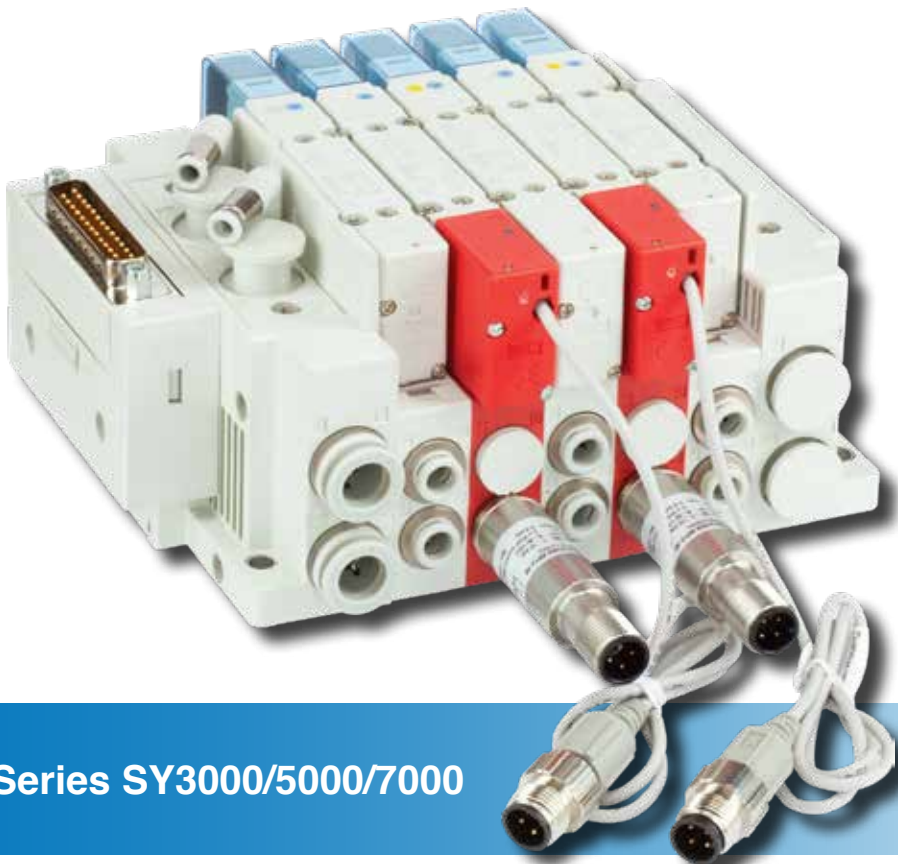


## SMC valve series SY in safety applications

Validated according to the principles of EN ISO 13849



**SMC Valve Series SY3000/5000/7000**

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## More flexibility for safety applications

**SMC is the world's leading manufacturer of pneumatic and electrical automation technology.**

In the development of innovative products, we focus on outstanding performance while at the same time ensuring optimum safety for the user. With sound professional expertise, we support you in the implementation of Machinery Directive 2006/42/EC and in the safe design of your plant, including economic issues.

### **Optimum safety - as early as in the design phase**

We have designed the valve manifolds to be as flexible as possible so that you can rely on familiar SMC safety as early as in the design phase: The SY series is available in the different sizes SY3000, SY5000 and SY7000.

It meets the highest safety requirements according to EN ISO 13849 and can be used up to Performance Level e.

### **Convincing advantages of the SY series:**

- Reliable use for safety-related control methods
- External pilot pressure control valve on the manifold, optionally with pressure monitoring or spool detection
- Working valve with spool detection for direct monitoring of the switch position
- Unique, rubber-sealed, double solenoid valve with detent (according to EN ISO 13849-2)
- Valves with spring return type lead the valve spool into the safety-related basic position
- SISTEMA Library available

### **Maximum process reliability**

The variable high-performance valve manifolds in the SY series hit the mark with practical benefits and meet your most demanding requirements:

- The SY series is also available as a single valve on a single sub-plate
- Long lifetime (min. 200 million cycles) enables high operational safety
- Optionally, two sizes are possible on one valve manifold, thereby saving an additional valve manifold
- Decentralized use directly at the application ensures an optimization the hose lengths (enclosure IP67)
- Power-saving circuits reduce current consumption to one third
- Reduction of the installation space by connections from the one side
- Working inputs are possible in all directions

“**Excellent all-rounder: the valve manifold can be configured exactly to your requirements**”

# Valve series SY in detail

## Modular assembly

### PROFIsafe fieldbus nodes

- ▶ 3 valve zones, 1 module zone
- ▶ 3x8 valve coils per zone, max. 8 output modules



