Plant Risk Assessments & Consulting
Machine Safety Guarding & Control
Mechanical, Electrical, Pneumatic & Hydraulic Safety Solutions
Power Press Safety Specialists
Monitored Valves
General Engineering & Fabrication
Industrial Electrical Contracting (REC 11659)
Winner of WorkSafe Award 2002

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Specialists in Machine Safety Integration

MONITORED VALVES

-INTERFACING FLUID POWER OPERATION WITH ELECTRICAL SAFETY CIRCUITS-

-PNEUMATIC RANGE-

TECHNICAL HANDBOOK

CE

Suitable for Category 4 applications
in accordance with AS 4024.1 and EN 954.1

SAFETY PACKAGE SYSTEM
ASG ISO 1 3/2 SYSTEM DUMP

SAFETY PACKAGE SYSTEM
ASG ISO 1 5/3 COMPONENT BLOCK

CONTENTS

1. RANGE OVERVIEW

WHAT ARE MONITORED VALVES AND HOW DO THEY WORK?

- Monitored Valves are essential for any fluid power systems interfaced with electrical safety circuits and suitable for use in all pneumatic safety applications (up to and including Category 4 applications in accordance with AS 4024.1 and EN 954.1).

- They are based around an ISO range of solenoid operated, pneumatic spool valves. Spool monitoring is achieved by the positively driven electro-mechanical switches integrated to the valves.
    - Solenoids control valve activation via an approved dual channel safety relay.
    - Switch contacts change state upon movement of the valve spool.
    - Valve spool movement is monitored by the switches.
    - Switch operation is interfaced through the electrical safety circuit to achieve the appropriate category of control system.

WHAT ARE THEY DESIGNED TO DO?

- They are designed as an interface between the fluid power operation and electrical safety circuits of machinery, with the objective of eliminating the exposure to workplace risks and hazards associated with pneumatic machinery.

- They are designed to:
    - Provide a means of compliant fluid power control.
    - Produce a safety system where both the fluid power and electrical systems meet their risk category requirements.
    - Replace non-monitored valves and regular solenoid valves in safety circuits or in circumstances where they are controlling critical processes.
    - Enhance existing systems which require a safety upgrade, by retro-fitting into the existing circuit.
    - Integrate into new system designs.
    - Be used in conjunction with the latest technologies of programmable safety systems.

WHO AND WHAT NEEDS MONITORED VALVES?

- Safety system designers.
- Designers and Integrators of fluid power systems and electrical safety circuits.
- Designers, Users, Suppliers and Manufacturers of machinery, manufacturing and process equipment utilising compressed air.
- Fluid power systems interfaced with electrical safety circuits.
- Pneumatic systems/processes associated with hazard and risk.

WHY MONITORED VALVES?

- Safe control and isolation of pneumatic power.
- To comply with requirements in AS 4024.1 and AS 1219.
- To ensure risk category compliance.
- To prevent accidents caused by the use and misuse of compressed air.
- To legally fulfil the duty of controlling risks.
- Because non-monitored valves can undetectably fail to danger.
- To increase and maintain the highest possible levels of safety.

PRODUCT RANGE

Product range available in both single and dual monitored configurations:

- ‘Single Units’ (Suit Category 1 and 2), and
- ‘Safety Package Systems’ (Suit Category 3 and 4).

1.1. Safety Package Systems

What are Safety Package Systems?

- *'Safety package systems'* are dual monitored valve systems which comprise of 2 monitored valves mounted on 1 series ported manifold for pneumatic safety applications.

- Used to interface fluid power operation of plant with electrical safety circuits, *'Safety package systems'* prevent single faults, within fluid power safety systems, from leading to the loss of the safety function.

- Correct monitoring ensures single fault detection and prevents further operation of the secondary valve until the fault is corrected.

- Thus, once correctly connected to an approved device (an approved, dual channel safety relay) for monitoring of the dual redundancy, the *'Safety package systems'* are:
    - Dual redundant in function.
    - Monitored for a fault and, therefore, the loss of dual redundancy.
    - Of fail-to-safe design (a single fault does not lead to the loss of the safety function).
    - Able to lock-out and inhibit further operation upon detection of a fault until corrected.

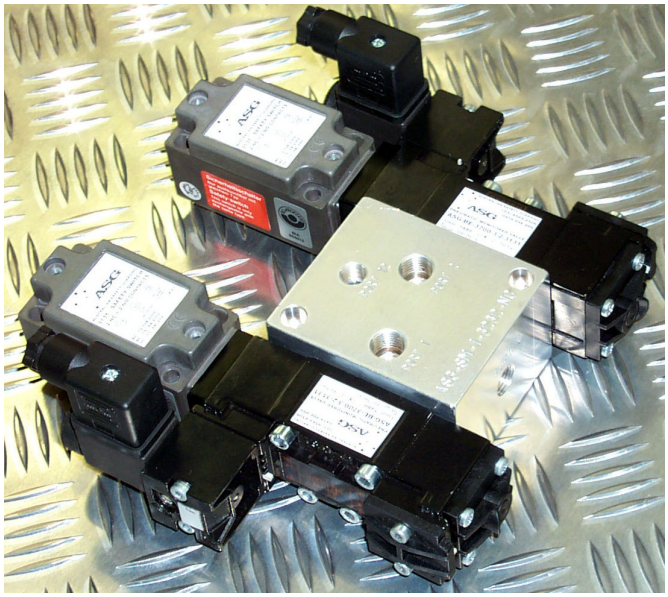
Range Design

- *'Safety package systems'* are available in a variety of port sizes, flow rates and spool configurations (depending on the application). This signifies that the versatile range is capable of safely controlling and isolating pneumatic power, whilst fulfilling the widest range of needs in pneumatic energy control.

- Refer to the following page for *'Safety package systems'* ordering codes (Safety Package System Part No.).

Approvals

- Our *'Safety package systems'* comply with all applicable directives (EC Machinery Directive 98/37/EC) and harmonized standards (EN 292-1, EN 292-2, EN 1050, EN 60204, EN 954.1, EN 983) for pneumatic fluid power systems and their components. They qualify for CE compliance and for use with Category 4 of control system in accordance with AS 4024 and EN 954.1.



SYSTEM DESCRIPTION		SYSTEM COMPONENTS	COMPONENT PART NO.	SAFETY PACKAGE SYSTEM PART NO.
2/2 SYSTEM BLOCK	**SIZE**			
Dual monitored 2/2 system block includes: ▪ 2x 5/2 monitored valves mounted on a series ported manifold to suit 2/2 operation for pneumatic safety applications. Typically used for safely blocking air to and from machinery.	ISO 1 (¼")	Valve A	ASG-BE-3700-5/2-3131	**ASG ISO 1 2/2 SYSTEM BLOCK**
		Valve B	ASG-BE-3700-5/2-3131	
		Sub-base	ASG-SM-1-2/2	
	ISO 2 (⅜")	Valve A	ASG-BE-4700-5/2-3131	**ASG ISO 2 2/2 SYSTEM BLOCK**
		Valve B	ASG-BE-4700-5/2-3131	
		Sub-base	ASG-SM-2-2/2	
	ISO 3 (½")	Valve A	ASG-BE-5700-5/2-3131	**ASG ISO 3 2/2 SYSTEM BLOCK**
		Valve B	ASG-BE-5700-5/2-3131	
		Sub-base	ASG-SM-3-2/2	
	ISO 4 (¾")	Valve A	ASG-BE-6700-5/2-3131	**ASG ISO 4 2/2 SYSTEM BLOCK**
		Valve B	ASG-BE-6700-5/2-3131	
		Sub-base	ASG-SM-4-2/2	
3/2 SYSTEM DUMP	**SIZE**			
Dual monitored 3/2 system dump includes: ▪ 2x 5/2 monitored valves mounted on a series ported manifold to suit 3/2 operation for pneumatic safety applications. Typically used for safely exhausting air from machinery.	ISO 1 (¼")	Valve A	ASG-BE-3700-5/2-3131	**ASG ISO 1 3/2 SYSTEM DUMP**
		Valve B	ASG-BE-3700-5/2-3131	
		Sub-base	ASG-SM-1-3/2	
	ISO 2 (⅜")	Valve A	ASG-BE-4700-5/2-3131	**ASG ISO 2 3/2 SYSTEM DUMP**
		Valve B	ASG-BE-4700-5/2-3131	
		Sub-base	ASG-SM-2-3/2	
	ISO 3 (½")	Valve A	ASG-BE-5700-5/2-3131	**ASG ISO 3 3/2 SYSTEM DUMP**
		Valve B	ASG-BE-5700-5/2-3131	
		Sub-base	ASG-SM-3-3/2	
	ISO 4 (¾")	Valve A	ASG-BE-6700-5/2-3131	**ASG ISO 4 3/2 SYSTEM DUMP**
		Valve B	ASG-BE-6700-5/2-3131	
		Sub-base	ASG-SM-4-3/2	
4/2 COMPONENT BLOCK	**SIZE**			
Dual monitored 4/2 component block includes: ▪ 2x 5/2 closed centre monitored valves mounted on a series ported manifold to suit 4/2 operation for pneumatic safety applications. Typically used for safely holding individual actuators or cylinders in place.	ISO 1 (¼")	Valve A	ASG-BE-3940-5/2-3131	**ASG ISO 1 4/2 COMPONENT BLOCK**
		Valve B	ASG-BE-3940-5/2-3131	
		Sub-base	ASG-SM-1-4/2	
	ISO 2 (⅜")	Valve A	ASG-BE-4940-5/2-3131	**ASG ISO 2 4/2 COMPONENT BLOCK**
		Valve B	ASG-BE-4940-5/2-3131	
		Sub-base	ASG-SM-2-4/2	
	ISO 3 (½")	Valve A	ASG-BE-5940-5/2-3131	**ASG ISO 3 4/2 COMPONENT BLOCK**
		Valve B	ASG-BE-5940-5/2-3131	
		Sub-base	ASG-SM-3-4/2	
	ISO 4 (¾")	Valve A	ASG-BE-6940-5/2-3131	**ASG ISO 4 4/2 COMPONENT BLOCK**
		Valve B	ASG-BE-6940-5/2-3131	
		Sub-base	ASG-SM-4-4/2	
5/3 COMPONENT BLOCK	**SIZE**			
Dual monitored 5/3 component block includes: ▪ 1x 5/2 & 1x 5/3 closed centre monitored valves mounted on a series ported manifold to suit 5/3 operation for pneumatic safety applications. Typically used for safely holding individual actuators or cylinders in place.	ISO 1 (¼")	Valve A	ASG-BE-3940-5/2-3131	**ASG ISO 1 5/3 COMPONENT BLOCK**
		Valve B	ASG-BE-3940-5/3-3131	
		Sub-base	ASG-SM-1-5/3	
	ISO 2 (⅜")	Valve A	ASG-BE-4940-5/2-3131	**ASG ISO 2 5/3 COMPONENT BLOCK**
		Valve B	ASG-BE-4940-5/3-3131	
		Sub-base	ASG-SM-2-5/3	
	ISO 3 (½")	Valve A	ASG-BE-5940-5/2-3131	**ASG ISO 3 5/3 COMPONENT BLOCK**
		Valve B	ASG-BE-5940-5/3-3131	
		Sub-base	ASG-SM-3-5/3	
	ISO 4 (¾")	Valve A	ASG-BE-6940-5/2-3131	**ASG ISO 4 5/3 COMPONENT BLOCK**
		Valve B	ASG-BE-6940-5/3-3131	
		Sub-base	ASG-SM-4-5/3	
5/3 COMPONENT DUMP	**SIZE**			
Dual monitored 5/3 component dump includes: ▪ 1x 5/2 & 1x 5/3 open centre monitored valves mounted on a series ported manifold to suit 5/3 operation for pneumatic safety applications. Typically used for safely exhausting air from specific parts of machinery i.e. single actuator or cylinder.	ISO 1 (¼")	Valve A	ASG-BE-3900-5/2-3131	**ASG ISO 1 5/3 COMPONENT DUMP**
		Valve B	ASG-BE-3900-5/3-3131	
		Sub-base	ASG-SM-1-5/3	
	ISO 2 (⅜")	Valve A	ASG-BE-4900-5/2-3131	**ASG ISO 2 5/3 COMPONENT DUMP**
		Valve B	ASG-BE-4900-5/3-3131	
		Sub-base	ASG-SM-2-5/3	
	ISO 3 (½")	Valve A	ASG-BE-5900-5/2-3131	**ASG ISO 3 5/3 COMPONENT DUMP**
		Valve B	ASG-BE-5900-5/3-3131	
		Sub-base	ASG-SM-3-5/3	
	ISO 4 (¾")	Valve A	ASG-BE-6900-5/2-3131	**ASG ISO 4 5/3 COMPONENT DUMP**
		Valve B	ASG-BE-6900-5/3-3131	
		Sub-base	ASG-SM-4-5/3	

