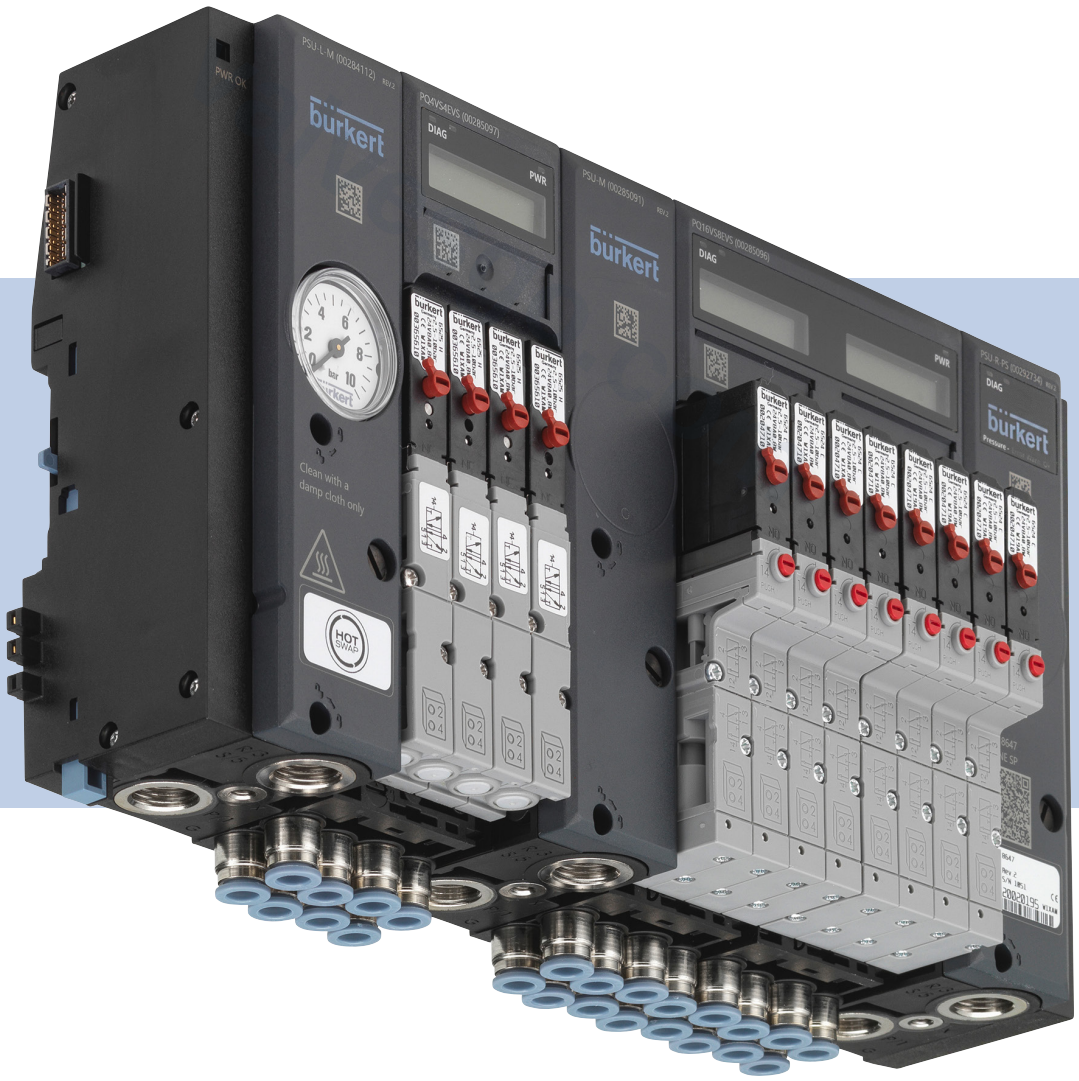
bürkert
FLUID CONTROL SYSTEMS

Type 8647
Valve block AirLINE SP

Valve block AirLINE SP with interface to the distributed I/O systems
SIMATIC ET 200SP and SIMATIC ET 200SP HA (Siemens)



Operating Instructions

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These operating instructions apply to device variants REV.1 and REV.2.

You can find information on differentiating characteristics between device variants REV.1 and REV.2 in chapter „5.2 Information on compatibility and revision status“ on page 14

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Operating Instructions 2605/08_ENen_00810495 / Original DE

Valve block AirLINE SP Type 8647

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1 THE OPERATING INSTRUCTIONS

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

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

Important safety information.

► Carefully read these instructions.

► Observe in particular the safety instructions, intended use, and operating conditions.

► Persons, who work on the device, must read and understand these instructions.

1.1 Symbols

DANGER

Warns of an immediate danger.

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

WARNING

Warns of a potentially dangerous situation.

► Failure to observe the warning may result in a fatal or serious injury.

CAUTION

Warns of a possible danger.

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

NOTE

Warns of damage to property.

► Failure to observe the warning may result in damage to device or system.

Indicates important additional information, tips and recommendations.

Refers to information in these instructions or in other documentation.

► Designates an instruction which you must follow to prevent a hazard.

→ Designates a procedure which you must carry out.

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1.2 Definitions of terms

Term	Is used in these instructions in substitution for
Device, valve block	Valve block AirLINE SP Type 8647
Valve terminal	Valve block AirLINE SP Type 8647 in combination with modules from the distributed I/O systems Siemens SIMATIC ET 200SP / SP HA
Valve, pilot valve	Solenoid valve for pneumatics that can be integrated in the valve block
Standard rail	Standard rail (for use with SIMATIC ET 200SP) or profile rail (for use with SIMATIC ET 200SP HA)
Actuator, process valve, pneumatic cylinder, pneumatic drive, pneumatic components	Pneumatic consumer activated by the valve block
System	Machine whose pneumatic consumers are controlled by the valve block

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2 AUTHORIZED USE

The valve block AirLINE SP Type 8647 is intended for activating pneumatic consumers in automation systems. The valve block should only be used to activate suitable pneumatic consumers.

- ▶ Use the device for its intended purpose only. Non-intended use of the device may be dangerous to people, nearby equipment and the environment.
- ▶ In areas at risk of explosion, only use devices approved for use in those areas. These devices are identified by additional approval data on the type label. When used in potentially explosive atmospheres, always observe the details on the type label and the additional instructions for the potentially explosive atmosphere included in the scope of delivery.
- ▶ Install the device in a suitable control cabinet or in a suitable housing. The control cabinet or housing requirements correspond to those of the distributed Siemens I/O systems “SIMATIC ET 200SP” or “SIMATIC ET 200SP HA”, but at least to degree of protection IP54.
- ▶ Do not use the device outdoors.
- ▶ Correct transportation, correct storage as well as correct installation, start-up, operation and maintenance are essential for reliable and problem-free operation.
- ▶ When using the device, observe the permitted data, operating conditions and application conditions. This information can be found in the contractual documents, the operating instructions and on the type label.
- ▶ Use the device only in conjunction with third-party devices and components recommended and authorized by Bürkert.
- ▶ Do not operate the device unless it is in perfect working order.

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

The valve terminal is only permitted in applications where there is a danger to life and limb if the SIA and EVS functions provided for this purpose are used with appropriate, approved equipment (safety relays, etc.).

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3 BASIC SAFETY INSTRUCTIONS

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

Risk of injury due to high pressure and escape of medium as well as uncontrolled movement of the actuators.

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

Risk of injury due to electric shock.

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

Risk of burns from hot device components.

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

Risk of injury due to improper installation and maintenance.

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

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

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

Risk of injury due to allergic reactions to lubricants.

- ► Avoid skin contact with lubricants.
- ► Wear protective gloves.

General hazardous situations.

To prevent injury, ensure the following:

- ► Do not transport, install or remove heavy devices without the aid of a second person and using suitable auxiliary equipment.
- ► Install the device according to the regulations applicable in the country.
- ► Do not supply the medium connectors of the device with aggressive or flammable media.
- ► Do not supply the medium connectors of the device with liquids.
- ► After an interruption, ensure that the process is restarted in a controlled manner.
  Observe the sequence:
  1. Connect power supply.
  2. Charge with medium.
- ► Do not make any changes to the device.
- ► Do not subject the device to mechanical loading.
- ► Observe the general rules of technology.

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NOTE

Electrostatic sensitive components and modules.

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

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

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4 GENERAL INFORMATION

4.1 Manufacturer

Bürkert Fluid Control Systems
Christian-Bürkert-Str. 13-17
D-74653 Ingelfingen
GERMANY

The contact addresses are available at Contact.

Need more information or additional products?
▶ Explore the full range of products on our eShop.

4.2 Warranty

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

4.3 Information on the Internet

The operating instructions and data sheets for valve block AirLINE SP Type 8647 can be found online at www.burkert.com

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

SIMATIC ET 200SP

System manual:
https://support.industry.siemens.com/cs/ww/en/view/58649293
Manual collection:
https://support.industry.siemens.com/cs/ww/en/view/84133942

SIMATIC ET 200SP HA

System manual:
https://support.industry.siemens.com/cs/ww/en/view/109761547

Manuals:
https://support.industry.siemens.com/cs/ww/en/ps/24728/man

Bürkert has no influence on the reliability of the linked web pages.

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4.4 Standards and directives

The device complies with the valid EU harmonisation legislation.

The harmonised standards that have been applied for the conformity assessment procedure are listed in the current version of the EU Declaration of Conformity.

Under certain circumstances, SIMATIC ET 200SP**/SP HA** comes with approvals that are not available for the valve block.

► Check and ensure the necessary approvals for all components of the valve terminal before using the device.

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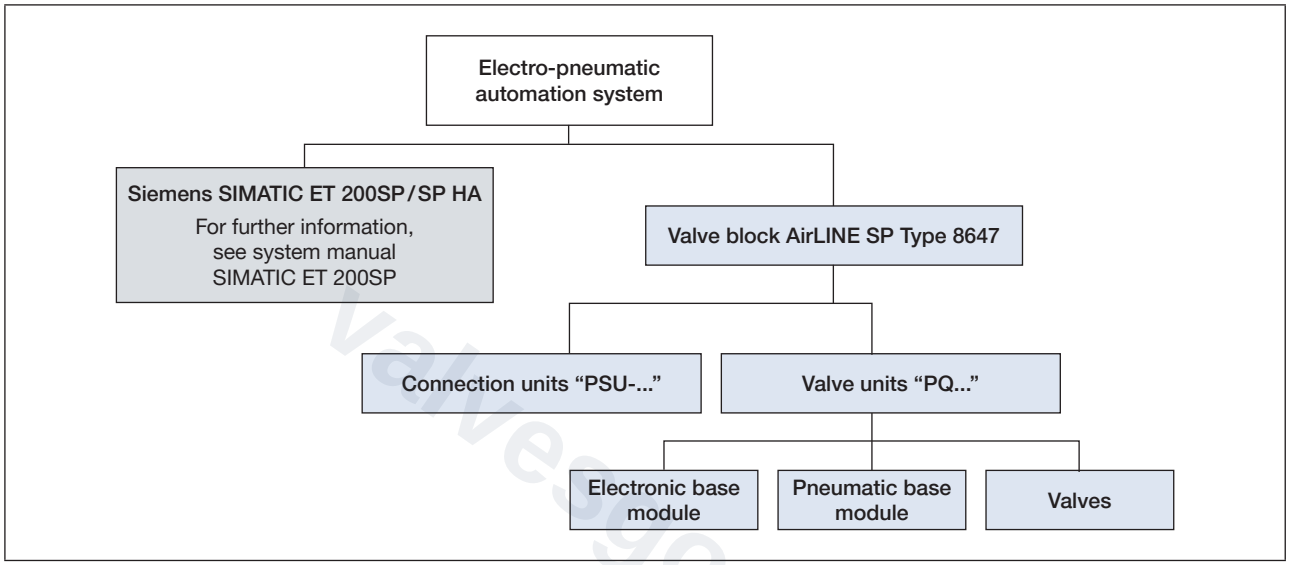
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5 SYSTEM OVERVIEW

Combining modules from the distributed Siemens I/O systems SIMATIC ET 200SP / SP HA with the valve block AirLINE SP Type 8647 provides an integrated system of electronic and pneumatic components. Depending on the requirement, electrical and pneumatic modules with various functions can be combined with each other by the observation of simple rules.

The option of combining the valve block with both SIMATIC ET 200SP and SIMATIC ET 200SP HA allows you to select the system properties required for the respective application (compactness, redundancy functions, etc.).



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5.1 Valve block AirLINE SP Type 8647

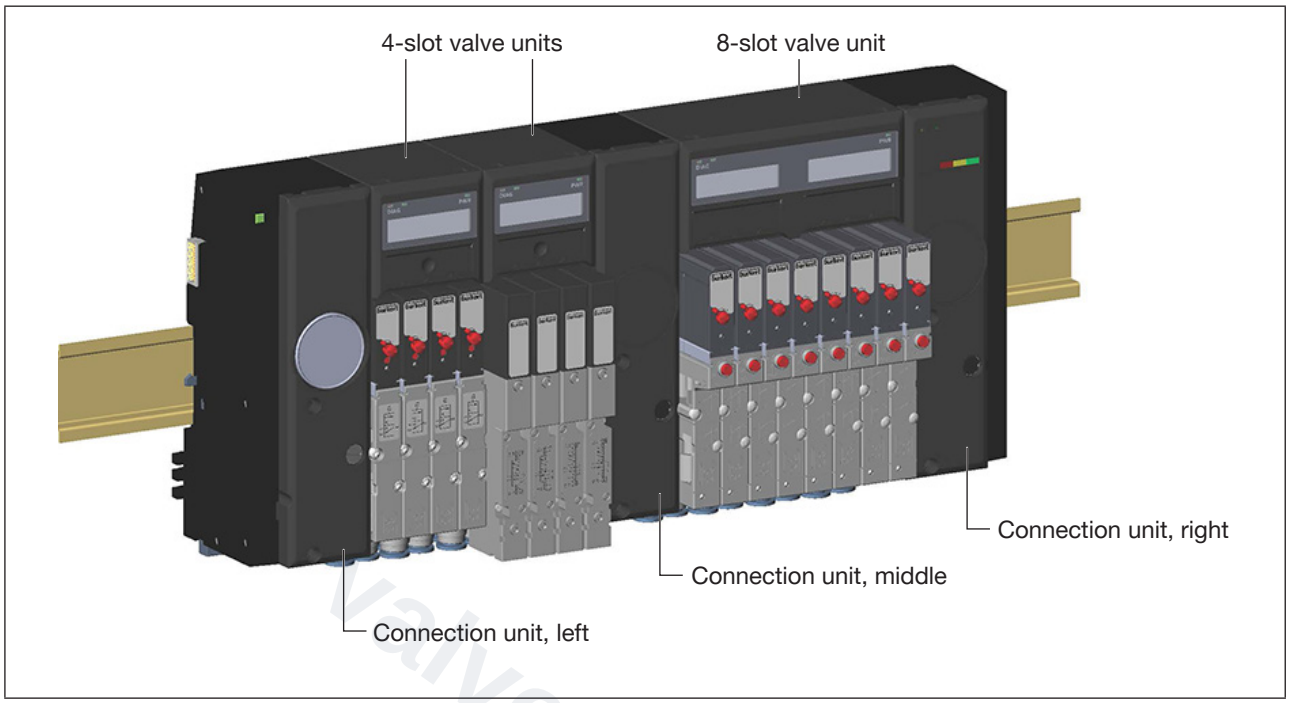


Figure 1: Overview of valve block AirLINE SP Type 8647

Valve block AirLINE SP Type 8647 is a modular, electro-pneumatic system consisting of connection and valve units. It is intended for complete integration into the distributed Siemens I/O systems “SIMATIC ET 200SP” and “SIMATIC ET 200SP HA”.

The valve block is used to incorporate pneumatic pilot valves directly in SIMATIC ET 200SP/SP HA and to activate them via SIMATIC ET 200SP/SP HA. Pneumatic cylinders, pneumatically actuated process valves or similar suitable pneumatic components can be connected at the pneumatic outputs.

If feedback indicators are installed at pneumatic components, the position of the activated pneumatic components can be displayed at the respective pilot valve. This ensures problems during installation or ongoing operation are easy to identify.

The valve block and the electronic modules of SIMATIC ET 200SP/SIMATIC ET 200SP HA provide numerous features, e.g. extensive configuration options or diagnostics capabilities. Optionally, valve groups can be switched off by an external, potential-free switching contact. It is then easy to implement control concepts, e.g. “Central system off”.

Due to module variants with integrated pressure gauge or pressure sensor, the media pressure can be monitored manually or automatically via the control.

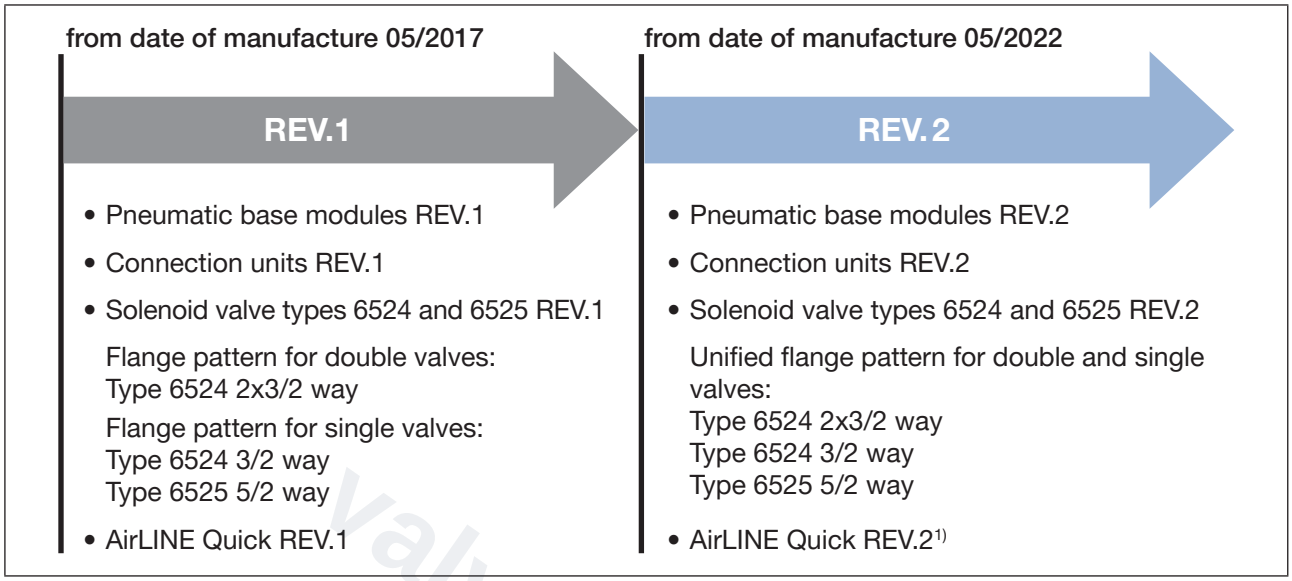
Parameterization and configuration take place using the same tools as for SIMATIC ET 200SP/SP HA, e.g. SIMATIC “STEP 7”, “TIA Portal” or “PCS7”. Integration in various PROFIBUS systems or PROFINET systems occurs via GSD/GSDML. When configuration tools from Siemens are used, integration via HSP or HUP is alternatively possible. As a result, further functions and more comfortable operation are possible.

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5.2 Information on compatibility and revision status

5.2.1 Overview of revision status



1) There is no difference between AirLINE Quick REV.1 and REV.2 in terms of assembly and installation.

5.2.2 Information on Revision 2 (REV.2)

The single valves of types 6524 and 6525, the pneumatic base modules, the connection units as well as the control cabinet base adaptation AirLINE Quick have been revised due to various optimisations. Compatibilities must therefore be taken into account in the following cases:

- Valve replacement (see chapter “12.2 Replace valve”)
- Expansion, repair or conversion of valve blocks

The new revision (REV.2) only affects pneumatic components of the valve block 8647. Not affected by the revision:

– Electrical data

– Configuration

– External dimensions

See also for further information

“5.5.1 Solenoid valves for pneumatics Type 6524 and Type 6525”

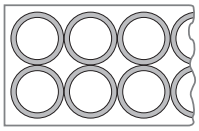
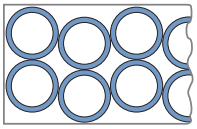
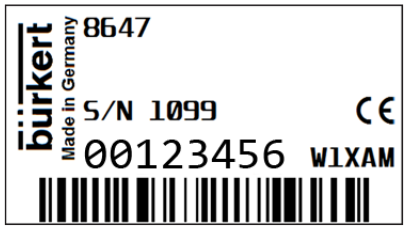
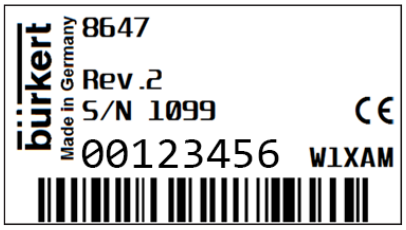
“5.3 Connection units”

“5.4 Valve units”

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5.2.3 Distinguishing features between REV.1 and REV.2

Feature	REV.1	REV.2
Colour of the release rings (push-in connectors)	black	blue
Channel arrangement of the working connections	 parallel	 wavy
Indication on type label (example)	 without “Rev.” specification	 with “Rev.2” specification

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5.3 Connection units

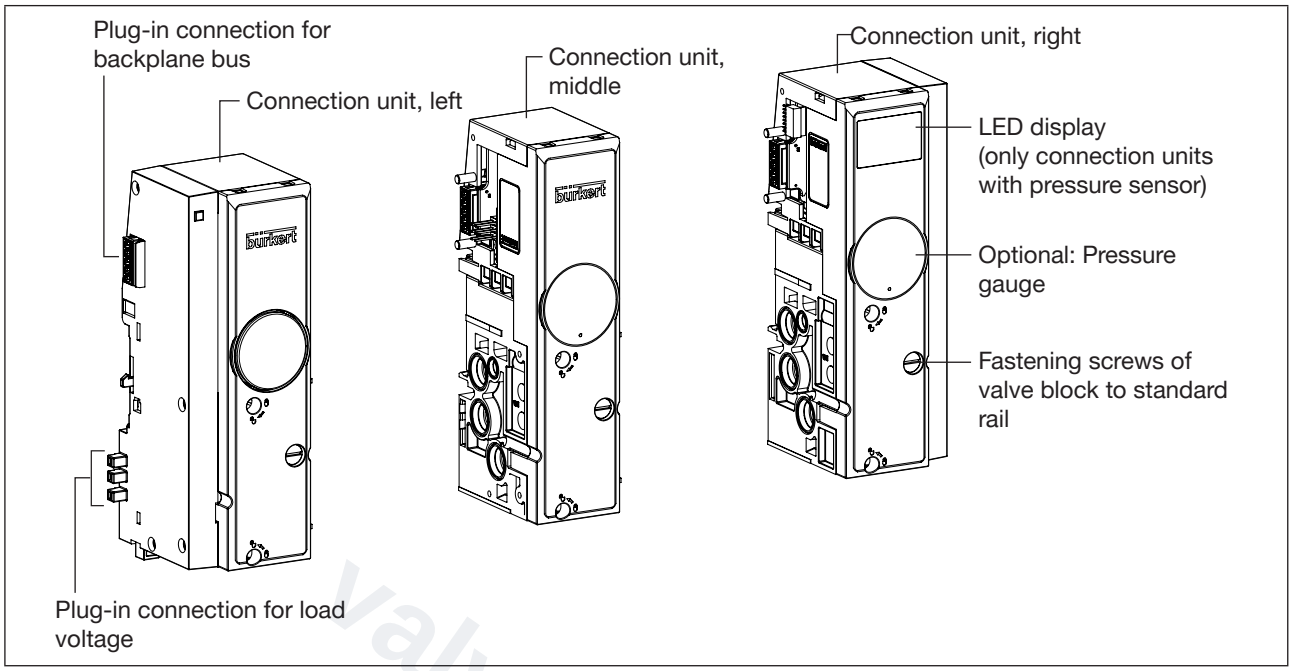


Figure 2: Overview of connection units (shown: REV.2 – only detail differences to REV.1)

The pneumatic supply and deaeration of the valve block occurs via connection units. Furthermore, the valve block is fixed to the standard rail via the connection units.

5.3.1 Options

Connection units can be optionally equipped with a pressure gauge or electronic pressure sensor. At the variant with electronic pressure sensor, the measured supply pressure is provided as an analog value via ET 200SP. This variant has five LEDs to display the device status (two LEDs for module status, three LEDs for pressure status).

5.3.2 Overview of connection units

Designation	ID number	Position in the valve block	Overall width [mm]	Pressure gauge	Pressure sensor
PSU-L	285088	left	44		
PSU-L-M	284112			X	
PSU-L-PS	292732				X
PSU-M	285091	centre	33		
PSU-M-M	284944			X	
PSU-R	285092	right	44		
PSU-R-M	284195			X	
PSU-R-PS	292734				X

Table 1: Overview of connection units

The configuration of connection units is described in chapter “9.2.2”.

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5.4 Valve units

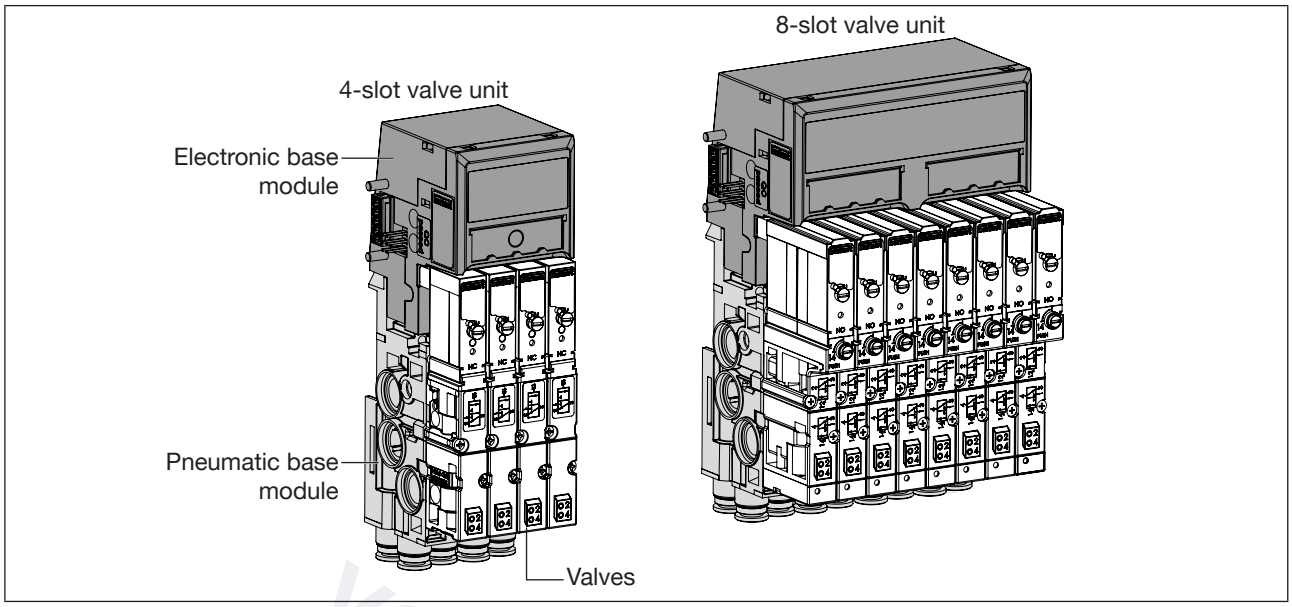


Figure 3: Overview of valve units (shown: REV.2 – only detail differences to REV.1)

Valve units convert the electrical control signals of the interface module into pneumatic output signals and provide the pneumatic outputs.

There are valve units with four valve slots (4-slot valve unit) or with eight valve slots (8-slot valve unit). The valves that can be integrated are described in chapter "5.5".

Various valve functions can be combined with each other.

Valve units consist of the following modules:

Electronic base module (see chapter "5.4.1", page 18)

Pneumatic base module (see chapter "5.4.2", page 19)

Valves (see chapter "5.5", page 19)

When configuration valve units, only the electronic base modules are relevant.

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5.4.1 Electronic base module (PQ module)

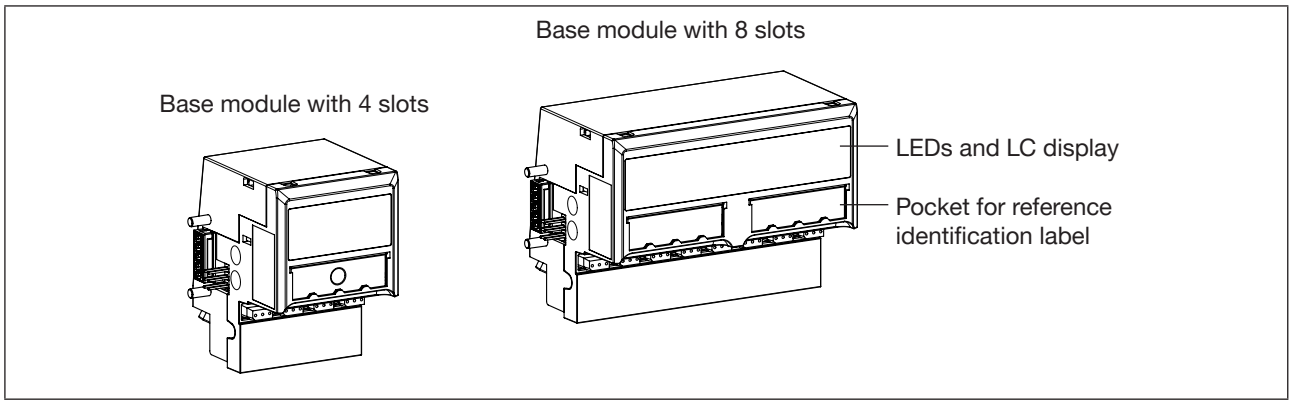


Figure 4: Overview of the electronic base module (part of the valve unit)

The electronic base module is part of the valve unit. It contains the electrical plug-in connections for the valves, the valve driving electronics, and the visual status indicators (LEDs for displaying the device status and a graphics LCD).