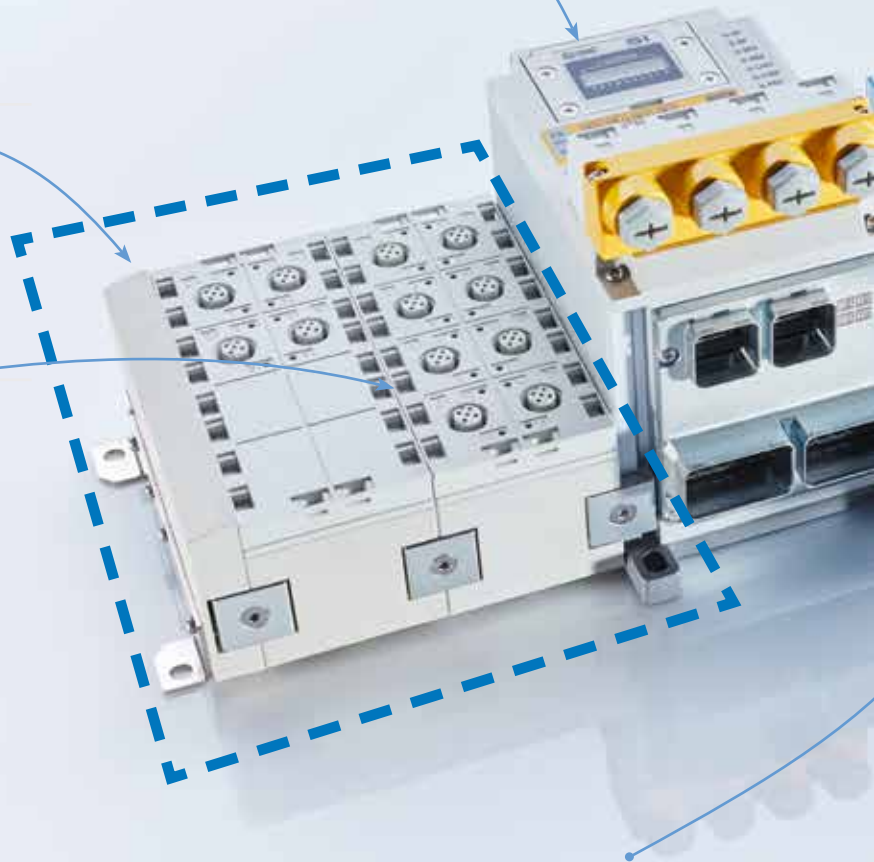
### Module Zone

#### Digital output module

- ▶ 8 outputs, 24V/0.5A per output
- ▶ Short circuit protection

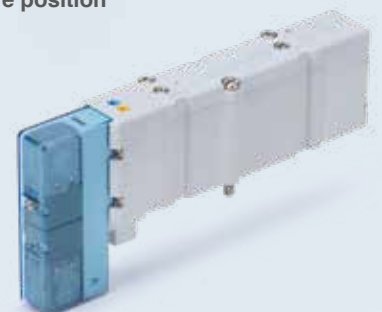
#### Digital input module

- ▶ 16 inputs, 24V/0.5A per socket
- ▶ Short circuit protection



### Double solenoid valve with detent

- ▶ Main valve is held in a secure position

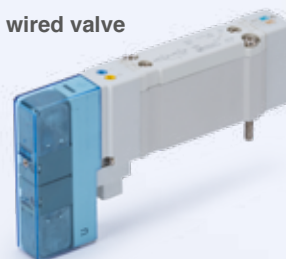


### External pilot pressure control valve

- ▶ Controlling the external pilot air inside the valve manifold
- ▶ Available with and without spool detection
- ▶ When the pilot air supply or the electrical signal is cut, the main valve returns to the original position by a pure spring return.

### Single solenoid valve with spring return

- ▶ When the pilot air supply or the electrical signal is cut, the main valve returns to the original position by a pure spring return.
- ▶ Also available as individually wired valve



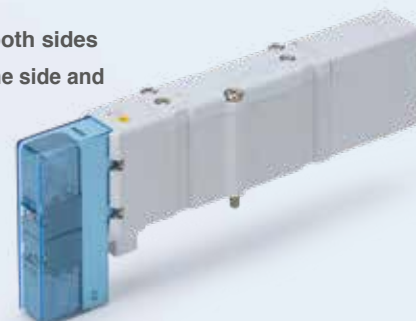
### Non-locking push type manual override

Locking-type manual overrides are not permitted in safety-related applications



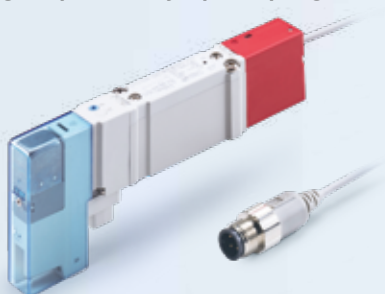
### 5/3 position valve

- ▶ With spring return on both sides
- ▶ With spring return on one side and detent on the other side



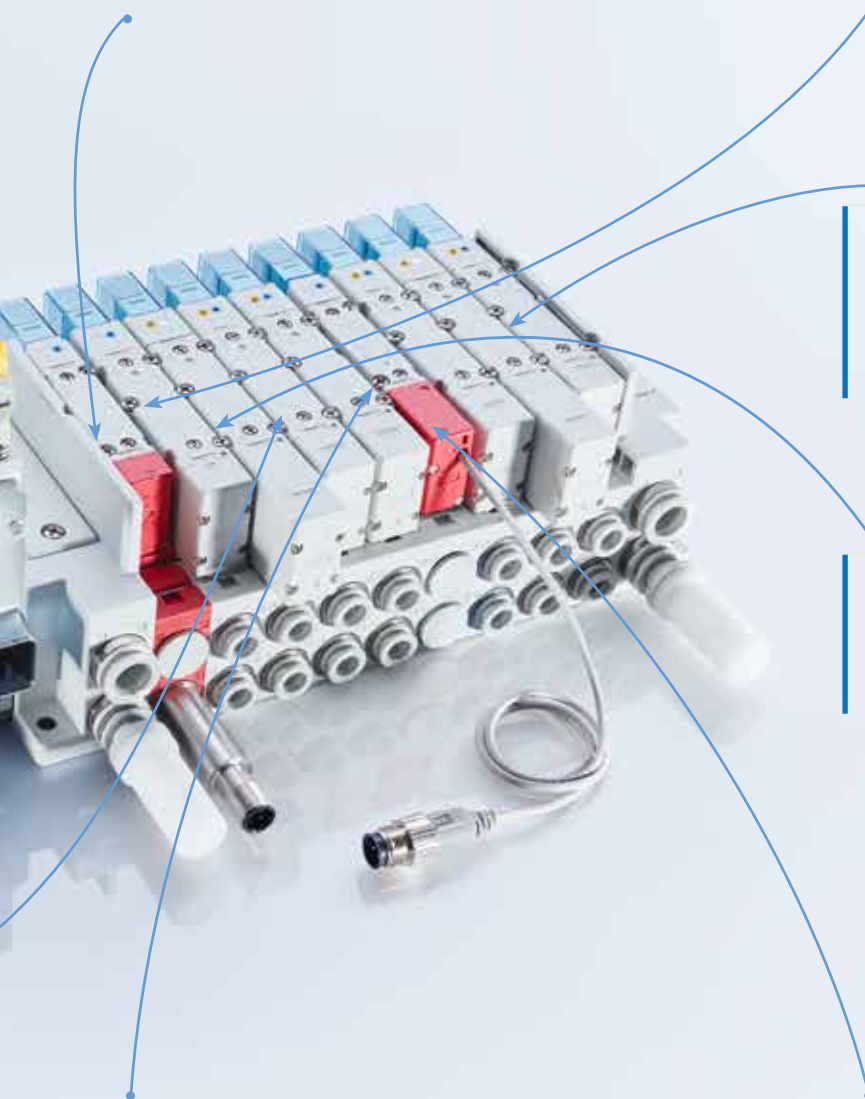
### Single solenoid working valve with spool detection

- ▶ Position of the main spool is monitored
- ▶ When the pilot air supply or the electrical signal is cut, the main valve returns to the original position by a pure spring return.
- ▶ Use as working valve



