

SOLENOID VALVES

integrated pilot operated spool type single/dual solenoid aluminium body, 1/4", NAMUR & Threaded style

3/2 5/2 Series

521 Process

FEATURES

- Compact size with high flow
- Environment protected construction to protect against the ingress of liquid, dust or any other foreign matter
- Multiple functions available with 5/2 Threaded and NAMUR options
- \bullet The same spool valve can be adapted for 3/2 $^{\text{\#}*}$ or 5/2 functions for controlling double-acting and single-acting actuators
- 8-shaped seal technology Small contact surface, low friction and minimize "sticking"
- Internal breathing feature where the return-spring chambers of the single-acting actuator "breath" through the spool valve
- NAMUR design (LH Orientation & RH Orientation) ensures supply and exhaust ports of the solenoid valve are facing down to prevent water and debris ingress
- Robust and long lasting 316 Stainless Steel Manual Operator (flush locking override)
- Epoxy coil with excellent moisture and high ambient temperature resistance
- For Threaded type, 5/2 can be converted to 3/2 NC or 3/2 NO by inserting plug on 5/2 body (plug not supplied)

GENERAL

2 - 8 bar (1 bar = 100 kPa)Differential pressure 1020 l/min (Threaded) Flow (Qv at 6 bar, ANR) 820 I/min (NAMUR)

Fluid (**)	Temperature Range (TS)	Seal Material
Air, inert gas, filtered	-20°C to +60°C	NBR (nitrile)

MATERIALS IN CONTACT WITH FLUID

(**) Ensure that the compatibility of the fluids in contact with the materials is verified

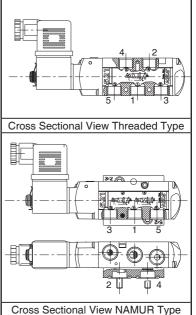
Body Aluminium, Anodized

Internal parts POM (Polyacetal), Stainless steel, Aluminium

Seals NBR Core tube **Brass**

Plugnut Stainless steel Shading coil Copper





ELECTRICAL CHARACTERISTICS

Coil insulation class Class F Coil material Ероху **Electrical safety IEC 335**

DC (=): 12V - 24V - 48V Standard voltages

(Other voltage and 60Hz available on request) AC (~): 24V - 48V - 110V - 230V/50-60Hz; AC 115V/50Hz, 120V/60Hz

	Non	ninal Po	wer Ra	tings	Operator		Electrical	Replacen	nent Coil
Solenoid Type ⁽¹⁾	Inrush ~	Holo	•	Hot/Cold =	Ambient Temperature Range (TS)	Safety Code	Enclosure Protection (EN 60529)	~	=
	(VA)	(VA)	(W)	(W)	(°C)		(EN 60329)	230 V / 50 Hz	24 V DC
Reduced Power	(RP)								
В	6	3.5	2.5	2.5/3	-20 to +60	EN 60529	Moulded IP65	43004886	43004869

⁽¹⁾ Refer to the dimensional drawings

ELECTRICAL CONNECTIONS

- 3			_ m
ı	Solenoid Type	Connection	2
	IVDAR	Spade plug connector (standard) with cable gland DIN 43650, 11mm, industry standard B, for cables with an outer diameter from 6 to 8mm	1-20
ı	IVDAR	diameter from 6 to 8mm	outer

^{*} For NAMUR type, 5/2 can be converted to 3/2 NC by rotating NAMUR plate



ADDITIONAL OPTIONS

 Plug with visual indication and peak voltage suppression or with cable length of 2m, solenoid type B only (Consult ASCO NUMATICS Office)

INSTALLATION

- Installation/maintenance instructions are included with each valve
- The solenoid valves can be mounted in any orientation without affecting performance
- Threaded 5/2 can be converted to 3/2 by inserting plug on 5/2 body (plug not supplied)
- For 3/2 NC conversion, insert plug into port (2) on 5/2 body and for 3/2 NO conversion, insert plug into port (4) on 5/2 body Spool valve is supplied with one NAMUR adaptor plate. Adapter plate can be rotated 180° to convert the spool valve to 3/2 NC or
- 5/2 function It is strongly recommended to connect pipes or fittings to the exhaust ports to protect the internal parts of the spool valve and its
- pneumatic operator if used in outdoor or harsh environments (dust, liquids, etc.)
- NAMUR accessories (Bolts, Gaskets, Nuts & Plate) are standard supplied for NAMUR version
- Threaded pipe connection identifier is: 8 = NPT (ANSI 1.20.3); G = G (ISO 228/1)