1.2. Single Units

What are Single Units?

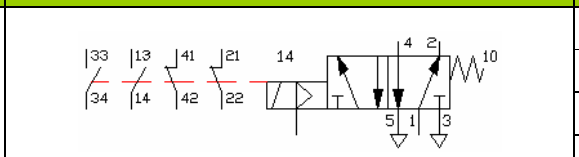
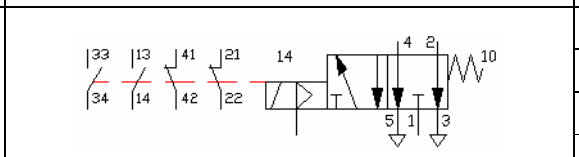
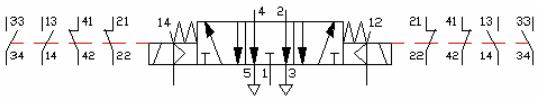
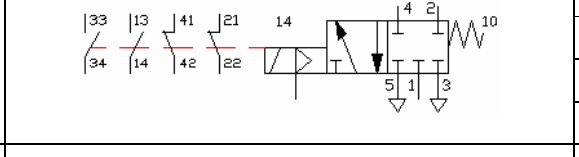
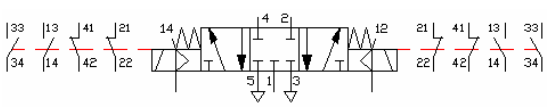
- *'Single Units'* are single monitored valves which comprise of 1 monitored valve mounted on 1 sub-base.
- They can be used in this configuration for risk Category 1 and 2 applications.
- They are used to create *'Safety package systems'* for risk Category 3 and 4 applications.

Range Design

- They are based around an ISO range of solenoid operated, pneumatic spool valves. Spool monitoring is achieved by the positively driven electro-mechanical switches integrated to the valves.
- *'Single Units'* are available in a variety of sizes, flow rates and spool configurations (depending on the application). This signifies that the versatile range is capable of safely controlling and isolating pneumatic power, whilst fulfilling the widest range of needs in pneumatic energy control.
- Refer to the table below for *'Single Units'* ordering codes (Single Units Part No.).

Approvals

- Our *'Single Units'* comply with all applicable directives (EC Machinery Directive 98/37/EC) and harmonized standards (EN 292-1, EN 292-2, EN 1050, EN 60204, EN 954.1, EN 983) for pneumatic fluid power systems and their components. They qualify for CE compliance and for use with Category 1 and 2 of control system in accordance with AS 4024 and EN 954.1.

Valve Type		Symbol	ISO Size	Time *MS*		Mass *KG*	Single Units Part No.
				NRG	DNRG		
Ways	5/2		1	21	35	0.65	**ASG-BE-3700-5/2-3131**
Actuation	Electrical		2	24	30	0.75	**ASG-BE-4700-5/2-3131**
Return	Mech. Spring		3	33	74	1.1	**ASG-BE-5700-5/2-3131**
Monitored	Single		4	39	68	1.3	**ASG-BE-6700-5/2-3131**
Ways	5/2		1	17	8	0.75	**ASG-BE-3900-5/2-3131**
Actuation	Electrical		2	18	9	1	**ASG-BE-4900-5/2-3131**
Return	Mech. Spring		3	26	17	1.4	**ASG-BE-5900-5/2-3131**
Monitored	Single		4	27	18	1.6	**ASG-BE-6900-5/2-3131**
Ways	5/3		1	17	28	0.95	**ASG-BE-3900-5/3-3131**
Actuation	Electrical		2	18	25	1.2	**ASG-BE-4900-5/3-3131**
Return	Mech. Spring		3	26	46	1.6	**ASG-BE-5900-5/3-3131**
Monitored	Double		4	27	42	1.8	**ASG-BE-6900-5/3-3131**
Ways	5/2		1	17	25	0.7	**ASG-BE-3940-5/2-3131**
Actuation	Electrical		2	18	27	1	**ASG-BE-4940-5/2-3131**
Return	Mech. Spring		3	26	50	1.4	**ASG-BE-5940-5/2-3131**
Monitored	Single		4	30	47	1.6	**ASG-BE-6940-5/2-3131**
Ways	5/3		1	17	25	0.9	**ASG-BE-3940-5/3-3131**
Actuation	Electrical		2	18	27	1.2	**ASG-BE-4940-5/3-3131**
Return	Mech. Spring		3	26	50	1.6	**ASG-BE-5940-5/3-3131**
Monitored	Double		4	30	47	1.8	**ASG-BE-6940-5/3-3131**