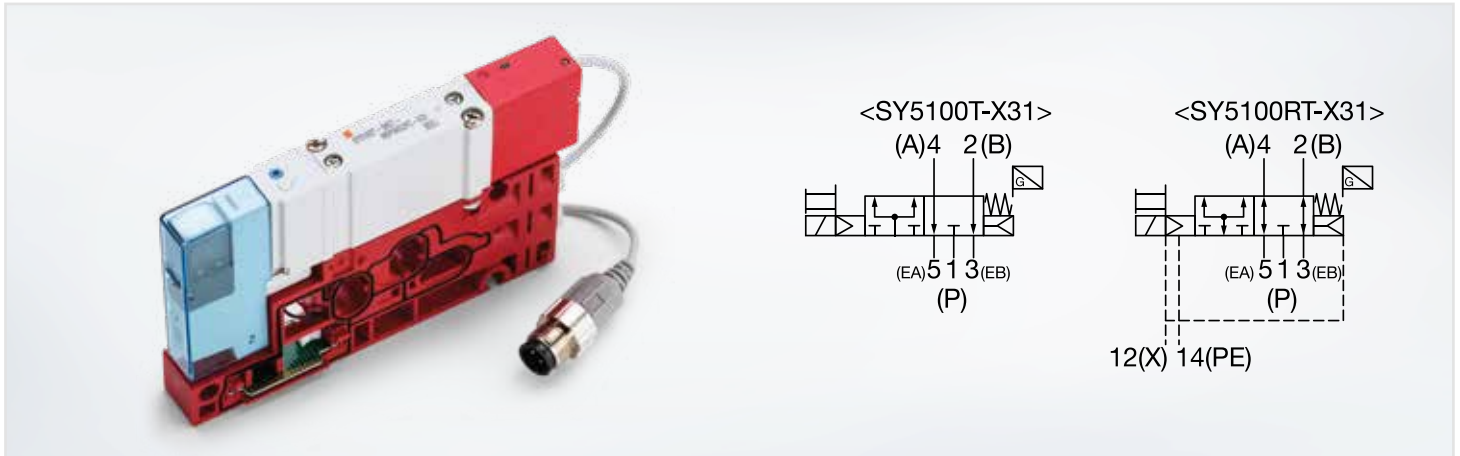
### Spool position detection for diagnostics

- ▶ Position of the main spool is monitored
- ▶ Diagnosis of the main spool position of the external pilot pressure control valve
- ▶ When the pilot air supply or the electrical signal is cut, the main valve returns to the original position by a pure spring return.



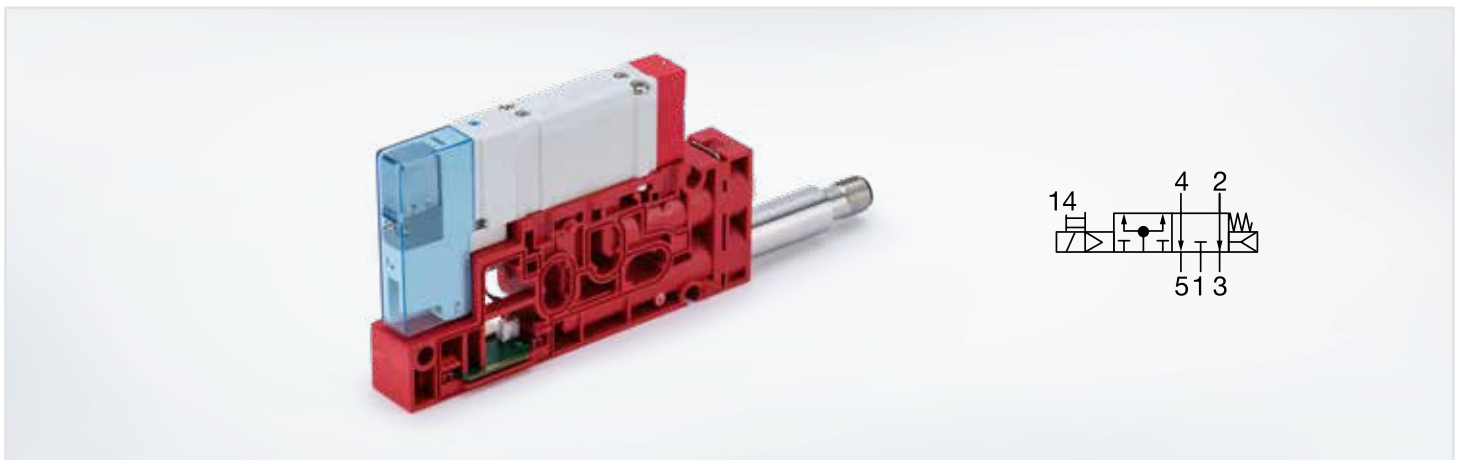
# External pilot pressure control valve

**SY5100-X31**  
**SY5100-X310**  
**SY5100-X74**



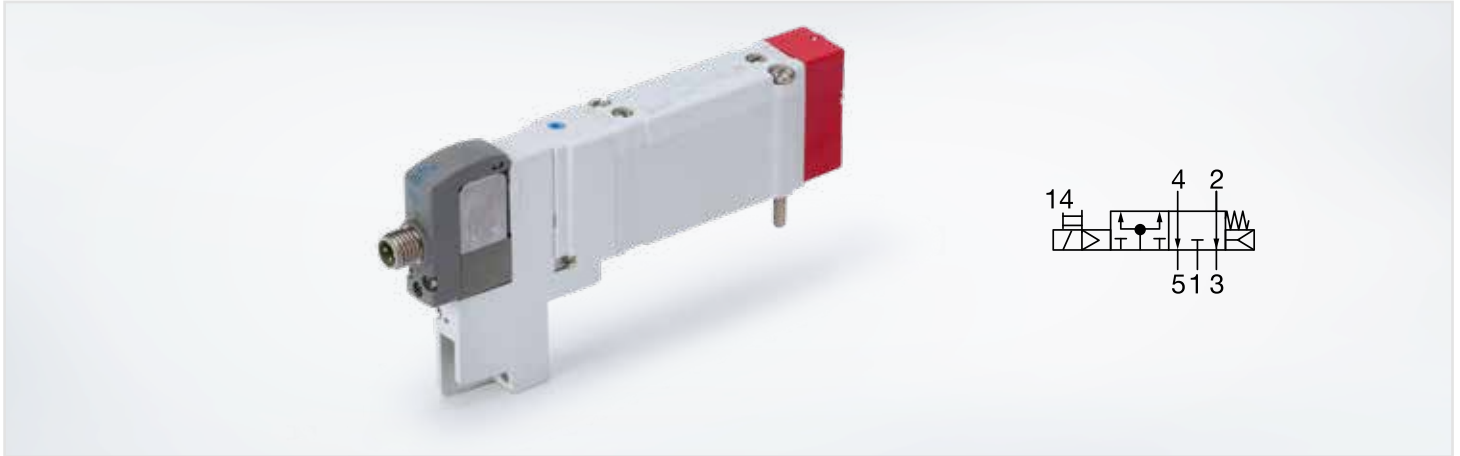
## SY5100-X31

- ▶ With spool position detection
- ▶ Also available: SY5100-X32 w/M8 connector and spool position detection