There are electronic base modules with slots for four and eight valves. One or two electrical outputs are provided for each slot depending on the valve type being used.

Safety shutdown per module

Optionally, electronic base modules (EVS variants) can be connected with an external, potential-free switching contact. As a result, the safety shutdown of all valves of this base module is possible (e.g. for "Central system off", for details see chapter "8.4").

Overview of electronic base modules

Designation	ID number	Number of valve slots	Overall width [mm]	Valve type*	EVS**
PQ4VS4	284935	4	44	I	
PQ4VS4EVS	285097			I	X
PQ8VS4	284936			II	
PQ8VS4EVS	285098			II	X
PQ8VS4EVS-5/3V	331588			III	X
PQ8VS8	283166	8	88	I	
PQ8VS8EVS	285095			I	X
PQ16VS8	284806			II	
PQ16VS8EVS	285096			II	X

Table 2: Overview of electronic base modules

The configuration of electronic base modules is described in chapter "9".

*) I = single valve (Type 6524 / 6525);
II = double valve (2x3/2-way valve Type 6524 and pulse valve Type 0460)
III = 5/3-way valve (Type 0460)

**) External valve shutdown

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5.4.2 Pneumatic base module

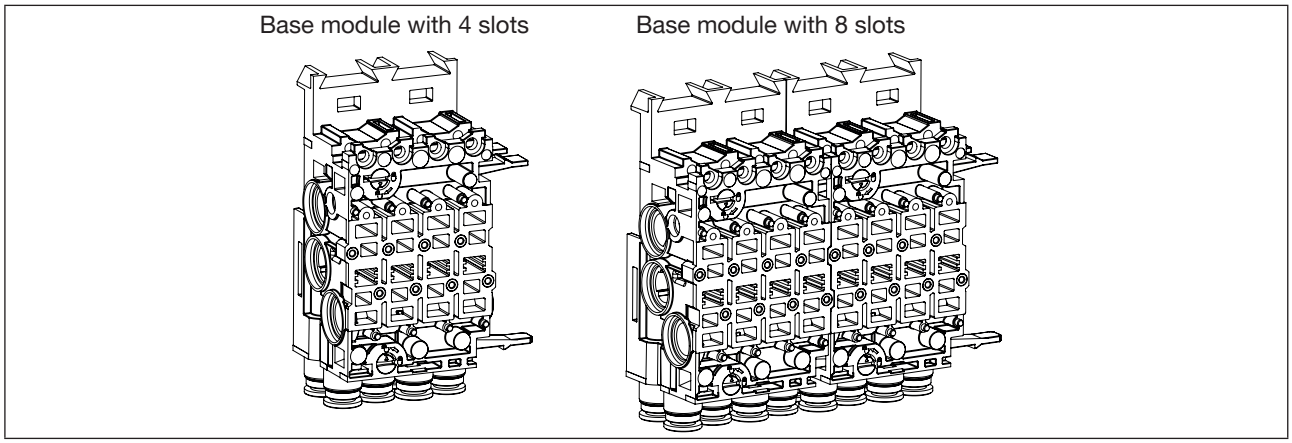


Figure 5: Overview of the pneumatic base module (shown: REV.2 – only detail differences to REV.1)

The pneumatic base module is part of the valve unit. It supports the valves, ensures the pneumatic supply and deaeration of the valves, and provides the pneumatic outputs. There are various options for connection and equipment (see data sheet).

5.5 Solenoid valves that can be integrated for pneumatics

5.5.1 Solenoid valves for pneumatics Type 6524 and Type 6525

NOTE

Damage to the manual override.

To avoid damage to the manual override, observe the following:

Manual override “A”:
► Press (push function) or turn (lock function).

Manual override “B”:
► Turn only (lock function).

Manual override “C”:
► Press (push function), turn **while pressed** (lock function).

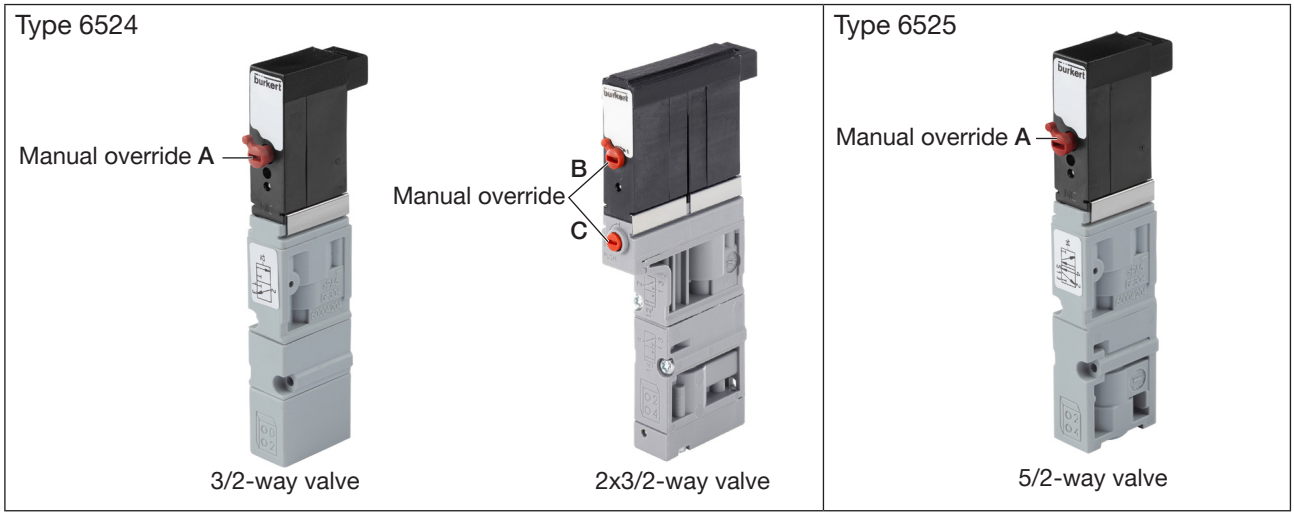


Figure 6: Valves Type 6524 (3/2-way and 2x3/2-way valve) and Type 6525 (5/2-way valve)

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Type 6524 is a 3/2-way valve or a 2x3/2-way valve. Type 6525 is a 5/2-way valve. The valves consist of a flipper solenoid valve as the pilot control and a pneumatic seat valve as the amplifier. They are monostable and equipped as standard with manual override.

Types 6524 and 6525 are suitable for individual assembly or block assembly and used for activating pneumatic actuators predominantly in valve blocks or valve terminals. They enable the switching of higher pressures at lower power consumption and short switching times.

2x3/2-way variant

With this variant, Type 6524 contains two separately operating 3/2-way valves. As a result, the valve block is extremely compact.

Safety shutdown per channel

Optionally, Type 6524 and 6525 valves can be equipped with a second connection (pressed on cable). As a result, safety shutdown per channel is possible. These valve variants are not equipped with manual override.

Bürkert has tested the function with a cable length of up to 2 m and the switching contact in the same control cabinet with regard to EMC conformity and voltage drop. The standard local requirements must be observed when wiring.

Also see “8.4.1 EVS connection”, page 41.

5.5.2 Fluidic connection single valves

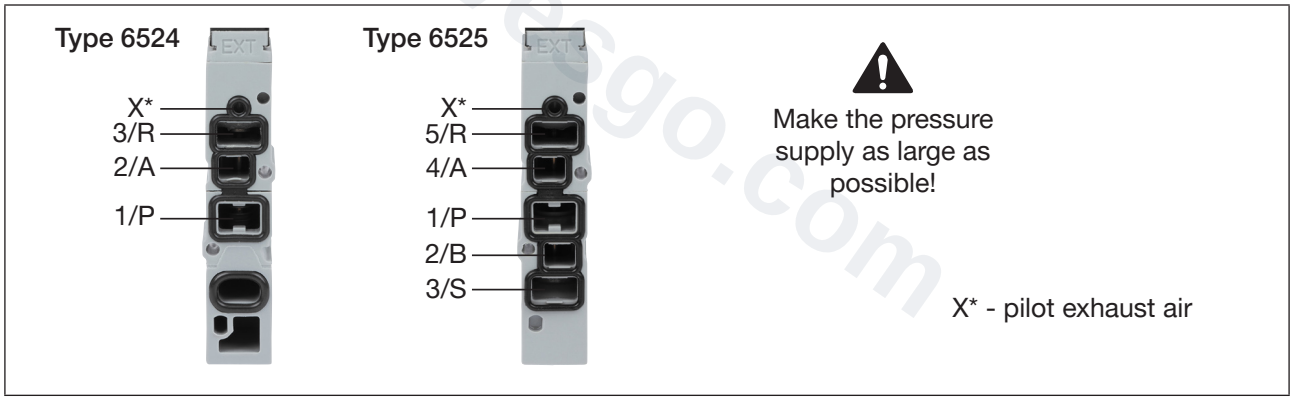


Figure 7: Fluid connection single valves type 6524 and type 6525

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5.5.3 Differentiating features between REV.1 and REV.2 in Type 6524 and Type 6525

REV.1:
The single valves of type 6425 3/2-way and type 6525 5/2-way have the same flange pattern toward the pneumatic base module.

This single valve flange pattern differs from that of the double valve type 6524 2x3/2-way.

REV.2:
Compared to the REV.1, the flange patterns of the valves have been standardised towards the pneumatic base modules. The single valves 3/2-way and 5/2-way as well as the double valves 2x3/2-way now have the same/unified pneumatic flange pattern.

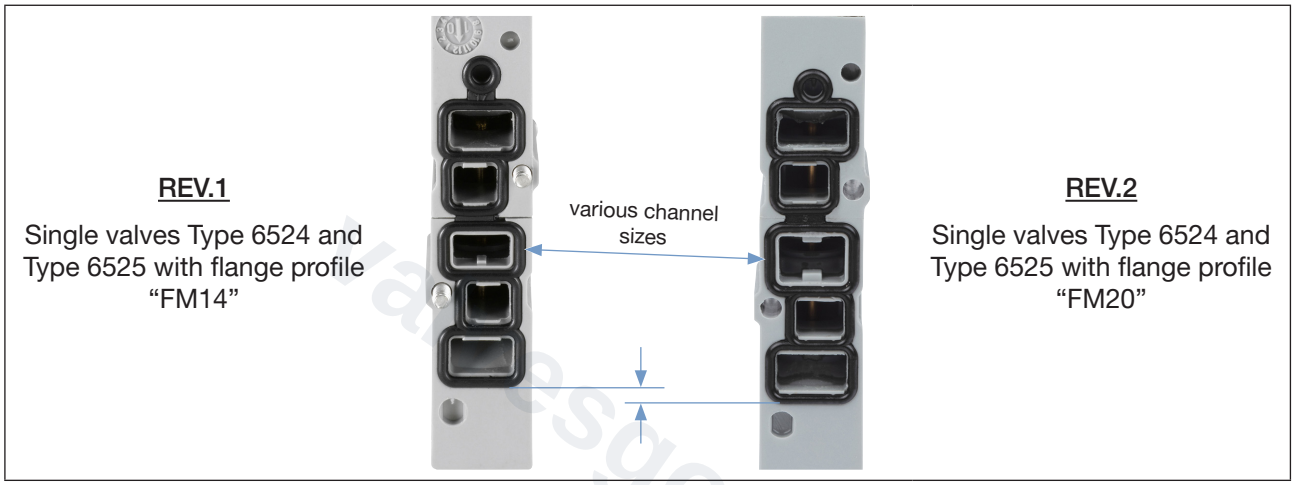


Figure 8: Variations in flange profiles of single valves Type 6524 and Type 6525

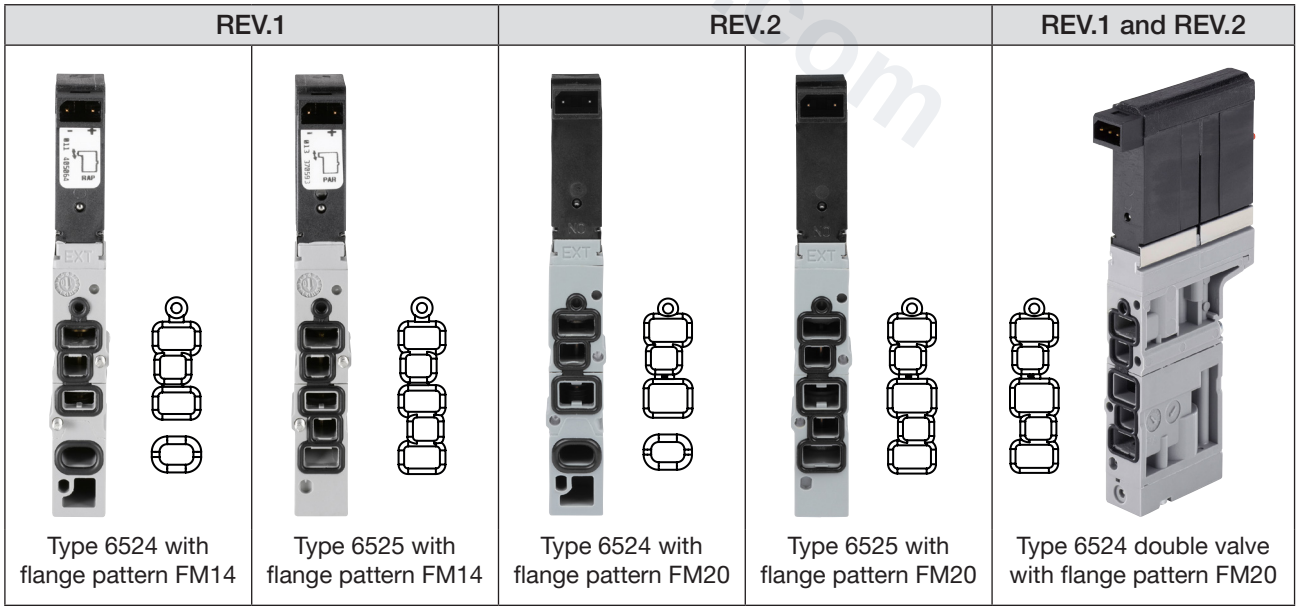


Figure 9: The pneumatic valves of the REV.1 and REV.2 can be visually differentiated using the fluidic flange images.

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5.5.4 Solenoid valves for pneumatics: Type 0460

NOTE

Damage to the manual override.

To avoid damage to the manual override, observe the following:

► Press (push function), turn **while pressed** (lock function).

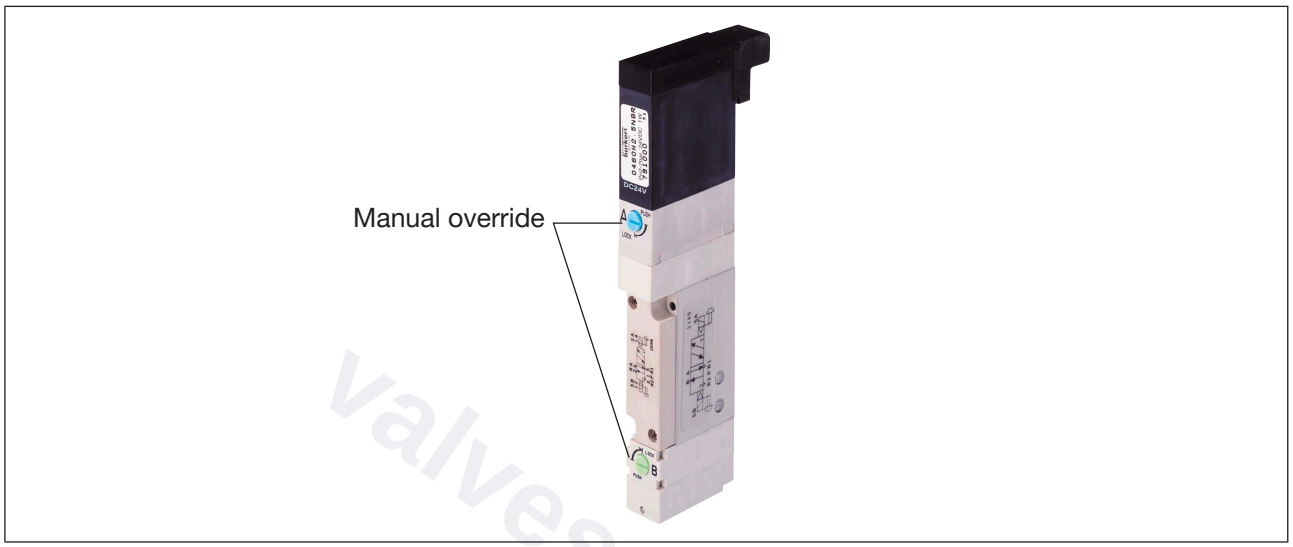


Figure 10: Type 0460 valve

The Type 0460 valve consists of two pilot solenoid valves and one pneumatic slide valve. The active principle enables the switching of higher pressures at lower power consumption and short switching times. The valves offer the functions 5/2-way pulse as well as 5/3-way and are equipped with manual override as standard.

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5.5.5 Unlockable double check valve: Type 0498

The unlockable double check valve, Type 0498, can be used to run a 5/3-way function.

It is available as an accessory and is not a component of the valve block. It is controlled by 2x 3/2-way valves of the valve block.

Compared to the use of a 5/3-way solenoid valve (Type 0460), Type 0498 offers the following advantages:

- Can be used individually for individual channels (Type 0460 only in blocks of 4)
- Suitable for use in potentially explosive atmospheres in conjunction with corresponding AirLINE SP Type 8647 device variants

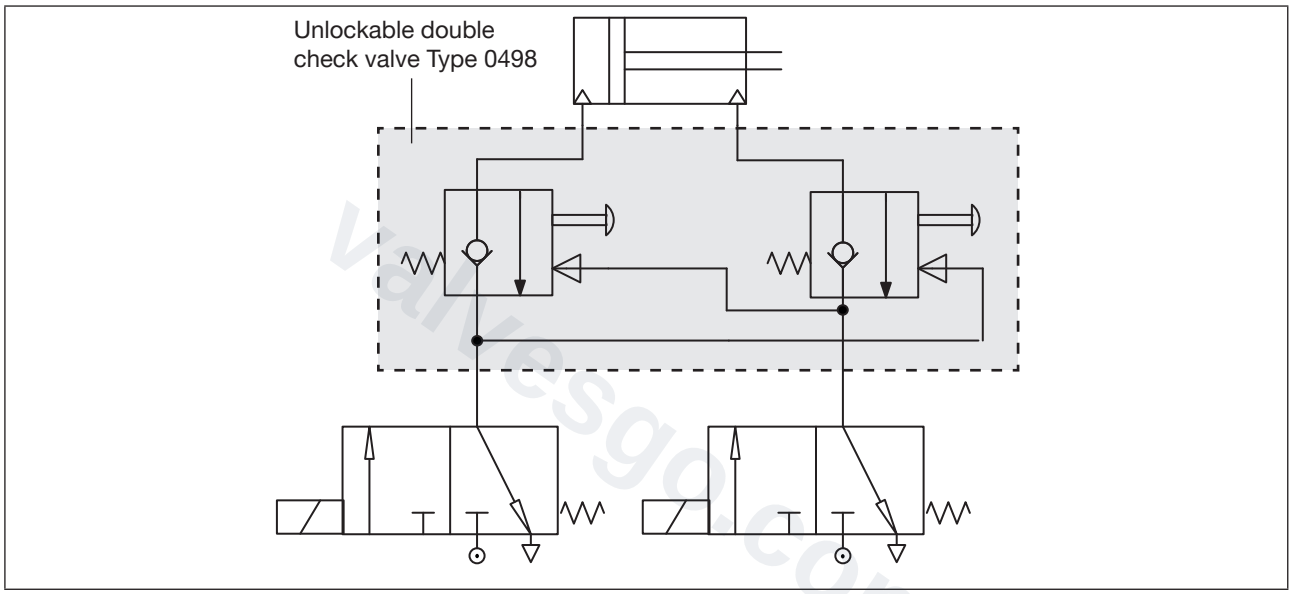


Figure 11: Running a 5/3-way function with valve, Type 0498, and 2x 3/2-way valves of the valve block

Further information and data sheets on the pilot-operated double check valve, Type 0498, can be found on the Internet under www.burkert.com.

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6 APPLICATION PLANNING

Valve block AirLINE SP Type 8647 is intended for use in automation systems within buildings. It must be installed in a suitable control cabinet or in a suitable housing. In this case, suitable means with a degree of protection of at least IP54 in accordance with EN 60529. The ambient conditions for operating the devices must be observed (also see the system manual SIMATIC ET 200SP or SIMATIC ET 200SP HA).

SIMATIC ET 200SP

System manual:
https://support.industry.siemens.com/cs/ww/en/view/58649293
Manual collection:
https://support.industry.siemens.com/cs/ww/en/view/84133942

SIMATIC ET 200SP HA

System manual:
https://support.industry.siemens.com/cs/ww/en/view/109761547

Manuals:
https://support.industry.siemens.com/cs/ww/en/ps/24728/man

For use in areas at risk of explosion, note the information provided in chapter “2 Authorized use”, page 7.

6.1 AirLINE SP Type 8647 in combination with SIMATIC ET 200SP HA

The valve block is integrated into the I/O system via the SIMATIC ET 200SP HA profile rail.

A SIMATIC ET 200SP BaseUnit is required directly to the left of the valve block (for the load voltage supply).

Please refer to the documentation of SIMATIC ET 200SP HA for information on how this BaseUnit may be equipped (cover/for I/O modules of SIMATIC ET 200SP released for SIMATIC ET 200SP HA). If a cover module is used, HSP0293 from Siemens is required for its configuration (supplied as standard with PCS7 from version 9.1).

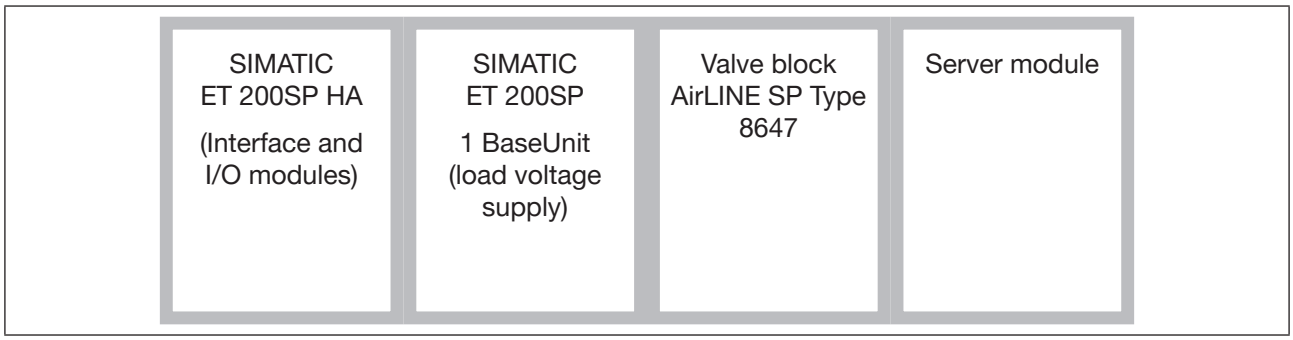


Figure 12: Schematic station layout SIMATIC ET 200SP HA with AirLINE SP Type 8647

Refer to section “6.3.3”, page 26 for more information on the layout.

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The "*Configuration in Run*" function may be limited in some circumstances.

Recommendation for changes to the structure of a station during operation:

- Make sure changes in the configuration system are always carried out per module.
- Then always perform a download onto the controller.

Example:

→ Delete 1 module from the configuration.

→ Perform download.

→ Delete next module from the configuration.

→ Perform download.

→ ...

6.2 Application conditions

Application conditions, e.g. the ambient temperature range, permissible installation position or applicable certifications, depend on the applied modules of SIMATIC ET 200SP / SP HA (also see the system manual SIMATIC ET 200SP / SP HA).

Consider the following when planning the power supply:

Based on the properties of the applied valves, the permissible tolerance of the load voltage is +/–10%. This value differs from the system properties of SIMATIC ET 200SP / SP HA and from the specifications of IEC 61131-2.

Recommendation (required in combination with SIMATIC ET 200SP HA!):

→ Install a light-colored BaseUnit (type code BU…D or BU…D/T) immediately in front of the valve block. As a result, the valve block receives a separate load voltage supply.

6.3 Maximum system extension

6.3.1 Valve block

Valve slots	Maximum of 64 (less when used with Type 0460 valves, 2x 3/2-way valve or the "AirLINE Quick" control cabinet base adaptation)
Connection units, middle	0...10 (depends on the number of valve slots and valve functions as well as the requirements of the application)
Valve functions	Maximum of 64
Width	Maximum 858 mm

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6.3.2 Valve block in combination with SIMATIC ET 200SP

Number of modules	64 I/O modules / connection units / electronic basic modules in complete valve island (Siemens SIMATIC ET 200SP + AirLINE SP Type 8647 valve blocks)
Valve blocks	Several possible in one station as long as the permissible width is adhered to.
Position on station	Valve blocks can be positioned as required. Further SIMATIC ET 200SP I/O modules can be mounted to the right of a valve block.
AirLINE Quick	It is possible to use the “AirLINE Quick” control cabinet base adaptation, but restrictions must be observed with regard to the applied BaseUnits and the number of SIMATIC ET 200SP modules (for details see section“7.4”, page 34).
Width	Maximum 975 mm* (incl. all Siemens modules, but without interface module)
Further restrictions may result from the installation position, the applied interface module and performance considerations (see also the SIMATIC ET 200SP system manual).	

*) Depending on the design of the valve block(s), 25 mm must be deducted from the specification of ET 200SP (1000 mm permissible).

6.3.3 Valve block in combination with SIMATIC ET 200SP HA

Number of modules	56 I/O modules / connection units / electronic basic modules in complete valve island (Siemens SIMATIC ET 200SP HA + valve block AirLINE SP Type 8647)
Valve blocks	Only one valve block per station possible.
Position on station	The valve block can only be mounted to the right of a SIMATIC ET 200SP HA station. Further SIMATIC ET 200SP I/O modules cannot be mounted to the right of the valve block.
AirLINE Quick	It is not possible to use the “AirLINE Quick” control cabinet base adaptation in combination with SIMATIC ET 200SP HA.
Width	Maximum 1240 mm** (incl. all Siemens modules, but without interface module(s))
Further restrictions may result from the installation position, the applied interface module and performance considerations (see also the SIMATIC ET 200SP HA system manual).	

**) Depending on the design of the valve block, 20 mm must be deducted from the specification of ET 200SP HA (1260 mm permissible).

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6.4 Use in safety-related applications

DANGER

The electrical shutdown of valve Types 6524 and 6525 causes them to return to the rest position. The selection of the appropriate circuit function of the valve (CFC, CFD or CFH) depends on the application and is the responsibility of the user.

To avoid brief back pressures in the event of a safety shutdown, the use of valve blocks with integrated check valves is strongly recommended.

Using manual override to operate valves overrides the electrical shutdown.

- ► Either use valve variants without manual override or protect the manual override against unintentional adjustment.
- ► Ensure that the exhaust air is discharged safely and quickly enough (at least 2 exhaust air connections, sufficiently large cross-sections)
- ► Do not use the device at altitudes above 2000 m.

The following variants are available for the device to be shut down:

SIA or EVS shut-off function

This variant is functionally effective and allows an external shutdown of individual valves or a module-by-module shutdown of all valves. However, there is currently no safety documentation or official testing available for this solution. Its use is therefore not based on a recognised safety assessment.

In the event of a shutdown using SIA or EVS, the diagnostic functions and the displays remain available on the LC display of the PQ modules.

System setup with the F-PM-E power module from Siemens

This variant has been documented and assessed in terms of safety. It meets the requirements for safety-related control systems in accordance with the applicable standards (e.g. DIN EN ISO 13849 or EN IEC 62061) and is suitable for use in safety-related applications.

In the event of a shutdown using the F-PM-E power module, the diagnostic functions and the displays are not available on the LC display of the PQ modules for the duration of the shutdown.

For safety-related applications, it is advisable to use only the documented and tested variant with F-PM-E module to ensure compliance with legal and normative requirements.

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6.4.1 SIA or EVS shut-off function

The SIA and EVS functions are not intended for use in safety-critical applications where a malfunction can result in injury or death.

DANGER

Risk of injury and material damage due to electrical faults.

If the PQ modules are not connected correctly to EVS or the SIA valves, there is a risk of injury due to the uncontrolled reaction of the system.
In the event of incorrect connection, the function of an upstream F-PM-E module can be disrupted.

- ▶ Only connect the EVS connection with a potential-free contact; do not supply energy.
- ▶ When using several modules with EVS, connect each EVS connection with a separate potential-free contact. **Never connect several contacts together under any circumstances!**
- ▶ Do not apply voltage to the EVS connections (risk of damage to the modules).
- ▶ When routing the connected cables, make sure that there is sufficient distance from other cables to ensure the necessary insulation.