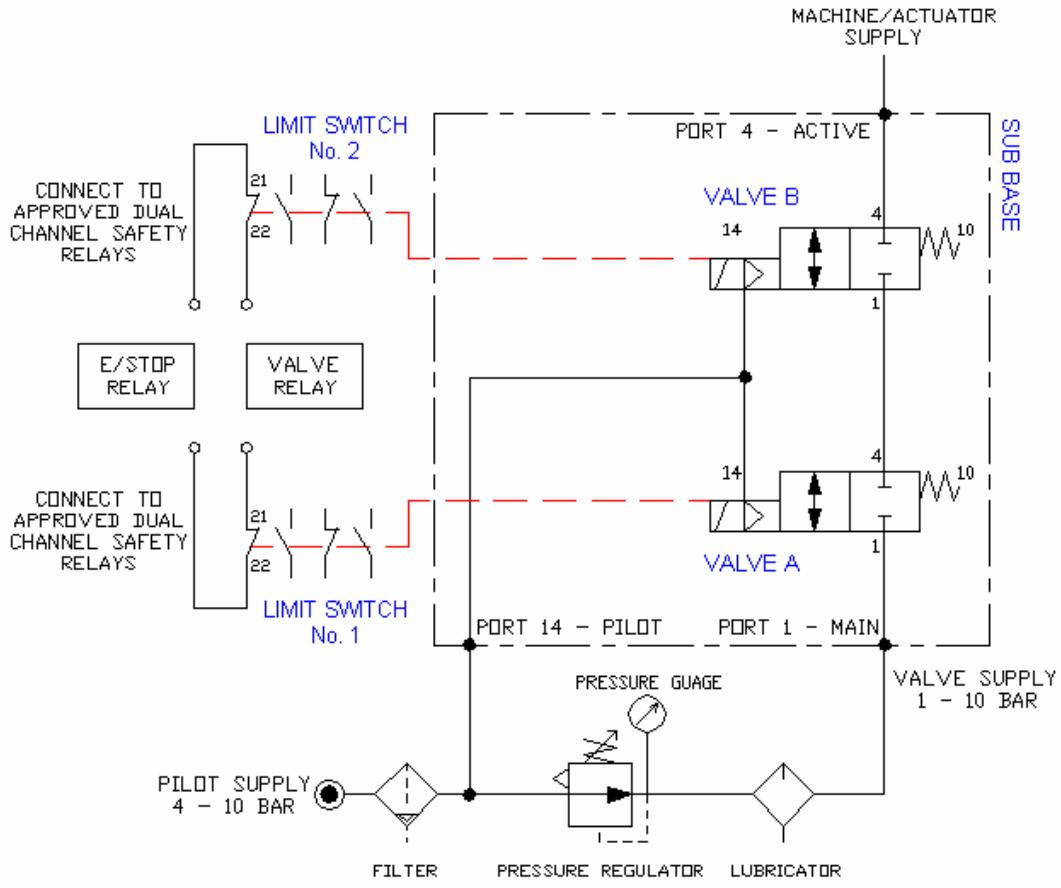
1.3. Technical Specifications

TECHNICAL SPECIFICATIONS					
	Models	Single valves and Dual redundant valve systems in 4 ISO sizes and a number of spool configurations and flowrates.			
	Configurations	2/2, 3/2, 4/2, 5/2, 5/3 (open & closed centres)			
	Design	Solenoid operated, monitored, floating spool system, pneumatic valves.			
	Approvals	EC Machinery Directive 98/37/EC (CE compliance). Suitable for use with Category 4 control system in accordance with AS 4024 and EN 954.1			
	Mounting	Manifold (single or dual redundant)			
	Connection (Port sizes)	**Size**	**Pilot Port**	**Port Size**	
		1	⅛" BSP	¼" BSP	
		2	⅛" BSP	⅜" BSP	
		3	⅛" BSP	½" BSP	
		4	⅛" BSP	¾" BSP	
Pneumatic data - Valve					
Performance	**Medium**	Compressed air, filtered (50µm) and lubricated			
	Valve operating pressure	1 – 10 bar			
	Pilot pressure	4 – 10 bar			
	Ambient temperature	-10°C – +50°C			
	Fluid temperature	-20°C – +50°C			
	Flowrates	**Size**	**Q_N (Nl/min)**	**C_V (Gl/min)**	
		1	1480	1.5	
		2	2300	2.4	
		3	4200	4.4	
		4	6600	6.9	
	Life	Long life – 10 million operations			
Materials	**Housing / Body**	Die-cast aluminium / Acetalic resin			
	Endcap	Anodised aluminium			
	Spool	Hard anodised aluminium			
	Seals	Nitrile rubber			
	Lubricant	Shell Alvania RL2			
	Manifold	**Single**		**Dual Redundant**	
		Zamak		Aluminium	
Electrical data - Switch					
	Design	Euchner 4 pole positive driven plunger type safety switch pre approved to Category 4 applications.			
Performance	**Ambient temperature**	-25°C – +80°C			
	Switching principle	Slow-action contact element			
	Mechanical service life	$30x10^6$ switching cycles			
	Protection	IP 67			
	Rated impulse withstand voltage U_{imp}	2.5 kV			
	Rated insulation voltage U_i	250 V≅			
	Short-circuit protection (control circuit fuse)	4 A gG			
	Switching current min. at switching voltage	1 mA		10 mA	
		24 V DC		12 V DC	
	Utilisation category to IEC 947-5-1	AC	AC-15 U_e 230 V I_e 4 A		
		DC	DC-13 U_e 24 V I_e 4 A		
Wiring	**Cable entry**	M20			
	Connection type	Screw terminal			
	Cable cross-section max.	$1.5mm^2$			
	Contacts	2 Normally Closed (positively driven) + 2 Normally Open contacts			
	Terminals	**21-22**	**41-42**	**13-14**	**33-34**
		N/C	N/C	N/O	N/O
Materials	**Housing**	Anodized die-cast alloy			
	Contact	Silver alloy, gold flashed			
Electrical data - Coil					
Performance	**Rated voltage**	AC	24, 110, 220 V AC / 50 – 60 Hz		
		DC	12, 24 V DC		
	Consumption	AC	5 VA		
		DC	3,5 W		
	Tolerance (tension)	± 10%			
	Ambient temperature	-10°C – +50°C			
	Coil winding	H class			
	Protection class	IP 65			

2. CIRCUIT DIAGRAMS

2.1. 2/2 System Block

- SAFETY FUNCTION: Locking air in machinery, whilst blocking the main air supply.



Typical Valve Connection Schematic – 2/2 System Block

- The *2/2 System Block* safety package system consists of two 5 port 2 position (5/2) solenoid operated, sliding spool type pneumatic valves, mounted on a series ported manifold to suit 2 port 2 position (2/2) normally closed operation for pneumatic safety applications.

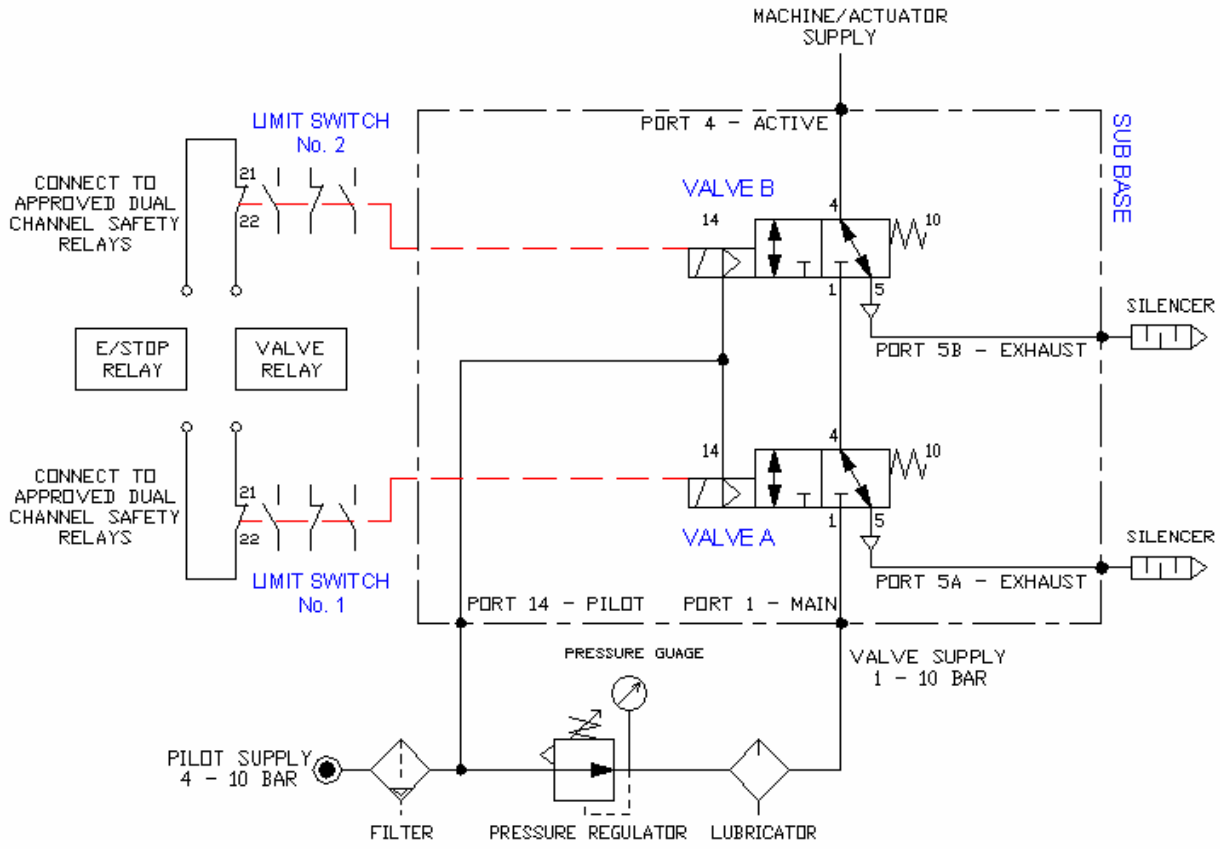
- The valves are integrated to 4 pole positively driven safety switches pre approved to category 4 applications.

- The *2/2 System Block* safety package system is typically used for safely supplying air to machinery (when actuated) and locking air in machinery (arresting and holding actuator movement), whilst blocking the main air supply (when un-actuated or upon system fault).

- The main difference between this system and standard solenoid valves is that any condition which might cause one valve element not to shift along with the other, results in all ports being sealed and isolated. In this situation the moving parts of the pneumatic actuators are guaranteed in the position reached.

2.2. 3/2 System Dump

- SAFETY FUNCTION: Exhausting air from machinery, whilst blocking the main air supply.



Typical Valve Connection Schematic – 3/2 System Dump

- The *3/2 System Dump* safety package system consists of two 5 port 2 position (5/2) solenoid operated, sliding spool type pneumatic valves, mounted on a series ported manifold to suit 3 port 2 position (3/2) normally closed operation for pneumatic safety applications.