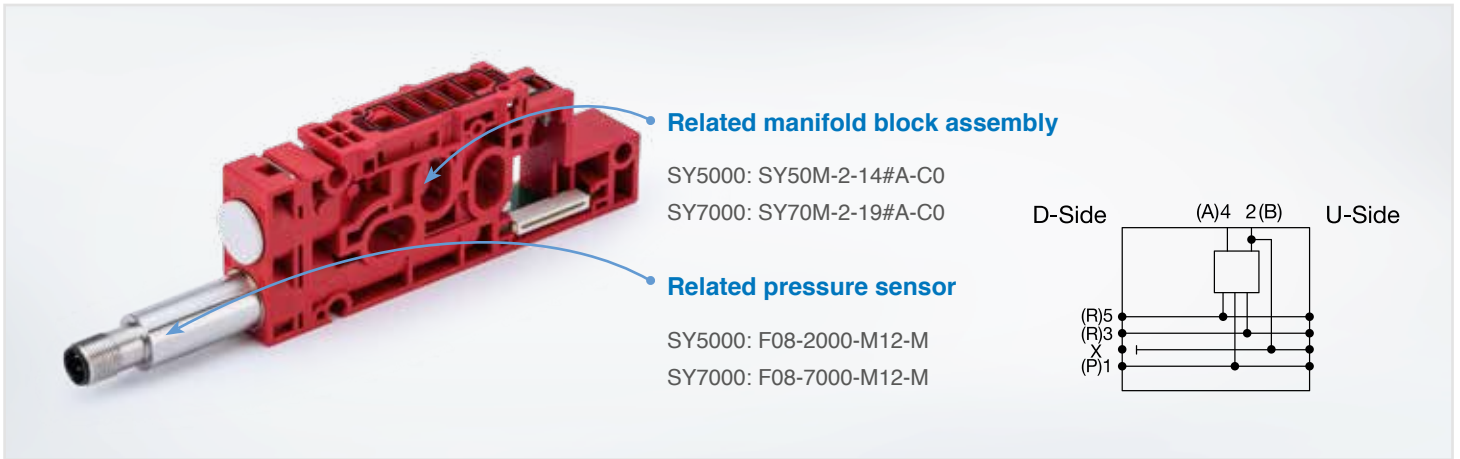
## SY5100-X310

- ▶ With pressure detection (optional)



**SY5100-X74**

▶ With M8 connector

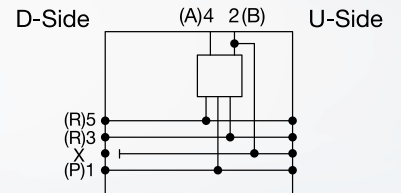


**Related manifold block assembly**

SY5000: SY50M-2-14#A-C0  
 SY7000: SY70M-2-19#A-C0

**Related pressure sensor**

SY5000: F08-2000-M12-M  
 SY7000: F08-7000-M12-M



**Manifold Body Assembly**

**Application**

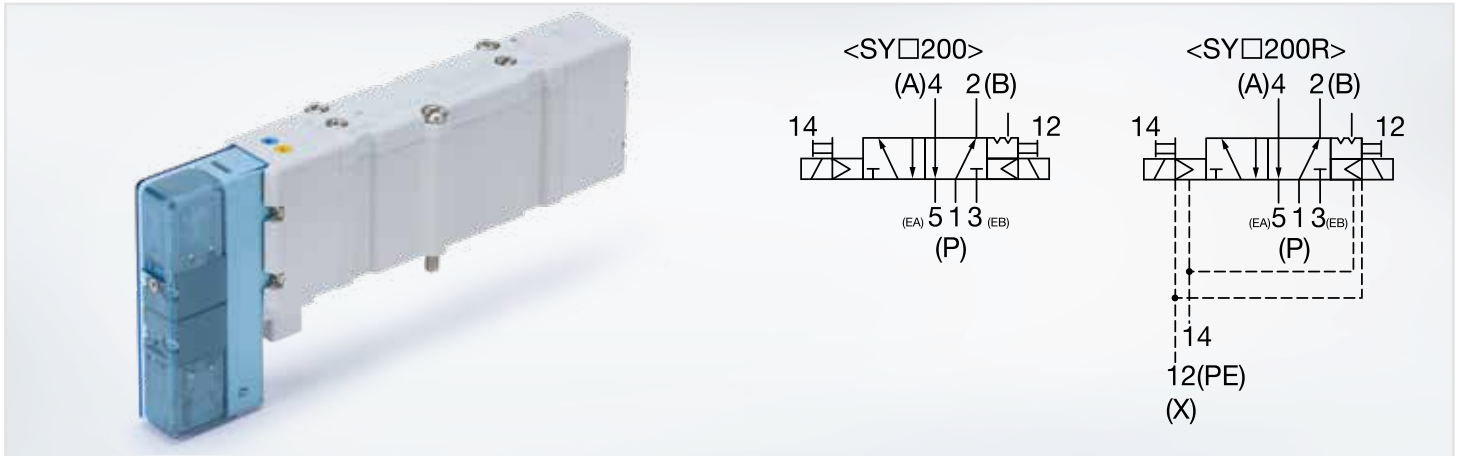
- ▶ Control of the external pilot air within the valve manifold
- ▶ Complies with basic and proven safety principles according to EN ISO 13849-2
- ▶ External pilot air can be released inside the valve manifold by a valve

