. 72: Assignment of modules

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Changing the parameters in HSP

→ Mark the module.
This displays its parameters, some of which can also be changed.

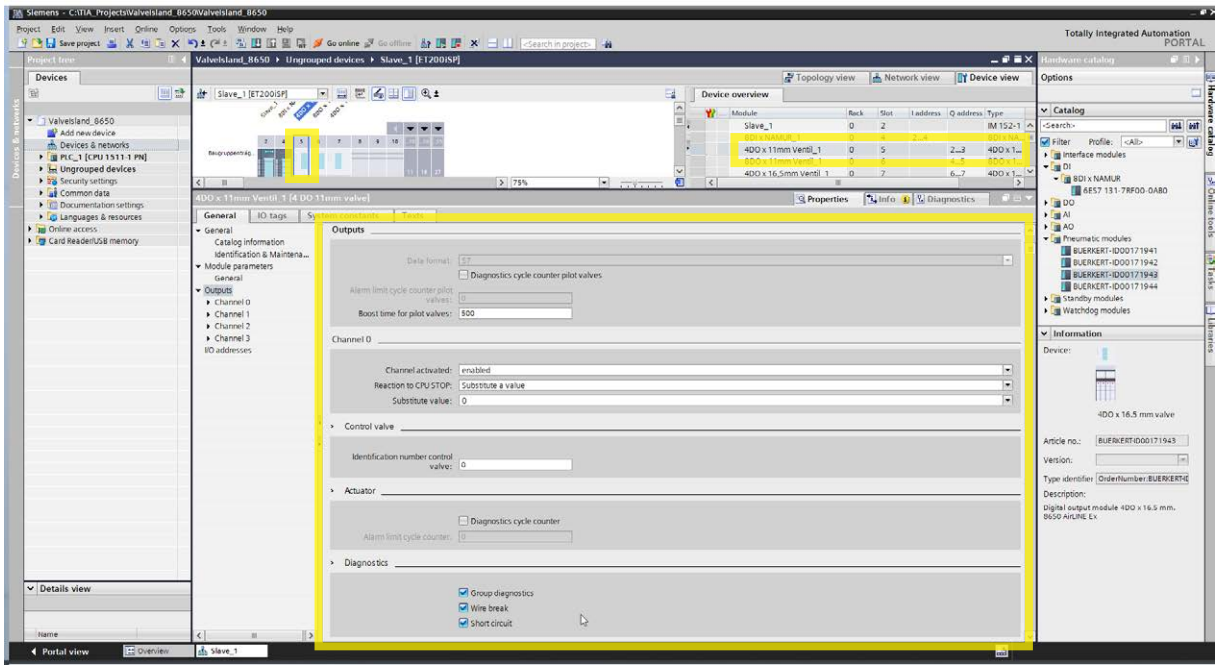

Fig. 73: Changing the parameters of a module

Changes to the settings of the switching cycle counters can currently only be made via SIMATIC PDM.

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17.7 Use of a HUP under SIMATIC PCS7

When using a HUP for the configuration, the required modules are created automatically for the valve block modules. These modules contain all the necessary data and diagnostics.

17.7.1 Hardware Update Package (HUP) for SIMATIC PCS7

From SIMATIC PCS7 V6.1, SP1 or higher, a HUP can be subsequently installed for the hardware catalogue. The HUP supplements the decentralised peripheral system Siemens SIMATIC ET 200iSP with the AirLINE Ex modules.

17.7.2 Installing the HUP

The hardware update package can be downloaded from the Bürkert homepage:
country.burkert.com → 8650 → Downloads: Software

There are various HUP versions available for different versions of PCS7;
HUPs were formerly referred to as “SUPs”. The version compatibilities are documented in the ZIP containers provided.

For PCS7 versions before V 9.0 SP2, the installation process may deviate from the depiction below.

→ Close PCS7.

→ Run the “PCS7_HUP_Burkert_8650_for_ET200iSP.exe” file and follow the wizard for installation.