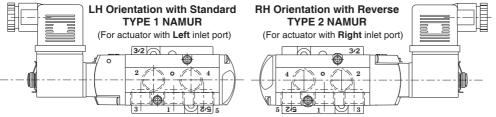
SPECIFICATIONS

Pipe size 1/4" Main valve orifice size 6 mm Operating pressure differential Min. 2 bar Max. 8 bar

-		0 1 1	Flow Coe	fficient Kv
Function	Construction	Symbols	(m³/h)	(l/min)
5/2 Way [#]	Single Solenoid, Spring Return		0.9	15
3/2 vvay	Dual Solenoid		0.9	15
	LH Orientation (Single Solenoid, Spring Return)	3/2 NC 5/2	0.75	12.5
NAMUR	LH Orientation (Dual Solenoid)	3/2 NC 5/2	0.75	12.5
3/2 NC - 5/2*	RH Orientation (Single Solenoid, Spring Return)	3/2 NC 5/2	0.75	12.5
	RH Orientation (Dual Solenoid)	3/2 NC 5/2	0.75	12.5

For Threaded type, 5/2 can be converted to 3/2NC or 3/2NO by inserting plug on 5/2 body (plug not supplied)

ACTUATOR MOUNTING POSITION



Depending on the actuator's port orientation, the ASCO 521 NAMUR Design (LH Orientation with Standard TYPE 1 NAMUR & RH Orientation with Reverse TYPE 2 NAMUR) is to ensure that the supply port (1) and exhaust ports (3 & 5) are always facing down to prevent water & debris ingress.

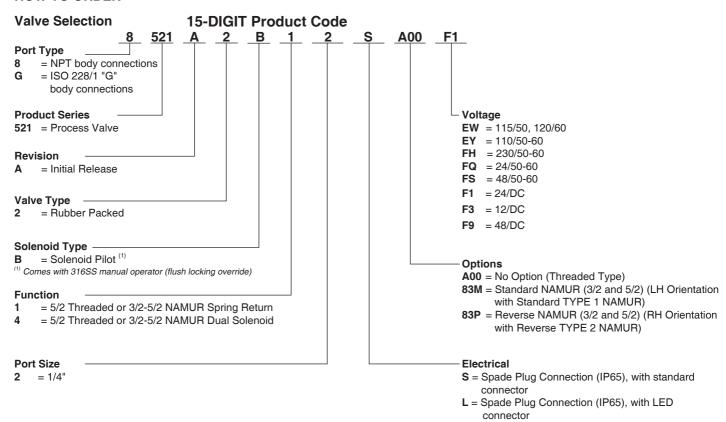
NOTE: Selection of LH Orientation with Standard TYPE 1 NAMUR or RH Orientation with Reverse TYPE 2 NAMUR is in accordance with the type of actuator inlet position used for mounting position

Port No.	NAMUR 3/2 NC	NAMUR 5/2	
1	Supply port	Supply port	ြ
2	Actuator's inlet port	Outlet port	2016/R1
3	Exhaust port	Exhaust port	116
4	Actuator's breather port	Outlet port	Ļ
5	Actuator's breather exhaust port	Exhaust port	PI-521

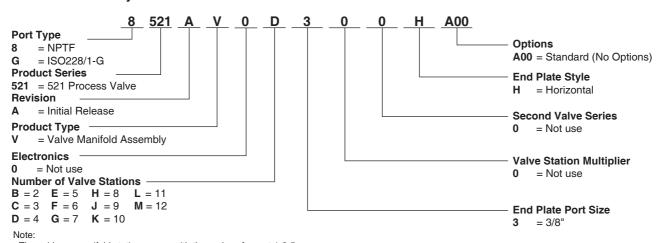
^{*} For NAMUR type, 5/2 can be converted to 3/2NC by rotating NAMUR plate



HOW TO ORDER



Manifold Assembly



[•] The subbase manifold station comes with three plugs for port 1-3-5.