- **SIA shut-off function – only shut down individual valves:**
  Variants of valve Types 6524 and 6525 are available that allow the connection of an external switching contact (e.g. safety relay). Bürkert has tested the function with a cable length of up to 2 m and the switching contact in the same control cabinet with regard to EMC conformity and voltage drop. The standard local requirements must be observed when wiring.

  For further information, see country.burkert.com.
- **EVS shut-off function – shut down all valves of an electronic base module:**
  This can be implemented by means of an EVS connection.
  For details, see “8.4.1 EVS connection”, page 41.
  Bürkert has tested the function with a cable length of up to 2 m and the switching contact in the same control cabinet with regard to EMC conformity and voltage drop. The standard local requirements must be observed when wiring.
- **All valves of a valve block:**
  By shutting down the supply voltage of the valve block, all valves are immediately de-energised (the energy contained in the energy packs of the valve block is negligible).

The advantage of the first two options is that logic, display and diagnostics continue running unaffected and therefore remain available.

For information on the electrical installation of the EVS connection, see “8.4.1 EVS connection”, page 41.

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6.4.2 System setup with the F-PM-E power module

The information in this chapter refers only to the combination of the valve block Type 8647 with ET 200SP, not to the combination with ET 200SP-HA.

If a valve block Type 8647 is operated in the potential group of an F-PM-E 24VDC/8A PPM ST power module of the ET 200SP, the load voltage of the valve block can be shut down by the power module for safety reasons. Valves of Types 6524 and 6525 return to their rest position.

The prerequisite for safe operation is that the electrical supply of the valve block is provided by a SELV/ PELV power supply unit.

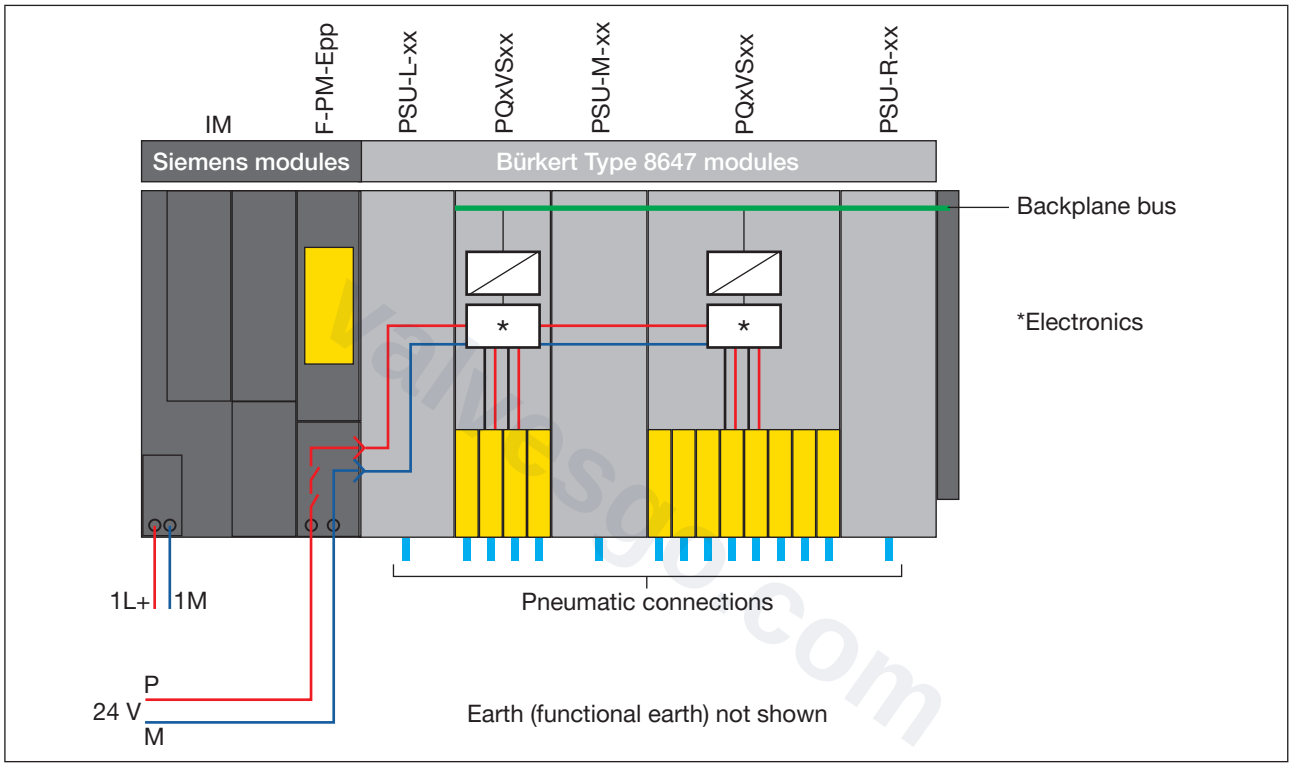


Figure 13: System setup with Siemens F-PM-E module

The Type 8647 modules are to be seen as “standard modules” in the sense of Siemens’ “fail-safe engineering”.

For information on the use of standard modules in fail-safe engineering, see
- supplementary information regarding the use of the valve island
- documentation from Siemens

Suitable for system setup with F-PM-E:	Not suitable for system setup with F-PM-E:
All Type 8647 PQ and PSU modules marked “FC” and valve Types 6524 and 6525.	• Modules with valve Type 0460 • Modules without “FC” marking

Safety characteristics for valve Types 6524 and 6525.

A manufacturer’s declaration on the use of Type 8647 in safety-related applications is available on request.

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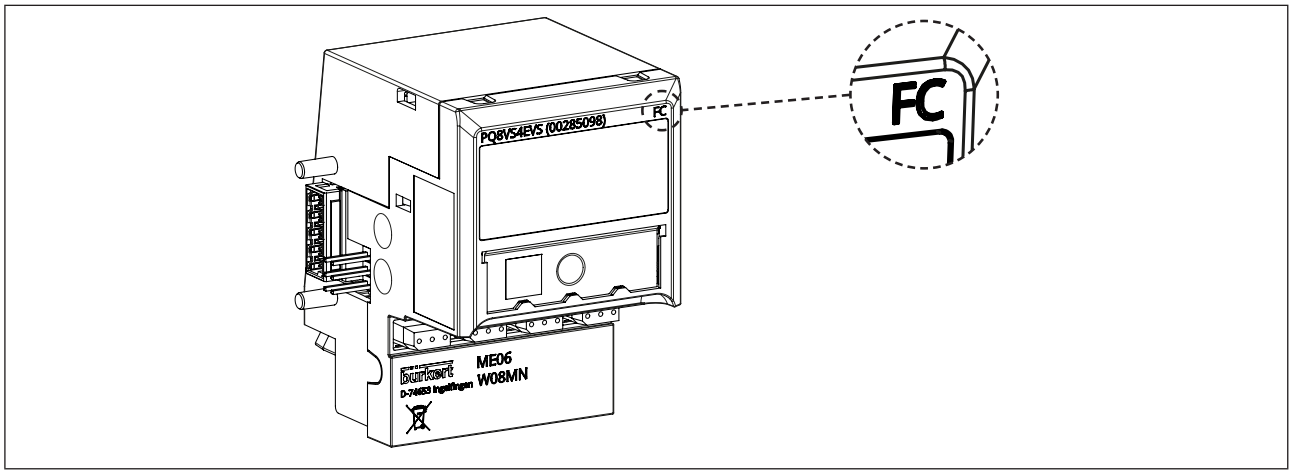


Figure 14: Modules compatible with F-PM-E are marked with “FC”

Configuration

During configuration, there is no distinction between the previous variants of the modules and the modules marked “FC”.

The configuration of the valve island Type 8647 in the potential group of an F-PM-E power module is possible by means of

- HSP: from TIA Portal V21 and in STEP 7 Classic
- GSDML

Modules with pressure sensors (PSU-...-PS) also work when the load voltage is switched off

Compatibility and spare parts

Previous variants of the modules and modules marked “FC” are compatible with each other. When used with fail-safe engineering (on the right of an F-PM-E), it must be ensured that all PQ and PSU modules of the relevant valve block Type 8647 have the marking “FC” and are equipped with valve Types 6524 or 6525. Otherwise, there may be a risk that safety in the fail-safe segment in question will not be guaranteed.

Recommendation for use in combination with a Siemens F-PM-E module

▶ Do not integrate other peripheral modules (from Siemens) into the same potential group (to avoid difficulties with suitable dark test times or the permissible load voltage range).

The F-PM-E module automatically performs “switch-on tests” and “dark tests” depending on the configuration.

To ensure trouble-free normal operation of Type 8647, the following parameter values must be set:

Parameter	Recommended value
Max. readback time for dark test and switch-**off** test	Between 1.5 and 2.5 ms
Max readback time for switch-**on** test	0.8 ms

If there is a deviation from the values recommended above, the function of the valve block may be restricted (valves shut down if the dark test time is too long) or diagnostics may be performed during the dark test (if the dark test time is too short).

If the “missing supply voltage L+” diagnostic function is performed for the PQ modules during the dark tests carried out cyclically by the F-PM-E module, it is advisable to reduce the dark test time to the minimum value indicated above or to deactivate this diagnostic function.

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7 INSTALLATION

7.1 Safety instructions

WARNING

Risk of injury from improper assembly.

- ► Only trained technicians may perform assembly and disassembly work.
- ► Perform installation work with suitable tools only.

CAUTION

Risk of injury as a result of a heavy device falling.

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

- ► Do not transport, install or remove heavy devices without the aid of a second person and using suitable auxiliary equipment.

The valve block is not connected securely to the standard rail before the fastening screws are tightened.

- ► Make sure the valve block cannot fall down during the entire installation process.

Risk of injury due to sharp edges.

Sharp edges may result in cut injuries.

- ► Wear suitable protective gloves.

Valve block AirLINE SP Type 8647 is supplied as a fully assembled device. Any modifications should only be carried out by Bürkert.

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

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7.2 Removing the transportation safety device from the valve block

The valve block is mounted on a standard rail for safe transportation. It must be removed from this standard rail for installation in the control cabinet.

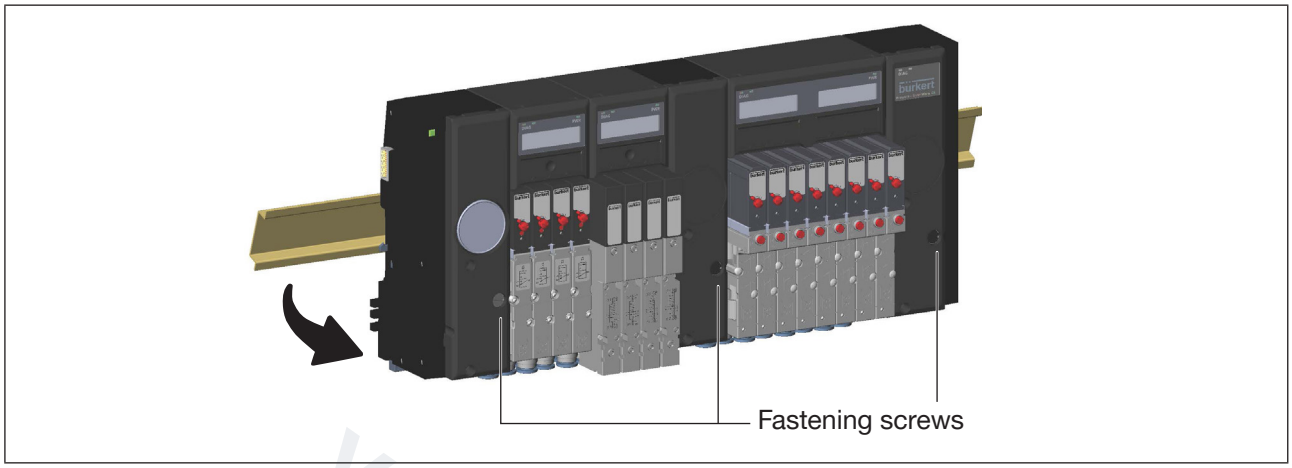


Figure 15: Releasing the valve block from the standard rail

→ Turn the fastening screws all the way counter-clockwise.

→ Tilt the valve block upward slightly and remove it from the standard rail.

7.3 Installing the valve block on the standard rail in the control cabinet

NOTE

- ▶ Observe the specifications in the configuration file for the installation sequence.
- ▶ Ground the standard rail with low impedance to guarantee the best possible EMC protection.
- ▶ Before installation in the control cabinet, check that the standard rail is anchored firmly in the control cabinet.

The valve block must be freely accessible from above. When installing the standard rail in the control cabinet, note that the valve block requires a **minimum clearance of 5 cm to the upper edge of the control cabinet** (“Figure 16”).

The minimum clearance is necessary for

– Assembly and disassembly of the device on the standard rail

– Avoidance of heat build-up through the device waste heat.

If the device contains electronic base modules **with EVS function**, a **minimum clearance of 8 cm to the upper edge of the control cabinet** is recommendable. This makes the EVS connection more accessible.

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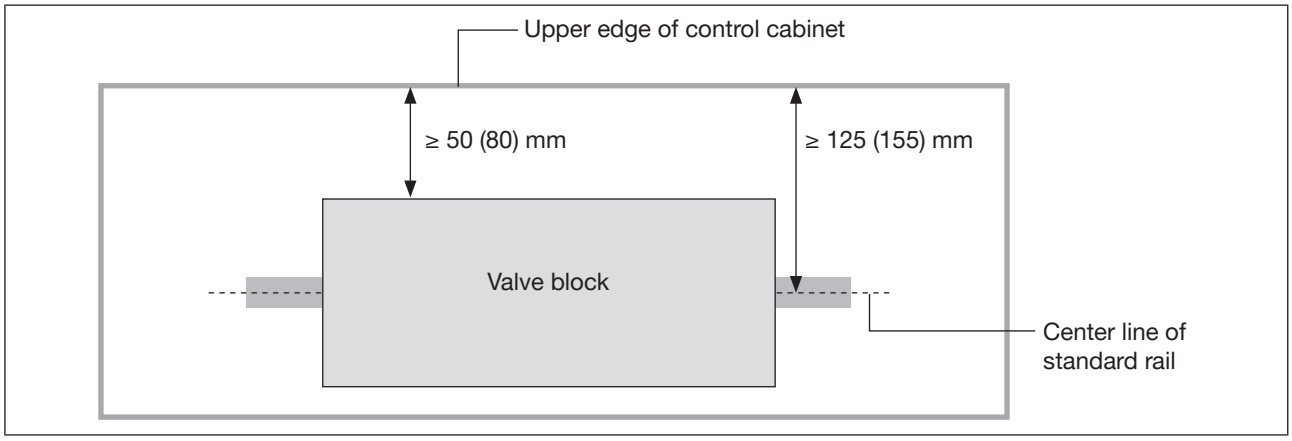


Figure 16: Installing the valve block on the standard rail in the control cabinet: Minimum clearance of the valve block to the upper edge of the control cabinet ≥ 5 cm (with EVS function ≥ 8 cm)

CAUTION

Risk of injury as a result of a heavy device falling.

The valve block is not connected securely to the standard rail before the fastening screws are tightened.

► Make sure the valve block cannot fall down during the entire installation process.

→ Make sure all the fastening screws of the valve block (see "Figure 15") are turned all the way counter-clockwise.

→ Place the valve block slightly tilted upwards on the standard rail in the desired position and swing it onto the standard rail. **Hold the valve block if not installed horizontally!**

→ Tighten the fastening screws clockwise (tightening torque approx. 1.8 Nm).

→ Attach the BaseUnits of SIMATIC ET 200SP / SP HA to the standard rail on the left of the valve block according to the instructions provided by the manufacturer. Push the BaseUnits to the valve block until the catch hook audibly engages. To ensure the plug-in connections are connected properly, make sure the BaseUnits are firmly on the valve block along the entire length.

→ Preferably install a light-colored BaseUnit (type code BU…D or BU…D/T) immediately to the left of the valve block (required in combination with SIMATIC ET 200SP HA).

→ To the right of the valve block, install either the server module or further BaseUnits of SIMATIC ET 200SP (only permissible with SIMATIC ET 200SP stations, not with SIMATIC ET 200SP HA stations). If further BaseUnits are to be installed, the first BaseUnit after the valve block must be a light-colored BaseUnit (BU...D or BU...D/T) to supply the necessary load voltage.

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7.4 Installing the valve block on the base of the control cabinet (with AirLINE Quick)

When using the control cabinet base adaption “AirLINE Quick”, the device is mounted to the control cabinet base via a solid metal plate. In this case, the device supports the standard rail (incl. the modules of SIMATIC ET 200SP mounted thereon) rather than the other way round.

NOTE

- ▶ Observe the specifications in the configuration file for the installation sequence.
- ▶ Ground the standard rail with low impedance to guarantee the best possible EMC protection.

When configuring the modules of SIMATIC ET 200SP, observe that the permissible projection of the standard rail is limited to 10 cm on both sides of the valve block.

Only short BaseUnits can be used.

Combination of AirLINE Quick with SIMATIC ET 200SP HA is not possible due to the design.

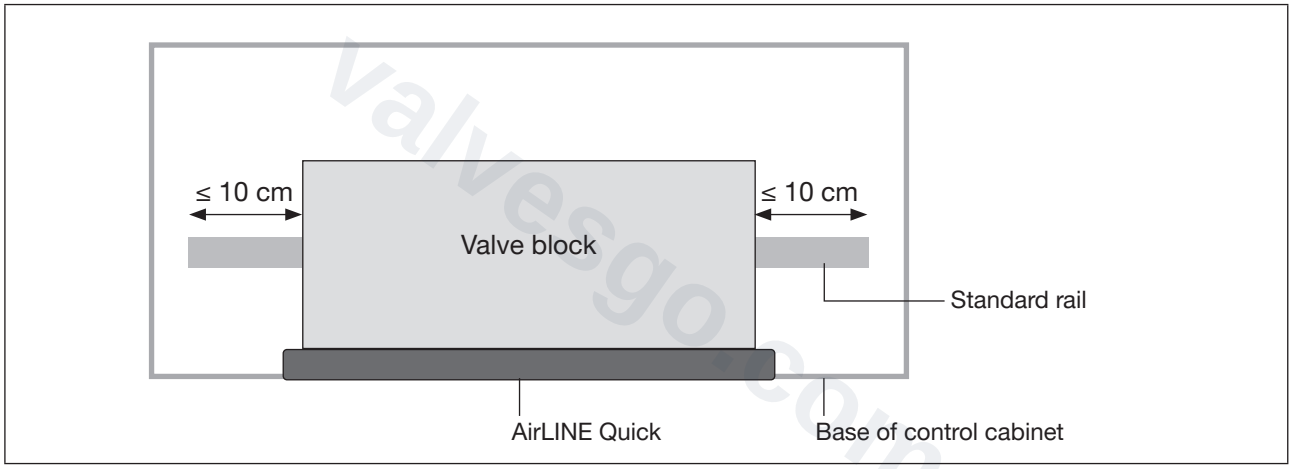


Figure 17: Installation position in the control cabinet when using AirLINE Quick

There is no difference between AirLINE Quick REV.1 and REV.2 in terms of assembly and installation.

7.4.1 AirLINE Quick in Ex areas

DANGER

Risk of explosion in the Ex area.

- ▶ When used in Ex areas, observe the information in the "*Operating instructions for the Ex areas type MP18*". These operating instructions are included in the scope of delivery of the Ex variant of the AirLINE Quick control cabinet base adaption.

7.4.2 Installation of AirLINE Quick

To install AirLINE Quick, a cut-out must be provided on the base of the control cabinet.
The cut-out can be created, e.g., through laser-cutting or punching.

Assignment of the pneumatic connections and the dimensions of the flange images can be found online at: www.burkert.com→8647→“Additional manual Type 8640 8644 | AirLINE Quick, Assignment of the pneumatic connections”

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NOTE

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

→ Insert the seal between AirLINE Quick and the control cabinet free from damage into the groove of the AirLINE Quick metal plate.

→ Place the valve block in the control cabinet on the prepared cut-out.

→ Attach the stability plate from the outside and fix with M5x10 screws (tightening torque 2.0 Nm).

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7.5 Disassembling from the standard rail in the control cabinet

DANGER

Risk of injury when the device is connected electrically and pneumatically.

If the device has been connected electrically and pneumatically, carry out the following before disassembling:

- ▶ Secure the actuators against moving.
- ▶ Switch off pressure. Vent or drain lines.
- ▶ Switch off the power supply. Secure against reactivation.

CAUTION

Risk of injury as a result of a heavy device falling.

The valve block is not connected securely to the standard rail after loosening the fastening screws.

- ▶ Make sure the valve block cannot fall down during the entire deinstallation process.

→ Disassemble the server module installed to the right of the valve block and any SIMATIC ET 200SP BaseUnits according to the manufacturer's instructions.

→ Turn the fastening screws of the valve block (see "Figure 15") carefully all the way counter-clockwise. **Hold the valve block! The valve block is not connected securely to the standard rail after loosening the fastening screws.**

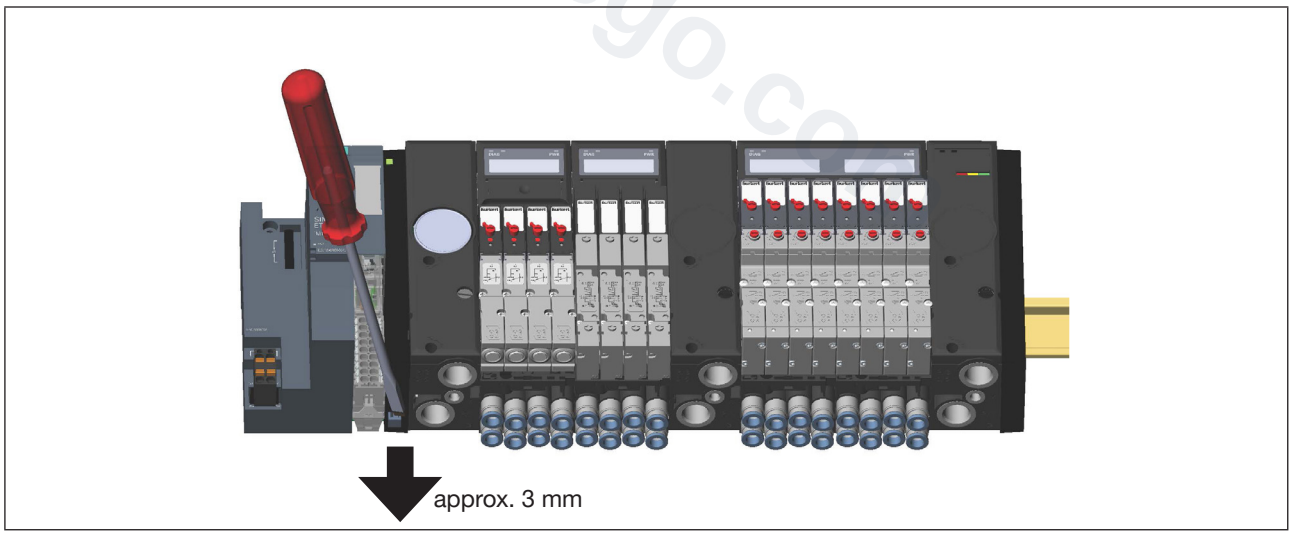


Figure 18: Disassembling the valve block from the standard rail in the control cabinet

→ Insert a flat-blade screwdriver (approx. 3 mm blade width) into the slide of the left-hand connection unit of the valve block. Now tilt and slightly extract the slide (approx. 3 mm).

→ Slide the valve block to the right away from the left-hand mounted modules of SIMATIC ET 200SP/SP HA along the standard rail.

→ Make sure the BaseUnit has been fully released from the connection unit. The interface between the connection unit and the BaseUnit contains elements which may be damaged if force is used!

→ Tilt the valve block upward and remove it from the standard rail.

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8 CONNECTING

8.1 Safety instructions

DANGER

Risk of injury from high pressure.

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

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

Actuators may change their position when the pressure changes.

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

WARNING

Risk of injury due to electric shock.

► Before working on the device or system, switch off the power supply. Secure against reactivation.

► Observe applicable accident prevention and safety regulations for electrical equipment.

Risk of injury from improper installation.

► Only trained technicians may perform installations.

► Perform installations with suitable tools only.

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

► Secure system against unintentional activation.

► Ensure that the system does not start up in an uncontrolled manner.

CAUTION

Risk of injury due to discharge of medium and malfunctioning.

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

► Ensure that all the seals are seated correctly.

Risk of injury from damaged contacts.

Damaged contacts may result in a short circuit and malfunctioning.

► Do not bend contacts.

► If contacts are damaged or bent, replace the affected components.

► Do not switch on the device unless the components are in perfect condition.

NOTE

► Operate the device with direct current only!

► Prevent a pressure drop. Design the pressure supply with the largest possible volume.

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8.2 Pneumatic Installation

DANGER

Risk of injury from high pressure.

- ▶ Before loosening lines and valves, turn off the pressure and vent the lines.
- ▶ Close the open connections not required with suitable plug elements.
- ▶ Connections for the pilot control exhaust air (x) must not be sealed.
- ▶ Check correct assignment of the connections 1 and 3/5. They may by no means be interchanged.

CAUTION

Uncontrolled reaction of the system due to back pressures.

Insufficient exhaust air ventilation can lead to unintended switching of the valves due to back pressures.

- ▶ Ensure that exhaust air is vented properly (e.g. via a large cable cross-section).
- ▶ Avoid pressure build-up in the exhaust air ducts. To do this, use all exhaust air ports and pilot exhaust air ports of the valve block and regularly check the exhaust air silencers and replace them if required.
- ▶ Design the pressure supply with the largest possible volume to prevent unwanted reaction of the system when switching the valves.

8.2.1 Pneumatic installation of the connection units

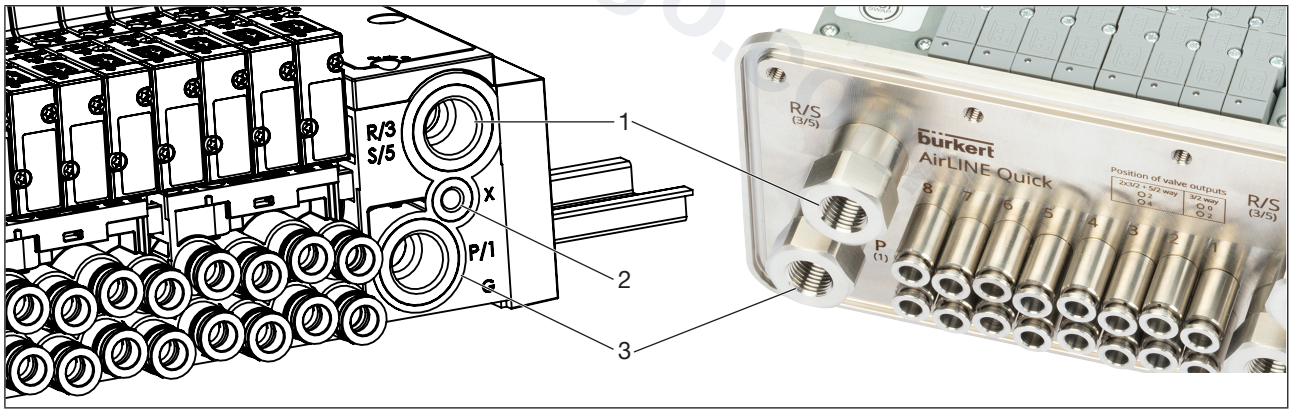


Figure 19: Pneumatic installation of connection units

Position	Identification	Function	Connection type
1	R/3 S/5	Exhaust air	G1/4”
2	X	Activation EXT: auxiliary control air INT: pilot control exhaust air	M5
3	P/1	Pressure supply	G1/4”

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8.2.2 Pneumatic installation of the valve units

NOTE

For 3/2-way valves, the upper connections remain free.

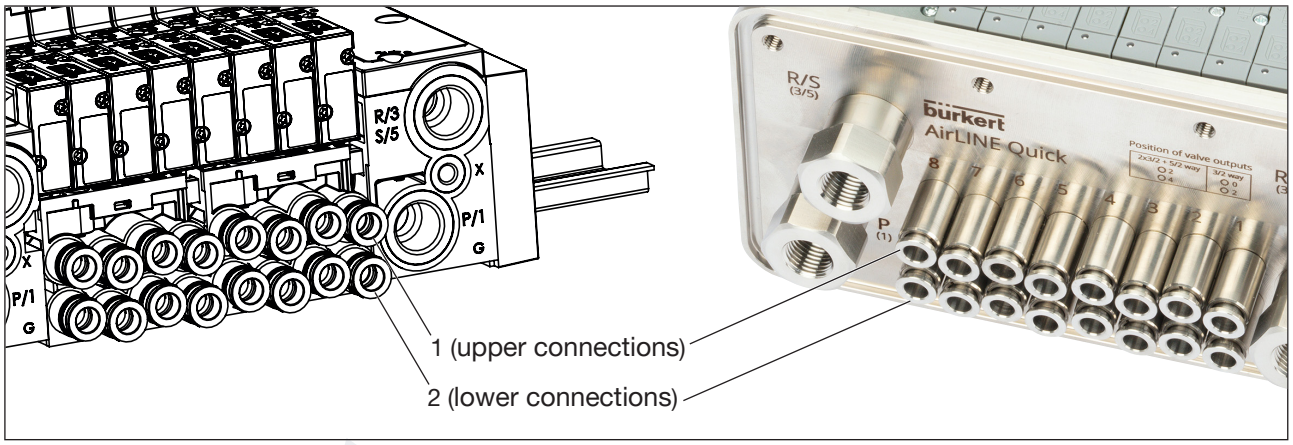


Figure 20: Pneumatic installation of valve units

Position	3/2-way valve Type 6524	2x3/2-way valve Type 6524	5/2-way valve Type 6525	Valve Type 0460
1 (upper connections)	Not used	2	2	2
2 (lower connections)	2	4	4	4

Table 3: Configuration of the working connections of the valve units

Configuration of the connections is displayed on the housing for Type 6524 and Type 6525 valves.

