

**Your safety is our focus**  
Safety related special products  
Pilot air control valve with position  
detection and spring return spool

## **SY-X31 Series**

# Pilot air control valve with position detection and spring return spool SY-X31 Series

- ▶ **We focus on machinery safety as a key part of our product development strategy. We have just developed a new version of our SY valve that will help you to satisfy your machine safety system requirements.**



## Main Features

- ▶ **A pilot air control valve with position detection – The concept**

The SY-X31 version controls the pilot air of manifold zones with an integrated auto-switch, that monitors the safe position of the spool.

The safe position is the spring-actuated position. A high signal on the auto switch represents the safe position of the spool, so achieving a high diagnostic coverage is simple.

- ▶ **Validated according to ISO 13849-2**

This product is capable of meeting the relevant basic and well-tried safety principles.

Please request our validation document for the details.

- ▶ **SISTEMA library is available**

SY safety valves data are integrated into SISTEMA free software tool.

Download it from our website and be ready to build your safety function.

- ▶ **Still an option of our SY, the all-purpose valve**

Benefit from the high versatility this series gives you and create your own configuration, tailored to your needs.



## Applications

Controlling the pilot air of a valve manifold requires externally piloted valves downstream of the pilot air control valve.

## How to Order

SY5100   T - 5   Z1 - M9   W     PC - X31

①                      ②                      ③                      ④                      ⑤

### ① Pilot type

<b>Nil</b>	External pilot
<b>R</b>	External pilot

### ② Polarity

<b>Nil</b>	Positive common
<b>N</b>	Negative common

### ③ Wiring and output type

<b>N</b>	3-wire, NPN
<b>P</b>	3-wire, PNP
<b>B</b>	2-wire

### ④ Cable length

<b>S</b>	0.5 m
<b>M</b>	1 m

### ⑤ Connector specifications

<b>A</b>	M8-3 pins
<b>B</b>	M8-4 pins
<b>D</b>	M12-4 pins

## Selected Part Numbers

Part number	Max. flow rate cfm (l/min)	Operating pressure range psi (MPa)	Connector type
SY5100T-5NZ1-M9PWSAPC-X31	36.8 (1042)	22 to 101 (0.15 - 0.7)	M8-3 pins
SY5100T-5NZ1-M9PWSDPC-X31	36.8 (1042)	22 to 101 (0.15 - 0.7)	M12-4 pins



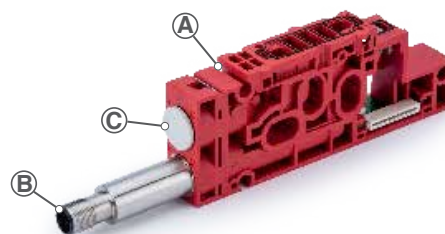
## Ⓐ Plug-in Sub-plate

Part number	Valve series	Max. flow rate cfm (l/min)	Operating pressure range psi (MPa)
SY50M-2-14SA-C0	SY 5000	36.8 (1042)	22 to 101 (0.15 - 0.7)
SY70M-2-19DA-C0	SY 7000	56.2 (1590)	22 to 101 (0.15 - 0.7)

Note) Requires external pilot end block for pilot exhaust

## Ⓑ Pressure Detection for SY31

Part number	Valve series
F08-2000-M12-M	SY 5000
F08-7000-M12-M	SY 7000



## Ⓒ Port Plug for Sub-plates

Part number	Valve series
VVQ1000-58A	SY 5000
VVQ2000-58A	SY 7000

Note) See SY catalog for additional fitting options

## Valve Specifications

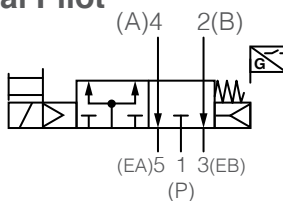
Valve type		5 port solenoid valve, position detection
Valve type		Rubber seal
Type of actuation		2-position single/spring and air return type
Spool detection		Auto switch signal output is active when valve is de-energized
Fluid		Air
Internal pilot operating pressure range		22 to 101 psi (0.15 to 0.7 MPa)
External pilot operating pressure range	Operating pressure range	-14.5 to 101 psi (-100 kPa to 0.7 MPa)
	2-position single	36 to 101 psi (0.25 to 0.7 MPa)
Ambient and fluid temperature		14 to 122 °F (-10 to 50 °C) No freezing
Manual override		Non-locking push type
Min. operating frequency [Hz]		1 cycle every 30 days
Max. operating frequency [Hz]		5
Lubrication		Not required
Mounting orientation		Unrestricted
Impact/Vibration resistance [m/s <sup>2</sup> ]		150/30
Enclosure		IEC529 standard IP67
Filtration		5 μm filtration or similar
Coil rated voltage [DC]		24 V
Allowable voltage fluctuation [V]		±10 % of rated voltage
Power consumption [W]	X31	0.1 (Inrush 0.35, holding: 0.1)
Surge voltage suppressor		Diode (Varistor for non-polar type)
Indicator light		LED
Pilot exhaust type	Internal pilot	Main/pilot valve common exhaust
	External pilot	Pilot valve individual exhaust