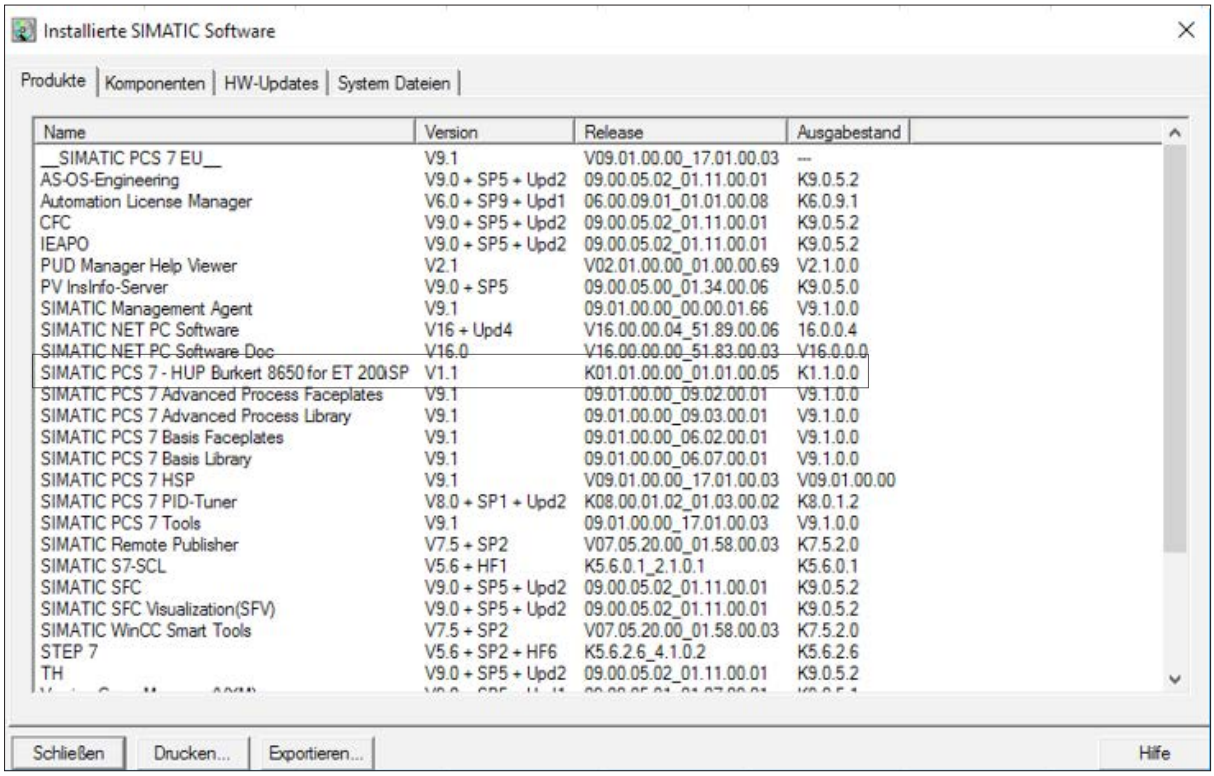

Fig. 74: HUP has been installed.