Information about assignment of the valves can be written to the reference identification labels of the electronic base modules.

If a higher air flow rate is required to control individual pneumatic consumers, the connections of several valves can be interconnected externally using a suitable adapter (Y-piece).

The relevant channels must then be controlled together in the controller program.

8.3 Tightening torques for port connections

Observe the following tightening torques when screwing into the port connections. The specified tightening torque may vary depending on the sealing system.

Port size	Marking/function	Recommended tightening torque [Nm]	Maximum tightening torque [Nm]
G1/4	P, R/S connection	4…7	20
M5	Auxiliary pilot air	1…1.2	3
M7	AirLINE Quick push-in connector	1.75…2.25	4

For an illustration of the connections, see “Figure 19”, page 38 and “Figure 20”, page 39

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8.4 Electrical installation

WARNING

Risk of injury due to electric shock.

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

The electrical connections of the valve block (load voltage, backplane bus, grounding) are established automatically when latched to the BaseUnits of SIMATIC ET 200SP. An exception are the EVS connections of the electronic base modules with “EVS” (see “8.4.1 EVS connection”).

The power supply of the valve block occurs via the power bus of the BaseUnits. The valve block only utilizes the “L+” and “M” connections; the “AUX” connection is not used.

There are several ways to de-energise valves irrespective of the control signals from the bus master. For more information, see “6.4.1 SIA or EVS shut-off function”, page 28.

Preferably install a light-colored BaseUnit (type code BU…D or BU…D/T) immediately to the left of the valve block (required in combination with SIMATIC ET 200SP HA!). It can be used to split the supply for the valve block. This additionally facilitates adherence to allowable voltage tolerances and permissible maximum currents.

If further BaseUnits of SIMATIC ET 200SP are to be installed to the right of the valve block (not permissible in combination with SIMATIC ET 200SP HA!), the first BaseUnit must be a light-colored BaseUnit (type code BU...D or BU...D/T) to supply the necessary load voltage.

The required steps for electrical connection can be found in the Siemens system manual “Distributed I/O system ET 200SP” or “Distributed I/O system ET 200SP HA”.

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8.4.1 EVS connection

DANGER

Risk of injury due to unintentional movement.

If the EVS function is required to control safety-critical procedures, a faulty EVS function can cause hazardous movements of the actuators.

► Ensure that the EVS function is functioning correctly before start-up.

In spite of an activated EVS function, actuators can be moved through manual overrides of the valves. If the EVS function is used to control safety-critical procedures:

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

WARNING

Risk of injury and material damage due to electrical faults.

If the EVS connections are not connected properly, there is a risk of injury due to the uncontrolled reaction of the system.

► When using several modules with “EVS”, connect each EVS connection with a separate potential-free contact. **Never interconnect several contacts!**

► Do not supply voltage to the EVS contacts (risk of damaging the modules).

Risk of injury due to sharp edges.

Sharp edges on the EVS connection or on the contacts of the plug-in screw-type terminal may result in cut injuries.

► Wear suitable protective gloves.

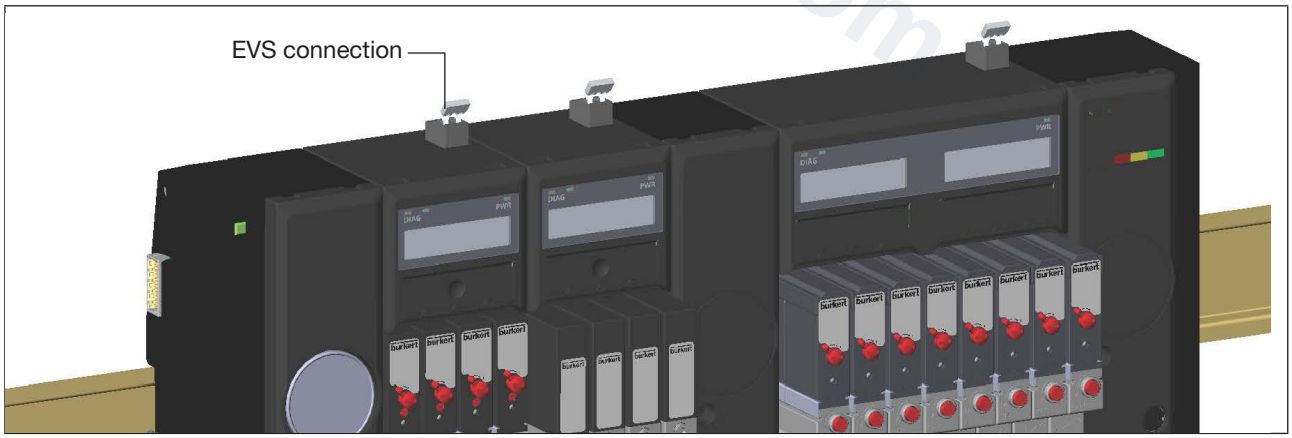


Figure 21: EVS connection

The abbreviation EVS stands for “External Valve Shutdown”.

Electronic base modules with “EVS” have an additional two-pole connection on the top. This connection can be used to interrupt the power supply of the valves to this module, e.g. to implement functions such as “Central system off” or deactivate actuators group by group.

An interruption on the EVS connection will immediately cause a single-pole interruption of the common supply to all valves of the module (see “Figure 22”).

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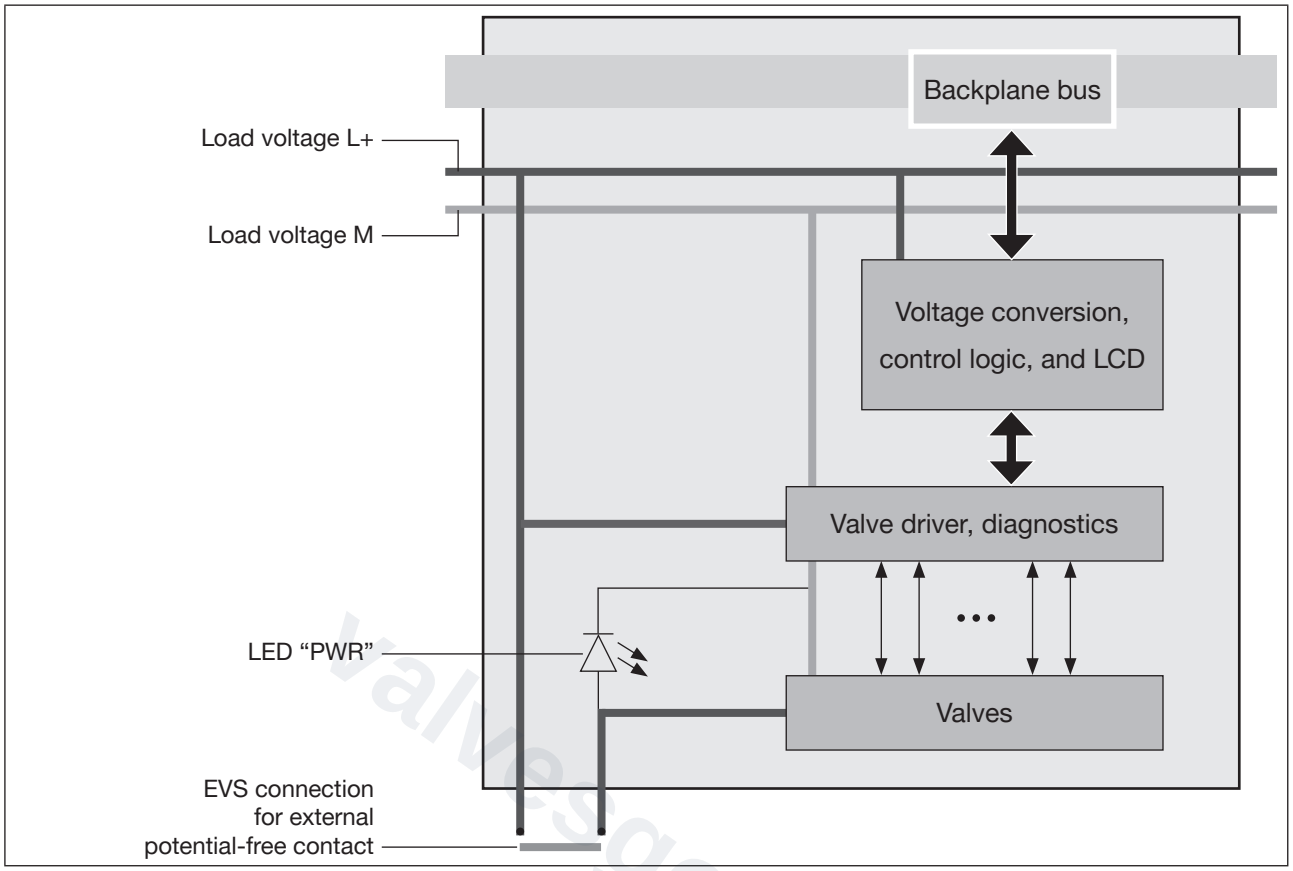


Figure 22: Schematic representation of a valve unit with EVS (External Valve Shutdown)

For use, the EVS connection must be connected to a potential-free contact (mechanical switch or relay), e.g. via a relay module RQ... or F-RQ … of SIMATIC ET 200SP / SP HA .

Bürkert has tested the function with a cable length of up to 2 m and the switching contact in the same control cabinet with regard to EMC conformity and voltage drop. The standard local requirements must be observed when wiring.

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

*) Upon delivery, the screw-type terminal is fitted with a bridge that enables immediate operation of the electronic base module. Remove the bridge before connecting a cable.

8.4.2 Diagnostics and reaction of electronic base modules with EVS

If the valves are switched via EVS, the logic and display of the electronic base module continue to run. “EVS active” is shown on the display, the diagnostics “No valve voltage / EVS active” (if activated) occurs via the backplane bus.

If there is no load voltage, the electronic base modules with EVS react the same as those without EVS. The display is off and the diagnostics “No supply voltage L+” (if activated) occurs.

If diagnostics messages for short circuit and wire break occurred prior to shutdown via EVS, the messages remain. If a short circuit or wire break occurred after shutdown via EVS, no diagnostics will be generated.

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9 CONFIGURATION

The valve block can be used with all interface modules of SIMATIC ET 200SP and SIMATIC ET 200SP HA, except for the interface modules “IM 155-6 PN HA” (6DL1 155-6AU00-0**EM**0) and “IM 155-6 PN HS (6ES7155-6AU00-0DN0)”.

Restrictions may apply with older versions.

Some interface modules (e.g. “Basic” models) may have restrictions, e.g. with regard to the number of maximum usable modules or the number of maximum available data bytes (for details see product documentation of the interface modules).

The following interface modules can only be configured from the firmware version stated below (if necessary, execute firmware update according to the manufacturer’s instructions):

Interface module	MLFB	Firmware version	Comments
IM 155-6 PN ST	6ES7 155-6AU00-0BN0	3.0 or higher	
	6ES7 155-6AU01-0BN0	4.1 or higher	
IM 155-6 PN HF	6ES7 155-6AU00-0CN0	2.2 or higher	
IM 155-6 PN/2 HF	6ES7 155-6AU01-0CN0	4.2 or higher	
IM 155-6 PN/3 HF	6ES7 155-6AU30-0CN0	4.2 or higher	
IM 155-6 PN BA	6ES7 155-6AR00-0AN0	3.2 or higher	
IM 155-6 PN HA	6DL1155-6AU00-0PM0	1.1 or higher	
IM 155-6 DP HF	6ES7 155-6BU00-0CN0	3.1 or higher	“PQ8VS4EVS-5/3V” modules with GSD are not adaptable
	6ES7 155-6BU01-0CN0	4.2 or higher	
IM155-6MF HF	6ES7155-6MU00-0CN0	5.0.3 or higher	Configuration only via GSDML*
CPU 15xx designed as the interface modules	Diverse		

Configuration options
(as of June 2019; further configuration options may be added in the future):

Configuration system	Configuration file	Type 8647 AirLINE SP in combination with …	
		SIMATIC ET 200SP	SIMATIC ET 200SP HA
Diverse	GSD/GSDML	X	–
STEP 7 Classic (version 5.5, SP4 or higher)	HSP	X	–
STEP 7 TIA portal (version 14, SP1 or higher)	HSP**	X	–
PCS 7 (version 9, SP2 or higher)	HUP	X***	X

*) See Siemens documentation for details

**) PQ...-5/3V modules can only be configured with HSP from TIA Portal V15.1

***) Only in combination with Siemens HF interface modules (art. no. 6ES7155-6AU00-0CN0 or 6ES7155-6BU00-0CN0). For further details, see the Siemens document “Process control system PCS 7 - Released modules (V9.0, SP1)”, chapter 9.5.

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Features and supported functions of the Type 8647 AirLINE SP modules:

	Electronic base modules ("PQ...")	Connection units ("PSU...")
Sub-modules (various configurations)	6	Not applicable
PROFIenergy	Yes	
Isochrone mode	No	No
I&M 0 to 3	Yes	Yes**
Station-internal lateral communication	No	No
Firmware update via backplane bus	Yes	Yes
R1 redundancy support	Yes***	Yes

**) When configuration with GSD, connection units without a pressure sensor (PSU-L/-M/-R and PSU-L-M/-M-M/-R-M) do not provide I&M data.

***) Firmware update for basic modules for smooth redundancy switching
A firmware update (see Chapter "12.3") is required for basic modules under the circumstances, in order to obtain full compatibility for the ET 200SP R1 system. If an older firmware version of the basic module is used as V01.01.01, this may impact process data during redundancy switching of the interface module.

9.1 Communication connection

Valve block AirLINE SP Type 8647 communicates with an interface module (IM155/CPU) via the backplane bus system of SIMATIC ET 200SP/SP HA. The interface module exchanges process data as well as parameter, configuration, and diagnostics data with a central bus master (control) via PROFIBUS DP or PROFINET.

Bus masters require a program to describe the hardware configuration (e.g. SIMATIC TIA Portal or SIMATIC STEP 7 V 5x for SIMATIC S7 controls). This program demands a device master file (GSD file) containing device-specific information about the valve block.

GSD file and GSDML file are available online:

GSD file:
https://support.industry.siemens.com/cs/document/73016883/profibus-gsd-dateien-%3A-et-200sp?dti=0&lc=de-WW

GSDML file:
https://support.industry.siemens.com/cs/document/57138621/profinet-gsd-dateien-%3A-et-200sp?dti=0&lc=de-WW

Bürkert has no influence on the reliability of the linked web pages.

This GSD file is also necessary when using configuration systems from other solution providers.

SIMATIC TIA Portal and SIMATIC STEP 7:

If SIMATIC TIA Portal V14, SP1 (or higher), SIMATIC STEP 7 V5.5 (or higher) or SIMATIC PCS7 V9.0, SP2 (or higher) is used, the valve block can be configured via a Hardware Support Package (HSP) or a Hardware Update Package (HUP) instead of via a GSD file.

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

- Convenient configuration
- Automatic testing of set-up rules
- Utilization of the valve block in conjunction with components of SIMATIC ET 200SP that cannot be configured via GSD / GSDML (e.g. IM with integrated CPU, F modules)

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9.2 General configuration procedure

→ Configure the system components from left to right.

→ Also configure the connection units. The identification numbers of the modules and the module codes (PSU, PQ, …) serve as reference. These are stated on the front of the modules (e.g. “PQ8VS4EVS (00285098)”).

When using certain interface modules (e.g. with an integrated CPU), configuration is only possible via a Hardware Support Package (HSP) or a Hardware Update Package (HUP).

9.2.1 Diagnostics

- Diagnostics are deactivated as standard.
- Diagnostics that are to be used must be activated.
- Some diagnostics can be set individually for each channel, while others can only be set per module (amongst other things, depending on whether used with PROFIBUS or PROFINET).
- The diagnostics “No supply voltage L+” can be set for every channel but always refers to the whole module. It is sufficient to activate this diagnostics just for one single channel.
- The diagnostics “Wire break” occurs when pilot valve diagnostics is activated for PROFIBUS, there are unoccupied valve slots at the valve block, and this type of channel is actuated.
  To delete or avoid the message, deactivate the respective channel in the configuration and upload the altered configuration into the control.

9.2.2 Connection units with pressure sensor (PSU-...-PS)

Configuration via the GSD/GSDML file

An error message is output at the module (DIAG-LED: “invalid parameters”) if the wrong limits are entered (e.g. “low limit” greater than “high limit”).

Configuration via HSP/HUP

Incorrect limit values are intercepted by STEP 7 / TIA Portal.

9.2.3 Recommended display presentation of valves Type 0460

Type 0460 valves are actuated with two channels. The two outputs are allocated four displays for feedback inputs.

All four feedback inputs are not usually required. It can be determined individually which feedback inputs are to be used. The following display presentation is recommended for typical use:



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9.3 Configuration of hardware via GSD using Siemens TIA Portal as an example

Software, e.g. TIA Portal from Siemens, is necessary to configure the bus master.

When the TIA Portal program from Siemens is applied, utilize version 13 or higher to guarantee compatibility to the hardware.

→ Before accessing the AirLINE SP system, the respective GSD file must be imported into the hardware catalog of the tool.

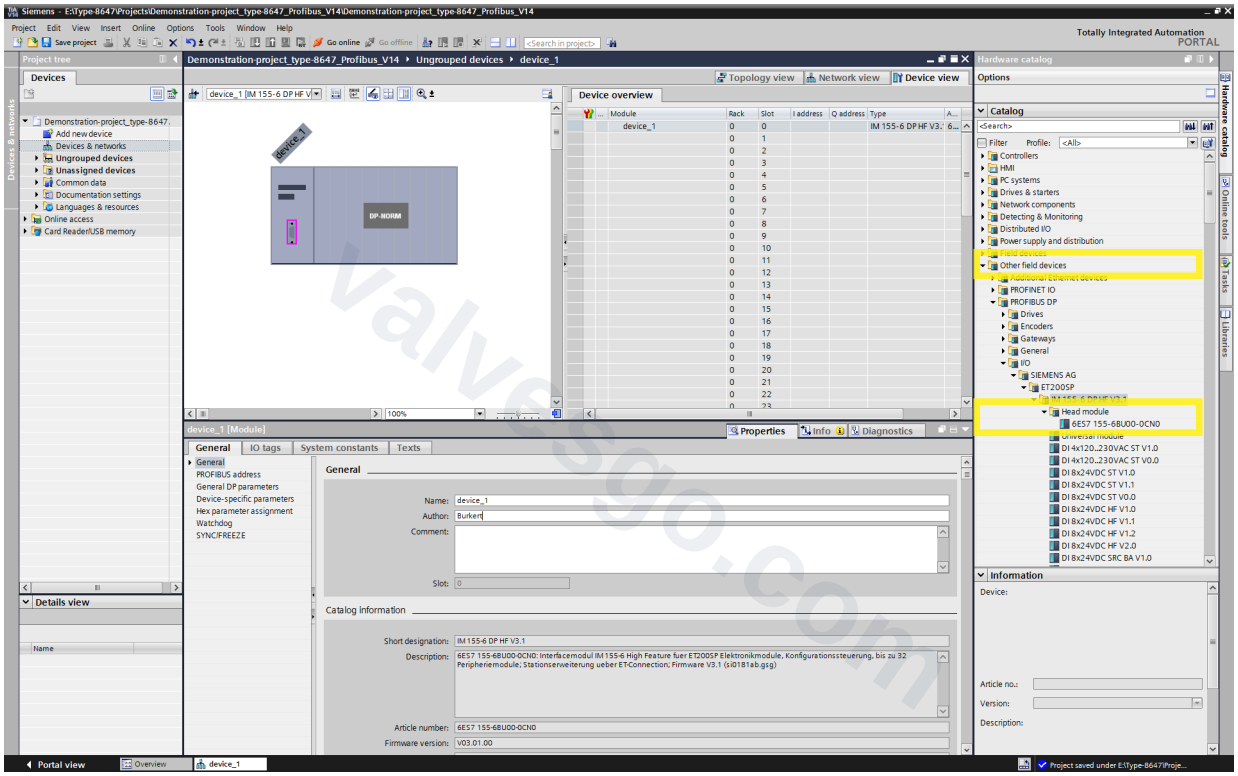


Figure 23: Select ET 200SP from the branch “Other field devices – PROFIBUS DP”.

→ In the hardware catalog of the TIA Portal, select the required interface module pull it into the operating range using drag-and-drop.

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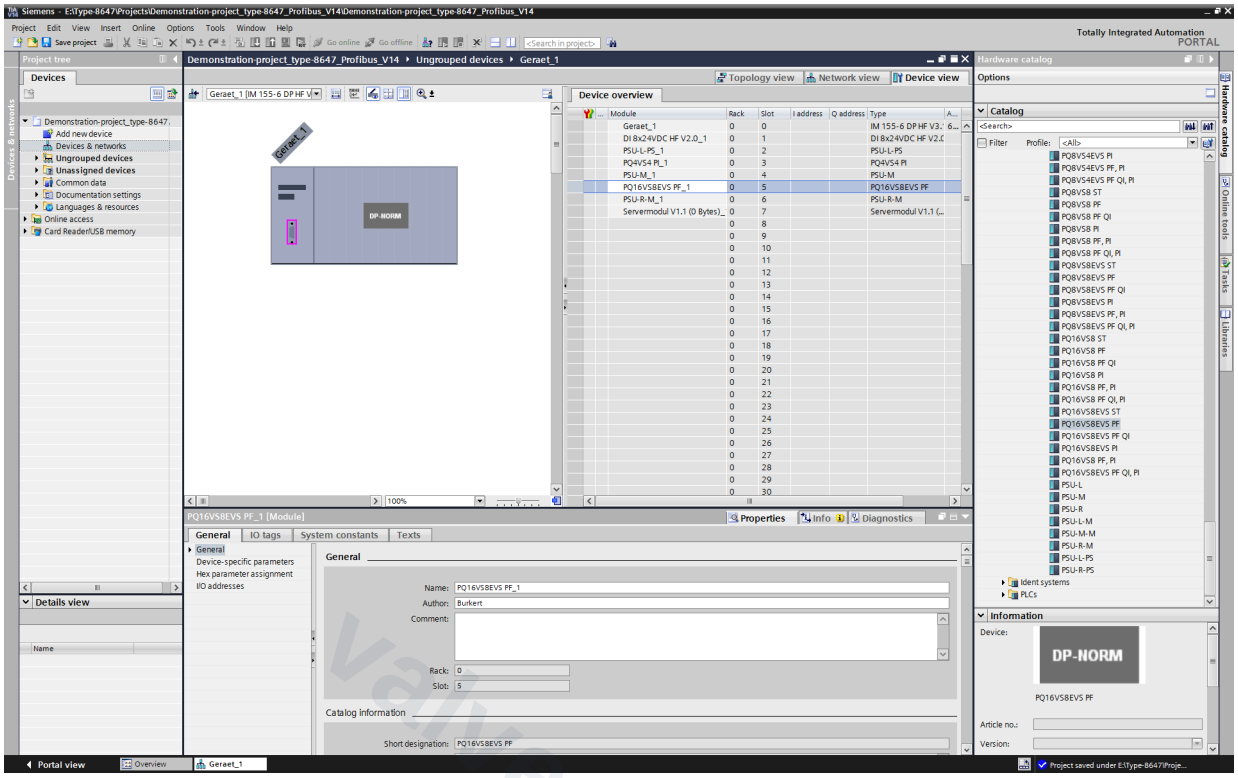


Figure 24: Selecting modules and assigning slots of the ET 200SP station

→ Select required modules from the catalog branch of the ET 200SP and pull onto the respective slot of the ET 200SP station using drag-and-drop. Map the real station structure from left to right. The designation and identification number of the AirLINE SP modules are stated on the front of each module, e.g. “PQ8VS4EVS (00285098)”.

The catalog contains several entries for the electronic base modules (e.g. PQ4VS4 ST, PQ4VS4 PF QI ...). Depending on the selected catalog entry, the same module hardware can be operated in functionally different configurations. See the following pages for more information.

Connection units (designation “PSU-…”) also have to be configured.

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When using PROFINET and GSDML, the AirLINE SP modules for the TIA Portal can be found in the sub-folder “Pneumatics (Burkert)”.

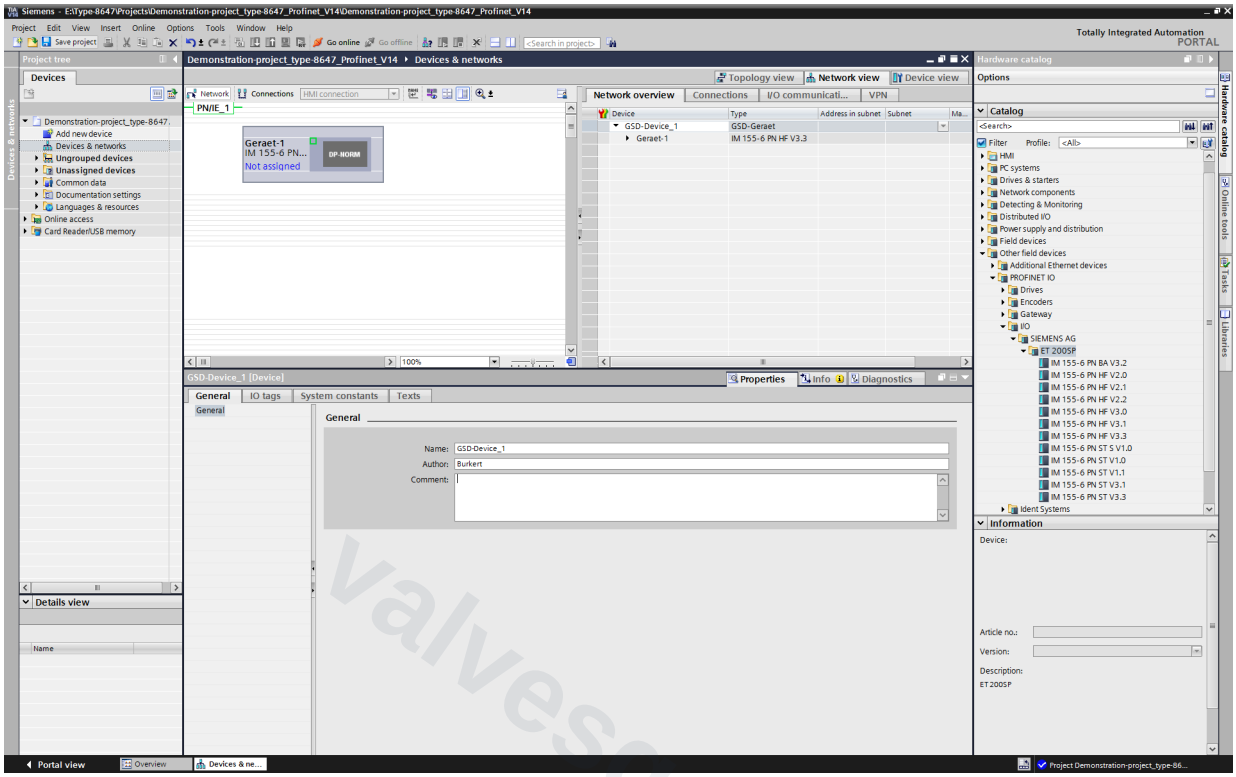


Figure 25: Select ET 200SP from the branch “Other field devices – PROFINET IO” (TIA Portal)

When using STEP 7 **V5.5 (or higher)** and GSDML, the AirLINE SP modules can be found under PROFINET IO => I/O => ET200SP => GSD => IM … => Pneumatics (Burkert)

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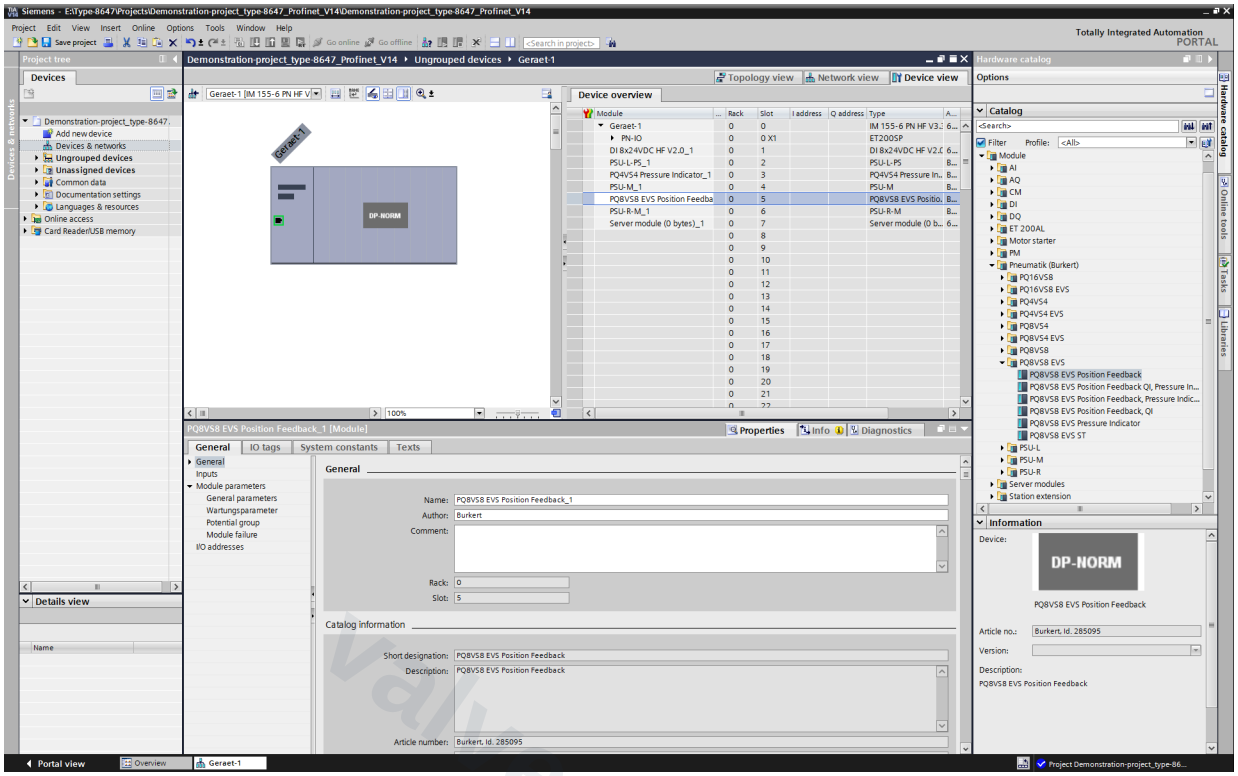


Figure 26: Selecting modules and assigning slots of the ET 200SP station

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9.3.1 Selection of the modules in the GSD file

Connection units (PSU-...)