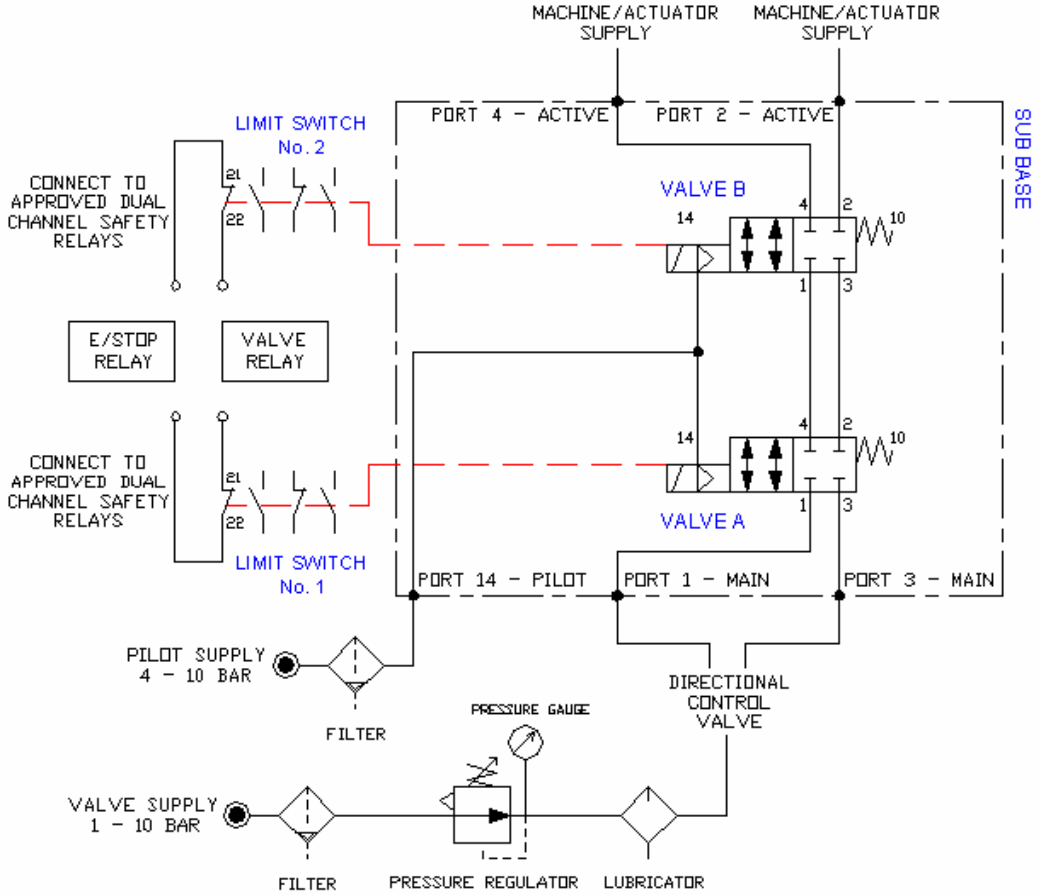
- The valves are integrated to 4 pole positively driven safety switches pre approved to category 4 applications.

- The *3/2 System Dump* safety package system is typically used for safely supplying air to machinery (when actuated) and exhausting air (arresting actuator movement) from machinery whilst blocking the main air supply (when un-actuated or upon system fault).

- The main difference between this system and standard solenoid valves is that any condition which might cause one valve element not to shift along with the other, results in no output to the active port. In this situation the active port is connected to the exhaust port and the main inlet port is blocked. Thus air is exhausted from the machinery.

2.3. 4/2 Component Block

- SAFETY FUNCTION: Locking air in specific parts of machinery i.e. single actuator or cylinder, whilst blocking the main air supply.



Typical Valve Connection Schematic – 4/2 Component Block

- The *4/2 Component Block* safety package system consists of two 5 port 2 position (5/2) solenoid operated, sliding spool type pneumatic valves, mounted on a series ported manifold to suit 4 port 2 position (4/2) blocked centre operation for pneumatic safety applications.

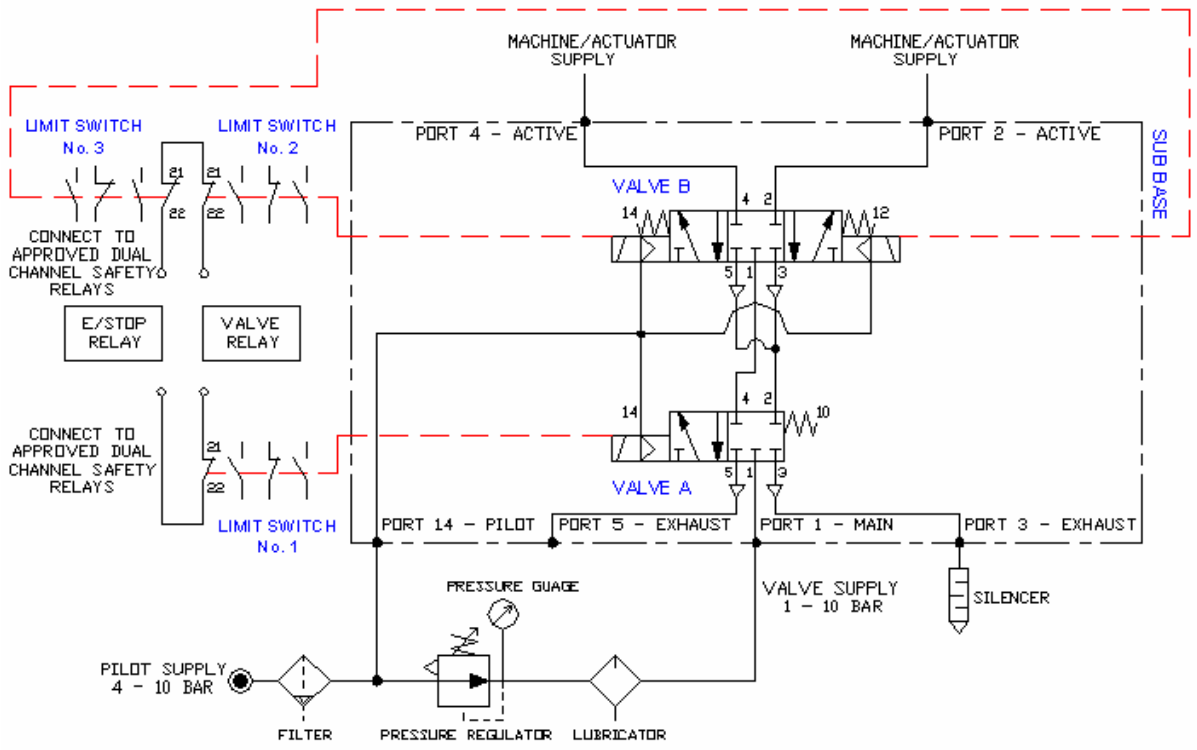
- The valves are integrated to 4 pole positively driven safety switches pre approved to category 4 applications.

- The *4/2 Component Block* safety package system is typically used for safely supplying air to machinery (when actuated) and locking air (arresting and holding actuator movement) whilst blocking the main air supply (when un-actuated or upon system fault).

- The main difference between this system and standard solenoid valves is that any condition which might cause one valve element not to shift along with the other, results in all ports being sealed and isolated. In this situation the moving part of the pneumatic actuator is guaranteed in the position reached.

2.4. 5/3 Component Block

- SAFETY FUNCTION: Locking air in specific parts of machinery i.e. single actuator or cylinder, whilst blocking the main air supply.



Typical Valve Connection Schematic – 5/3 Component Block

- The *5/3 Component Block* safety package system consists of one 5 port 2 position (5/2) and one 5 port 3 position (5/3) solenoid operated, sliding spool type pneumatic valves, mounted on a series ported manifold to suit 5 port 3 position (5/3) blocked centre operation for pneumatic safety applications.

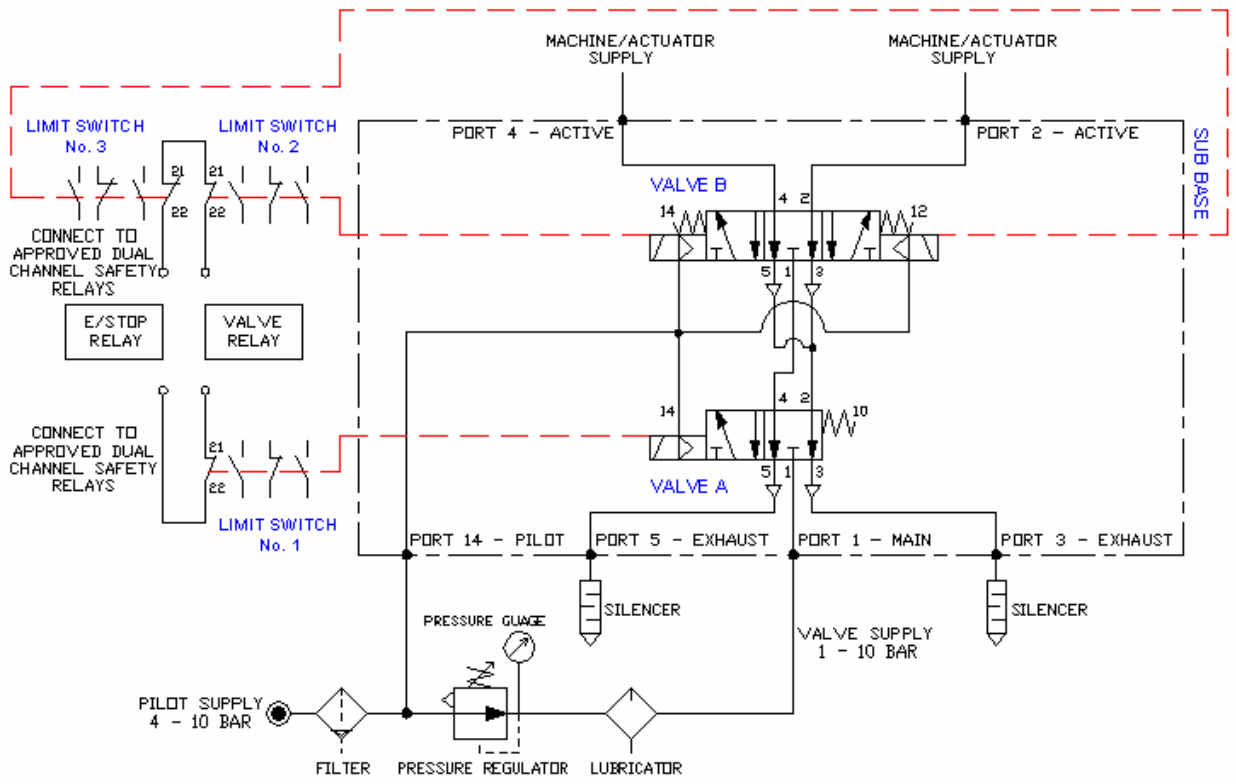
- The valves are integrated to 4 pole positively driven safety switches pre approved to category 4 applications.