ORDERING EXAMPLE

Manifold Assembly 8521AV0D300HA00 Valve Station 1 8521A2B12SA00F1 Valve Station 2 8521A2B12SA00F1 Valve Station 3 8521A2B12SA00F1 Valve Station 4 8521A2B12SA00F1

ASSEMBLED



DIMENSIONS(mm), WEIGHT(kg)

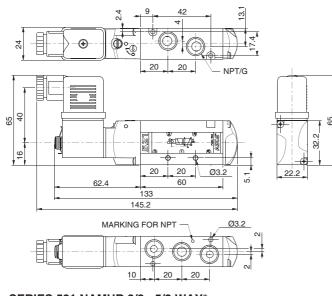


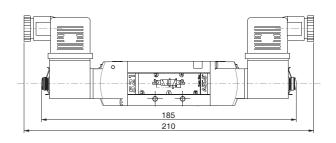


SOLENOID TYPE B Solenoid with DIN spade plug connector (standard) Moulded IP65 Reduced power IEC 335 / DIN 43650

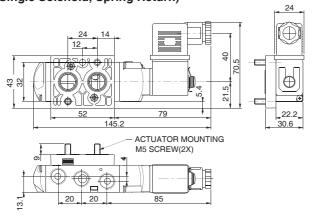
SERIES 521 THREADED 5/2 WAY* (Single Solenoid, Spring Return)

SERIES 521 THREADED 5/2 WAY# (Dual Solenoid)

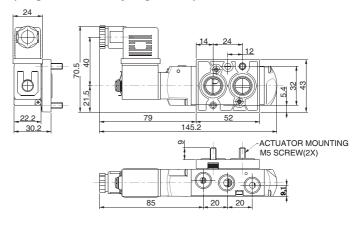




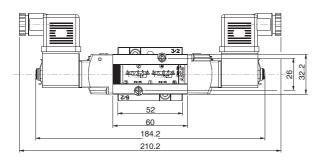
SERIES 521 NAMUR 3/2 - 5/2 WAY* LH Orientation with Standard TYPE 1 NAMUR (Single Solenoid, Spring Return)



RH Orientation with Reverse TYPE 2 NAMUR (Single Solenoid, Spring Return)



NAMUR Dual Solenoid (LH & RH Orientation)



		Type B ight)
Function	Single	Dual
THREADED 5/2#	0.23 kg	0.35 kg
NAMUR 3/2 - 5/2*	0.25 kg	0.38 kg

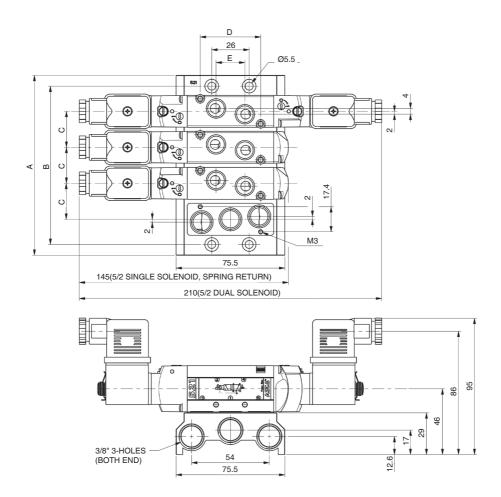
^{*} For Threaded type, 5/2 can be converted to 3/2 NC or 3/2 NO by inserting

plug on 5/2 body (plug not supplied)
*For NAMUR type, 5/2 can be converted to 3/2 NC by rotating NAMUR plate



SERIES 521 THREADED 5/2 WAY (MANIFOLD ASSEMBLY)*

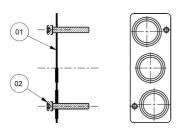
 * For Threaded type, 5/2 can be converted to 3/2 NC or 3/2 NO by inserting plug on 5/2 body (plug not supplied)



			Manifold fo	or Solenoid	Гуре В		
				5/2			
No. of Chatian	Dim A	Dim D	Dim O	Dim D	Dim F	Par	t No
No. of Station	Dim A	Dim B	Dim C	Dim D	Dim E	For G Thread	For NPT Thread
02	75	60				G521AM514127002	8521AM514127002
03	100	85	1			G521AM514127003	8521AM514127003
04	125	110	1			G521AM514127004	8521AM514127004
05	150	135	1			G521AM514127005	8521AM514127005
06	175	160	1			G521AM514127006	8521AM514127006
07	200	185	25	42	20	G521AM514127007	8521AM514127007
08	225	210	1			G521AM514127008	8521AM514127008
09	250	235				G521AM514127009	8521AM514127009
10	275	260	1			G521AM514127010	8521AM514127010
11	300	285	1			G521AM514127011	8521AM514127011
12	325	310	1			G521AM514127012	8521AM514127012