Designation	ID number	Position in the valve block	Overall width [mm]	Pressure gauge	Pressure sensor
PSU-L	285088	left	44		
PSU-L-M	284112			X	
PSU-L-PS	292732				X
PSU-M	285091	centre	33		
PSU-M-M	284944			X	
PSU-R	285092	right	44		
PSU-R-M	284195			X	
PSU-R-PS	292734				X

Electronic base modules (PQ modules)

Designation	ID number	Number of valve slots	Overall width [mm]	Valve type*	EVS**
PQ4VS4	284935	4	44	I	
PQ4VS4EVS	285097			I	X
PQ8VS4	284936			II	
PQ8VS4EVS	285098			II	X
PQ8VS4EVS-5/3V	331588			III	X
PQ8VS8	283166	8	88	I	
PQ8VS8EVS	285095			I	X
PQ16VS8	284806			II	
PQ16VS8EVS	285096			II	X

*) I = single valve (Type 6524 / 6525);
II = double valve (2x3/2-way valve Type 6524 and pulse valve Type 0460)
III = 5/3-way valve (Type 0460)

**) External valve shutdown

Modules with the designation PQ... can be operated in various configurations. To do so, select the required entry from the GSD. The following abbreviations can be added to the module code.

ST: **Standard**
Only switch valves, no additional functions.

PF: **Position Feedback**
Status of assigned feedbacks of controlled actuators can be shown on the display.

PF QI: **Position Feedback QI** (position feedback and QI analysis of the position feedback)
Like PF, a value status (Quality Information, QI) of the feedback indicator status is additionally analyzed for display purposes.

PI: **Pressure Indicator**
Measured value of the pressure sensor of a connection unit PSU-…-PS is displayed numerically.

The options are available for each PQ module in various combinations.

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9.3.2 Process data of connection units

Designation	ID number	Process data [byte]
PSU-L	285088	0
PSU-L-M	284112	
PSU-L-PS	292732	4
PSU-M	285091	0
PSU-M-M	284944	
PSU-R	285092	
PSU-R-M	284195	
PSU-R-PS	292734	4

9.3.2.1 Connection units with pressure sensor (PSU-...-PS)

Connection units with pressure sensor supply 4 byte input data.

Content of bytes:

	Bits 7...4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Analog pressure value (high byte)				
Byte 1	Analog pressure value (low byte)				
Byte 2	reserved	Diagnostics “Low warning”	Diagnostics “High warning”	Diagnostics “Low error”	Diagnostics “High error”
Byte 3	reserved				Pressure value QI

Conversion of the analog pressure value:

Formula: $value\ (decimal) = \frac{pressure\ [bar] * 27648}{10}$

Pressure [bar]	Pressure [psi]	Value		Pressure value QI bit**
0...10	0...145	Decimal	Hexadecimal	
> 10	> 145	0	0	0
10	145	27648	0x6C00	1
7.5	109	20736	0x5100	
1.0	14.5	2765	0xACD	
(0.1)*	(1.45)*	(276)	(0x114)	
0	0	0	0	
< 0	< 0			0

*) Connection units are equipped with a cut-off function which hides minor fluctuations of 0 bar (→output value 0). Above 0.2 bar (3 psi), the measured value is output in the respective value.

**) At pressures < 0 bar and > 10 bar or with an internal module error, the QI bit is set as negative and the value 0 is output.

Additional filtering of the measured value at the control
Connection units with pressure sensor are equipped with a filter function for smoothing slight peaks or drops in pressure. If many valves are switched at the same time or if large volume actuators are connected, additional filtering of the measured value at the control may be worthwhile.

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9.3.3 Process data of electronic base modules

The process data structures displayed below are also valid for configuration via HSP.

Value status (Quality Information, QI)

The value status “QI” for valves indicates whether a valve is in perfect electrical condition. This is done by analog value monitoring on the solenoid valves and pilot controls with corresponding switching thresholds. The value status does not provide any information on the mechanical or pneumatic state of the valves.

The valve island Type 8647 permanently monitors the supply voltage. If this falls below the lower tolerance limit (24 V –10%), the “PWR OK” LED on the left PSU-L-xx connection unit goes out and the PQ modules report “No supply voltage”.

If the supply voltage drops, this diagnostic message always appears before the switching thresholds for the QI value status are reached and this changes.

To display the pressure value of a connection unit PSU-...-PS on a PQ module, the first 2 bytes of the supplied process data and the “QI to pressure value” byte must be transferred to the corresponding 3 bytes of the PQ module (“Analog pressure value” and “QI to pressure value”) by the control.

At devices equipped with a bulkhead (= segmentation of the media supply), the pressure value should be displayed on the PQ module, which is installed next to the connection unit containing the pressure sensor.

There is a consistency across all bytes for the process data displayed below.

For explanations of the abbreviations ST, PF, QI, and PI, see the info box in chapter “9.3.1”

Assignment of the valve output channels to the pneumatic working connections of the valve block

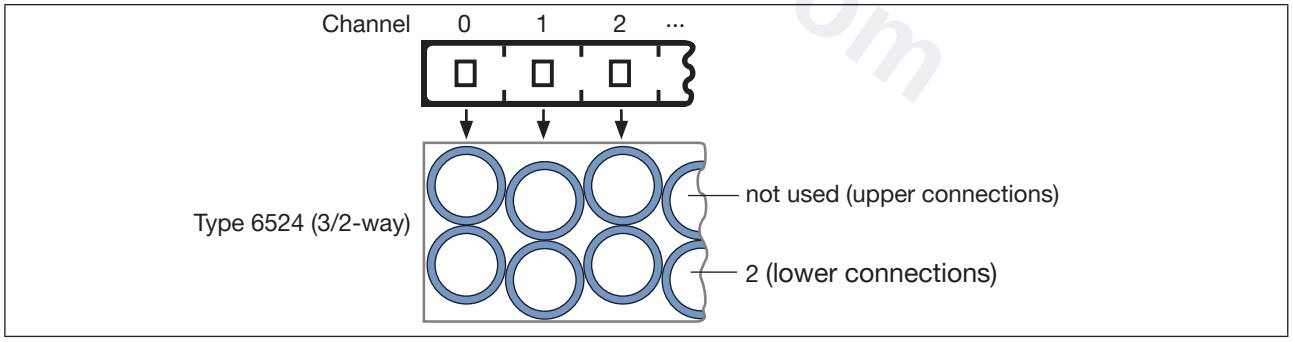


Figure 27: Assignment of the valve output channels when using Type 6524 (3/2-way)

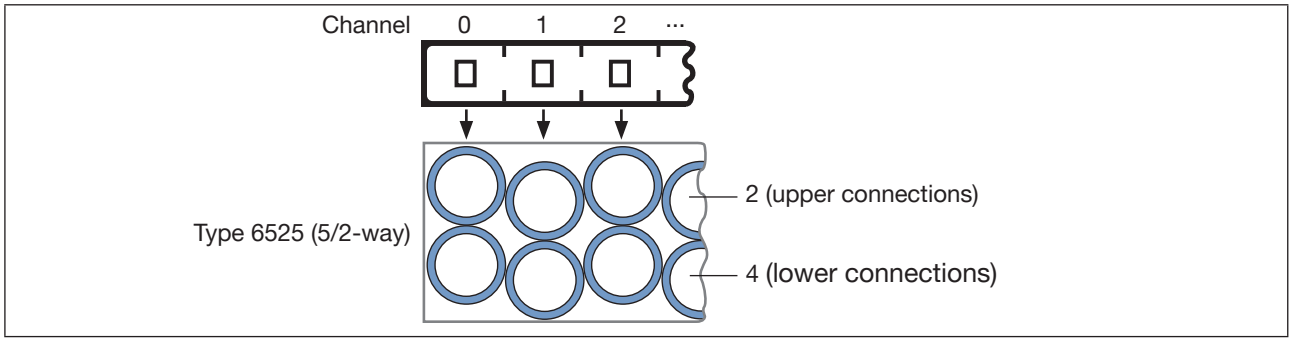


Figure 28: Assignment of the valve output channels when using Type 6525 (5/2-way)

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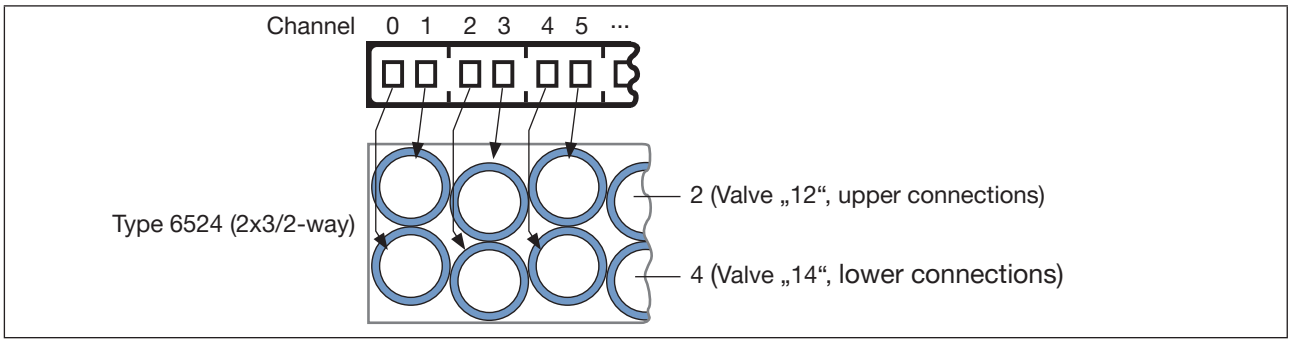


Figure 29: Assignment of the valve output channels when using Type 6524 (2x3/2-way)

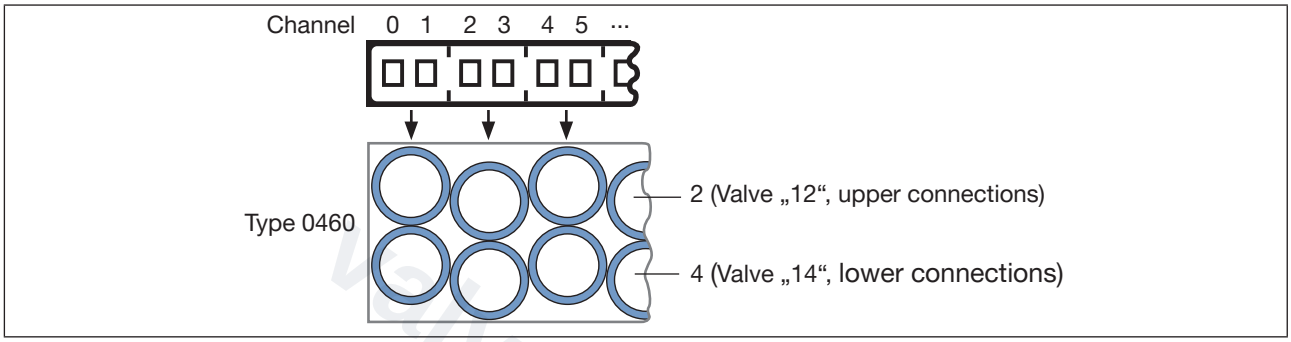


Figure 30: Assignment of the valve output channels when using Type 0460

9.3.3.1 Electronic base modules PQ4VS4 and PQ4VS4EVS

Standard module configuration (“ST”)

Output byte	Bits 7...4	Bit 3	Bits 2+1	Bit 0
Byte 0	reserved	Valve output channel 3	...	Valve output channel 0
Input byte	**Bits 7...4**	**Bit 3**	**Bits 2+1**	**Bit 0**
Byte 0	reserved	QI to valve output channel 3	...	QI to valve output channel 0

Module configuration with position feedback (Position Feedback, “PF”)

Output byte	Bits 7...4	Bit 3	Bits 2+1	Bit 0
Byte 0	reserved	Valve output channel 3	...	Valve output channel 0
		Position feedback channel 3		Position feedback channel 0
Byte 1		Upper position (A)	...	Upper position (A)
Byte 2		Lower position (B)		Lower position (B)
Input byte	**Bits 7...4**	**Bit 3**	**Bits 2+1**	**Bit 0**
Byte 0	reserved	QI to valve output channel 3	...	QI to valve output channel 0

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Module configuration with position feedback and pressure indicator (Position Feedback, Pressure Indicator “PF, PI”)

Output byte	Bits 7...4	Bit 3	Bits 2+1	Bit 0
Byte 0	reserved	Valve output channel 3	...	Valve output channel 0
		Position feedback channel 3		Position feedback channel 0
Byte 1		Upper position (A)	...	Upper position (A)
Byte 2		Lower position (B)		Lower position (B)
Byte 3	Analog pressure value (high byte)			
Byte 4	Analog pressure value (low byte)			
Byte 5	reserved			QI to pressure value
Input byte	**Bits 7...4**	**Bit 3**	**Bits 2+1**	**Bit 0**
Byte 0	reserved	QI to valve output channel 3	...	QI to valve output channel 0

Module configuration with position feedback and QI analysis of the position feedback (Position Feedback QI, “PF QI”)

Output byte	Bits 7...4	Bit 3	Bits 2+1	Bit 0
Byte 0	reserved	Valve output channel 3	...	Valve output channel 0
		Position feedback channel 3		Position feedback channel 0
Byte 1		Upper position (A)	...	Upper position (A)
Byte 2		Lower position (B)		Lower position (B)
		QI to position feedback channel 3:	...	QI to position feedback channel 0:
Byte 3		Upper position (A)		Upper position (A)
Byte 4		Lower position (B)		Lower position (B)
Input byte	**Bits 7...4**	**Bit 3**	**Bits 2+1**	**Bit 0**
Byte 0	reserved	QI to valve output channel 3	...	QI to valve output channel 0

Module configuration with position feedback, QI analysis of the position feedback, and pressure indicator (Position Feedback QI, Pressure Indicator “PF QI, PI”)

Output byte	Bits 7...4	Bit 3	Bits 2+1	Bit 0
Byte 0	reserved	Valve output channel 3	...	Valve output channel 0
		Position feedback channel 3		Position feedback channel 0
Byte 1		Upper position (A)	...	Upper position (A)
Byte 2		Lower position (B)		Lower position (B)
Byte 3	Analog pressure value (high byte)			
Byte 4	Analog pressure value (low byte)			
	reserved	QI to position feedback channel 3:	...	QI to position feedback channel 0:
Byte 5		Upper position (A)		Upper position (A)
Byte 6		Lower position (B)		Lower position (B)
Byte 7	reserved			QI to pressure value
Input byte	**Bits 7...4**	**Bit 3**	**Bits 2+1**	**Bit 0**
Byte 0	reserved	QI to valve output channel 3	...	QI to valve output channel 0

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Module configuration with pressure indicator (Pressure Indicator “PI”)

Output byte	Bits 7...4	Bit 3	Bits 2+1	Bit 0
Byte 0	reserved	Valve output channel 3	...	Valve output channel 0
Byte 1	Analog pressure value (high byte)			
Byte 2	Analog pressure value (low byte)			
Byte 3	reserved			QI to pressure value
Input byte	**Bits 7...4**	**Bit 3**	**Bits 2+1**	**Bit 0**
Byte 0	reserved	QI to valve output channel 3	...	QI to valve output channel 0

9.3.3.2 Electronic base modules PQ8VS4, PQ8VS4EVS, PQ8VS4EVS-5/3V, PQ8VS8, PQ8VS8EVS

Standard module configuration (“ST”)

Output byte	Bit 7	Bit 6	Bits 5...1	Bit 0
	Valve output			Valve output
Byte 0	Channel 7	Channel 6	...	Channel 0
Input byte	**Bit 7**	**Bit 6**	**Bits 5...1**	**Bit 0**
	QI to valve output			QI to valve output
Byte 0	Channel 7	Channel 6	...	Channel 0

Module configuration with position feedback (Position Feedback, “PF”)

Output byte	Bit 7	Bit 6	Bits 5...1	Bit 0
	Valve output		...	Valve output
Byte 0	Channel 7	Channel 6		Channel 0
	Position feedback			Position feedback
	Channel 7:	Channel 6:		Channel 0:
Byte 1	Upper position (A)	Upper position (A)	...	Upper position (A)
Byte 2	Lower position (B)	Lower position (B)		Lower position (B)
Input byte	**Bit 7**	**Bit 6**	**Bits 5...1**	**Bit 0**
	QI to valve output			QI to valve output
Byte 0	Channel 7	Channel 6	...	Channel 0

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Module configuration with position feedback and pressure indicator (Position Feedback, Pressure Indicator “PF, PI”)

Output byte	Bit 7	Bit 6	Bits 5...1	Bit 0
Byte 0	Valve output Channel 7	Channel 6	...	Valve output Channel 0
	Position feedback Channel 7:	Channel 6:	...	Position feedback Channel 0:
Byte 1	Upper position (A)	Upper position (A)		Upper position (A)
Byte 2	Lower position (B)	Lower position (B)		Lower position (B)
Byte 3	Analog pressure value (high byte)			
Byte 4	Analog pressure value (low byte)			
Byte 5	reserved			QI to pressure value
Input byte	**Bit 7**	**Bit 6**	**Bits 5...1**	**Bit 0**
Byte 0	QI to valve output Channel 7	Channel 6	...	QI to valve output Channel 0

Module configuration with position feedback and QI analysis of the position feedback (Position Feedback QI, “PF QI”)

Output byte	Bit 7	Bit 6	Bits 5...1	Bit 0
Byte 0	Valve output Channel 7	Channel 6	...	Valve output Channel 0
	Position feedback Channel 7:	Channel 6:	...	Position feedback Channel 0:
Byte 1	Upper position (A)	Upper position (A)		Upper position (A)
Byte 2	Lower position (B)	Lower position (B)		Lower position (B)
	QI to position feedback Channel 7:	Channel 6:	...	QI to position feedback Channel 0:
Byte 3	Upper position (A)	Upper position (A)		Upper position (A)
Byte 4	Lower position (B)	Lower position (B)		Lower position (B)
Input byte	**Bit 7**	**Bit 6**	**Bits 5...1**	**Bit 0**
Byte 0	QI to valve output Channel 7	Channel 6	...	QI to valve output Channel 0

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Module configuration with position feedback, QI analysis of the position feedback, and pressure indicator (Position Feedback QI, Pressure Indicator “PF QI, PI”)

Output byte	Bit 7	Bit 6	Bits 5...1	Bit 0
	Valve output			Valve output
Byte 0	Channel 7	Channel 6	...	Channel 0
	Position feedback			Position feedback
	Channel 7:	Channel 6:	...	Channel 0:
Byte 1	Upper position (A)	Upper position (A)		Upper position (A)
Byte 2	Lower position (B)	Lower position (B)		Lower position (B)
Byte 3	Analog pressure value (high byte)			
Byte 4	Analog pressure value (low byte)			
	QI to position feedback			QI to position feedback
	Channel 7:	Channel 6:	...	Channel 0:
Byte 5	Upper position (A)	Upper position (A)		Upper position (A)
Byte 6	Lower position (B)	Lower position (B)		Lower position (B)
Byte 7	reserved			QI to pressure value
Input byte	**Bit 7**	**Bit 6**	**Bits 5...1**	**Bit 0**
	QI to valve output			QI to valve output
Byte 0	Channel 7	Channel 6	...	Channel 0

Module configuration with pressure indicator (Pressure Indicator “PI“)

Output byte	Bit 7	Bit 6	Bits 5...1	Bit 0
	Valve output			Valve output
Byte 0	Channel 7	Channel 6	...	Channel 0
Byte 1	Analog pressure value (high byte)			
Byte 2	Analog pressure value (low byte)			
Byte 3	reserved			QI to pressure value
Input byte	**Bit 7**	**Bit 6**	**Bits 5...1**	**Bit 0**
	QI to valve output			QI to valve output
Byte 0	Channel 7	Channel 6	...	Channel 0

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9.3.3.3 Electronic base modules PQ16VS8 and PQ16VS8EVS

Use the data format “byte” for the outputs.
If “WORD” is used, pay attention to correct allocation of the data.

Standard module configuration (“ST”)

Output byte	Bit 7	Bit 6	Bits 5...1	Bit 0
	Valve output			Valve output
Byte 0	Channel 7	Channel 6	...	Channel 0
Byte 1	Channel 15	Channel 14		Channel 8
Input byte	**Bit 7**	**Bit 6**	**Bits 5...1**	**Bit 0**
	QI to valve output			QI to valve output
Byte 0	Channel 7	Channel 6	...	Channel 0
Byte 1	Channel 15	Channel 14		Channel 8

Module configuration with position feedback (Position Feedback, “PF”)

Output byte	Bit 7	Bit 6	Bits 5...1	Bit 0
	Valve output			Valve output
Byte 0	Channel 7	Channel 6	...	Channel 0
Byte 1	Channel 15	Channel 14		Channel 8
	Position feedback upper position (A):			Position feedback upper position (A):
Byte 2	Channel 7	Channel 6	...	Channel 0
Byte 3	Channel 15	Channel 14		Channel 8
	Position feedback lower position (B):			Position feedback lower position (B):
Byte 4	Channel 7	Channel 6	...	Channel 0
Byte 5	Channel 15	Channel 14		Channel 8
Input byte	**Bit 7**	**Bit 6**	**Bits 5...1**	**Bit 0**
	QI to valve output			QI to valve output
Byte 0	Channel 7	Channel 6	...	Channel 0
Byte 1	Channel 15	Channel 14		Channel 8

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Module configuration with position feedback and pressure indicator (Position Feedback, Pressure Indicator “PF, PI”)

Output byte	Bit 7	Bit 6	Bits 5...1	Bit 0
	Valve output			Valve output
Byte 0	Channel 7	Channel 6	...	Channel 0
Byte 1	Channel 15	Channel 14		Channel 8
	Position feedback upper position (A):			Position feedback upper position (A):
Byte 2	Channel 7	Channel 6	...	Channel 0
Byte 3	Channel 15	Channel 14		Channel 8
	Position feedback lower position (B):			Position feedback lower position (B):
Byte 4	Channel 7	Channel 6	...	Channel 0
Byte 5	Channel 15	Channel 14		Channel 8
Byte 6	Analog pressure value (high byte)			
Byte 7	Analog pressure value (low byte)			
Byte 8	reserved			QI to pressure value
Input byte	**Bit 7**	**Bit 6**	**Bits 5...1**	**Bit 0**
	QI to valve output			QI to valve output
Byte 0	Channel 7	Channel 6	...	Channel 0
Byte 1	Channel 15	Channel 14		Channel 8

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Module configuration with position feedback and QI analysis of the position feedback (Position Feedback QI, “PF QI”)

Output byte	Bit 7	Bit 6	Bits 5...1	Bit 0
	Valve output			Valve output
Byte 0	Channel 7	Channel 6	...	Channel 0
Byte 1	Channel 15	Channel 14		Channel 8
	Position feedback upper position (A):			Position feedback upper position (A):
Byte 2	Channel 7	Channel 6	...	Channel 0
Byte 3	Channel 15	Channel 14		Channel 8
	Position feedback lower position (B):			Position feedback lower position (B):
Byte 4	Channel 7	Channel 6	...	Channel 0
Byte 5	Channel 15	Channel 14		Channel 8
	QI to position feedback upper position (A):			QI to position feedback upper position (A):
Byte 6	Channel 7	Channel 6	...	Channel 0
Byte 7	Channel 15	Channel 14		Channel 8
	QI to position feedback lower position (B):			QI to position feedback lower position (B):
Byte 8	Channel 7	Channel 6	...	Channel 0
Byte 9	Channel 15	Channel 14		Channel 8
Input byte	**Bit 7**	**Bit 6**	**Bits 5...1**	**Bit 0**
	QI to valve output			QI to valve output
Byte 0	Channel 7	Channel 6	...	Channel 0
Byte 1	Channel 15	Channel 14		Channel 8

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Module configuration with position feedback, QI analysis of the position feedback, and pressure indicator (Position Feedback QI, Pressure Indicator “PF QI, PI”)

Output byte	Bit 7	Bit 6	Bits 5...1	Bit 0
	Valve output			Valve output
Byte 0	Channel 7	Channel 6	...	Channel 0
Byte 1	Channel 15	Channel 14		Channel 8
	Position feedback upper position (A):			Position feedback upper position (A):
Byte 2	Channel 7	Channel 6	...	Channel 0
Byte 3	Channel 15	Channel 14		Channel 8
	Position feedback lower position (B):			Position feedback lower position (B):
Byte 4	Channel 7	Channel 6	...	Channel 0
Byte 5	Channel 15	Channel 14		Channel 8
Byte 6	Analog pressure value (high byte)			
Byte 7	Analog pressure value (low byte)			
	QI to position feedback upper position (A):			QI to position feedback upper position (A):
Byte 8	Channel 7	Channel 6	...	Channel 0
Byte 9	Channel 15	Channel 14		Channel 8
	QI to position feedback lower position (B):			QI to position feedback lower position (B):
Byte 10	Channel 7	Channel 6	...	Channel 0
Byte 11	Channel 15	Channel 14		Channel 8
Byte 12	reserved			QI to pressure value
Input byte	**Bit 7**	**Bit 6**	**Bits 5...1**	**Bit 0**
	QI to valve output			QI to valve output
Byte 0	Channel 7	Channel 6	...	Channel 0
Byte 1	Channel 15	Channel 14		Channel 8

Module configuration with pressure indicator (Pressure Indicator “PI”)

Output byte	Bit 7	Bit 6	Bits 5...1	Bit 0
	Valve output			Valve output
Byte 0	Channel 7	Channel 6	–	Channel 0
Byte 1	Channel 15	Channel 14		Channel 8
Byte 2	Analog pressure value (high byte)			
Byte 3	Analog pressure value (low byte)			
Byte 4	reserved			QI to pressure value
Input byte	**Bit 7**	**Bit 6**	**Bits 5...1**	**Bit 0**
	QI to valve output			QI to valve output
Byte 0	Channel 7	Channel 6	–	Channel 0
Byte 1	Channel 15	Channel 14		Channel 8

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9.4 Parameters of the AirLINE SP modules

9.4.1 Parameter that need to be edited during configuration

9.4.1.1 Connection units with pressure sensor (“PSU-...-PS”)

Parameter	Description	Default
Pressure measurement	Pressure measurement enabled	activated
Diag: High error limit	Diagnostics when exceeding the high error limit enabled	deactivated
Diag: Low error limit	Diagnostics when undercutting the low error limit enabled	deactivated
Diag: High warning limit	Diagnostics when exceeding the high warning limit enabled	deactivated
Diag: Low warning limit	Diagnostics when undercutting the low warning limit enabled	deactivated
High error limit	Numerical value for the high error limit	
Low error limit	Numerical value for the low error limit	
High warning limit	Numerical value for the high warning limit	
Low warning limit	Numerical value for the low warning limit	

9.4.1.2 Electronic base modules (“PQ...”)

Which parameters can be set and whether the setting is possible per module or per channel depends, amongst other things, on the selected configuration method (see chapter “9.4.1.3” to “9.4.1.5”).

Parameter		Description	Default
Diag: No supply voltage		Diagnostics “No supply voltage” enabled	deactivated
Diag: Pilot valves		Diagnostics of pilot valves enabled (wire break, short circuit)**	deactivated
Diag: No valve voltage		Diagnostics of “No valve voltage” enabled (module logic running but valves not supplied, e.g. when “EVS active”)	deactivated
Pressure indicator*		Display of the pressure measurement value of a unit “PSU-…-PS”	deactivated
Cx active		Channel x enabled**	activated
Cx substitute value		Substitute value for channel x*** ****	“Shutdown”
Switching cycle counter	Diagnostics switching cycle counter enabled: Value	Defines whether a diagnostics message is generated when the warning limit of the switching cycle counter is exceeded.	deactivated
	Warning limit switching cycle counter	Defines at which value of the switching cycle counter a diagnostics message is generated as a warning.	0

*) Parameter only available when a module configuration with pressure indicator has been selected.
**) If individual valve slots are not equipped, the corresponding channels should be deactivated to prevent incorrect diagnostics. Alternatively, the diagnostics for the corresponding channels can be deactivated for this purpose (when configuring with a GSD file, channel-by-channel deactivation of diagnostics is not possible).
***) When using valves with an external switch-off option or PQ modules with EVS, the "active position" cannot be switched if the voltage has been interrupted externally.
****) When using pulse valves, it should be noted that they retain their last position with the substitute value "switch off".