- The *5/3 Component Block* safety package system is typically used for safely supplying air and controlling machinery (when actuated) and locking air (arresting and holding actuator movement) whilst blocking the main air supply (when un-actuated or upon system fault).

- The main difference between this system and standard solenoid valves is that any condition which might cause one valve element not to shift along with the other, results in all ports being sealed and isolated. In this situation the moving part of the pneumatic actuator is guaranteed in the position reached.

2.5. 5/3 Component Dump

- SAFETY FUNCTION: Exhausting air from specific parts of machinery i.e. single actuator or cylinder, whilst blocking the main air supply.



Typical Valve Connection Schematic – 5/3 Component Dump

- The *5/3 Component Dump* safety package system consists of one 5 port 2 position (5/2) and one 5 port 3 position (5/3) solenoid operated, sliding spool type pneumatic valves, mounted on a series ported manifold to suit 5 port 3 position (5/3) exhausted centre operation for pneumatic safety applications.

- The valves are integrated to 4 pole positively driven safety switches pre approved to category 4 applications.

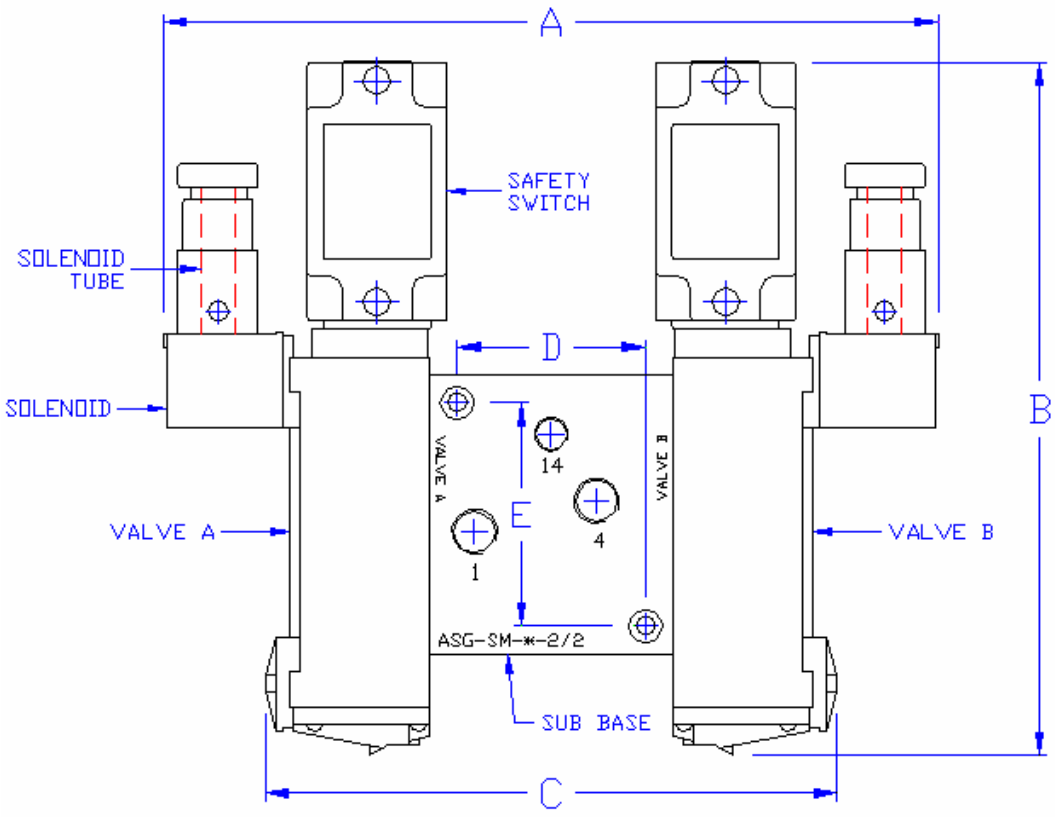
- The 5/3 Component Dump safety package system is typically used for safely supplying air and controlling machinery (when actuated) and exhausting air (arresting actuator movement) from machinery whilst blocking the main air supply (when un-actuated or upon system fault).

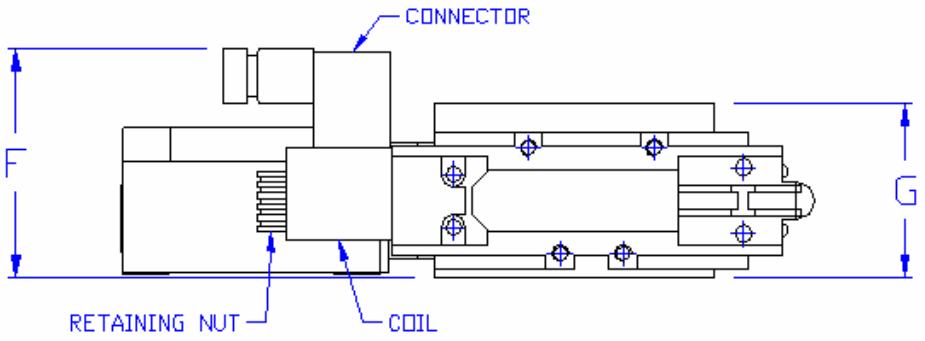
- The main difference between this system and standard solenoid valves is that any condition which might cause one valve element not to shift along with the other, results in no output to the active ports. In this situation the active ports are connected to the exhaust ports and the inlet port is blocked. Thus air is exhausted from the machinery.

3. DIMENSIONAL DRAWINGS

3.1. Safety Package Systems

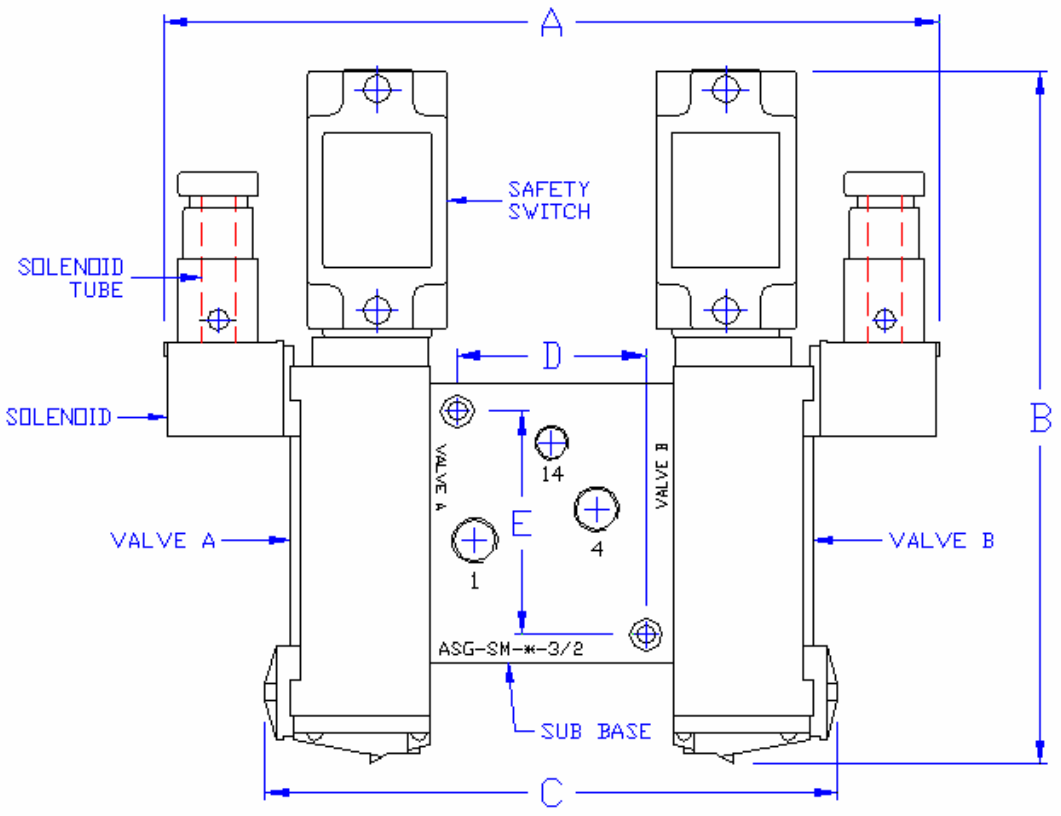
3.1.1. 2/2 System Block

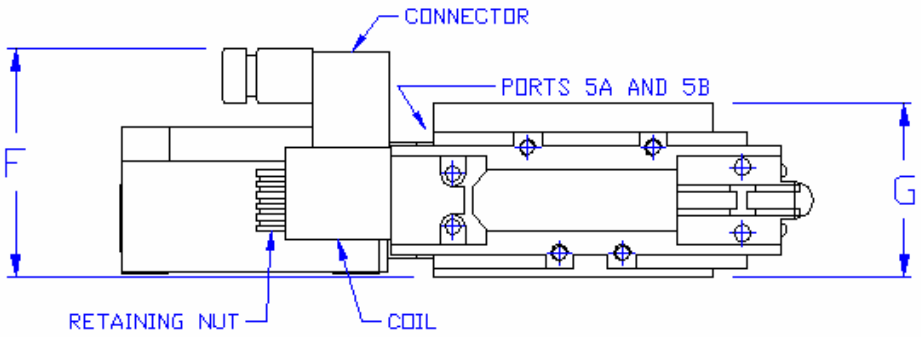




DIMENSION	ASG ISO 1 2/2 SYSTEM BLOCK mm	ASG ISO 2 2/2 SYSTEM BLOCK mm	ASG ISO 3 2/2 SYSTEM BLOCK mm	ASG ISO 4 2/2 SYSTEM BLOCK mm
A	210	250	290	320
B	210	220	270	300
C	170	200	230	270
D	54	70	90	110
E	64	85	105	140
F	75	85	90	100
G	50	65	80	100
PORT	**PORT SIZE**	**PORT SIZE**	**PORT SIZE**	**PORT SIZE**
1	G ¼	G ⅜	G ½	G ¾
4	G ¼	G ⅜	G ½	G ¾
14	G ⅛	G ⅛	G ⅛	G ⅛
	SYSTEM MOUNTING	**SYSTEM MOUNTING**	**SYSTEM MOUNTING**	**SYSTEM MOUNTING**
	2x M5 SHCS	2x M6 SHCS	2x M8 SHCS	2x M8 SHCS