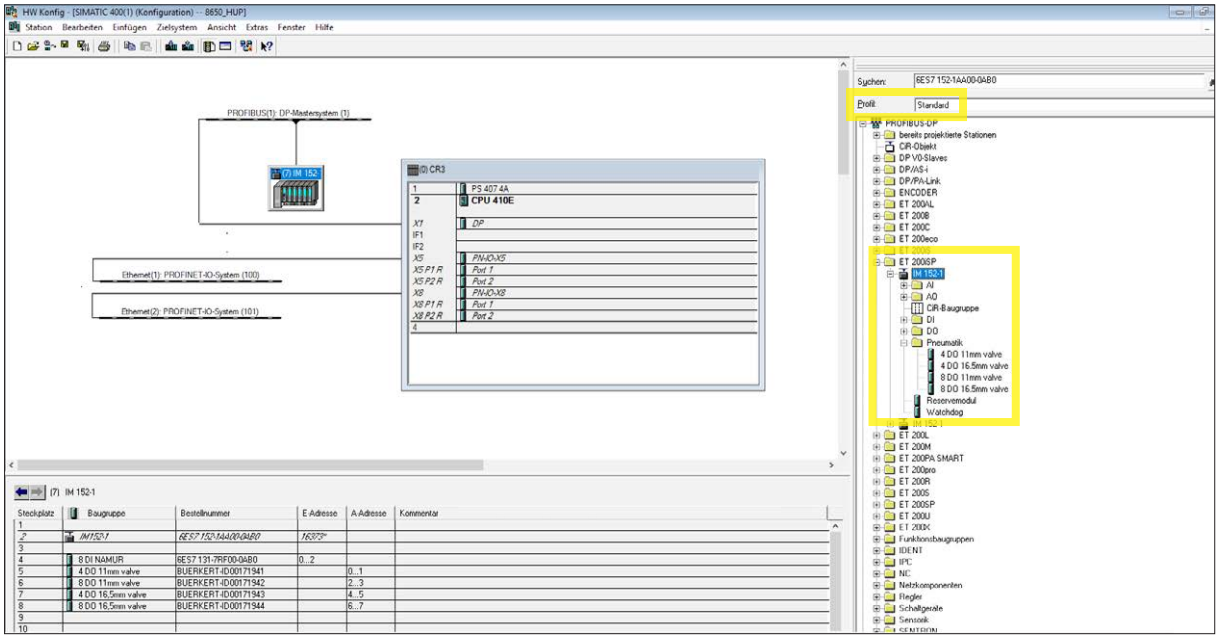

Fig. 75: Projecting PCS7 (HW-Konfig)

The filter in the hardware catalogue must be set to “Standard” so that the AirLINE Ex modules are displayed.

Changes to the switching cycle counter settings can currently only be made via SIMATIC PDM (can be integrated in PCS7).

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18 SERIALISATION DATA SET

The serialisation data of fully assembled Type 8650 systems are available as an electronic data set for documentation purposes.

The data set contains the identification numbers and serial numbers of all Ex-related components (valves, electronic modules and terminal modules). The sequence is always based on the system assembly from left to right (serial number of valve block – serial numbers of all electronic modules – serial numbers of all valves – serial numbers of all terminal modules).

A suitable mobile device can be used to pull up the device-specific information via the Internet with the 2D code on the device type label, including the aforementioned data set.

Alternatively, the data set can be accessed via the website country-burkert.com. After entering the identification number of the valve block and selecting the product, the serial number can be entered. The data set is then displayed for download.

An example structure of a serialisation data set is shown below.