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Information on using the switching cycle counters:
The switching cycle counters are always active and parameterization only occurs depending on whether a diagnostics message is generated or not when the set warning limit is exceeded.

→ If the switching cycle counters are to be used, activate the “diagnostics switching cycle counter enabled” as early as project planning.

→ If the switching cycle counters are to be reset by means of a data block, create the data block as early as programming of the CPU (see chapter “9.4.2”).

→ To prevent unintentional or unauthorized resetting of the switching cycle counters, provide protective measures (e.g. by security prompt or authorization code).

Why separate switching cycle counters for pilot valve and actuator?

The pilot valve on the valve block and the actuator in the field can be maintained or replaced separately. Each electronic base module therefore provides two separate switching cycle counters per channel (1x for pilot valve, 1x for actuator).

Example: As part of preventive maintenance, wearing parts are replaced at the process valve in the field.
– The actuator-switching cycle counter can be reset.
– The pilot valve and its current number of switching cycles remain unaffected.

9.4.1.3 Parameters for configuration with GSD (PROFIBUS)

Parameter		Description	Default
Switching cycle counter	Warning limit switching cycle counter	– 1000 increment (entered value is automatically multiplied by 1000) – Can be set per module – Separate values for pilot valve and actuator	0
	Warning limit exceeded	– Activation for pilot valves possible per module – Activation for actuators possible per channel	deactivated
Reaction to CPU STOP		– Reaction to CPU-STOP can be set per module – When “Substitute values” is selected, they can be set per channel	“Shutdown”
Potential group		Informative display, parameters cannot be altered.	

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9.4.1.4 Parameters for configuration with GSDML (PROFINET)

Parameter		Description	Default
Switching cycle counter for pilot valves	Warning limit switching cycle counter	Can be set per module	0
	Warning limit exceeded	Activation possible per channel	deactivated
Switching cycle counter for actuators	Warning limit switching cycle counter	Can be set per channel	0
	Warning limit exceeded	Activation possible per channel	deactivated
Reaction to CPU STOP		Reaction to CPU-STOP can be set per channel	“Shutdown”
Potential group		Informative display, parameters cannot be altered.	
Identification number pilot valves		The identification number of the pilot valves can be entered informatively (e.g. for preventive maintenance work). There is no comparison with the identification number of the actually applied pilot valve.	0

9.4.1.5 Parameters for configuration with HSP (PROFIBUS/PROFINET)

Parameter		Description	Default
Switching cycle counter for pilot valves	Warning limit switching cycle counter	Can be set per module	0
	Warning limit exceeded	Activation possible per channel	deactivated
Switching cycle counter for actuators	Warning limit switching cycle counter	Can be set per channel	0
	Warning limit exceeded	Activation possible per channel	deactivated
Reaction to CPU STOP		Reaction to CPU-STOP can be set per channel	“Shutdown”
Potential group		Informative display, parameters cannot be altered.	
Identification number pilot valves		The identification number of the pilot valves can be entered informatively (e.g. for preventive maintenance work). There is no comparison with the identification number of the actually applied pilot valve.	0

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9.4.2 Control data records that must be used for the runtime

The control data records for electronic base modules with 16 channels are presented below. The tables apply accordingly for electronic base modules with less channels.

Access to the control data records can take place, e.g., in SIMATIC STEP 7 via data blocks “WRREC” and “RDREC”.

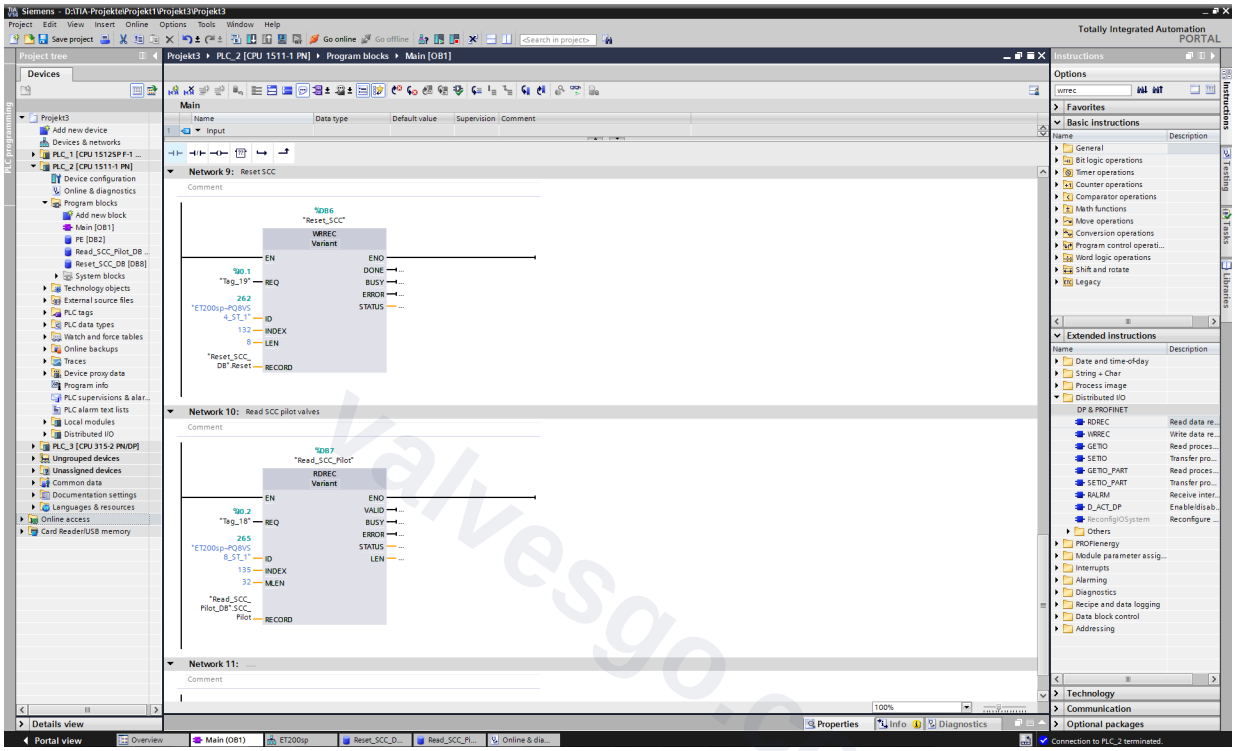


Figure 31: Switching cycle counter reset via data blocks “WRREC” and “RDREC”

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9.4.2.1 DS 130: Control data record "Current status of switching cycle counter pilot valves" (read only)

Specifies how many switching cycles of the pilot valve have been executed since the last switching cycle counter reset.

Byte	Bits 7...0	Channel
0	Current status of switching cycle counter **pilot valve** byte 0 (MSB)	0
1	Current status of switching cycle counter **pilot valve** byte 1	
2	Current status of switching cycle counter **pilot valve** byte 2	
3	Current status of switching cycle counter **pilot valve** byte 3 (LSB)	
4...7	Current status of switching cycle counter **pilot valve** 4 bytes as with channel 0	1
8...11		2
12...15		3
16...19		4
20...23		5
24...27		6
28...31		7
32...35		8
36...39		9
40...43		10
44...47		11
48...51		12
52...55		13
56...59		14
60...63		15

9.4.2.2 DS 131: Control data record "Current status of switching cycle counter actuators" (read only)

Specifies how many switching cycles of the actuators have been executed since the last switching cycle counter reset (actuations of the channel are counted).

Byte	Bits 7...0	Channel
0	Current status of switching cycle counter **actuator** byte 0 (MSB)	0
1	Current status of switching cycle counter **actuator** byte 1	
2	Current status of switching cycle counter **actuator** byte 2	
3	Current status of switching cycle counter **actuator** byte 3 (LSB)	
4...7	Current status of switching cycle counter **actuator** byte 4 as with channel 0	1
8...11		2
12...15		3
16...19		4
20...23		5
24...27		6
28...31		7
32...35		8
36...39		9
40...43		10
44...47		11
48...51		12
52...55		13
56...59		14
60...63		15

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9.4.2.3 DS 132: Control data record “Reset switching cycle counter” (write only)

Writing a 1 on the respective bit triggers a reset of the corresponding switching cycle counter.

Byte	Bits 7...2	Bit 1	Bit 0	Channel
0	reserved	Reset SCC actuator 0	Reset SCC pilot valve 0	0
1		Reset SCC actuator 1	Reset SCC pilot valve 1	1
2		Reset SCC actuator 2	Reset SCC pilot valve 2	2
3		Reset SCC actuator 3	Reset SCC pilot valve 3	3
4		Reset SCC actuator 4	Reset SCC pilot valve 4	4
5		Reset SCC actuator 5	Reset SCC pilot valve 5	5
6		Reset SCC actuator 6	Reset SCC pilot valve 6	6
7		Reset SCC actuator 7	Reset SCC pilot valve 7	7
8		Reset SCC actuator 8	Reset SCC pilot valve 8	8
9		Reset SCC actuator 9	Reset SCC pilot valve 9	9
10		Reset SCC actuator 10	Reset SCC pilot valve 10	10
11		Reset SCC actuator 11	Reset SCC pilot valve 11	11
12		Reset SCC actuator 12	Reset SCC pilot valve 12	12
13		Reset SCC actuator 13	Reset SCC pilot valve 13	13
14		Reset SCC actuator 14	Reset SCC pilot valve 14	14
15		Reset SCC actuator 15	Reset SCC pilot valve 15	15

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9.4.2.4 DS 133: Control data record “Date of last actuator maintenance” (read/write)

Provides the option of entering a date when an actuator was last serviced. The entry is only informative and does not activate any functions (e.g. diagnostics).

BCD format
dd (day): 0x01 .. 0x32
mm (month): 0x01 .. 0x12 = January .. December
yy (year): 0x90 .. 0x99 = 1990 .. 1999, 0x00 .. 0x89 = 2000 .. 2089

Byte	Bits 7...0	Channel
0	Date of **last** actuator maintenance (BCD format) byte 0 → dd in (dd.mm.yy)	0
1	Date of **last** actuator maintenance (BCD format) byte 1 → mm in (dd.mm.yy)	
2	Date of **last** actuator maintenance (BCD format) byte 2 → yy in (dd.mm.yy)	
3...5	byte 3 “Date of **last** actuator maintenance” as for channel 0	1
6...8		2
9...11		3
12...14		4
15...17		5
18...20		6
21...23		7
24...26		8
27...29		9
30...32		10
33...35		11
36...38		12
39...41		13
42...44		14
45...47		15

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9.4.2.5 DS 134: Control data record “Date of next actuator maintenance” (read/write)

Provides the option of entering a date when an actuator is to be next serviced. The entry is only informative and does not activate any functions (e.g. diagnostics).

Info on BCD format, see “9.4.2.4”

Byte	Bits 7...0	Channel
0	Date of **next** actuator maintenance (BCD format) byte 0 → dd in (dd.mm.yy)	0
1	Date of **next** actuator maintenance (BCD format) byte 1 → mm in (dd.mm.yy)	
2	Date of **next** actuator maintenance (BCD format) byte 2 → yy in (dd.mm.yy)	
3...5	byte 3 “Date of **next** actuator maintenance” as for channel 0	1
6...8		2
9...11		3
12...14		4
15...17		5
18...20		6
21...23		7
24...26		8
27...29		9
30...32		10
33...35		11
36...38		12
39...41		13
42...44		14
45...47		15

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9.4.2.6 DS 135: Control data record “Identification number of pilot valves” (read/write)

This data record allows you to enter the identification number of the applied pilot valve. The identification number is thus readily available when replacing or maintaining the pilot valve.

This control data record is not available when PROFIBUS configuration via GSD.

Byte	Bits 7...0	Channel
0	Identification number pilot valve byte 0 (MSB)	0
1	Identification number pilot valve byte 1	
2	Identification number pilot valve byte 2	
3	Identification number pilot valve byte 3 (LSB)	
4...7	Identification number pilot valve byte 4 (like channel 0)	1
8...11		2
12...15		3
16...19		4
20...23		5
24...27		6
28...31		7
32...35		8
36...39		9
40...43		10
44...47		11
48...51		12
52...55		13
56...59		14
60...63		15

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9.5 Utilization of HSP under SIMATIC STEP 7

9.5.1 Hardware Support Packages (HSP) for SIMATIC STEP 7

As of SIMATIC STEP 7 V5.5 and as of TIA Portal V14, SP1, an HSP can be subsequently installed for the hardware catalog. The HSP supplements the decentralized peripheral system Siemens SIMATIC ET 200SP with the AirLINE SP modules.

Depending on the applied version of SIMATIC STEP 7, different versions of the HSP's are required.

- The "HSP2105 for SIMATIC STEP 7 V 5.x" is suitable for SIMATIC STEP 7 V 5.5 or higher.
- The "HSP0225" is required for SIMATIC STEP 7 TIA Portal.

9.5.2 Installation of the HSP

The Hardware Support Package can be downloaded from the Bürkert website: www.burkert.com.

→ Save and unpack the "hspXXXX.zip" file in a directory of your choice.

→ In SIMATIC STEP 7 under the "*Options*" menu, select "*Support Packages*".

→ In the following dialog, select "*Add from file system*", mark and install "HSPXXXX...".

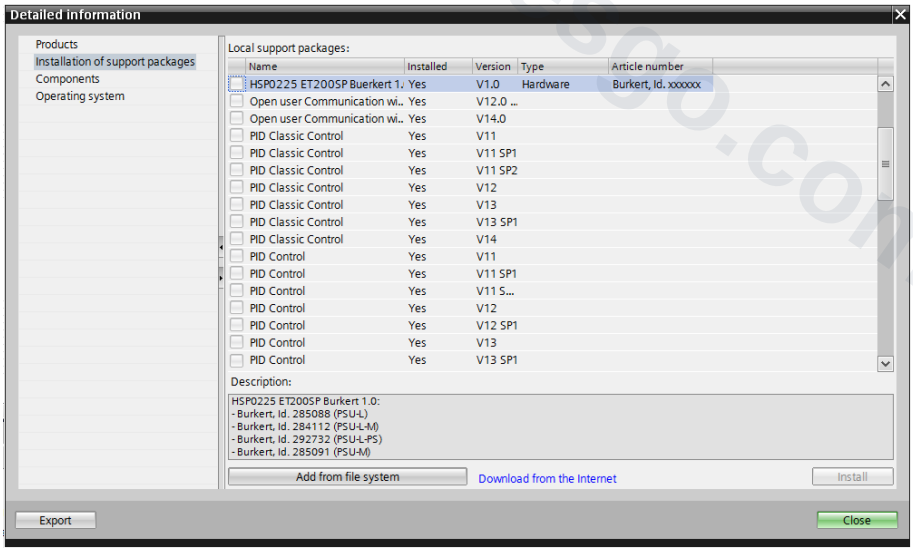


Figure 32: Installing the HSP

After carrying out installation, the AirLINE SP modules are integrated in the hardware catalog.

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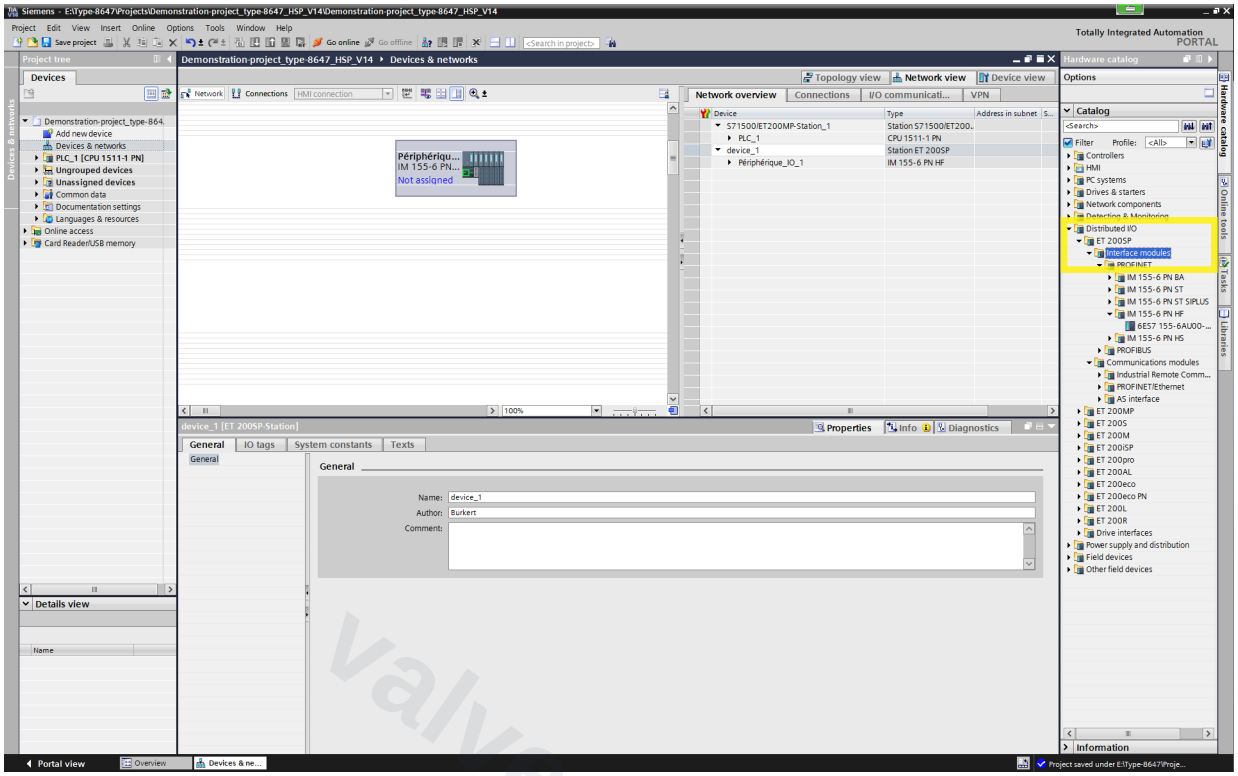


Figure 33: Select ET 200SP from the branch “Distributed I/O system”

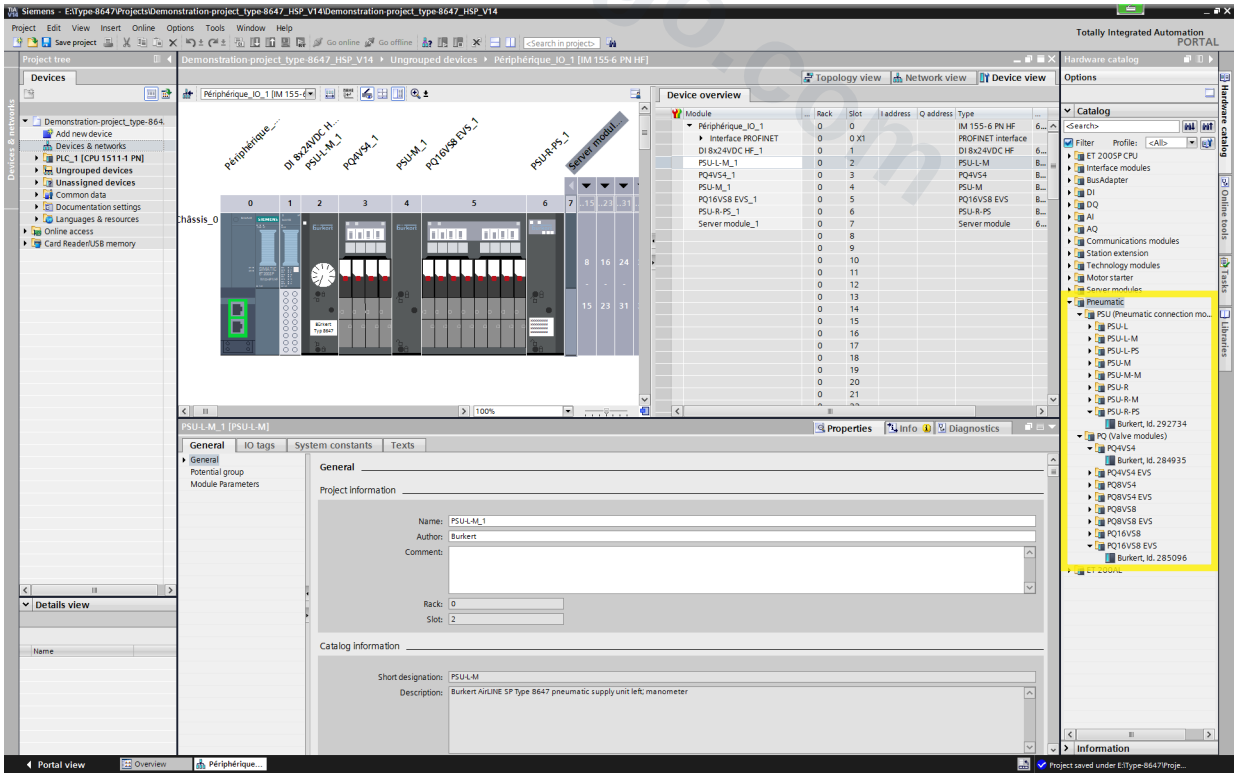


Figure 34: Select AirLINE SP modules from the branch “Pneumatics” and assign to slots of the ET 200SP station

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9.5.3 Changing the parameters in the HSP

→ Mark a module to display and change its parameters.

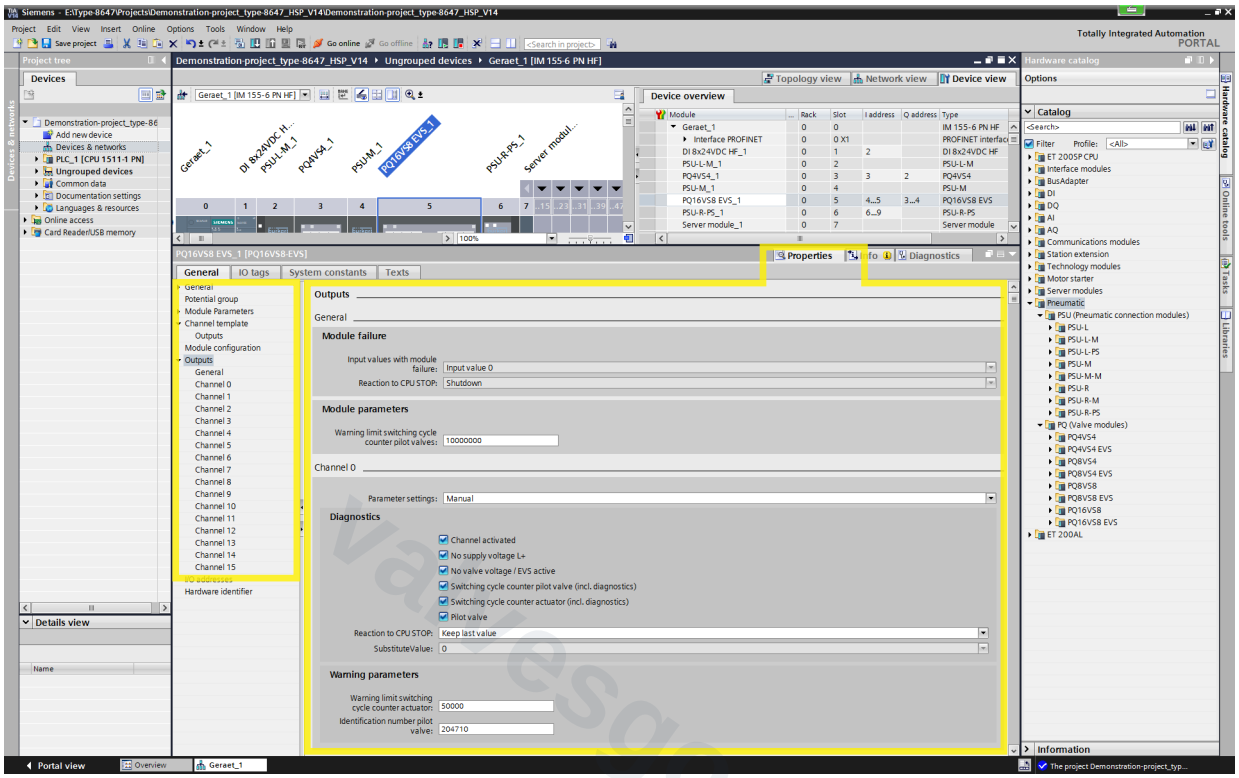


Figure 35: Changing the parameters of a module

9.5.3.1 Process data of electronic base modules

When configuring the electronic base modules, there are various module configurations available for each basic module. The structure of the process data of electronic base modules depends on the selected module configuration (see chapter “9.3.3”, page 52 and the following table).

PF Position feedback in display	**QI** Value status of position feedback*	**PI** Pressure indicator**	**Process data structure according to tables chapter “9.3.3”**
			PCS.
x			PF
x		x	PF, PI
(x)	x		PF QI
(x)	x	x	PF QI, PI
		x	PI

Table 4: Assignment of the process data structure of electronic base modules for the selected module configuration

*) Only available when “Position feedback in display” is activated

**) activated (“Alternating with valve status” or “Permanently”)

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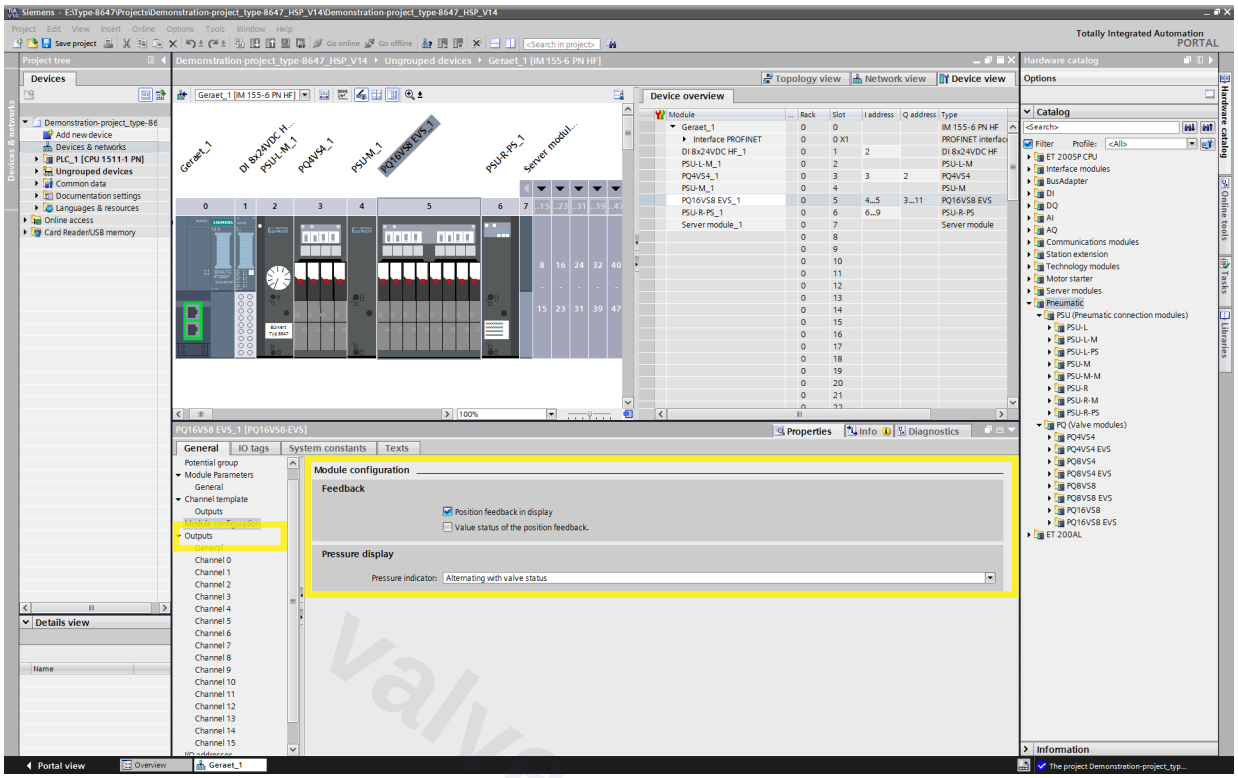


Figure 36: Changing the configuration of a module

9.5.3.2 Connection units with pressure sensor (PSU-...-PS)

Incorrect limit values (e.g. “low limit” higher than “high limit”) are intercepted by STEP 7 / TIA Portal.

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9.6 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.

9.6.1 Hardware Update Package (HUP) for SIMATIC PCS7

From SIMATIC PCS7 V9.0, SP2 or higher, a HUP can be subsequently installed for the hardware catalogue. The HUP supplements the decentralised peripheral system Siemens SIMATIC ET 200SP / SP HA with the AirLINE SP modules.

9.6.2 Installation of the HUP

The Hardware Update Package can be downloaded from the Bürkert website:
www.buerkert.com→8647→Downloads: Software

→ Close PCS7.

→ Run the “PCS7_HUP_Burkert_8647_for_ET200SP_SPHA.exe” file and follow the wizard for installation.