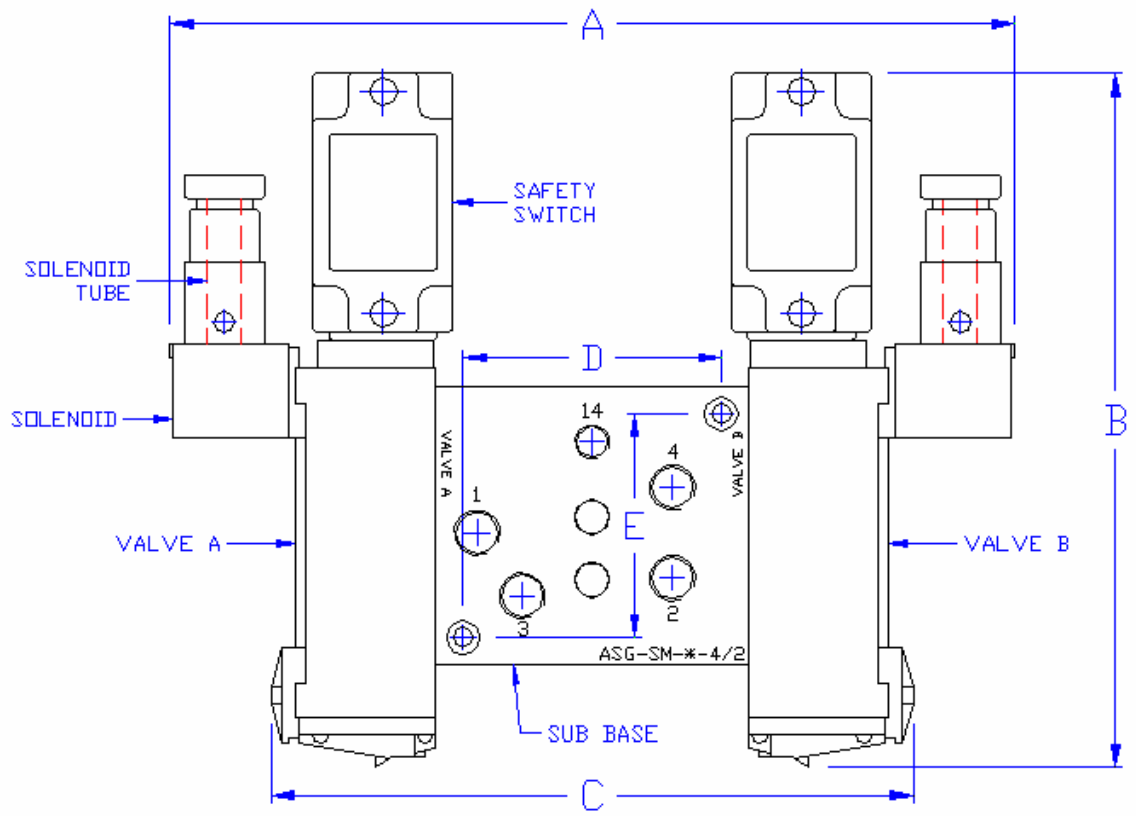
3.1.2. 3/2 System Dump

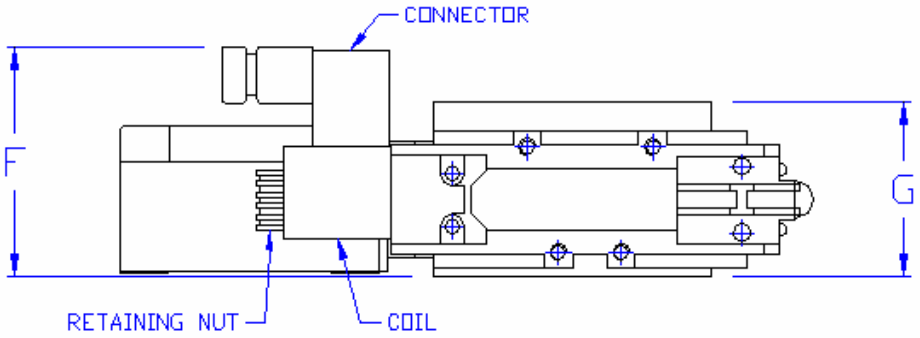




DIMENSION	ASG ISO 1 3/2 SYSTEM DUMP mm	ASG ISO 2 3/2 SYSTEM DUMP mm	ASG ISO 3 3/2 SYSTEM DUMP mm	ASG ISO 4 3/2 SYSTEM DUMP mm
A	210	250	290	320
B	210	220	270	300
C	170	200	230	270
D	54	70	90	110
E	64	85	105	140
F	75	85	90	100
G	50	65	80	100
PORT	**PORT SIZE**	**PORT SIZE**	**PORT SIZE**	**PORT SIZE**
1	G ¼	G ⅜	G ½	G ¾
4	G ¼	G ⅜	G ½	G ¾
5A	G ¼	G ⅜	G ½	G ¾
5B	G ¼	G ⅜	G ½	G ¾
14	G ⅛	G ⅛	G ⅛	G ⅛
	SYSTEM MOUNTING	**SYSTEM MOUNTING**	**SYSTEM MOUNTING**	**SYSTEM MOUNTING**
	2x M5 SHCS	2x M6 SHCS	2x M8 SHCS	2x M8 SHCS

