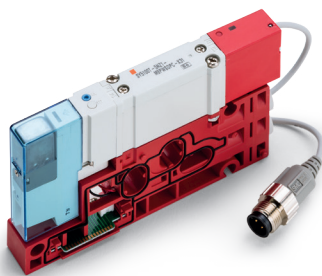
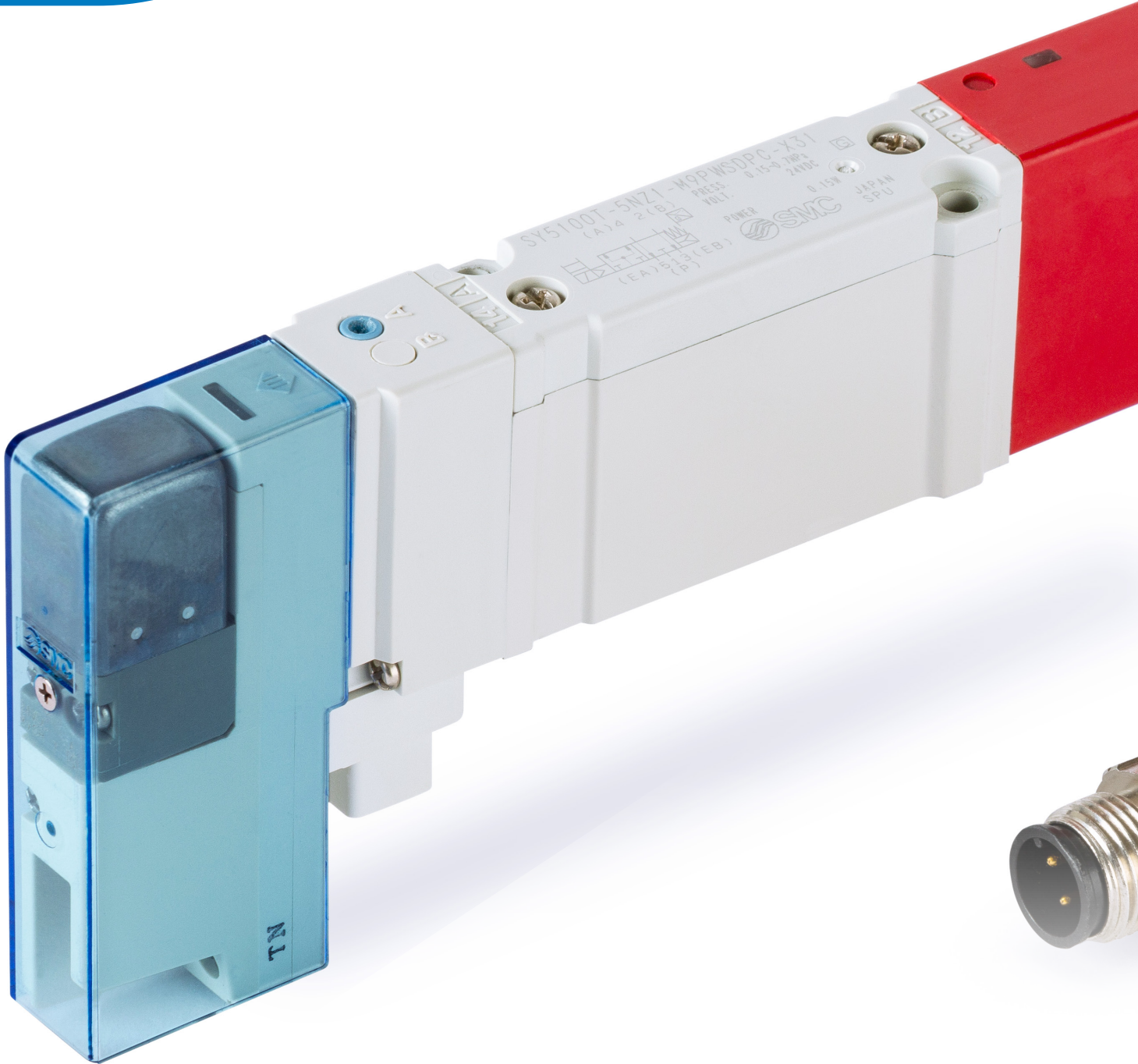




Expertise – Passion – Automation



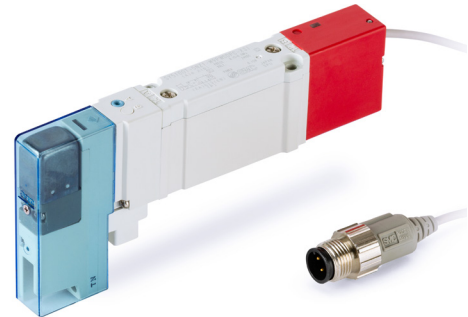
Your safety in our focus

Safety-related products
Pilot air control valve
with spool position detection
SY-X31 Series

Pilot air control valve with spool position detection

SY-X31 Series

- ▶ We focus on machinery safety as a key part of our product development strategy. This version will help satisfy your machine safety system requirements.