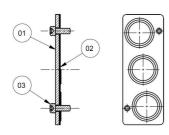


MANIFOLD KIT



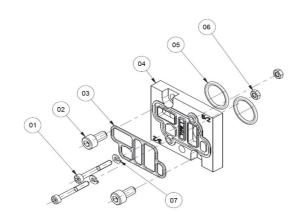
	Manifold Kit	Number	
Det. No.	Part Name	Qty	5/2
01	Gasket	1	R521AC514631001
02	Mounting Screw	2	N321AC314031001

BLANK STATION PLATE KIT



	Blank Station I	Kit Number	
Det. No.	Part Name	Qty	5/2
01	Blank Plate	1	
02	Gasket	1	R521AB514632001
03	Mounting Screw	2	

NAMUR ADAPTOR KIT (LH ORIENTATION WITH STANDARD TYPE 1 NAMUR & RH ORIENTATION WITH REVERSE TYPE 2 NAMUR)



	NAMU	R Ad	aptor Kit Number	
Det. No	Part Name	Qty	LH Orientation (Type 1)	RH Orientation (Type 2)
01	Mounting Screw M3	2		
02	Adaptor Screw M5	2		
03	Profile Gasket	1		
04	NAMUR Plate	1	R521AT514630001	R521AT514630002
05	O Ring	2		
06	M3 Nut	2		
07	Lock Washer	2		



521 PROCESS VALVE

ALUMINIUM BODY, 1/4", NAMUR & THREADED STYLE

SERIES
521 PROCESS

DESCRIPTION

Series 521 5/2 & NAMUR spool type valves have an anodized aluminium body with all 1/4" threaded pneumatic connection, max. port depth 11 mm, equipped with spade plug connector (A) at Fig. A & Fig. D with an IP65 rating.

- NOTE: Do not connect the pressure supply to the exhaust port. The "environmentally-protected" construction is not adapted for a "distributing" function or use in NO function. Contact us for functions available in specific versions(Table 1).
- NAMUR-type rotating adaptor plate on Fig. B & Fig. C for direct installation on a single-acting 3/2 NC function or double-acting 5/2 pneumatic actuator. Adaptor plate can be rotated 180° to convert the spool valve to 3/2 NC or 5/2 function.
- LH Orientation with Standard TYPE 1 NAMUR or RH Orientation with Reverse TYPE 2 NAMUR valves are available to suit with the type of actuator's inlet used.

Versions isolated from atmosphere: The internal parts of the valve are isolated from the outside atmosphere in order to provide protection in aggressive environments. All the exhaust ports of the spool valve can be piped to provide better environmental protection. Particularly recommended for sensitive areas such as clean rooms and applications in the pharmaceutical or food processing industries. It is strongly recommended to connect pipes or fittings to the exhaust ports to protect the internal parts of the spool valve if used in outdoor or harsh environments (dusts, liquids etc.).

Recommended versions:

- Single solenoid spool valve: electrically or air operated, spring return.
- Dual solenoid spool valve: solenoid-air or air operation and return.

Note: Threaded 5/2 (Single solenoid, spring return & Dual solenoid) can be converted to 3/2 (Single solenoid, spring return & Dual solenoid) by inserting plug on 5/2 body (plug not supplied). For 3/2 NC conversion, insert plug on port (2) on 5/2 body and for 3/2 NO conversion, insert plug (4) on 5/2 body (see Fig. A).

All exhaust ports of the valves and pilots must be protected with exhaust protectors. When used outdoor or stored for long periods of time, and or where exposed to harsh environments (dusts, liquids etc.), exhaust protectors must be used. The reliability of the valve cannot be guaranteed if an exhaust protection other than that supplied is used.

SPECIAL CONDITIONS FOR SAFE USE

- Storage conditions: Protected from exposure to weather
- Storage temperature: -20°C to +60°C
- Relative humidity: 95 % max.
- The spool valve must be kept in its original packaging as long as it is left unused. The protective covers must not be removed from the connection ports and solenoid operators.
- -The max, temperature of the fluid must not exceed the ambient temperature. After storage at low temperature, the spool valves must gradually be brought to room temperature prior to pressurisation.