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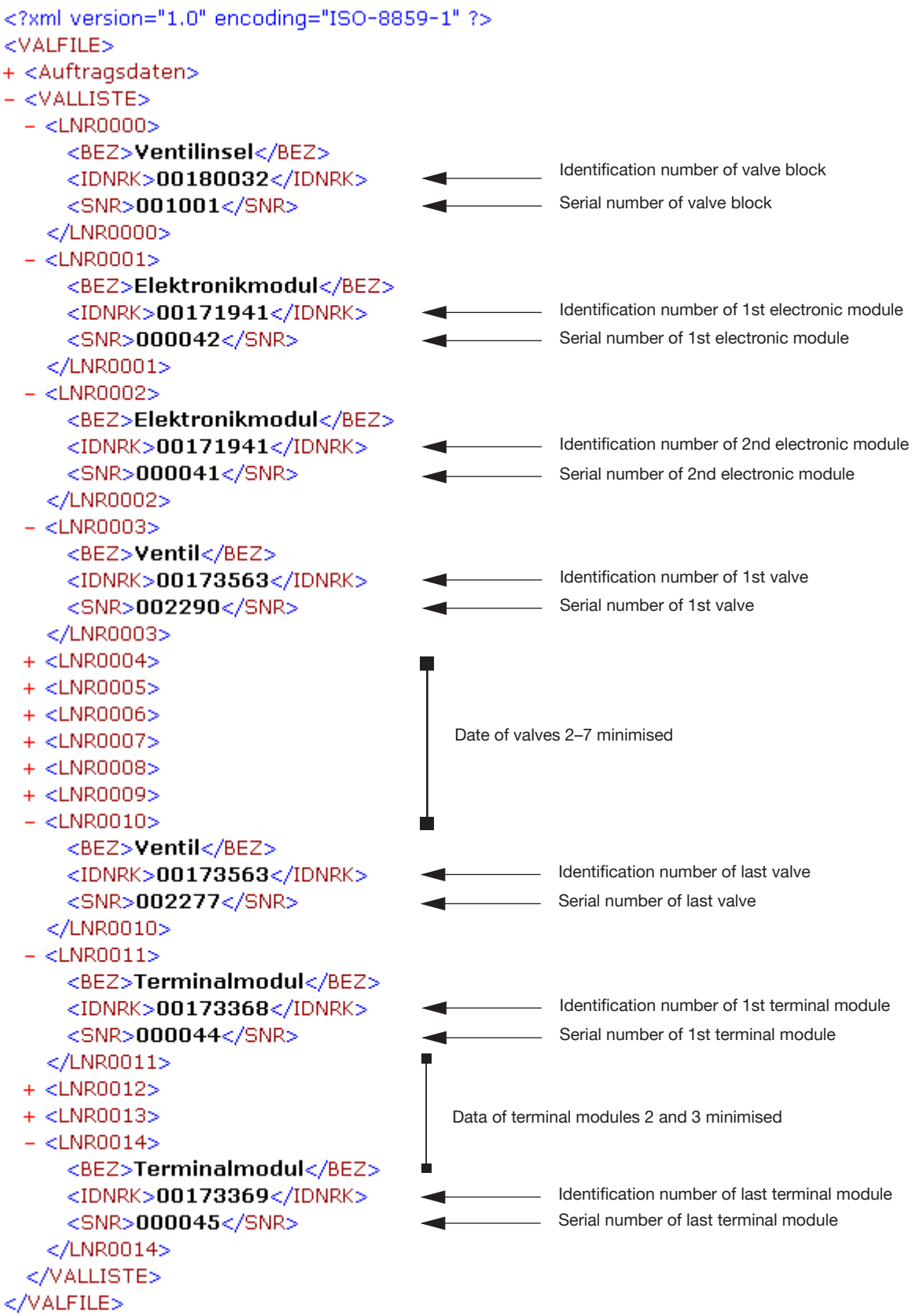

Fig. 76: Example of a serialisation data set

19 SERVICING AND MAINTENANCE

19.1 Safety instructions

DANGER

Risk of injury due to high pressure and escaping medium.

- Switch off the pressure before working on the device or system. Vent or empty the lines.

Risk of injury from electric shock.

- Switch off the power supply before working on the device or system. Secure it against reactivation.
- Observe any applicable accident prevention and safety regulations for electrical devices. (Valves and electronic modules can be replaced under voltage.)

Risk of explosion due to improper handling.

Only certain activities are allowed during operation in a potentially explosive area. In addition to the activities listed in the documentation for SIMATIC ET 200iSP, the following also apply to AirLINE Ex Type 8650: Pulling/plugging valves and electronic modules during operation in Zone 1 and Zone 2, see chapter“19.3 Upkeep”.

WARNING

Risk of injury due to improper maintenance work.

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

Risk of burns from hot device surfaces.

The valves may be hot during a long duty cycle.

- Let the valves cool before unplugging them, or wear heat-resistant gloves.

Risk of injury due to unintentional activation of the system and uncontrolled restart.

- Secure the device or system to prevent unintentional activation.
- Following interruption of the process, ensure that the process is restarted in a controlled manner.