# Double solenoid valves with detent

SY3200-X25

SY5200-X25

SY7200-X25



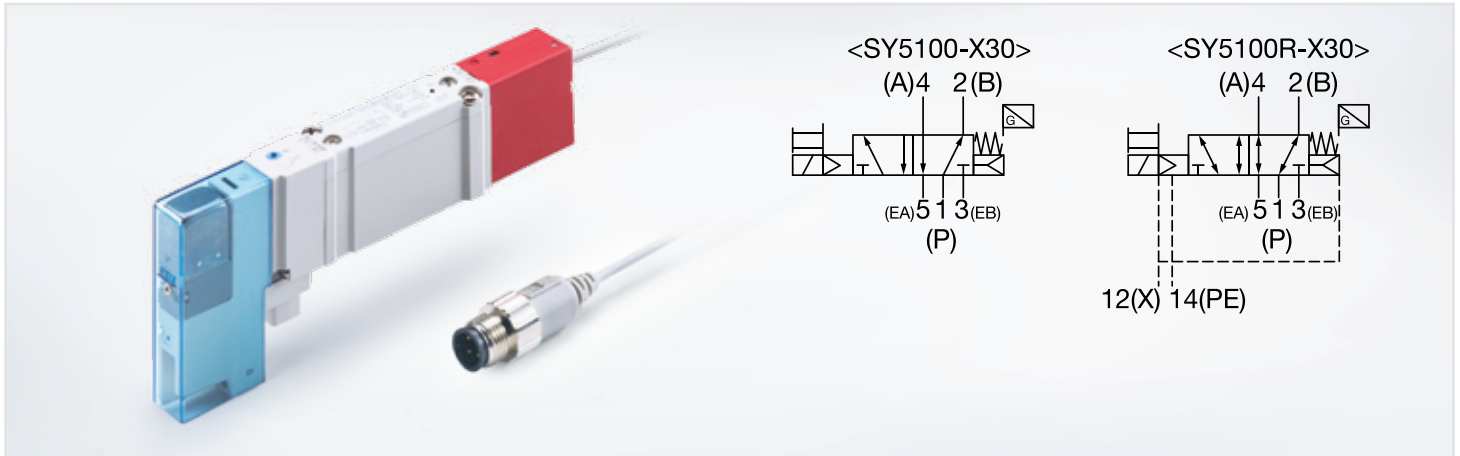
## Application

- ▶ The intended use of this valve is to control an actuator
- ▶ Rubber-sealed valve with detent on both sides (according to EN ISO 13849-2)
- ▶ Main spool is held in the respective secured position by a mechanical detent
- ▶ Complies with basic and proven safety principles according to EN ISO 13849-2



# Single solenoid valves with spool position detection

## SY5100-X30



## Application

- ▶ The intended use of this valve is to control an actuator
- ▶ Working valve with pure spring return
- ▶ With spool position detection
- ▶ When the pilot air supply or the electrical signal is cut, the main valve returns to the original position by a pure spring return.
- ▶ Complies with basic and proven safety principles according to EN ISO 13849-2