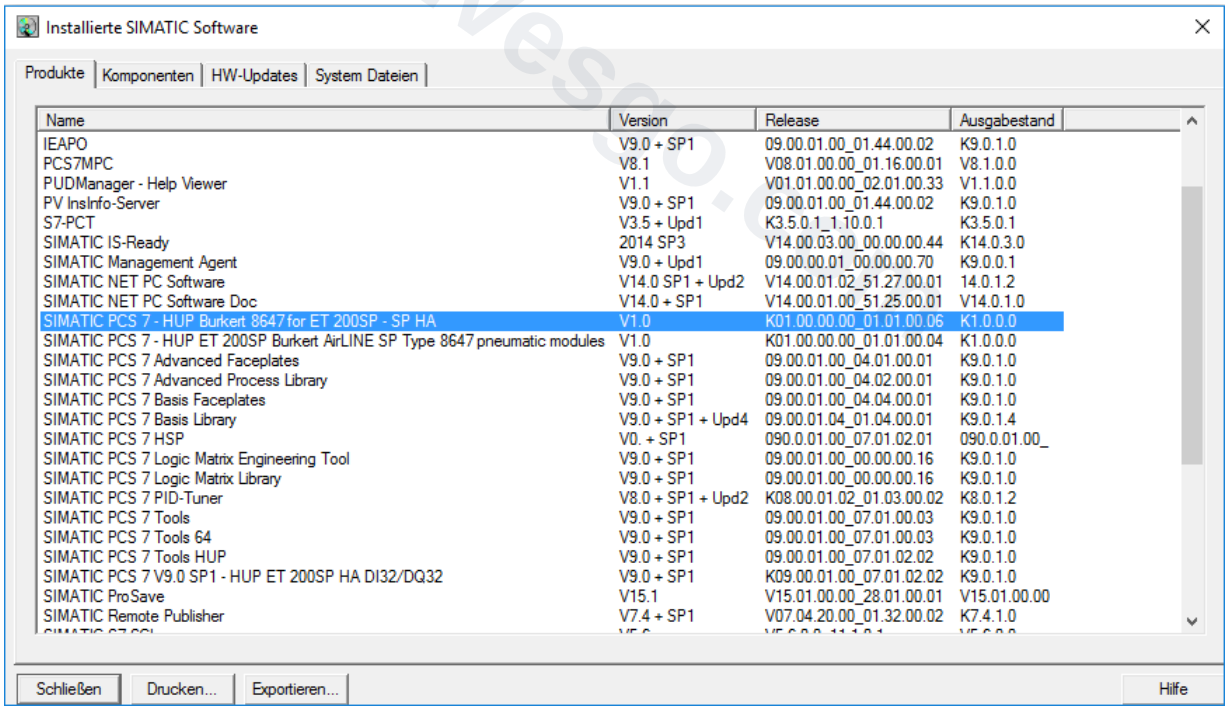


Figure 37: HUP has been installed.

After completing the installation, the modules of the AirLINE SP are included in the hardware catalogue (the filter must be set to „Standard“). The next steps are the same as when using HSPs (see chapter “9.5”, page 71).

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10 START-UPS

10.1 Safety instructions

WARNING

Risk of injury from improper operation.

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

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

Risk of injury due to an incorrectly functioning system.

Before start-up, carry out tests to ensure correct functioning of the system. This helps to avoid personal injury and damage to the system during operation.

- ► Before final system start-up, carry out a full function test and the required safety tests.
- ► Plan foreseeable possible faults in the tests.

Configuration must be fully completed to start up the equipment:

10.2 Electrical start-up

CAUTION

Undefined reaction of the valves.

The reaction of the valves is undefined if the supply voltage is too low. This may result in unintentional processes in the system.

- ► Ensure that the level of supply voltage is above the low tolerance limit (see “14.4 Electrical data”, page 99)

Risk of injury due to hot surfaces.

A longer duty cycle may result in the valves becoming hot.

- ► Let the valves cool down before removing them or wear heat-resistant protective gloves.

When using UL-certified device versions with 2x3/2-way valves, Type 6524:

- ► If switching occurs frequently, leave at least 100 ms pause before switching on again.

Feedback about sufficient supply voltage is displayed at the valve block via the PWR LEDs (connection units PSU-L… and all PQ modules).
If diagnostics has been activated, a diagnostics message occurs via SIMATIC ET 200SP / SP HA.

Procedures before electrical start-up:

→ Check the connections.

→ Check supply voltage.

→ Set manual overrides of the valves in neutral position.

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Electrical start-up of the valve terminal corresponds to start-up of the distributed I/O system SIMATIC ET 200SP / SP HA (Siemens).

Please refer to the Siemens system manual
“Distributed I/O system ET 200SP” or “Distributed I/O system ET 200SP HA” for all the steps required for electrical start-up.

Modules with EVS

If the functions “Switched off load voltage” and “PROFIenergy” are active, it is not possible to, among other things, activate the valve positions programmed by the user.

If the outputs (valves) have been switched off via EVS, it is displayed in the LC display. Additionally, the output data sent by the control are also displayed (regular alternating of “EVS active” and “Output data”).

10.3 Pneumatic start-up

CAUTION

Hazard posed by noise.

Increased noise can be generated when switching pressurized valves.

- ▸ Discharge exhaust air via a hose.
- ▸ Connect a silencer to the exhaust air connection.
- ▸ Wear ear defenders.

Procedures before pneumatic start-up

→ Check connections, voltage, and operating pressure.

→ Check correct assignment of the connections 1 and 3 / 5. They may by no means be interchanged.

→ Set manual overrides of the valves in the neutral position for electrical operation.

Pneumatic start-up

→ Do not exceed maximum operating data values (see type label).

→ Switch on the supply pressure first.

→ Then switch on the voltage supply.

10.4 Individual labeling

At each valve unit there are pockets that can be used for individual labeling. Labels, e.g. made of cardboard/paper (max. 0.2 mm thick) can be used for this purpose.

Perforated blank sheets are included in the valve block’s scope of supply and additionally available from your local Bürkert branch office or at www.burkert.com.

An editable template for labeling blank sheets at a PC / printer can be found on the last page of these instructions.

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10.5 “PRONETA” and “SIMATIC Automation Tool”

Type 8647 is included in the Siemens tools “PRONETA” and “SIMATIC Automation Tool”, i.e. their functions can also be used for Type 8647 (e.g. during start-up).

Type 8647 is available in PRONETA from version 2.5 or higher, and in the SIMATIC Automation Tool from version 3.1, SP2 or higher.

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11 OPERATION

11.1 Safety instructions

WARNING

Risk of injury from improper use.

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

- ► The operating personnel must know and have understood the contents of the operating instructions fully.
- ► Observe safety instructions and information on intended use.
- ► Only adequately trained personnel may operate the system.

The valve block is controlled via the interface module of SIMATIC ET 200SP / SP HA.

Device statuses are displayed via LEDs and the LC displays of the valve units. For details, see chapter “11.3” and “11.4”.

11.2 Manual activation of the valves

WARNING

Risk of injury due to actuators.

Unintentional system movements or states may result from manual activation of the valves.

- ► Ensure that the movements of connected actuators cannot cause injuries, damage or unwanted actions in the system.

CAUTION

Risk of injury due to hot device components.

A longer duty cycle may result in the valves becoming hot.

- ► Only active manual override with a screwdriver.

Depending on the type of valve, valves can be activated manually, e.g. for start-up or service tasks.

The valves can be manually activated even when the valve block is not electrically powered.

→ Press (for key function) and rotate (for lock function) manual override. Depending on the type of valve, it results in electrical activation of the valve being canceled or limited.

→ Set manual overrides in the neutral position after completing the tasks.

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11.3 LED display connection units

The left-hand connection units feature the LED display “PWR OK” for visual display of the operating state.

If the connection units are equipped with a pressure sensor (“PSU-..-PS”), they feature further LED displays:

- “DIAG” LED (red/green) for module status
- “Pressure” LED (red/yellow/green) for pressure status (depends on the parameterized limit values)

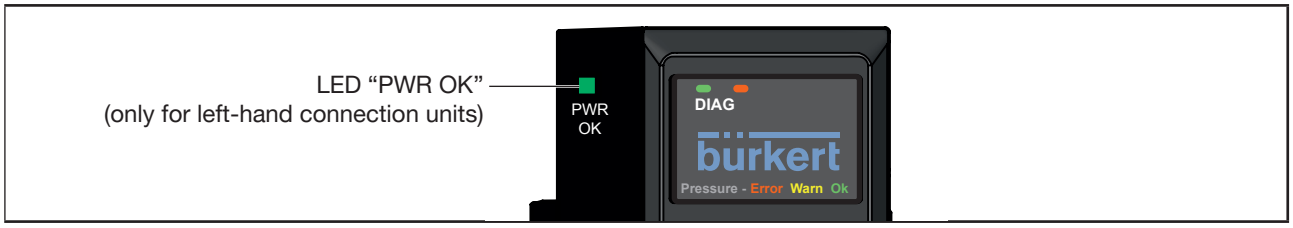


Figure 38: LED displays of connection units

11.4 LED display of electronic base modules

The electronic base modules (part of the valve unit) feature two LED displays:

– “DIAG” LED (red/green) for module status

– “PWR” LED (green) for load voltage



Figure 39: LED display of a valve unit

11.5 LC display of electronic base modules

The electronic base modules (part of the valve unit) feature an LC display for displaying the device status. The switching position and possible fault states of the outputs are graphically presented on the display. Depending on the module configuration, further information can be displayed, e.g.

– Position of the actuator assigned to the output

– Measured value of the pressure sensor of a connection unit (PSU-...-PS).

Arising messages (information, warnings, faults) appear as text on the LC display. The text message is displayed alternately with the graphical display of the channel status.

Electronics modules with eight valve slots are equipped with two LC displays. In this case, numbering of the channels occurs across both displays.

Example:

Module	Left-hand display	Right-hand display
PQ8VS8	Channel 0...3	Channel 4...7
PQ16VS8	Channel 0...7	Channel 8...15

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11.5.1 Pressure value display

The pressure value display is generally intended for use during start-up.

Depending on the parameterization, the value ist displayed

– alternately with the normal status display (text messages are suppressed!)

– permanently (all other displays are suppressed).

11.5.2 Priorities

Priority	Message	
1	Pressure value*	Higher priority messages suppress lower priority messages.
2	PROFIenergy	
3	Standard message (if several messages are pending, they are displayed alternately with “EVS active”, wire break, short circuit, switching cycle counter, …)	

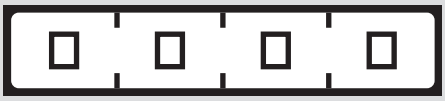
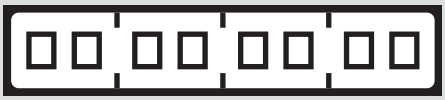
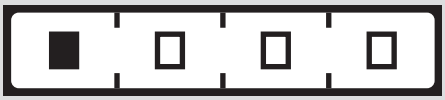
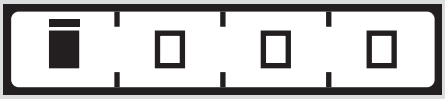
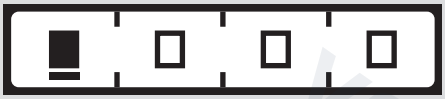
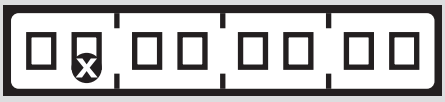
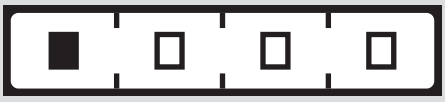
*) At electronic base modules with eight valve slots only one LC display is required to display the pressure value. Lower priority messages are shown on the second LC display.

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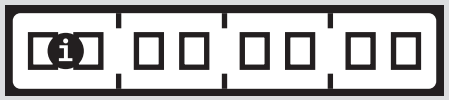
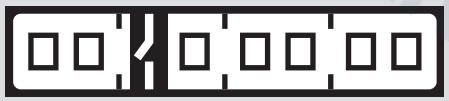
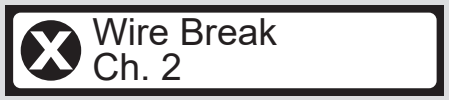
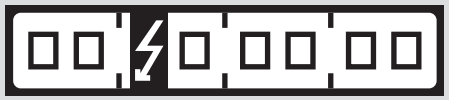
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11.5.3 Display contents

	Display view with four positions (from left to right channel 0–3 or channel 4–7)	
	Display view with eight positions (from left to right channel 0-7 or channel 8-15)	
	*Valve channel 0 activated*	
	*Valve channel 0 activated* *Feedback: “Upper position (A) reached”*	
	*Valve channel 0 activated* *Feedback: “Lower position (B) reached”*	
	Pressure value display	
Message 1 / Message 2 alternating:  Message 1  Message 2	*Channel 1* *Feedback error lower position (B)*	Example of other possible messages: **Feedback Err.** **Up 1** *Channel 1* *Feedback error upper position (A)*
Message 1 / Message 2 alternating:  Message 1  Message 2	*Channel 0 activated* *External valve shutdown active* Message 1: Process data sent by the control. These are shown on the display despite “EVS active”.	

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Message 1 / Message 2 alternating:  Message 1  Message 2	*Channel 0 activated* *PROFIenergy active*	
Message 1 / Message 2 alternating:  Message 1  Message 2	*Maintenance required!* *Pilot valve channel 0:* *Switching cycle counter limit reached*	Example of other possible messages: **Act. SCC Limit Ch. 1** *Maintenance required!* *Activated process valve channel 1:* *Switching cycle counter limit reached*
Message 1 / Message 2 alternating:  Message 1  Message 2	*Wire break at channel 2*	
Message 1 / Message 2 alternating:  Message 1  Message 2	*Short circuit at channel 2*	

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11.6 Diagnostics reaction

System reaction to insufficient voltage

If the supplied load voltage drops below the specified limit (see chapter "14.4 Electrical data"), diagnostics "No load voltage" will be generated. To avoid undefined switching reaction of the valves, the valves are switched off (module logic and display continue to run).

Electronic base modules: Channel-related messages are only shown in the display when the respective channel is activated and the module is in cyclical data exchange (= parameterized and configured).

- Only when the channel is activated can the errors "wire break" and "short circuit" be detected and diagnostics triggered.
- When configuring with GSD, connection units without a pressure sensor (PSU-L/-M/-R and PSU-L-M/-M-M/-R-M) do not provide diagnostics data.

Depending on the applied control system and configuration program, diagnostics are output numerically or as text.

If more than eight diagnostics are pending at a single module, a diagnostics entry may not be generated for all diagnostics at some controls.

The following diagnostics are possible:

Diagnostics no. Hex. (dec)	Diagnostics	Cause	Corrective action
0x09 (9)	Error	General error (e.g. Hardware defect)	Check installation; if necessary, replace hardware
0x10 (16)	Parameterization error	Module not parameterized correctly; at connection units "PSU-…-PS", e.g., values of the warning/error limits overlap	Check parameterization
0x11 (17)	No supply voltage	Load voltage too low or not present	Check load voltage
0x1A (26)	external error	Can occur when using a PROFIBUS interface module. The general diagnostics is displayed instead of specific diagnostics. Remedy: Check whether there is a diagnostics no. error above value 752.	
0x1F (31)	Channel/Component temporarily unavailable	Firmware update active or canceled. Module does not output process data in this state.	• Wait for firmware update • Restart firmware update
0x02F0 (752)	Pilot valve: Switching cycle counter limit reached	Switching cycle counter warning limit pilot valve reached	Replace pilot valve, reset switching cycle counter
0x02F1 (753)	Actuator: Switching cycle counter limit reached	Switching cycle counter warning limit actuator reached	Maintain actuator, reset switching cycle counter

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Diagnostics no. Hex. (dec)	Diagnostics	Cause	Corrective action
0x02F2 (754)	No valve voltage	EVS active or EVS connection incorrect or module-internal fuse blown	At EVS modules, check EVS connection or replace module
0x02F3 (755)	Pilot valve: Wire break*	Valve defective or faulty contact	Check correct installation of pilot valve, if necessary, replace pilot valve**
0x02F4 (756)	Pilot valve: Short circuit*	Valve defective or faulty contact; output switched off until the error has been eliminated.	
0x02F5 (757)	Internal module fault	Pressure sensor defective	Replace module
0x02F6 (758)	Pressure limit value exceeded	Limit value for pressure monitoring was exceeded	Check pressure supply or adapt limit value
0x02F7 (759)	Pressure limit value undercut	Limit value for pressure monitoring was undercut	

*) At electronic base modules with EVS: Diagnostics for short circuit and wire break remain if they occurred before “EVS activation”. Short circuits and wire breaks that occur after “EVS activation” do not trigger diagnostics.

**) If EVS is activated during a short circuit and the valve is then replaced, the short circuit diagnostics may subsequently remain. In this case, deactivate EVS, then disconnect the valve briefly.

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11.7 PROFIenergy

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PROFIenergy is only supported by SIMATIC ET 200SP; not by SIMATIC ET 200SP HA.

PROFIenergy is a data interface based on PROFINET for switching off consumers centrally and with full coordination during idle times in order to reduce the energy demands of the controlled system significantly. This operating state is termed "Pause" in PROFIenergy.

Activation of the pause state of PROFINET devices occurs via special commands in the user program of the PROFINET IO controller.

The electronic base modules ("PQ…") of the valve block Type 8647 support the PROFIenergy function.

11.7.1 "Pause" behavior and "Pause" control

11.7.1.1 LED displays

In general, PROFIenergy does not have an effect on the LED displays, "PROFIenergy active" is shown on the LC display.

11.7.1.2 Reaction when recognizing errors

The fault "No load voltage L+" is detected, reported, and ends the "Pause" function irrespective of the pause status. All channels whose pause mode is set to "PE_MODE_PROCEED" report faults as in productive operation.

The following rules apply to channels which switch to a pause mode other than "PE_MODE_PROCEED":

- Faults that are unrelated to the switch to "Pause" are reported.
- If error recognition is possible during "Pause", these errors continue to be reported.
- All fault messages which are caused by the switch to "Pause" are suppressed.

The following applies if error recognition is not possible during the "Pause":

- The status of faults already pending before the "Pause" is retained.
- Incoming and outgoing faults are reported once the "Pause" has ended.

Switching to "Pause" and out of "Pause" may cause a fault to be reported.

11.7.2 Parameter assignment

Parameter assignment of PROFIenergy takes place by means of the user program and parameter data record (version 2), index 3. The interface module distributes the PROFIenergy parameters to the electronic base modules ("PQ…").

The parameter assignment of an additional pause behavior is possible immediately after the start of the previous "Pause". The required state for the following pause is activated with a new "Start_Pause" command.

The parameter assignment can be written as often as necessary.

The interface module checks the distribution of the parameters to the electronic base modules and returns the result of the write job by means of a return value. In case of a negative return value, there are one or more electronic base modules that have not accepted the parameter data record. In this case, the electronic base modules respond according to their last valid PROFIenergy parameter assignment with an incoming "Start_Pause" command.

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Parameter assignment by means of the parameter data record has to be repeated in case of an electronic base module failure or station failure.

SIMATIC ET 200SP supports the setting for the behavior of **1** “Pause”. If a different reaction is required **for an additional** “Pause”, it must be parameterized again.

The response (shutdown) of the electronic base modules to PROFIenergy is related to the slot, which means that **all** channels of the slot show the same behavior.

11.7.3 Parameter data record

Which electronic base modules (slots) are controlled with PROFIenergy commands is specified in the parameter data record for PROFIenergy.

11.7.4 Ending a “Pause”

The pause is ended in the following cases:

- Supply voltage L+ has failed
- Re-parameterization of the electronic base module with DS128
- “End_Pause” command
- Controller failure
- Firmware update
- Station stop
- Interface module restart

For further information, refer to the product information PROFIenergy in the manual collection for SIMATIC ET 200SP: https://support.industry.siemens.com/cs/ww/en/view/84133942

11.8 Switching cycle counter

Access to the switching cycle counters (reading current counters, resetting counters) takes place via acyclic communication, see chapter “9.4 Parameters of the AirLINE SP modules”.

Setting values for warning limits: see “9 Configuration”.

Current counter readings are regularly stored as remanent data in the electronic base modules.

If the operating voltage is switched off frequently, some switching cycles may not be recorded in the remanent memory and, as a result, the number of saved switching cycles may be slightly less than the number of actually occurred switching cycles.

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12 MAINTENANCE

12.1 Safety instructions

DANGER

Risk of injury due to pressure change.

Actuators can change their position due to pressure change which may result in injury or material damage.

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

Risk of injury from high pressure.

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

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

WARNING

Risk of injury due to electric shock.

► Before working on the device or system, switch off the power supply. Secure against reactivation.

► Observe applicable accident prevention and safety regulations for electrical equipment. (Replacement of valves is also permitted when power is supplied.)

Risk of injury due to improper installation and maintenance.

► Only trained technicians may perform installation and maintenance work.

► Perform installation and maintenance work with suitable tools only.

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

► Secure system against unintentional activation.

► Ensure that the system does not start up in an uncontrolled manner.

CAUTION

Risk of injury due to hot device components.

A longer duty cycle may result in the valves becoming hot.

► Let the valves cool down before removing them or wear heat-resistant protective gloves

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12.2 Replace valve

DANGER

Risk of injury due to pressure change.

Actuators can change their position due to pressure change which may result in injury or material damage.

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

Risk of injury due to high pressure at pneumatic base modules without P shutoff.

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

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

Risk of injury due to pressure change at pneumatic base modules with P shutoff.

When the valve is removed, only the P channel is shut off. As a result, the existing pressure at the outputs A or B is released. An interconnected actuator is thus also depressurized, which may result in actuator movement.

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

Risk of deposits or components coming loose.

When releasing a valve under pressure with P shutoff, deposits or aged components may come loose.

▶ Use suitable safety glasses when replacing valves.

CAUTION

Risk of malfunction of the valve block.

Single valves REV.1 and REV.2 are not compatible.

▶ Replace single valves REV.1 only with single valves REV.1.

▶ Replace single valves REV.2 only with single valves REV.2.

For distinguishing features of the single valves, see chapter “5.5.3”, page 21

Pneumatic base modules with “P shutoff”:

If the pneumatic base module in question is equipped with “P shutoff” (marked at the module), a valve can also be replaced when supply pressure is present.

When the valve is removed, a relatively large amount of air is initially blown into the open for functional reasons until the required pressure difference is reached. Due to the automatic shutoff, residual leakage is reduced to a minimum and the remaining valves of the valve block can still operate.

It is not recommendable to remove several valves from the pneumatic base module at the same time.

→ Using a screwdriver, loosen the fastening screws of the valve.

→ Remove the valve with flange seal from the valve block.

→ Connect a new valve with correctly inserted flange seals to the valve slot.

→ Tighten the fastening screws in diagonal pairs while observe the permitted tightening torque (see “Figure 40”).

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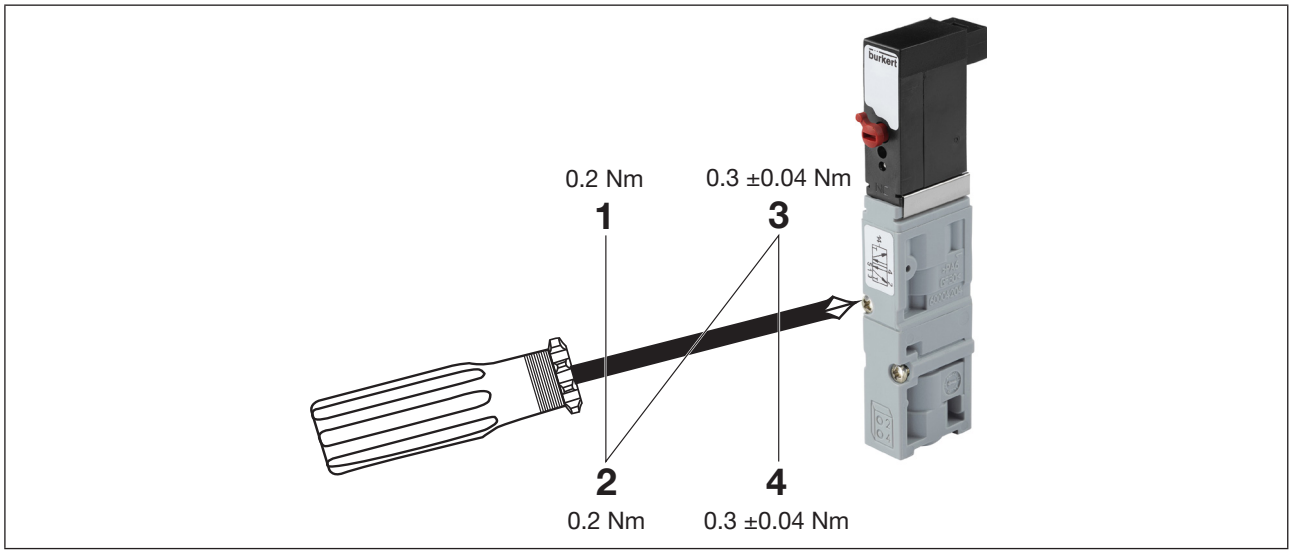


Figure 40: Tightening the screws when replacing the valve

12.3 Firmware update

Both the connection units (“PSU…”) and the electronic base modules (“PQ…”) provide the option of a firmware update.

If available, update files are provided at www.burkert.com

The update can, e.g., be executed via the SIMATIC TIA Portal. When using an interface module with integrated CPU, the update can also be carried out using an SD card.

If the firmware is updated via the webserver of a CPU, a warning message may occur regarding the file name of the update file. This warning message can be ignored

Detailed information on executing firmware updates on ET 200SP systems can be found in the system manual of SIMATIC ET 200SP:
https://support.industry.siemens.com/cs/ww/en/view/58649293

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13 TROUBLESHOOTING

13.1 Valve reaction

Malfunction	Possible cause	Corrective action
Valves do not switch	• No or insufficient load voltage	→ Check the electrical connection → Ensure correct load voltage
	• Manual override of the valves not in neutral position	→ Bring manual override into neutral position
	• Inadequate or no pressure supply	→ Design the pressure supply with the largest possible volume (even for upstream devices such as pressure controllers, maintenance units, shut-off valves, etc.). → Ensure a minimum operating pressure of 2.5 bar for valves without auxiliary control air
	• Incorrect configuration	→ Configure the system according to the hardware set-up
	• Channel not released for use	→ Change adjustment of the parameters
	• Device outputs substitute values	→ Eliminate the cause for substitute values (e.g. communication interrupted or PROFIenergy activated)
	• For valves with a second connection for shutdown function: Valve connection interrupted	→ Check connection
	• Load voltage supply at EVS connection interrupted (only modules with EVS connection)	→ Check wiring and activation of EVS connection
	• Module-internal fuse has tripped or other module defect	→ Replace electronics module (please contact the Bürkert Service)
Valves switch with a delay or blow off at the deaeration connections	• Inadequate or no pressure supply	→ Design the pressure supply with the largest possible volume (even for upstream devices such as pressure controllers, maintenance units, shut-off valves, etc.). → For valves without auxiliary control air: Ensure a minimum operating pressure of 2.5 bar
	• Valves are not in home position (de-energized) during pressure build-up	→ Before switching the valves, pressurize the valve block
	• Deaeration of the exhaust air ducts inadequate due to too small or dirty silencers (back pressures)	→ Use appropriately sized silencers or expansion tanks → Clean dirty silencers
	• Impurities or foreign objects in the pilot valve	→ Replace valve

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13.2 Module reaction

13.2.1 LED display PSU-L-...connection units

Malfunction	Possible cause	Corrective action
LED PWR OK off	• No or insufficient load voltage (see chapter “14 Technical data”	→ Check the electrical connection → Ensure correct load voltage
	• Module-internal fuse has tripped or other module defect	→ Replace connection unit (please contact the Bürkert Service)

13.2.2 LED display PQ modules and PSU-...-PS connection units

Malfunction	Possible cause	Corrective action
LED DIAG off	• Backplane bus supply of ET 200SP / SP HA faulty	→ Check operating voltage of the interface module → Check correct arrangement of ET 200SP / SP HA modules and valve block
LED DIAG flashes green	• Module not ready for operation (not parameterized)	→ Carry out valid parameterization via the configuration tool
LED DIAG flashes red	• Module is parameterized, module sends diagnostics	→ Eliminate cause for diagnostics
LED PWR off (only PQ modules)	• No or insufficient load voltage	→ Check the electrical connection → Ensure correct load voltage
	• Module-internal fuse has tripped or other module defect	→ Replace electronics module (please contact the Bürkert Service)
	• Load voltage supply at EVS connection interrupted (only modules with EVS connection)	→ Check wiring of EVS connection
LED Pressure lights up orange (“Warn”, only PSU-...-PS connection units)	• Parameterized warning limit undercut	→ Increase pressure or → Set a lower warning limit
	• Parameterized warning limit exceeded	→ Reduce pressure or → Set higher warning limit
LED Pressure lights up red (“Error”, only PSU-...-PS connection units)	• Parameterized error limit undercut	→ Increase pressure or → Set lower error limit
	• Parameterized error limit exceeded	→ Reduce pressure or → Set higher error limit

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13.3 LC display of PQ modules

An overview of the possible display contents is provided in chapter "LC display of electronic base modules", page 80.