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NOTE

Only provide the device with electricity via SIMATIC ET 200iSP

- In order to prevent damage to the device, the device must solely obtain its power supply via the Power-Supply module of the ET 200iSP.

Preventing pressure drop

- To avoid a pressure drop, provide the device's pressure supply to the greatest extent possible.

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.

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19.2 Maintenance

19.2.1 Maintaining modules

The AirLINE Ex system modules do not require maintenance if used in accordance with these operating instructions.

If coarse residue occurs in the compressed air supply lines, it may accumulate in the filter of the connection segments (only REV.2). If necessary, uninstall the filter as described in chapter “16.10.1 Connection segments” on page 73, clean it and reinstall it.

19.2.2 Cleaning

DANGER

Risk of explosion due to electrostatic charge

If there is a sudden discharge of electrostatically charged devices or persons, there is a risk of explosion in the potentially explosive atmosphere.

▸ Clean the device surface by gently wiping it with a **damp** cloth only.

→ Only use a damp, lint-free cloth to clean the system.
Detergents or alcohol are not suitable for cleaning. They can damage plastic parts.

19.2.3 Diagnostics function

Switching cycle counter

The current counter values are saved in the electronic modules in an outage-proof manner at regular intervals.

In the event of frequent operating voltage failures, it may happen that individual switching cycles are not documented in the remanent storage, thereby causing the saved number of switching cycles to be slightly lower than the number of actual switching cycles.

Details can be found in chapters “12.1” on page 45 and “17” on page 83.

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19.3 Upkeep

DANGER

Risk of injury due to high pressure and escaping medium.

▸ Switch off the pressure before working on the device or system. Vent or empty the lines.

The valves can show signs of wear over time (e.g. tightness may deteriorate). Valves opened when necessary must be replaced as described below.

19.3.1 Replacing valves in operation

DANGER

Risk of injury due to pressure change.

Only the P channel is blocked during deinstallation of a valve from a base module with P shutoff. The pressure at work outlets A or B is reduced. Any connected actuator is thus also depressurised, which can cause movement.

▸ In the event of a potential hazard, mechanically secure the position of the actuator or apply a block to the work connections in order to prevent the actuator from moving.

Installation instructions

→ Put the system in a secure state before replacing the valve. If the respective valve position is not equipped with a P shutoff, depressurise the system first.

Base module with P shutoff:

If valves are switched under pressure, only a maximum of 4 valves can be uninstalled at the same time. Otherwise the pressure may drastically decrease in the other valves.

When the valve is being uninstalled, a lot of air is emitted at first until the valve is completely loosened. However, an automatic block reduces the air loss so that there is only a minor residual leak when the P shutoff is closed.

Installing

DANGER

Risk of injury due to pressure change.

When installing the valve, make sure that the work connections in the corresponding rest position of the valve are also pressurised until it is switched. A connected actuator can thus move depending on the pressurisation.

▸ Ensure that the actuator's movements cannot damage the system or cause it to perform any undesired actions.

→ Before installation, make sure that the seal on the bottom of the valve is correctly positioned.

→ Install the valve as shown in the following image, while observing the specified tightening torques and sequence.