NOTE: If, in Zone 1, Group IIC, the 521 series with integrated pilot, the product must be protected against ambient air flow and friction in order to prevent electrostatic charge on the synthetic materiel casing.

- Wearing of dry clothes and/or friction on the surface of the magnetic head should be avoided during installation and maintenance.
- The spool valves are intended to be operated within the technical characteristics specified on the nameplate. Modifications to the equipment may only be made after consulting the manufacturer or his representative.

INSTALLATION

⚠ Installation and maintenance of the valve must be carried out by qualified personnel only.

These valves are designed to operate with *filtered neutral gas or air.* Do not exceed the maximum allowable pressure of 8 bar.

- Minimum fluid/ambient temperature: -20°C
- Before mounting the spool valve on the operator, it must be set to the required function.
- Mount the solenoid valves (Fig. A) with the two M3 screws (not supplied)
- Ex versions: Make sure that all metal or conductive parts are always interconnected and connected to earth. The valve body is connected to earth with the fastening screw.

ASSEMBLY / DISASSEMBLY

THREADED PORTS: Mount the valve with two M3x35 screws (not supplied).

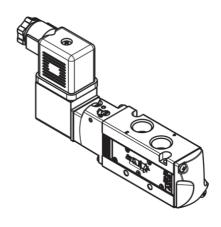
For 5/2 Spring & Solenoid return, refer Fig. A. For Dual Solenoid, refer Fig. D.

- Mounting at any position

NAMUR mounting pad: (Fig. B, Fig. C)

Before mounting the spool valve on the actuator, it must be set to the required function.

- Series 521: Take the adaptor plate and rotate it 180° to position it in the recommended 3/2 or 5/2
- *Step 1, Insert nut (supplied) and gaskets on the adaptor plate back side grooves, then mount the adaptor plate directly on the Namur actuator with 2 supplied M5 screws (Required torque is 2.2 N +/- 0.2 Nm).
- *Step 2, Insert Profile gasket on the groove in NAMUR adaptor plate on the top side provision, then Mount NAMUR valve to the adaptor plate with the 2 supplied M3 screws (Required torque is 1.4 N +/- 0.15 Nm).
- Make sure the seal is properly seated .
- Observe the mounting direction.
- Make sure the indication of the function is placed on the return side (polarising slot).
- LH Orientation with Standard TYPE 1 NAMUR (Fig. B) or RH Orientation with Reverse TYPE 2 NAMUR (Fig. C) versions in assembly methods are the same. Direction of solenoid assembly position changed with respect body design.









521 PROCESS VALVE

ALUMINIUM BODY, 1/4", NAMUR & THREADED STYLE

SERIES 521 PROCESS

PNEUMATIC CONNECTION

• Connection of the spool valve (Fig. A, Fig. D)

Connect pipes in accordance with the indications on the nameplate.

- Pressure at. port 1, Cylinder or utilization at port 2 & 4.
- Exhausts are channelled through the valve to ports 3 and 5.
- Valve can also be installed on field bus through adaptor for it has 2 M3 screws holes in valve body.

· Connection of pilot exhausts

It is possible to connect the solenoid pilot exhaust port.

- Remove the plastic protective cover (purge cover) shown in Fig. $\ensuremath{\text{C}}$
- Connect the M5 exhaust port.
- The manual operator, indicated by the symbol (Fig. E) allows operation of the valve when de-energized.

⚠ Before any operation of restarting, verify that the manual operator is in the "0" (De-Energized) position to prevent injury or damage. (Fig. F)

General recommendations concerning pneumatic connection

- Connect pipes for required functions in accordance with this documentation and the port markings on the valve.
- Make sure that no foreign matter enters the system.
- Correctly support and align the pipes to avoid subjecting the valve to mechanical stress. When tightening, avoid using the valve as a lever. Use proper tools and locate wrenches as close as possible to the connection point. To avoid damage of the equipment, **DO NOT OVERTIGHTEN pipe connections**.

ELECTRICAL CONNECTION

• Please refer to (Fig. 2):

- Fit the coil on the tube (rotatable through 360°), then CM22 spade terminal connector, rotatable by 180°increments (3 pin: 2+earth) (Fig. D)

• General recommendation for electrical connection

- \(\tilde{\Delta}\) Electrical connections are only to be made by trained personnel and in accordance with the applicable regulations and standards.