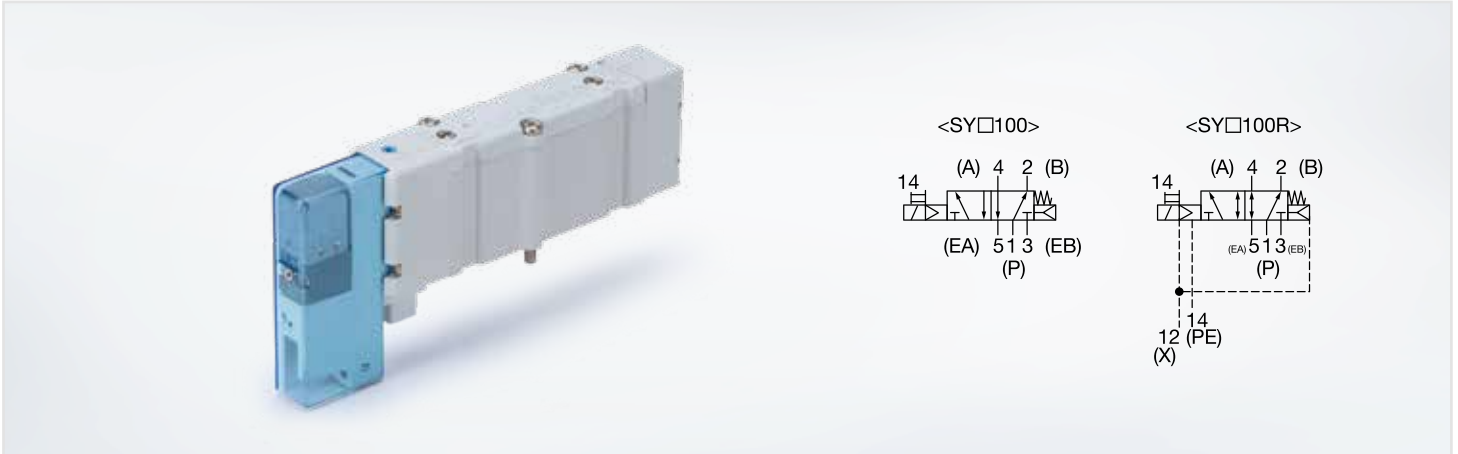
# Spring return valves

**SY3000/5000/7000-X350**

**SY5000-X49**

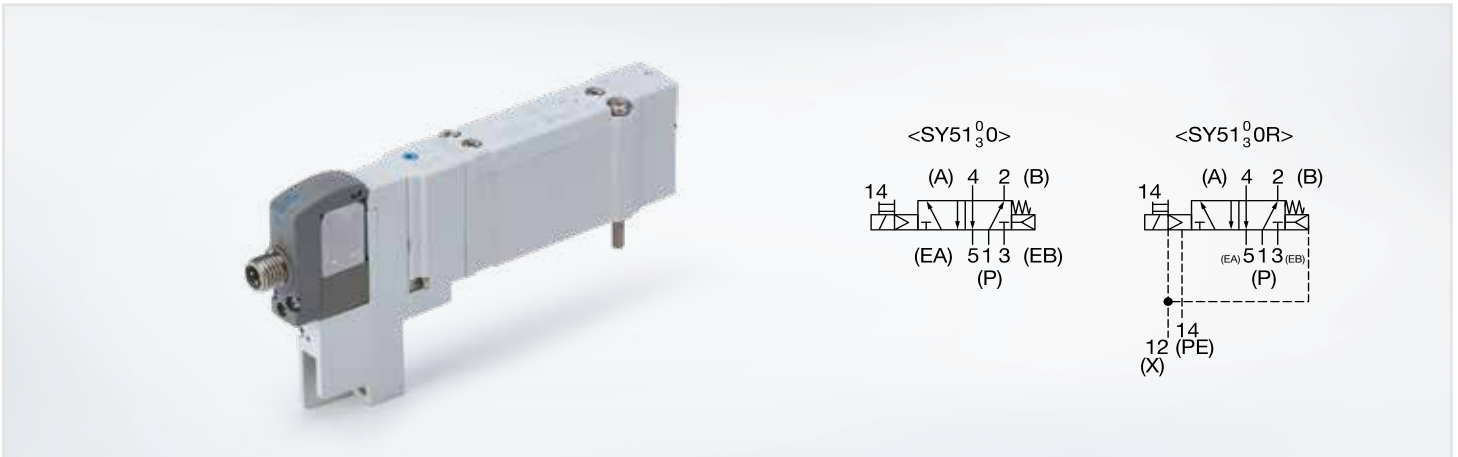
**SY5000-X67**

**SY7000-X323**



**SY3000/5000/7000-X350**

► Pure spring return valve



**SY5000-X49**

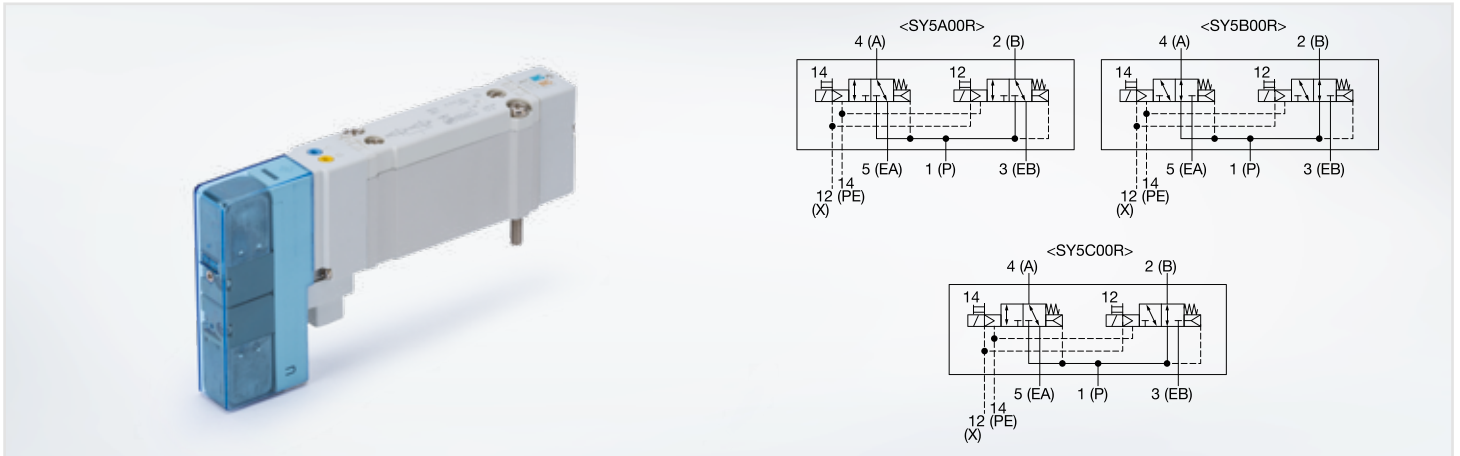
► Pure spring return valve

► Individually wired with M8 connector

## Application

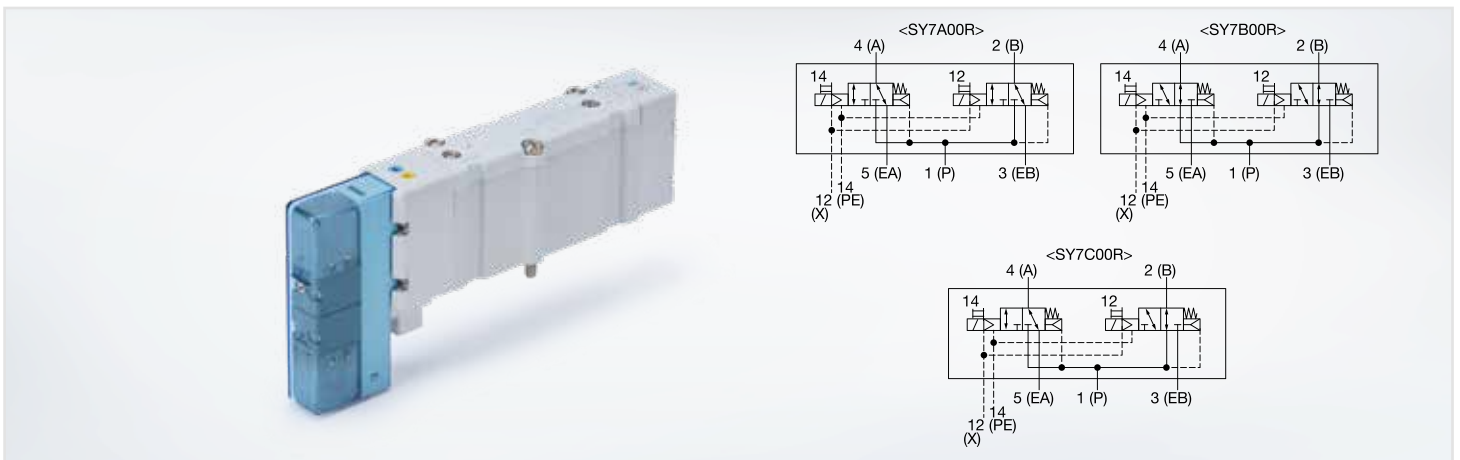
- The intended use of this valve is to control an actuator
- Complies with basic and proven safety principles according to EN ISO 13849-2

- When the pilot air supply or the electrical signal is cut, the main valve returns to the original position by a pure spring return.