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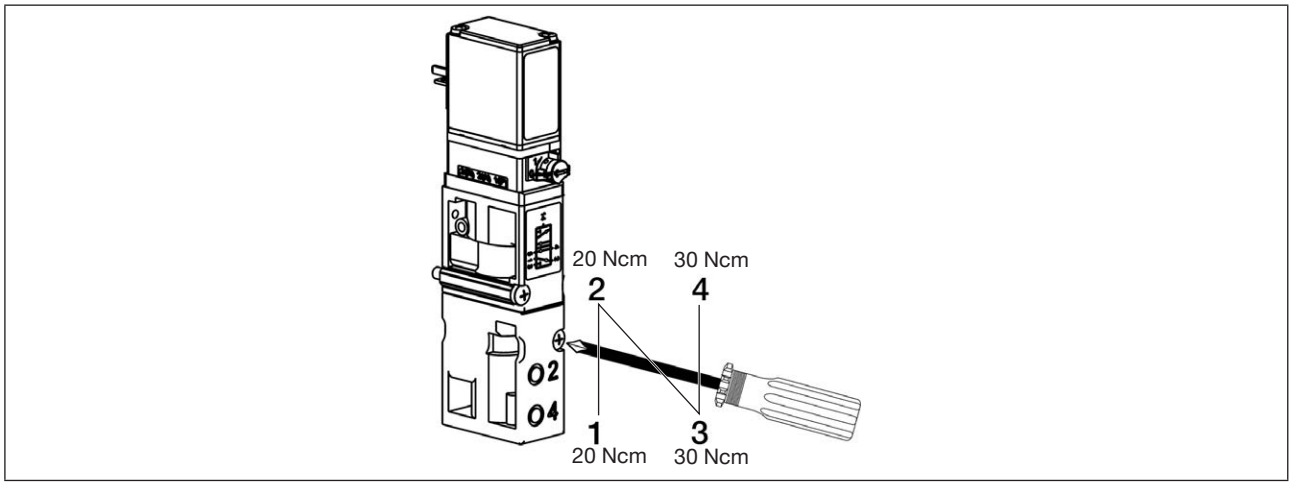

19.3.2 Replacing the electronic module in operation

SIMATIC ET 200iSP only allows the removal of **on** individual electronic module in operation. If multiple electronic modules are being removed simultaneously, the station reports the disruption.

→ First remove all connected valves as described in the previous chapter "19.3.1". Remove the protective caps of the electrical contacts of unused valve positions.

→ Remove the electronic module.
The procedure is described in chapter "16.10.2 Valve segments" on page 75.

→ The substitute module is installed in reverse order.

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19.4 Troubleshooting

Fault	Possible cause	
Valves do not switch.	No operating voltage or operating voltage too low.	→ Check the electrical connection. → Ensure the correct operating voltage.
	Manual override not in neutral position.	→ Bring manual override to zero position.
	Pressure supply insufficient or not available.	→ Set up the largest possible volume of pressure supply (also for upstream devices such as pressure regulators, maintenance units, on/off valves, etc.). Minimum operating pressure ≥ 2.5 bar
	Wrong configuration.	→ Use the corresponding module from the hardware catalogue.
	Channel not approved for use.	→ Change parameter setting (see chapter “17.5 Acyclical parameters of AirLINE Ex modules” on page 95)
	Set to lower value for “boost time”.	
	The fuse in the module was triggered by a short circuit (can only occur in an extreme malfunction).	→ Replace the electronic module. Check whether the respective valves might be damaged.
Valves switch with a delay or blow off at the exhaust ports.	Pressure supply insufficient or not available.	→ Set up the largest possible volume of pressure supply (also for upstream devices such as pressure regulators, maintenance units, on/off valves, etc.). Minimum operating pressure ≥ 2.5 bar
	Valves are not in home position (de-energised) during pressure build-up.	→ Apply pressure to the valve block before switching the valves.
	Insufficient ventilation of the exhaust air ducts due to too small or dirty silencers (back pressure).	→ Use suitably sized silencers or expansion vessels. → Clean the dirty silencers.
	Impurities or foreign matter in the pilot valve or main valve.	→ Replace valve.
Leaky valve blocks.	• Missing or crushed O-rings between the modules. • Missing or incorrectly positioned flat seals between valve and pneumatic base plate.	→ Identify leaks or missing seals. → Insert missing seals or replace damaged seals.

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Fault	Possible cause	
CF LED is lit.	Wrong configuration.	→ Use the corresponding module from the hardware catalogue.
	Valve diagnostics responds (short circuit, open output).	→ Check whether the valve is properly installed. → Replace defective valves. → Disable diagnostics for unused valve seats.
	The module is not starting up due to internal power limit (short circuits in the outputs).	→ Remove short circuits (defective valves at outputs). → Perform power reset of the module or system.