- Note that the electrical power supply to de-energize all components.

- Depending upon the voltage, electrical components must be provided with an earth connection and satisfy local regulations and standards.

Most valves are equipped with coils designed for continuous duty service. To avoid any possibility of damage or injury, do not touch the solenoid, which can become hot under normal operating conditions. If the solenoid valve is easily accessible, the installer must provide protection against accidental contact.

MAINTENANCE

• Prior to any maintenance work or putting into operation, cut-off the supply to the pilot, depressurize the valve and vent it in order to prevent injury or damage.

- Cleaning

Maintenance of the valves depends on the operating conditions. They shall be cleaned at regular intervals. During servicing, the components must be checked for excessive wear. If sluggish operation is observed, check that the pilot pressure is correct and check for unusual noise or leakage.

- Sound emission

The emission of sound depends on the application, medium and nature of the equipment used. The exact determination of the sound level can only be carried out by the user having the valve installed in his system.

- Preventive maintenance

- Operate the valve at least once a month to check function.
- Should any difficulties or questions arise during installation and maintenance, please contact ASCO or their authorized representatives.

- Troubleshooting

- Incorrect outlet pressure: Check the pressure on the supply side of the valve, it must correspond to the values indicated on the nameplate.

Caution, observe the minimum pilot pressure values: 2 bar.

- To avoid any risk of damage or injury, check that the valve operates correctly before putting it back into service.

-Spare parts

Coils are available as spare parts.

If necessary, change the entire valve.

Table 1

5,	/2		NAI	VIUR	
Spring return	Solenoid return	LH Single Orientation (TYPE 1)	LH Dual Orientation (TYPE 1)	RH Single Orientation (TYPE 2)	RH Dual Orientation (TYPE 2)
	H T T T T T T T T T T T T T T T T T T T	32 NC 62	李 <u>大</u> 32 NC 62	32 NC 62	32 NC 62





Form No. IM 512494 Rev : -

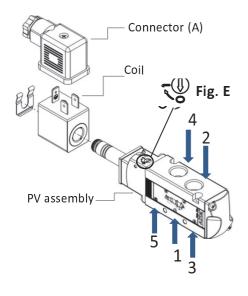


521 PROCESS VALVE

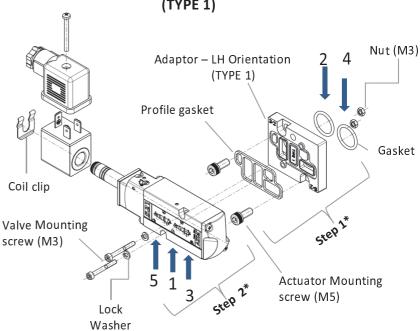
ALUMINIUM BODY, 1/4", NAMUR & THREADED STYLE

SERIES 521 PROCESS

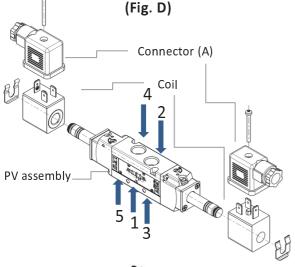
Single Solenoid, Spring Return (Fig. A)

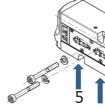


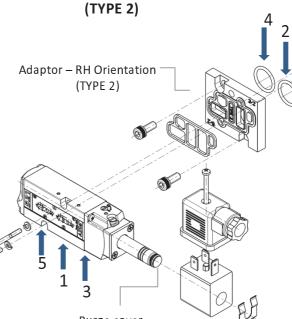
NAMUR – LH Orientation, Standard (Fig. B) (TYPE 1)



Dual Solenoid,

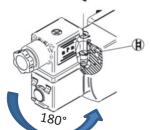






NAMUR - RH Orientation, Reverse (Fig. C)











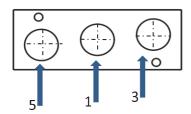


521 PROCESS VALVE MANIFOLD ASSEMBLY

SERIES 521 PROCESS

DESCRIPTION

- The manifold is attached to a support with 2 screws (supplied) M3x35
- Correctly place the flat seals in the directions indicated in the drawings below; notice which holes are for fluid and which are for mounting.
- IMPORTANT- When mounting the spool valves, respect the position of ports 4-2 in relation to the manifold ports 5-1-3 (see



• Plates and seals can be used to block the pneumatic mounting surface in free spaces which can eventually be used for additional spool valves.