**SY5000-X67**

▶ 2x3/2-4 position dual 3-port valve with pure spring return

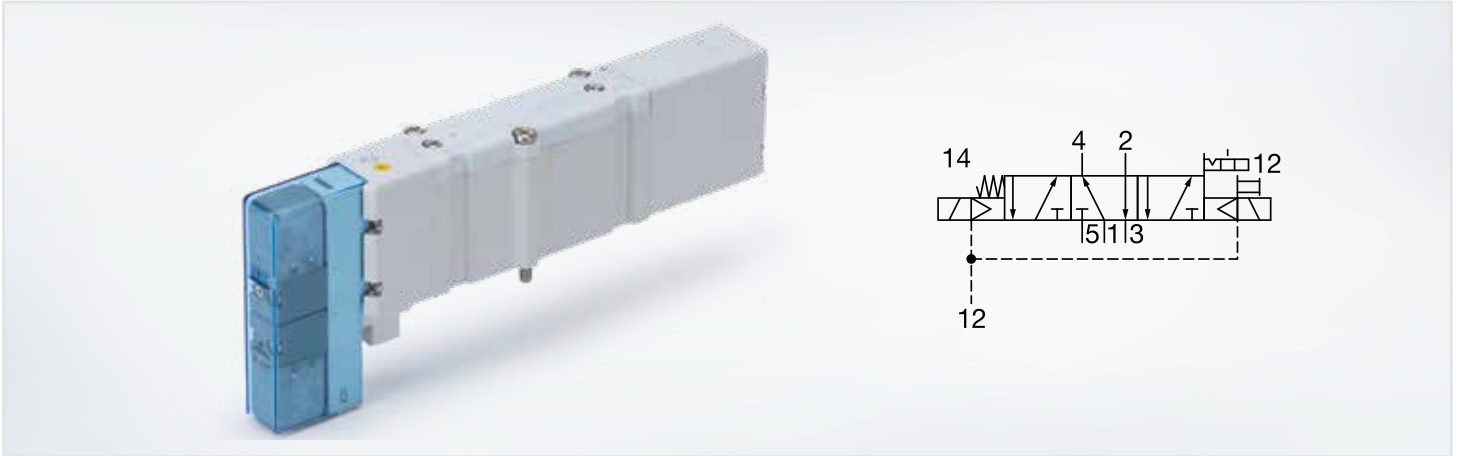


**SY7000-X323**

▶ 2x3/2-4 position dual 3-port valve with pure spring return

# 5/3-3-position valve with spring return on one side and detent on the other side

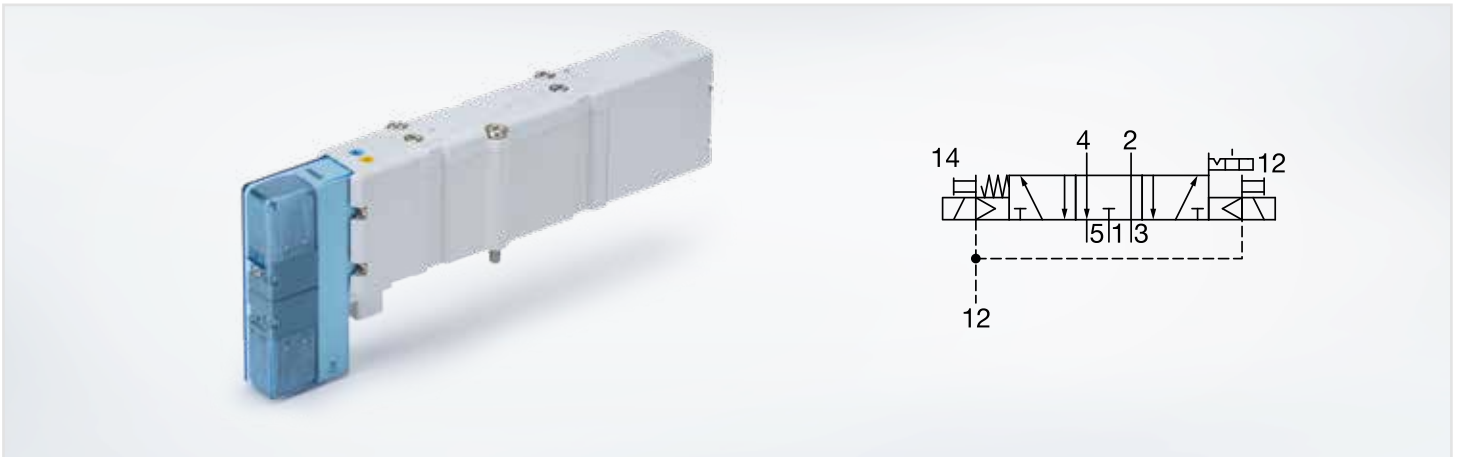
## SY7700-X311



### SY7700-X311

- ▶ Only the B coil has a non-locking manual override
- ▶ 5/3-3-position valve with special function
  - Middle position – output A(4) pressurized with air
  - Switching position A and B - Output B(2) pressurized with air

## SY7400-X312



### SY7400-X312

- ▶ Middle position exhausted

## Application

- ▶ The intended use of this valve is to control an actuator
- ▶ Complies with basic and proven safety principles according to EN ISO 13849-2
- ▶ A side with detent and B side with spring return

# Zone switch-off

EX9-PE1-X61  
 EX9-PE1-X62  
 EX9-PE1-X63  
 EX9-PE1-X64



## EX9-PE1-X61

- ▶ Switch-off of valve coil 1-4
- ▶ Switch-off of valve coil 5-8

## EX9-PE1-X62

- ▶ Switch-off of valve coil 9-12
- ▶ Switch-off of valve coil 13-16

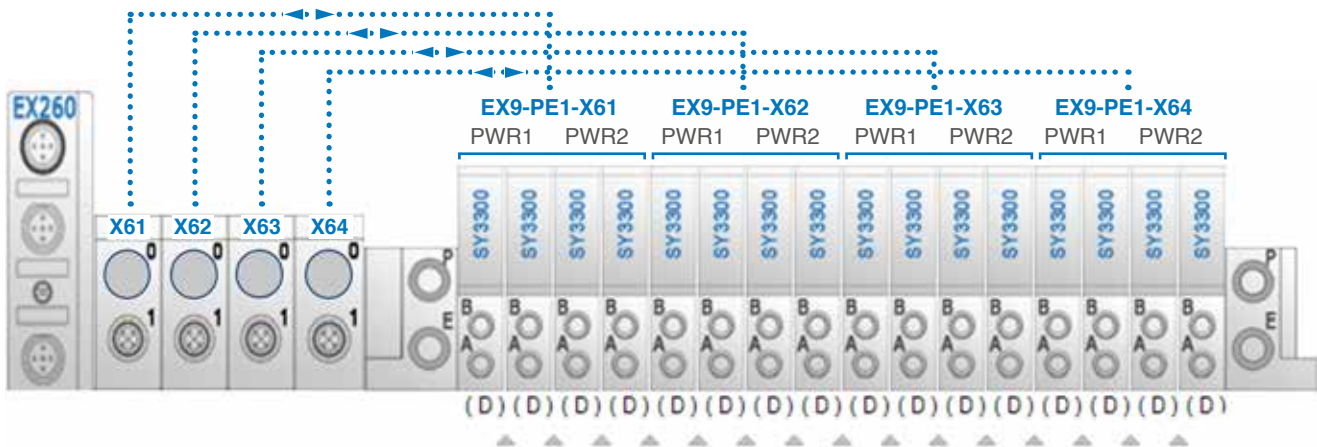
## EX9-PE1-X63

- ▶ Switch-off of valve coil 17-20
- ▶ Switch-off of valve coil 21-24

## EX9-PE1-X64

- ▶ Switch-off of valve coil 25-28
- ▶ Switch-off of valve coil 29-32

## Output 0-31 can be switched-off in blocks of 4



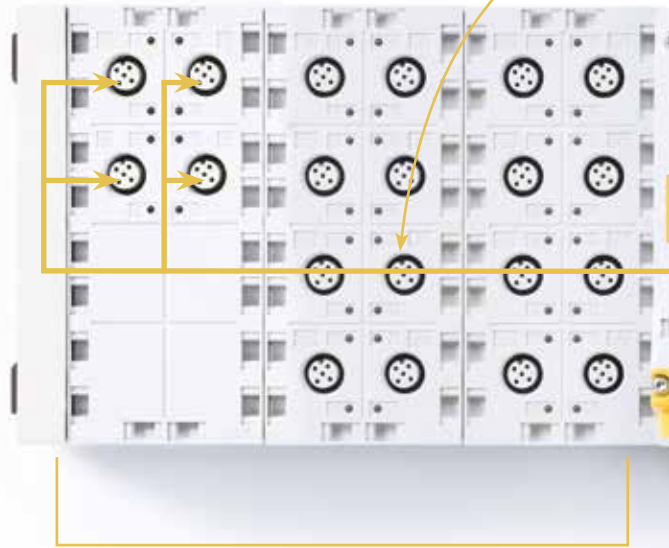
## Application

- ▶ Switch-off of the control voltage of 4 valve coils each
- ▶ Can be mounted between electrical input and valve manifold
- ▶ Compatible with safety pulse tests

# Safety over fieldbus with PROFI-safe

With the EX245-FPS#-X35, SMC offers a solution for Safety over Fieldbus, a completely certified PROFI-safe product for use in safety applications up to PL e according to EN ISO 13849-1 and SIL 3 according to IEC 62061/IEC 61508.