If the ET 200iSP station (interface module IM 152) has started up with a profibus address X, the address can be changed as follows (for details see SIMATIC ET 200iSP operating instructions):

→ Switch off the station.

→ Set the address 0 (all DIP switches in OFF position).

→ Switch on the station and wait approx. 10 seconds.

→ Switch off the station and then wait approx. 10 seconds.

→ Set the new, desired address Y.

→ Switch on the station.

The new address is adopted.

19.5 Repairs

If a repair is required, send the assembly to the responsible Bürkert branch or contact our Customer Service.

Find the address and telephone number in chapter “5.1 Contact addresses” on page 14.

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20 DECOMMISSIONING

20.1 Safety instructions

DANGER

Risk of injury due to high pressure and escaping medium.

- Switch off the pressure before working on the device or system. Vent or empty the lines.

Risk of injury from electric shock.

- Switch off the power supply before working on the device or system. Secure it against reactivation.
- Observe any applicable accident prevention and safety regulations for electrical devices. (Valves and electronic modules can be replaced under voltage.)

WARNING

Risk of injury due to improper installation work.

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

Risk of injury due to unintentional activation of the system and uncontrolled restart.

- Secure the device or system to prevent unintentional activation.
- Following interruption of the process, ensure that the process is restarted in a controlled manner.

20.2 Deactivate the system

→ Vent the system.

→ Switch off the power supply.

→ Uninstall the modules. The procedure is described in chapter “16.10 Installing/uninstalling individual segments”.

→ Store modules in the original packaging or a similar protective packaging.

20.3 Reactivation

→ Unpack the modules and acclimatise them before reactivation.

Start-up is described in chapter “17 Initial start-up and project planning” on page 83 .

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21 ACCESSORIES

21.1 System accessories

Description	Ident. No.
Blind plate for sealing an unused valve plate Width per valve 11 mm (valves Type 6524 and 6525)	661 092
Blind plate for sealing an unused valve plate Width per valve 16.5 mm (valves Type 6526 and 6527)	653 765
Cover plate for valve plug contact	653 670

21.2 Spare parts

Description	Ident. No.
Seals set (12 pc.) for valves Type 6524 and 6525 (width per valve 11 mm)	2001 6305
Seals set (12 pc.) for valves Type 6526 and 6527 (width per valve 16.5 mm)	2001 6307
Seals set (for 4 module interfaces) for pneumatic base and connection modules	2001 6310

Contact our sales partner in your area for a competent consultation.

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22 STORAGE

NOTE

Incorrect storage may damage the device.

▸ Store the device in a dry and dust-free location.

Storage temperature -40 – +70 °C

The following information applies to assemblies stored in the original packaging.

Requirement	Permissible range
Free fall	≤1 m
Temperature	-40 – +70 °C
change in temperature	max. 20 K/h
Air pressure	1,080– 660 hPa (equates to a height of -1,000 m – +3,500 m)
Relative humidity	5– 95 %, without condensation

AirLINE Ex exceeds the storage condition requirements of IEC 61131-2.

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23 PACKAGING AND TRANSPORT

NOTE

Transport damages.

Inadequately protected devices may be damaged during transport.

- ▸ Protect the device against moisture and dirt in shock-resistant packaging during transportation.
- ▸ Avoid exceeding or dropping below the permitted storage temperature.
- ▸ Protect the electrical interfaces and the pneumatic connections from damage by placing protective caps on them.

The following information applies to assemblies transported in the original packaging.

Requirement	Permissible range
Free fall	≤1 m
Temperature	-40 – +70 °C
change in temperature	max. 20 K/h
Air pressure	1,080– 660 hPa (equates to a height of -1,000 m – +3,500 m)
Relative humidity	5– 95 %, without condensation

AirLINE Ex exceeds the transportation requirements of IEC 61131-2.

24 DISPOSAL

→ Dispose of the device and packaging in an environmentally friendly manner.

NOTE

Damage to the environment caused by device parts that are contaminated with media.

- ▸ Observe applicable disposal and environmental regulations.

Observe national waste disposal regulations.

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