PNEUMATIC CONNECTION

• On the manifold (Fig. 1)

The manifold has ducts for collecting common pneumatic signals: supply pressure (1), and exhaust (3) and (5). Connection ports are threaded at the two ends of the manifold fitted with 3 plugs, allowing:

- Choice of the pneumatic connection side
- Supply pressure connection (1) on one side and exhaust on the other side
- Manifold supply on both sides if the application requires a high flow rate
- Up to 5 spool valves can be operated with 1 supply connection. For more than 5 spool valves, pressure must be supplied through both sides of the manifold and the plugs on ports (3) and (5) must be removed.



- 2 connection possibilities for the operating ports (2) and (4):
- Threaded connection, directly on the spool valve body
- Connection with instant fittings for flexible hose (flanges equipped with pressure indicators)

ELECTRICAL CONNECTION

- With a standard size 22M DIN connector IP65 rotatable 180°
- Visualisation and protection modules can be mounted between the coil and the connector (rotatable180°). These modules are offered as accessories.
- -Size 22 pre-cabled connectors (2 m long) with or without indication and integrated protection can be used.
- Before turning on, check the voltage compatibility between the coil and the supply system.
- The solenoid valve is built to operate properly within the following temperature range: -20°C; +60°C

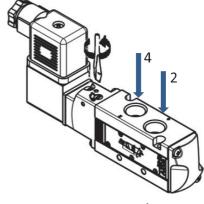
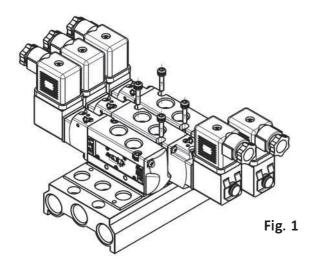
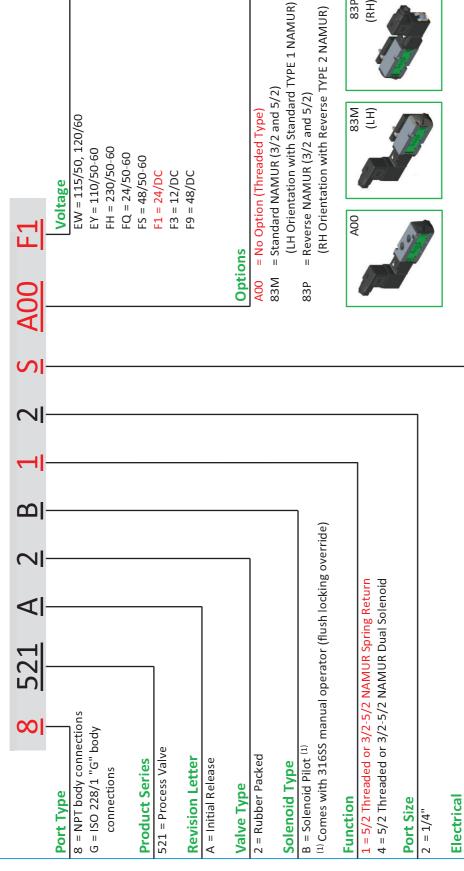


Fig. 2





Product Coding: Finished Goods (FG)









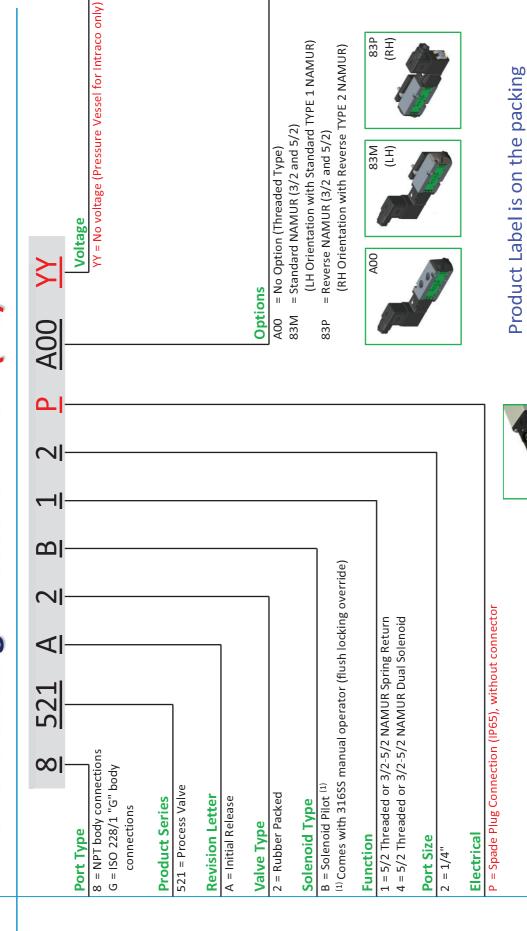
83P (RH)