Message	Possible cause	Corrective action
No message, LC display off	• No or insufficient load voltage	→ Check the electrical connection → Ensure correct load voltage
	• Voltage interruption during firmware update	→ Execute firmware update again
EVS active	• Load voltage supply at EVS connection interrupted (only modules with EVS connection)	→ Check wiring of EVS connection
	• Module-internal fuse has tripped (can only occur in the event of extreme faults) or other module defect	→ Replace electronics module (please contact the Bürkert Service)
Feedback Err Down x or **Feedback Err Up x**	• Error at lower or upper feedback indicator to channel x	→ Eliminate error at feedback indicator
	• Input units do not deliver QI values*	→ Use input units with QI support (or set QI for the respective channel to 1 if the sensor does not deliver QI but QI is to be used as other sensors deliver the QI) or → Configure PQ module without QI
Pilot SCC Limit Ch. x or **Act. SCC Limit Ch. x**	• Warning limit switching cycle counter pilot valve or actuator exceeded	→ Replace pilot valve or maintain actuator and reset switching cycle counter or → Deactivate switching cycle counter or → Increase warning limit switching cycle counter
Short Circuit Ch. x	• Short circuit on output channel x (valve or plug-in connection faulty)	→ Check plug-in connection → Replace valve
Wire Break Ch. x	• Wire break on output channel x (valve or plug-in connection faulty)	→ Check plug-in connection → Replace valve
Display permanently shows **Pressure …**	• Module has been configured with permanent pressure display	→ Change module configuration (pressure display alternating with switching positions of the outputs or deactivate pressure display)

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Message	Possible cause	Corrective action
… SCC Limit …, Short Circuit … or Wire Break … But no diagnostics message on the control	• Diagnostics of the channel in question not activated during configuration	→ Activate diagnostics of the channel in question
	• Channel not activated during configuration	→ Activate channel

*) QI = Quality Information (value status). Input units that monitor the status of a connected feedback indicator (e.g. current loop), can deliver a value status. This can be output on the display of the PQ modules.

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13.4 Recommended action for push-in connectors

Our push-in connectors meet the requirements specified in the ISO 14743:2020 standard. However, if you encounter leakage or retention problems when installing pneumatic hoses in the push-in connectors, you can take the following measures:

Use suitable materials

→ Ensure that the appropriate combination of hose material (polyamide or polyurethane) and push-in connector is used, as different materials require different holding forces.

Check the hose size

→ Ensure that the outer diameter of the hose matches the specification of the push-in connector. Hoses that are too small or too large may not sit correctly in the push-in connector.

According to ISO 14743:2020, depending on the outer diameter (OD) of the hose, the tolerances must not exceed the following values:

Material	Hose OD [mm]	Permitted deviation OD [mm]
Polyamide (PA)	3…10	±0.08
	12…16	±0.1
Polyurethane (PU)	3…8	±0.1
	10…16	±0.15

Check the hose for damage

→ Check the hose for visible damage such as cracks, kinks or wear. Such defects can prevent the hose from seating properly in the push-in connector.

Cut the hose correctly

→ Cut the hose straight. Cutting it diagonally adversely affects the holding force. If the hose is not seated evenly in the push-in connector, the holding force is reduced and the seal between the push-in connector and hose is no longer sufficient. Furthermore, the pressure will be distributed unevenly in the system, which can cause the hose to slip or be pulled out of the push-in connector under pressure.

Insert the hose correctly

→ Press the hose into the push-in connector with sufficient force. The hose must be inserted deep enough into the push-in connector so that it is held correctly by the claws.

Check the push-in connector system

→ Ensure that the push-in connector system is designed for the corresponding operating conditions. The push-in connectors must function reliably at pressures from –0.09 MPa (–0.9 bar) to 1.6 MPa (16 bar) and be designed for temperatures from –20 °C to +80 °C. Even if the operating conditions for push-in connectors are specified in accordance with ISO 14743:2020, the specific operating conditions of the product used (e.g. those of a valve island) must be taken into account.

Check the holding capacity of the push-in connector

→ When installing the hose, make sure that it is firmly seated in the push-in connector and can reliably withstand the specified minimum tensile forces to ensure a secure connection. It is recommended not to increase the load beyond what is necessary, as excessive tensile force can impair the function and safety of the connection.

For orientation: depending on body weight and fitness, an average person can apply forces of around 300 to 500 N when pulling.

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Hose OD, D, mm	3	4	6	8	10	12	14	16
Hose OD, D, in (mm)	1/8 (3.17)	5/32 (4)	1/4 (6.35)	5/16 (8)	3/8 (9.52)	1/2 (12.7)	–	5/8 (16)
Minimum tensile force for polyamide hose (PA), N	60	70	120	170	250	300	300	350
Minimum tensile force for polyurethane hose (PU), N	25	50	100	150	200	200	250	300

Table 5: Minimum tensile force for the tensile test (DIN ISO 14743:2020)

If the problem persists despite the measures taken, it is possible to use support sleeves (ID 20099400). These sleeves help to increase the stability and tightness of hoses in push-in connectors. This is particularly important when softer or more flexible hoses such as polyurethane (PU) ones are used.

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14 TECHNICAL DATA

14.1 Operating conditions

WARNING

Malfunction if used outside.

Extreme outdoor temperatures, condensate formation or UV radiation can impair proper functioning of the system or damage the device permanently.

► Do not use the system outdoors.

► Avoid heat sources, which may cause the permissible temperature range to be exceeded.

NOTE

The permissible operating conditions for Siemens SIMATIC ET 200SP may differ from the values listed below, e.g. depending on the installation position. Failure to observe this may result in malfunction or damage, e.g. due to heat build-up.

► Observe the permissible operating conditions specified in the system manual of the Siemens I/O system.

SIMATIC ET 200SP

System manual:
https://support.industry.siemens.com/cs/ww/en/view/58649293
Manual collection:
https://support.industry.siemens.com/cs/ww/en/view/84133942

SIMATIC ET 200SP HA

System manual:
https://support.industry.siemens.com/cs/ww/en/view/109761547

Manuals:
https://support.industry.siemens.com/cs/ww/en/ps/24728/man

The complete system must be installed in a suitable control cabinet or in a suitable housing. Requirements placed on the control cabinet correspond to those of the distributed I/O system “SIMATIC ET 200SP” or “SIMATIC ET 200SP HA” (Siemens), with a degree of protection of at least IP54.

Type of condition	Permissible range
Ambient temperature	0...+55 °C Valve blocks with valve Type 0460: 0...+50 °C
Humidity	75% on average, 85% occasionally, Condensation not permitted
Air pressure	80 kPa to 106 kPa (When used at heights above 2000 m mean sea level, the power supply must take place via a SELV/PELV power supply unit approved for use at this height.)
Media	Neutral gaseous media, oiled or unoiled Max. particle size 5 µm
Altitude	Restricted to max. 2000 m above sea level for UL approved versions and safety-relevant applications

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14.2 General technical data

Dimensions	max. 858 mm x 142 mm x 78 mm (depending on the extension, valve variants, module variants)
Weight	max. 10 kg (depending on the extension)
Material of the housing	PA, PC (valves: PA / PPS / Al)
Material of the seal	NBR
Degree of protection (according to EN 60529) verified by Bürkert, not evaluated by UL	IP20 IP65 in closed control cabinets
UL Type Rating (according to UL 50/50E)	4X in combination with AirLINE Quick (see chapter “7.4”, page 34) in closed control cabinets
Protection class (according to DIN EN 61140, VDE 0140)	3 Installation on standard rail with FE functional ground required

14.3 Pneumatic data

Control medium	Dry compressed air oiled or unoiled, neutral gases
Compressed air quality as per	ISO 8573-1: 2010, class 7.4.4*
Temperature range of the medium	–10...+50 °C (when using valve Type 0460: +5...+50 °C)
Pressure range	Vacuum up to 10 bar (when using valve Type 0460: 2...7 bar)
Air flow rate (QNn value, for further details see data sheet):	
Monostable valves (Type 6524 and Type 6525)	300 l/min (when using pneumatic base modules with P shutoff/HotSwap function, the flow rate is reduced: REV.1 Flow rate reduction by up to 50% REV.2 Flow rate reduction by approx. 20%)
Impulse valves (Type 0460)	200 l/min
Connections:	
Compressed air supply and exhaust air	G1/4” thread (other connections possible via adapter)
Auxiliary control air or pilot control exhaust air	M5
Working connections	Plug-in coupling D6 or D1/4”
Pressure sensor (connection units PSU-...-PS):	
Measuring range	0...10 bar (relative to environment)
Overpressure resistance	14 bar (with higher pressures, irreversible impairment of the measuring precision)
Precision	0.2 bar
Measurement rate	> 10/second
Filtering	Median filter (additional filtering of the measured value at the control is recommended in case of highly variable media consumption)

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

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14.4 Electrical data

Connections:	
Communication	Due to the arrangement, the modules automatically contact the backplane bus of the I/O system SIMATIC ET 200SP / SP HA.
Load voltage	Due to the arrangement, the modules automatically contact the power bus of the I/O system SIMATIC ET 200SP. **Exception:** The power bus is not continued at the right-hand interface. If further function modules of the SIMATIC ET 200SP I/O system are added to the right of the valve block, (not permissible in combination with SIMATIC ET 200SP HA), the load voltage must be re-supplied for the modules.
EVS connection (optional)	Pluggable screw-type terminal, 2-pole, for wires with a cable cross-section of 0.14...1.5 mm^2 (in accordance with AWG 28-16)
Power supply voltage:	
Backplane bus	Central supply through the interface module of SIMATIC ET 200SP / SP HA
Load side (valves)	24 V ⎓ ±10% SELV / PELV, max. residual ripple 2.4 Vss**
Power consumption (load side)	Depending on the system extension, max. 3 A (also see chapter “14.4.1”)
Power consumption of valve block	Depending on the system extension, max. 80 W
Power consumption valves Type 6524 and Type 6525	0.8 W (Type 6524, 2x3/2-way valve: 2 x 0.8 W)
Power consumption valve Type 0460	0.4 W
Fuses (load side)	All valve outputs are protected against short circuits by resettable fuses. After an occurred short circuit has been rectified, it might take a few seconds for the fuse to reset. Additionally, each electronic base module and the left-hand connection unit are equipped with a fuse (blow fuse).

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

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14.4.1 Maximum power consumption

The maximum power consumption of the system can be calculated using the following table. To do so, multiply and sum up the values for the maximum power consumption with the number of module versions installed in the valve block.

The maximum power consumption only occurs when switching on the valves.

Power consumption (from the load voltage) of the connection units and the electronic base modules

Designation	ID number	Power consumption [mA]		Number of modules	Current [mA]
		min.	max.		
PSU-L	285088	10	15	1	15
PSU-L-M	284112				
PSU-L-PS	292732				
PSU-M	285091	0	0		
PSU-M-M	284944				
PSU-R	285092				
PSU-R-M	284195				
PSU-R-PS	292734				
PQ4VS4	284935	<15	180		
PQ4VS4EVS	285097				
PQ8VS4	284936		345		
PQ8VS4EVS	285098				
PQ8VS4EVS-5/3V	331588				
PQ8VS8	283166	<20	350		
PQ8VS8EVS	285095				
PQ16VS8	284806		680		
PQ16VS8EVS	285096				
				Max. power consumption of the system:	

Table 6: Power consumption of the connection units and the electronic base modules

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14.5 Location and description of the type labels

14.5.1 Valve island type label

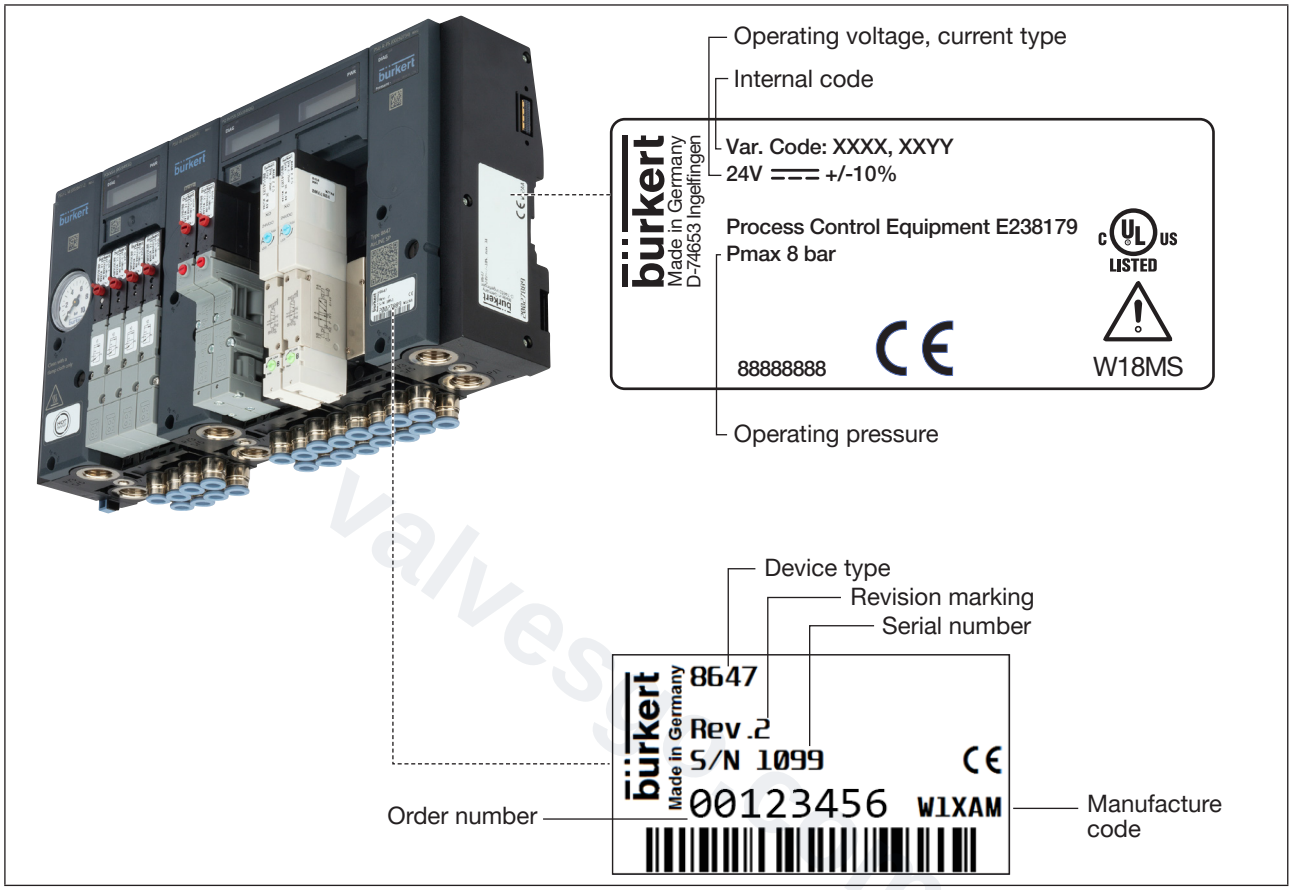


Figure 41: Location and description of the type label (example)

14.5.2 Valve type label

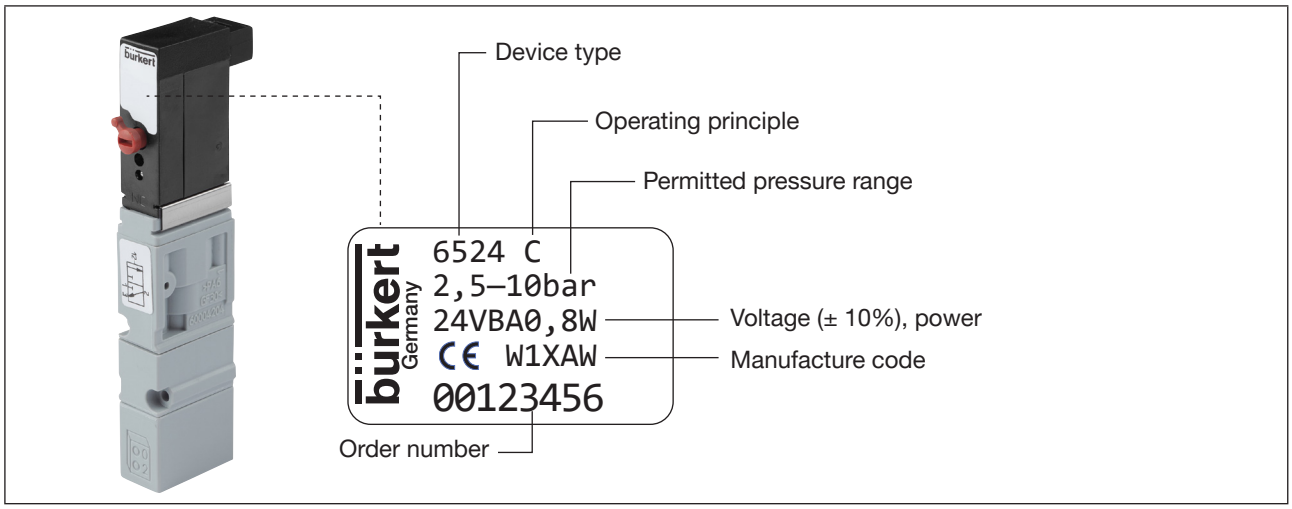
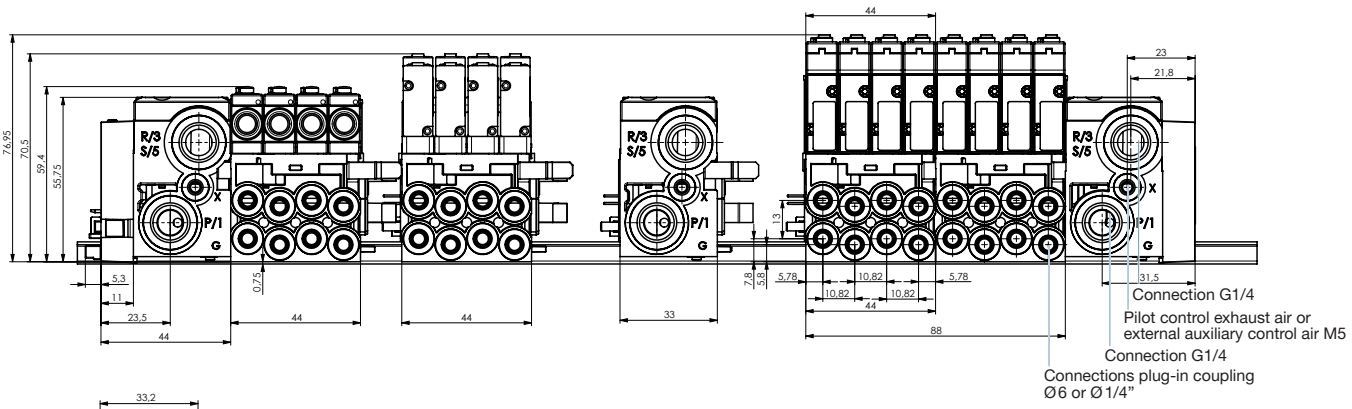


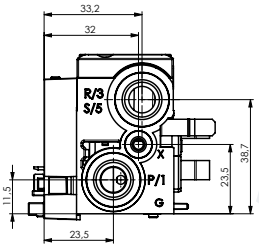
Figure 42: Location and description of the type label (example Type 6524)

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15 DIMENSION DRAWINGS



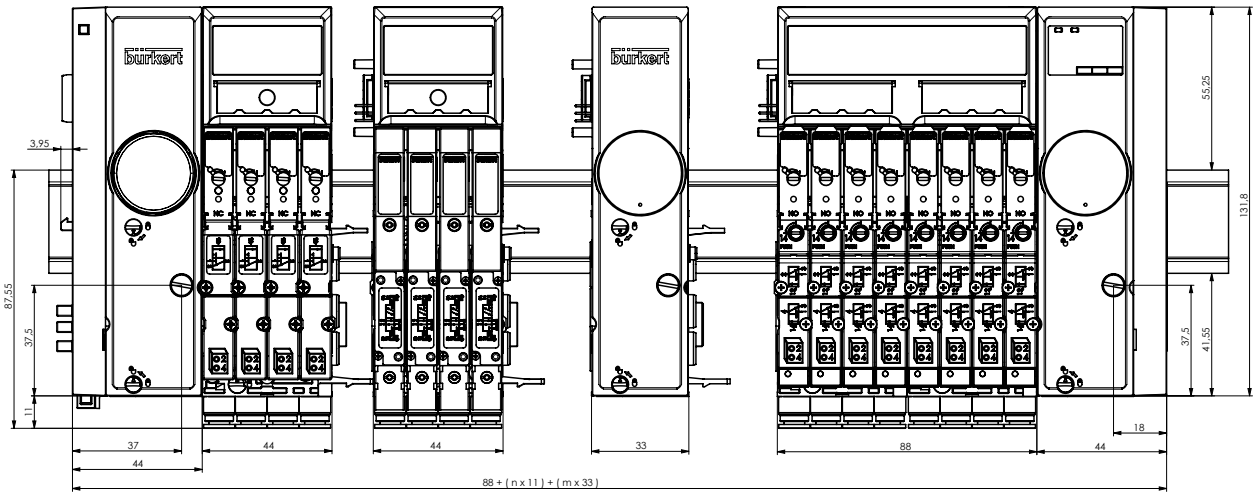


◂ Connection unit on the left

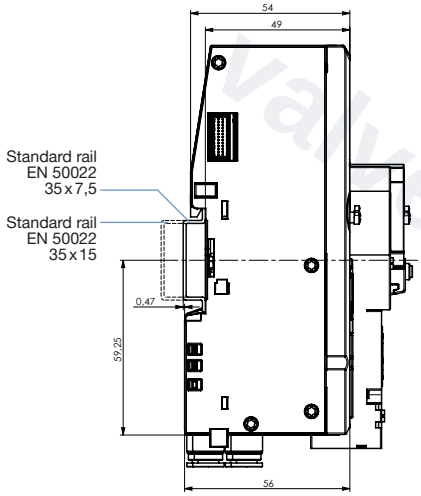
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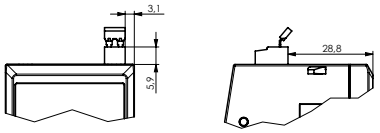
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n = number of valve positions
m = number of connection units in the middle



Variant with EVS



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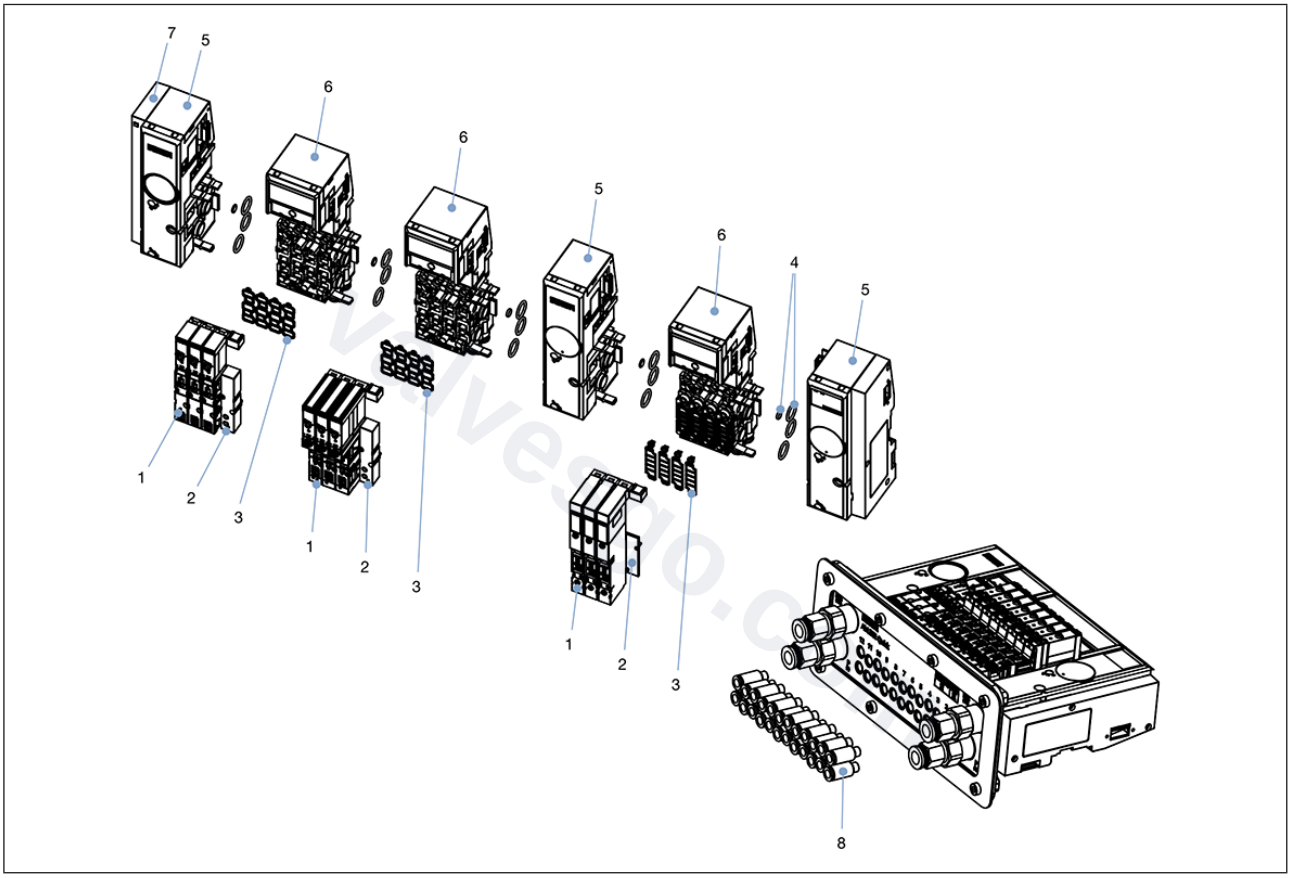
16 ACCESSORIES, SPARE PARTS

CAUTION

Risk of injury and/or damage due to the use of incorrect parts.

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

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



Pos.	Designation	Content	Order no.
1	Type 6524, 6525, 0460 solenoid valves (REV.1/REV.2 see “5.2 Information on compatibility and revision status”, page 14		see data sheet
2	Cover plate for solenoid valves type 6524/6525 (REV.1)	1 cover plate	650373
	Cover plate for solenoid valves type 6524/6525 (REV.2)		661092
	Cover plate for solenoid valves type 6524 2x3/2-way		661092
2	Cover plate		see data sheet

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3	Sets profile seal solenoid valves	on request	
	Type 6524 2x3/2-way	12 seals	2001 6305
	Type 6525 REV.1	12 seals	2002 4334
	Type 6525 REV.2	12 seals	2001 6305
	Type 6524 3/2-way REV.1	12 seals	2002 4333
	Type 6524 3/2-way REV.2	12 seals	2002 4336
	Type 0460	12 seals	2002 4330
4	Set seals units	12 seals	2002 4339
5	Connection units	on request	
6	Valve units	on request	
7	Set interface unit left	1 set	2002 9826
8	Push-in connector Ø6mm Messing	8 pieces	2002 4340
8	Push-in connector Ø6mm VA	8 pieces	2002 4341

The article numbers of the solenoid valve types 6524, 6525 and 0460 and the corresponding cover plates can be found in the data sheets for these types.

16.1 Accessories, spare parts for width per station 11 mm

Different flange patterns of the single valve Types 6524/6525 REV.1 and 6524/6525 REV.2!

**The single valves (3/2-way valve Type 6524 and 5/2-way valve Type 6525) were optimised. Among other things, the channel cross-sections and thus the flange pattern of these valves were revised.
Valves REV.1 and valves REV.2 are therefore different.**

When replacing single valves, observe the following:

- The different design of the mechanical interface prevents 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, take care to ensure that the matching variant of the valve is used.**

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

Additional spare parts are available under Type SVVI. The corresponding article numbers can be found on the data sheet of the valve island or in the Bürkert e-Shop.

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17 PACKAGING, TRANSPORT, STORAGE

CAUTION

Risk of injury due to inappropriate behavior during transportation.

- ▶ Only trained technicians may transport devices.

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

- ▶ Do not transport, install or remove heavy devices without the aid of a second person and using suitable auxiliary equipment.

NOTE

Transport damage.

Inadequately protected devices may be damaged during transportation.

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

Incorrect storage may damage the device.

- ▶ Store the device in a dry and dust-free location.
- ▶ Storage temperature -20...+60 °C.

18 ENVIRONMENTALLY FRIENDLY DISPOSAL



- ▶ Follow national regulations regarding disposal and the environment.
- ▶ Collect electrical and electronic devices separately and dispose of them as special waste.

Further information country.burkert.com.

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19 GLOSSARY

GSD/GSDML file	Device master file The GSD/GSDML file contains the device-specific data of a device required for operating the device via PROFIBUS or PROFINET.
HSP	Hardware Support Package The Hardware Support Package enables a more convenient communication connection of PROFIBUS and PROFINET devices to a master. The application is limited to configuration with Siemens STEP 7
HUP	Hardware Update Package The Hardware Update Package enables a more convenient communication connection of PROFIBUS and PROFINET devices to a master. The application is limited to configuration with Siemens PCS7.

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Template for labels

This editable template allows you to label perforated blank sheets for the pockets of the valve block AirLINE SP type 8647 at a PC/printer.

We recommend doing a test print beforehand on a DIN A4 sheet of paper. Observe the following for the printer settings: DIN A4, no scaling

Perforated blank sheets are included in the valve block's scope of supply and additionally available from your local Bürkert branch office or at www.burkert.com.

top left

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