Main features

▶ A pilot air control valve with spool position detection – the concept

The valve is used to control the pilot air supply to externally piloted valves on the manifold. An auto-switch integrated into the valve monitors the spool position and switches on when the spool is in the de-energised position, which is usually the safe state for the application. This indirect monitoring provides a medium level of diagnostic coverage.

▶ Validated according to ISO 13849-2

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

Please download our reliability data for the details.

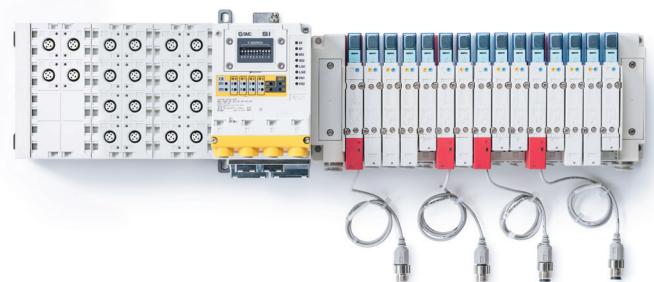
▶ SISTEMA library is available

SY safety-related valves data are additionally integrated into the SISTEMA software tool.

Download the library file from our website and be ready to build your safety function.

▶ SY series valves

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



Applications

Controlling the pilot air supply to externally piloted manifold mounted valves.

How to order

SY5100T - 5(N)Z1 - M9 W PC - X31
 ① ② ③

① Wiring and output type

N	3-wire, NPN
P	3-wire, PNP
B	2-wire

② Cable length

S	0.5 m
M	1 m

③ Connector specifications

A	M8-3 pins
B	M8-4 pins
D	M12-4 pins

Note) Refer to the reliability data for the latest "How to order".

Best selling part numbers

Part number	Connector type
SY5100T-5NZ1-M9PWSAPC-X31	M8-3 pins
SY5100T-5NZ1-M9PWSDPC-X31	M12-4 pins

Plug-in base

Part number	Manifold series
SY50M-2-14 _D ^S A-C0	SY5000
SY70M-2-19 _D ^S A-C0	SY7000

Note) This special base is required.

Valve specifications

Valve type	5 port solenoid valve, spool position detection
Valve type	Rubber seal
Type of actuation	2-position single/spring and air return type
Spool position detection	Auto switch signal output is on when the spool is in the de-energised position
Fluid	Air
Internal pilot operating pressure range [MPa]	0.15 to 0.7
Ambient and fluid temperature [°C]	-10 to 50 (No freezing)
Manual override	Non-locking push type
Max. operating frequency [Hz]	5
Min. operating frequency	1 cycle every 30 days
Lubrication	Not required
Mounting orientation	Unrestricted
Impact/Vibration resistance ¹⁾ [m/s ²]	150/30
Enclosure	IEC60529 standard IP67
Filtration	5 µm filtration or smaller
Coil rated voltage [VDC]	24
Allowable voltage fluctuation [V]	-7 % to +10 % of rated voltage
Power consumption [W]	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

1) Impact resistance: No malfunction occurred when it is tested in the axial direction and at the right angles to the main valve and armature in both energised and de-energised states every time in each condition. (Values at the initial period)

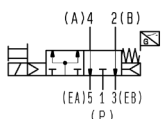
Vibration resistance: No malfunction occurred in a one-sweep test between 45 and 2000 Hz. Test was performed at both energised and de-energised states in the axial direction and at right angles to the main valve and armature. (Values at the initial period)

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 ² , 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		
Ambient temperature	-10 to 60 °C		
Enclosure	IEC60529 standard IP67, JISC0920 water-proof construction		

Symbols

Internal pilot



Manifold flow characteristics ^{1) 2)}

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 ³ /(s·bar)]	b	Q [l/min] (ANR) ³⁾	C [dm ³ /(s·bar)]	b	Q [l/min] (ANR) ³⁾
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 ³ /(s·bar)]	b	Q [l/min] (ANR) ³⁾	C [dm ³ /(s·bar)]	b	Q [l/min] (ANR) ³⁾
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.