## Auto Switch Specifications

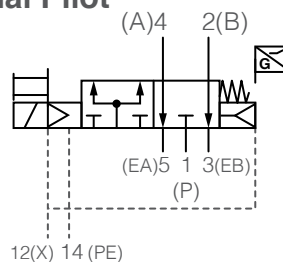
Auto switch model	D-M9NW	D-M9PW	D-M9BW
Wiring type	3-Wire	2-Wire	
Output type	NPN	PNP	—
Applicable load	IC circuit, Relay, PLC		24 VDC relay PLC
Power supply voltage	5, 12, 24 VDC (4.5 to 28 V)		—
Current consumption	10 mA or less		
Load voltage	28 VDC or less	—	24 VDC (10 to 28 VDC)
Load current	40 mA or less		2.5 to 40 mA
Internal voltage drop	0.8 V or less at 10 mA Load current (2 V or less at 40 mA)		4 V or less
Leakage current	100 μA or less at 24 VDC		0.8 mA or less
Operating time	1 ms or less		
Indicator light	Green LED when turned on Red LED when within operating range		
Standard	CE marking, RoHS		
Electrical entry system	Grommet		
Lead wire	Oil-proof heavy-duty vinyl cord 2.7 x 3.2 oval, 0.15 mm <sup>2</sup> , 2 wire (D-M9BW), 3 wire (D-M9NW/D-M9PW)		
Withstand voltage	1000 VAC for 1 min (between terminals and housing)		
Insulation resistance	50 MΩ or more at 500 VDC mega		
Ambient temperature	±10 to 60 °C		
Enclosure	IEC529 standard IP67, JISC0920 water-proof construction		

## Symbols

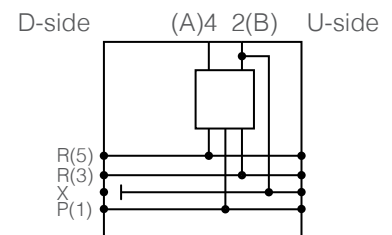
### Internal Pilot



### External Pilot



### Manifold Block



# Pilot air control valve with position detection and spring return spool

## SY-X31 Series



### Manifold Flow characteristics <sup>1)</sup>

#### Plug-in metal base

Series	Piping option	Port size		Valve flow-rate characteristics					
		1, 5, 3 (P, EA, EB)	4, 2 (A, B)	1→4/2 (P→A/B)			4/2→5/3 (A/B→E)		
				C [dm <sup>3</sup> /(s·bar)]	b	Q [l/min] (ANR) <sup>2)</sup>	C [dm <sup>3</sup> /(s·bar)]	b	Q [l/min] (ANR) <sup>2)</sup>
SY5000	Side ported	1/4	C8	2.6	0.28	653	2.6	0.14	603
	Bottom ported	1/4	C8	2.7	0.35	709	2.8	0.20	671

#### Resin base

Series	Piping option	Port size		Valve flow-rate characteristics					
		1, 5, 3 (P, EA, EB)	4, 2 (A, B)	1→4/2 (P→A/B)			4/2→5/3 (A/B→E)		
				C [dm <sup>3</sup> /(s·bar)]	b	Q [l/min] (ANR) <sup>2)</sup>	C [dm <sup>3</sup> /(s·bar)]	b	Q [l/min] (ANR) <sup>2)</sup>
SY5000	Side ported	C10	C8	3.3	0.30	839	3.6	0.17	848
	Bottom ported	C10	C8	3.3	0.29	834	4.2	0.26	1042

1) The value is for manifold base with 5 stations and individually operated 2-position type.

2) These values have been calculated according to ISO 6358 and indicate the flow rate under standard conditions with an inlet pressure of 87 psi (0.6 MPa) (relative pressure) and a pressure drop of 14.5 psi (0.1 MPa).

3) These values are applicable to rubber seal type valves.

### Dimensions

Dimensions are the same as the standard product.



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