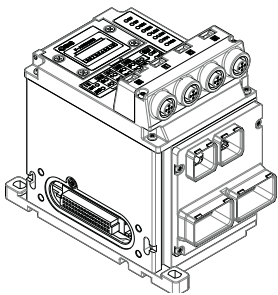
- ▶ Comprehensive diagnostic system and error messages
- ▶ Same mechanical floor space as the existing EX245 PROFINET product line
- ▶ Compatible with EX245 IO modules and can be used as valve nodes



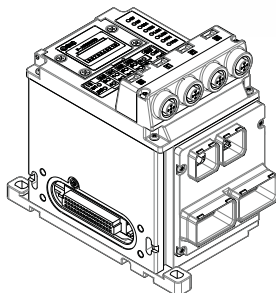
Up to 8x16 inputs (128 inputs) or up to 8x8 outputs (64 outputs)

## Inputs: 4 safe input ports with two digital channels /push press fittings

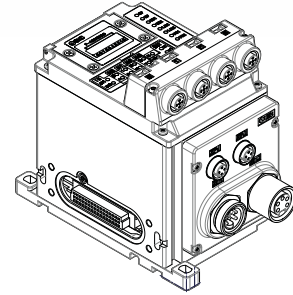
- ▶ Customizable channels for specific applications
- ▶ Single-channel (max. 8) or dual-channel (max. 4) configuration



EX245-FPS1-X35



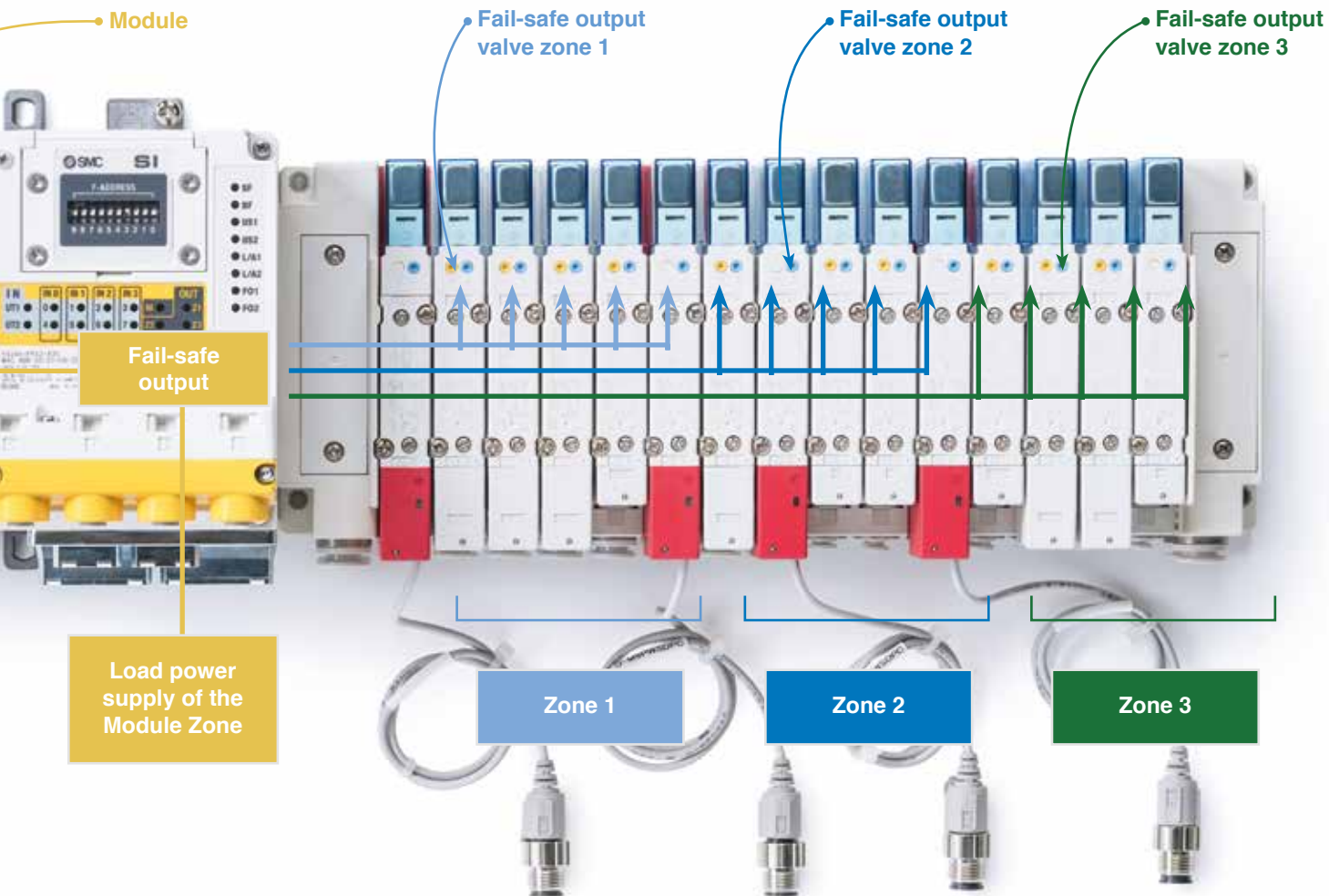
EX245-FPS2-X35



EX245-FPS3-X35

## Push press fitting: available with a variety of power levels, push press fitting and media interfaces

- ▶ Optical fiber communication (Push Pull connector SCRJ) or copper communication (Push Pull connector RJ45 or M12 4 pins socket/D-cod)
- ▶ Power supply: Push Pull or 7/8" plug and socket



## Outputs: 4 channels of safe output power zones with independent control and operation

- ▶ Up to 3 valve zones can be processed, zones 1 and 2 provide a control signal for pilot air activation and 8 control signals for working valves
- ▶ Zone 3 supplies a control signal for pilot air activation and 7 control signals for working valves
- ▶ 1 zone assigned for use of the output module

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