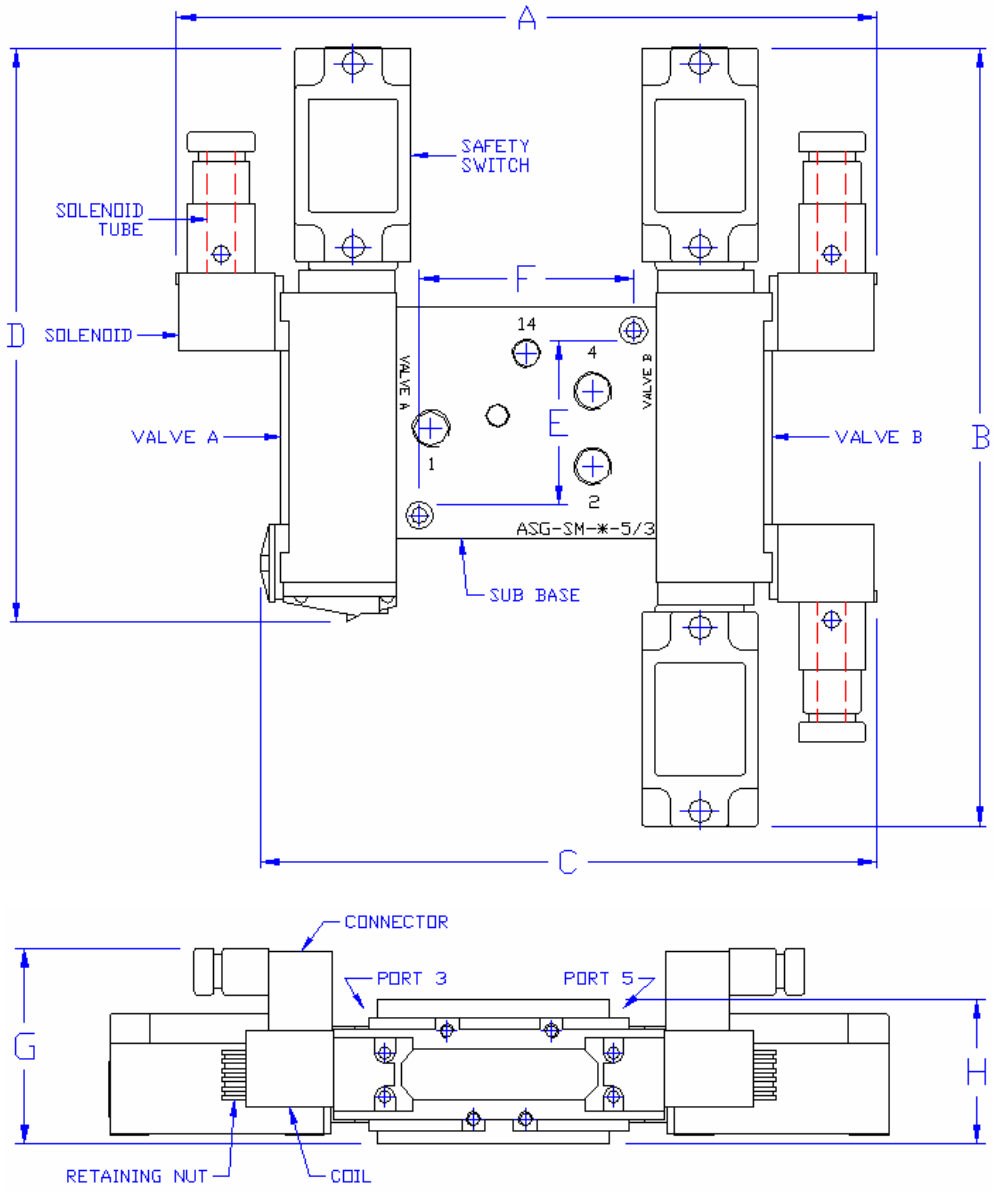
3.1.3. 4/2 Component Block





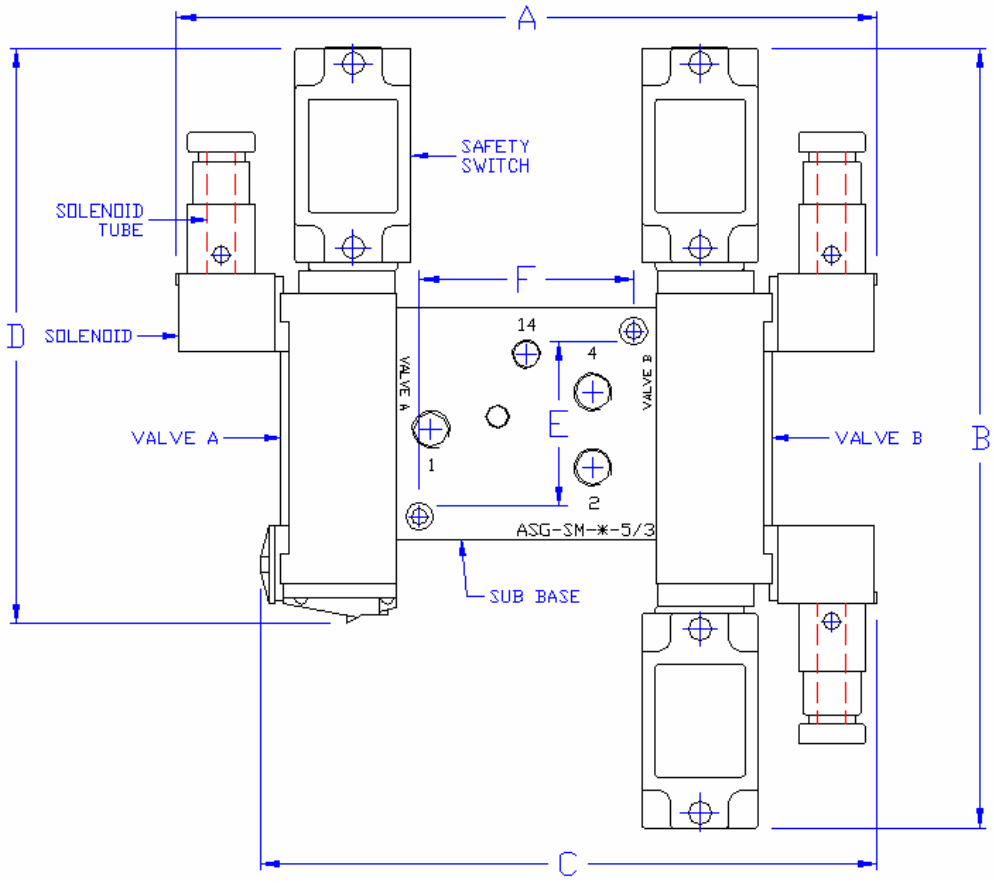
DIMENSION	ASG ISO 1 4/2 COMPONENT BLOCK mm	ASG ISO 2 4/2 COMPONENT BLOCK mm	ASG ISO 3 4/2 COMPONENT BLOCK mm	ASG ISO 4 4/2 COMPONENT BLOCK mm
A	210	270	310	350
B	210	220	270	300
C	170	220	250	280
D	54	95	110	135
E	64	85	105	125
F	75	85	90	95
G	50	65	80	100
PORT	**PORT SIZE**	**PORT SIZE**	**PORT SIZE**	**PORT SIZE**
1	G ¼	G ⅜	G ½	G ¾
2	G ¼	G ⅜	G ½	G ¾
3	G ¼	G ⅜	G ½	G ¾
4	G ¼	G ⅜	G ½	G ¾
14	G ⅛	G ⅛	G ⅛	G ⅛
	SYSTEM MOUNTING	**SYSTEM MOUNTING**	**SYSTEM MOUNTING**	**SYSTEM MOUNTING**
	2x M5 SHCS	2x M6 SHCS	2x M8 SHCS	2x M8 SHCS

3.1.4. 5/3 Component Block



DIMENSION	ASG ISO 1 5/3 COMPONENT BLOCK mm	ASG ISO 2 5/3 COMPONENT BLOCK mm	ASG ISO 3 5/3 COMPONENT BLOCK mm	ASG ISO 4 5/3 COMPONENT BLOCK mm
A	230	270	310	350
B	270	290	335	365
C	210	240	270	300
D	210	220	270	300
E	64	85	105	125
F	74	95	110	135
G	80	90	100	110
H	50	65	80	100
PORT	**PORT SIZE**	**PORT SIZE**	**PORT SIZE**	**PORT SIZE**
1	G ¼	G ⅜	G ½	G ¾
2	G ¼	G ⅜	G ½	G ¾
3	G ¼	G ⅜	G ½	G ¾
4	G ¼	G ⅜	G ½	G ¾
5	G ¼	G ⅜	G ½	G ¾
14	G ⅛	G ⅛	G ⅛	G ⅛
	SYSTEM MOUNTING	**SYSTEM MOUNTING**	**SYSTEM MOUNTING**	**SYSTEM MOUNTING**
	2x M5 SHCS	2x M6 SHCS	2x M8 SHCS	2x M8 SHCS

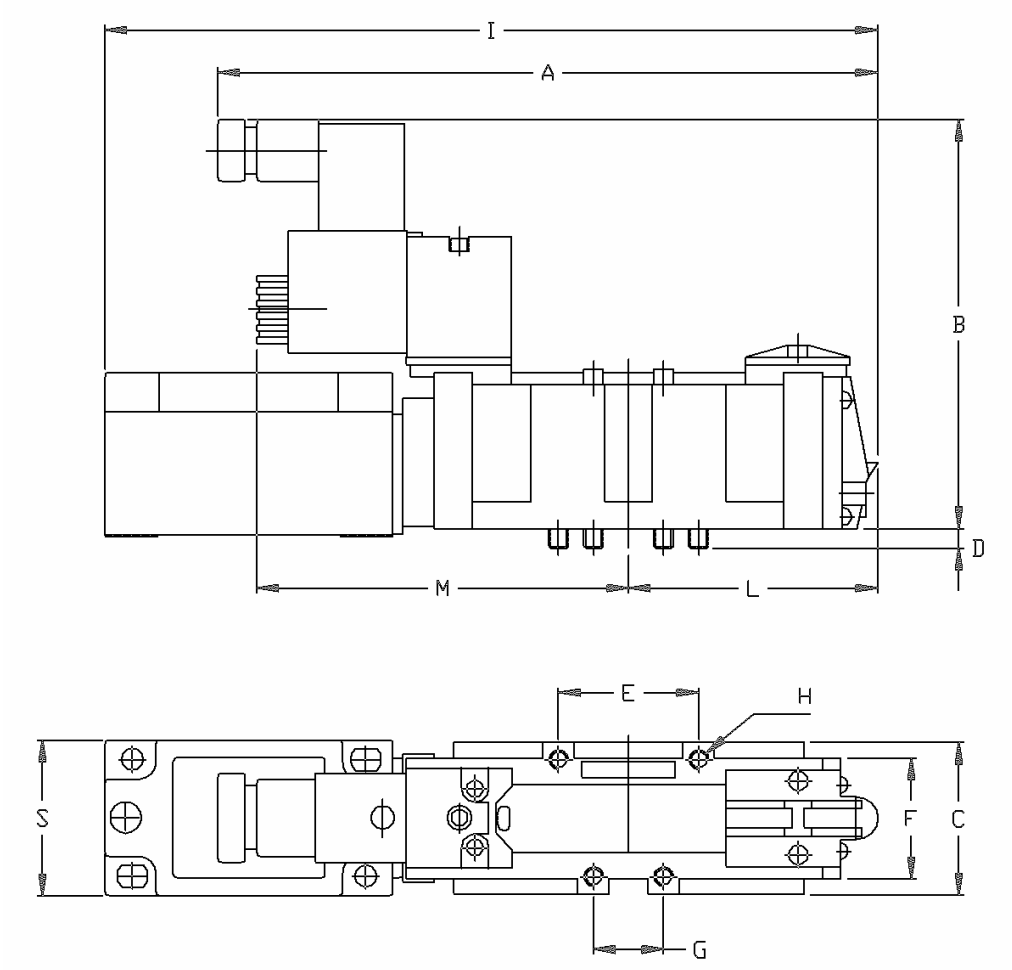
3.1.5. 5/3 Component Dump



DIMENSION	ASG ISO 1 5/3 COMPONENT DUMP mm	ASG ISO 2 5/3 COMPONENT DUMP mm	ASG ISO 3 5/3 COMPONENT DUMP mm	ASG ISO 4 5/3 COMPONENT DUMP mm
A	230	270	310	350
B	270	290	335	365
C	210	240	270	300
D	210	220	270	300
E	64	85	105	125
F	74	95	110	135
G	80	90	100	110
H	50	65	80	100
PORT	**PORT SIZE**	**PORT SIZE**	**PORT SIZE**	**PORT SIZE**
1	G ¼	G ⅜	G ½	G ¾
2	G ¼	G ⅜	G ½	G ¾
3	G ¼	G ⅜	G ½	G ¾
4	G ¼	G ⅜	G ½	G ¾
5	G ¼	G ⅜	G ½	G ¾
14	G ⅛	G ⅛	G ⅛	G ⅛
	SYSTEM MOUNTING	**SYSTEM MOUNTING**	**SYSTEM MOUNTING**	**SYSTEM MOUNTING**
	2x M5 SHCS	2x M6 SHCS	2x M8 SHCS	2x M8 SHCS