S = Spade Plug Connection (IP65), with standard connector

L = Spade Plug Connection (IP65), with LED connector

Product Coding: Pressure Vessel (PV)







Product Coding: Manifold

			Manifold fo	Manifold for Solenoid Type B	rype B		
				5/2			
10 to	< <u></u>	<u>.</u>	2		- Sign	Part No	No
NO. OI SIBIIOII	¥ III					For G Thread	For NPT Thread
02	75	09				G521AM514127002	8521AM514127002
03	100	85				G521AM514127003	8521AM514127003
04	125	110				G521AM514127004	8521AM514127004
90	150	135				G521AM514127005	8521AM514127005
90	175	160				G521AM514127006	8521AM514127006
20	200	185	25	42	20	G521AM514127007	8521AM514127007
80	225	210				G521AM514127008	8521AM514127008
60	250	235				G521AM514127009	8521AM514127009
10	275	260				G521AM514127010	8521AM514127010
11	300	285				G521AM514127011	8521AM514127011
12	325	310				G521AM514127012	8521AM514127012





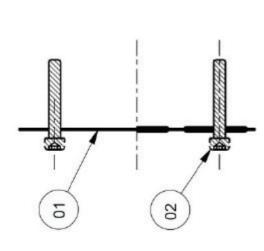


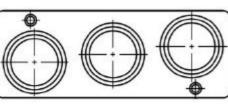
AP Marketing (V16.1.11a)

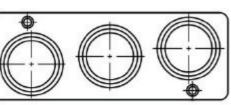
Product Coding: Manifold Kit & Blank Station Plate Kit

BLANK STATION PLATE KIT

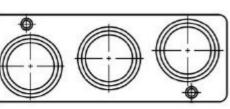
MANIFOLD KIT

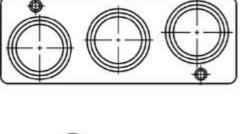






03





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	Blank Station Kit Number	Kit Number	
Det. No.	Part Name	Qty	5/2
01	Blank Plate	-	
02	Gasket	1	R521AB514632001
03	Mounting Screw	2	

R521AC514631001 5/2

Mounting Screw

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Manifold Kit Number

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Part Name Gasket

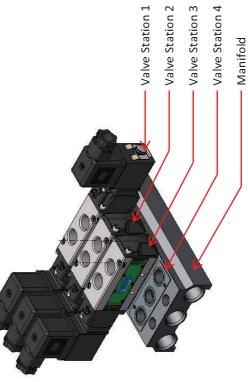
Det. No.





Manifold, Solenoid Valve & Accessories Ordering Example 2:

Part Name / Position	Product Code	Description
Manifold	8521AM514127004	4 stations manifold
Valve Station 1	8521A2B42SA00F1	5/2-Way Solenoid Valve, Dual Coil, 24Vdc
Valve Station 2	8521A2B12SA00F1	5/2-Way Solenoid Valve, Spring Return, 24Vdc
Valve Station 3	8521A2B12SA00F1	5/2-Way Solenoid Valve, Spring Return, 24Vdc
Valve Station 4	R521AB514632001	Blank Station Plate Kit
Manifold Kit	R521AC514631001	Manifold Kit x 3 sets



8521A2B42SA00F1
5/2-Way Solenoid Valve, Dual Coil, 24Vdc
8521A2B12SA00F1
5/2-Way Solenoid Valve, Spring Return, 24Vdc
8521A2B12SA00F1
5/2-Way Solenoid Valve, Spring Return, 24Vdc
R521AB514632001
Blank Station Plate Kit

R521AB514632001 Blank Station Plate Kit 8521AM514127004 4 stations manifold