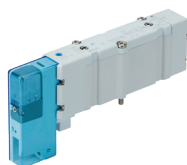
2) These values are applicable to rubber seal type valves.

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

Note

For confirmation of detailed specifications and dimensions, refer to product drawings, instruction manual, reliability data and catalogue at www.smc.eu.

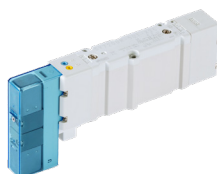
Other related SY products



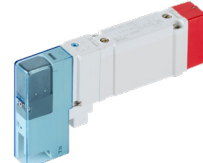
5 port solenoid valve with spring return spool
SY-X350 Series



5 port solenoid valve with spool position detection
SY-X30 Series



5 port solenoid valve with detent
SY-X25 Series



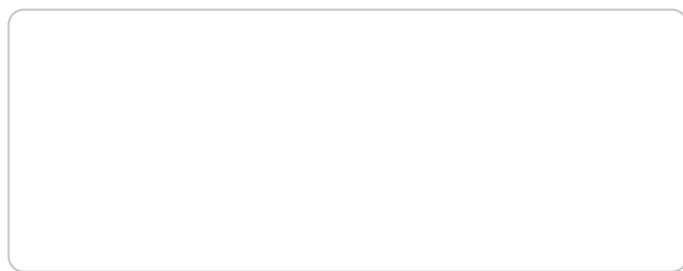
External pilot air control valve
SY-X310 Series



Expertise – Passion – Automation

SMC Corporation

Akihabara UDX 15F, 4-14-1
Sotokanda, Chiyoda-ku, Tokyo 101-0021, JAPAN
Phone: 03-5207-8249
Fax: 03-5298-5362



Austria	+43 (0)2262622800	www.smc.at	office@smc.at
Belgium	+32 (0)33551464	www.smc.be	info@smc.be
Bulgaria	+359 (0)2807670	www.smc.bg	office@smc.bg
Croatia	+385 (0)13707288	www.smc.hr	office@smc.hr
Czech Republic	+420 541424611	www.smc.cz	office@smc.cz
Denmark	+45 70252900	www.smc.dk.com	smc@smcdk.com
Estonia	+372 651 0370	www.smcee.ee	info@smcee.ee
Finland	+358 207513513	www.smc.fi	smcfi@smc.fi
France	+33 (0)164761000	www.smc-france.fr	supportclient@smc-france.fr
Germany	+49 (0)61034020	www.smc.de	info@smc.de
Greece	+30 210 2717265	www.smchellas.gr	sales@smchellas.gr
Hungary	+36 23513000	www.smc.hu	office@smc.hu
Ireland	+353 (0)14039000	www.smcautomation.ie	sales@smcautomation.ie
Italy	+39 03990691	www.smcitalia.it	mailbox@smcitalia.it
Latvia	+371 67817700	www.smc.lv	info@smc.lv

Lithuania	+370 5 2308118	www.smclt.lt	info@smclt.lt
Netherlands	+31 (0)205318888	www.smc.nl	info@smc.nl
Norway	+47 67129020	www.smc-norge.no	post@smc-norge.no
Poland	+48 222119600	www.smc.pl	office@smc.pl
Portugal	+351 214724500	www.smc.eu	apoioclientept@smc.smces.es
Romania	+40 213205111	www.smcromania.ro	smcromania@smcromania.ro
Russia	+7 (812)3036600	www.smc.eu	sales@smcru.com
Slovakia	+421 (0)413213212	www.smc.sk	office@smc.sk
Slovenia	+386 (0)73885412	www.smc.si	office@smc.si
Spain	+34 945184100	www.smc.eu	post@smc.smces.es
Sweden	+46 (0)86031240	www.smc.nu	smc@smc.nu
Switzerland	+41 (0)523963131	www.smc.ch	info@smc.ch
Turkey	+90 212 489 0 440	www.smcpnomatik.com.tr	info@smc pnomatik.com.tr
UK	+44 (0)845 121 5122	www.smc.uk	sales@smc.uk

South Africa +27 10 900 1233 www.smcza.co.za zasales@smcza.co.za