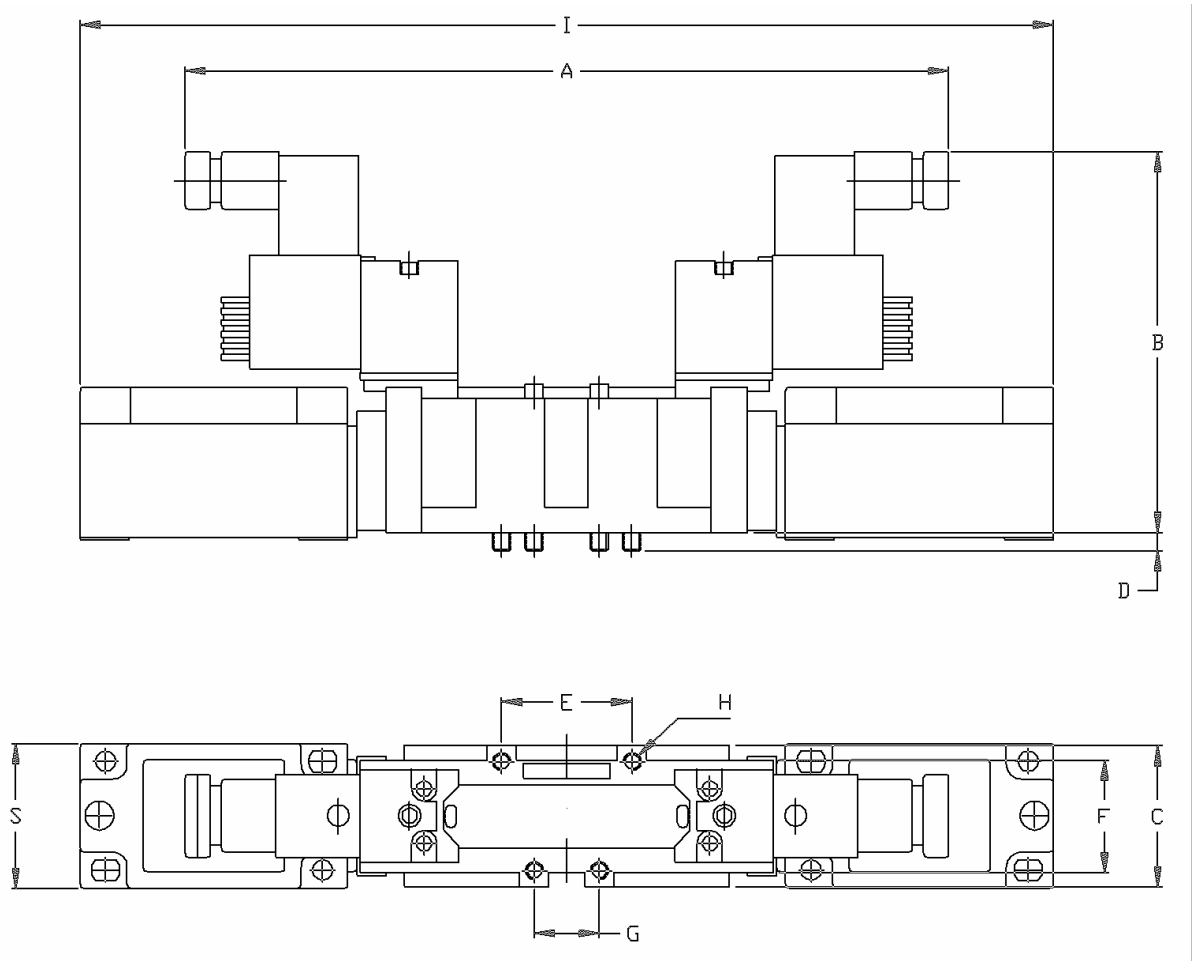
3.2. Single Units

3.2.1. 5/2 Valves



	ISO1	ISO 2	ISO 3	ISO 4
A	170	195	220	255
B	105	105	120	120
C	40	55	65	75
D	5	5	10	10
E	36	48	64	80
F	30	40	50	60
G	18	24	32	40
H	M5 x 35	M6 x 35	M8 x 50	M8 x 50
I	200	215	265	295
L	65	75	95	110
M	95	105	115	125
S	40	40	40	40

3.2.2. 5/3 Valves



	ISO1	ISO 2	ISO 3	ISO 4
A	210	225	250	270
B	105	105	120	120
C	40	55	65	75
D	5	5	10	10
E	36	48	64	80
F	30	40	50	60
G	18	24	32	40
H	M5 x 35	M6 x 35	M8 x 50	M8 x 50
I	270	290	335	365
S	40	40	40	40

4. APPROVALS

EC MACHINERY DIRECTIVE 98/37/EC
ASSESSMENT OF CONFORMITY

FOR SAFETY COMPONENT IN ACCORDANCE WITH ANNEX IIC

Report No.	:	280604
Machine/equipment	:	Monitored pneumatic valves – ASG ISO_2/2 System Block using ASG-BE-_700-5/2-3131 valves and ASG-SM-_-2/2 Sub-base ASG ISO _ 3/2 System Dump using ASG-BE-_700-5/2-3131 valves and ASG-SM-_-3/2 Sub-base ASG ISO_4/2 System Block using ASG-BE-_940-5/2-3131 valves and ASG-SM-_-4/2 Sub-base ASG ISO _ 5/3 Component Block using ASG-BE-_940-5/2-3131 valves and ASG-SM-_-5/3 Sub-base ASG ISO _ 5/3 Component Dump using ASG-BE-_900-5/3-3131 valves and ASG-SM-_-5/3 Sub-base
Manufacturer	:	Australian Safety Guarding
Assessment Dates	:	28 June 2004
Relevant Standards	:	Essential Health and Safety Requirements, EN 292-1, EN 292-2, EN 1050, EN 60204 EN 954.1, EN 983.

Based on the inspection of the valves and evidence presented in the Technical Construction File, RiskPlant Consultants Pty Ltd (EC Conformity Assessment Body No. 929) certify that the valve identified above conforms with the requirements for safety components in accordance with Annex II c of the EC Machinery Directive 98/37/EC.

NATA Authorised signatory:

ROGER LIM, MIEAust,CPEng,MSIA
Principal Consulting Engineer

NATA Accredited (No. 14155)
Inspection Service
EC Designated Conformity Assessment Body (No. 929)

Issued date: 22 July 2004

CE **EUCHNER**

Sicherheitsschalter / Kat. 2	NM.VZ...	a, b, c
	NP...	a, b, c
Safety Switches / Cat. 2	TP... (AS)	a, b, c, (e)
	NZ.VZ...	a, b, c
	NZ.VZ...VSE/VSM	a, b
	TZ... (AS)	a, b, c, (e)
	TX...	a, b, c
Reihengrenztaster	GS...08	a
(elektromechanisch)	GS...12 / GS...16	a
	GL...08	a
Multiple Plunger Limit Switches	GL...12 / GL...16	a
(electromechanical)	RG...12 / RG...16	a
	SN...08 / SB...08	a
	SN...12 / SN...16	a
	GL...508/514 / GS...508/514	a, b, c
	RG...508/514 / SN...508/514	a, b, c
Schaltwerke (elektromech.)	SW...502	a
Rotary cam switches (electromechanical)		
Zustimmungsschalter	ZSA1..., ZSG...	a
Enabling Switches	ZSA2/3..., ZSB..., ZSE..., ZSR...	a, b
Einhebelbefehlsgeräte	KB.../KC.../KE.../KF.../WE.../WK...	a
Joystick Switches		

Die Verwendung dieser Produkte in einer Maschine gewährleistet nicht, daß die gesamte Maschine oder Anlage den europäischen Richtlinien entspricht.

The use of these products within a machine does not guarantee that the entire machine corresponds to the European directives.

Die Verwendung der o.g. Produkte findet u.a. in folgenden Normen ihre Anwendung:

The use of the a.m. products is applied in the following standards:

EN 292-1 **EN 292-2**	Sicherheit von Maschinen; Allgemeine Gestaltungsleitsätze	**EN 292-1** **EN 292-2**	*Safety of machinery; General principles for design*
EN 775	Industrieroboter; Sicherheit	**EN 775**	*Manipulating industrial robots; Safety*
EN 953	Sicherheit von Maschinen; Allgemeine Anforderung an Gestaltung und Bau von trennenden Schutzeinrichtungen	**EN 953**	*Safety of machinery; General requirements for the design and construction of guards*
EN 1050	Sicherheit von Maschinen; Risikobeurteilung	**EN 1050**	*Safety of machinery; Risk assessment*
EN 60204-1	Sicherheit von Maschinen; Elektrische Ausrüstung von Maschinen	**EN 60204-1**	*Safety of machinery; Electrical equipment of machines*

Leinfelden, im Dezember 2002

Dipl.-Ing. Michael Euchner
Geschäftsführer
Managing Director

CE **EUCHNER**

Konformitätserklärung
Declaration of Conformity

Elektromechanische Schaltgeräte

Gemäß den Anforderungen der **Niederspannungs-richtlinie** 73/23/EWG und der **Maschinenrichtlinie** 98/37/EG erklären wir hiermit die Konformität der nachfolgend aufgeführten Produkte mit folgenden europäischen Normen:

Electromechanical Switchgear

*In accordance with the **low voltage switchgear directive** 73/23/EWG and the **machinery directive** 98/37/EG we hereby declare that the beneath listed products conform to the following European standards:*

a: EN 60947-5-1	Niederspannung-Schaltgeräte; Steuergeräte und Schaltelemente; Elektromechanische Steuergeräte	**a: EN 60947-5-1**	*Low voltage switchgear and controlgear; Control circuit devices and switching elements; Electro-mechanical control circuit devices*
b: EN 60947-5-1	Anhang K; Besondere Anforderungen an zwangsöffnende Hilfsstromschalter	**b: EN 60947-5-1**	*Annex K; Special requirements for control switches with direct opening action*
c: EN 1088	Sicherheit von Maschinen; Verriegelungseinrichtungen in Verbindung mit trennenden Schutzeinrichtungen	**c: EN 1088**	*Safety of machinery; Interlocking devices associated with guards*
d: EN 50041	Industrielle Niederspannungs-Schaltgeräte; Hilfsstromschalter; Positionsschalter 42,5x80; Maße und Kennwerte	**d: EN 50041**	*Low voltage switchgear and controlgear for industrial use; Control switches; Position switches 42,5x80; Dimensions and characteristics*
e: EN 50295	Niederspannungsschaltgeräte - Steuerungs- und Geräte-Interface-Systeme – Aktuator Sensor Interface (AS-i)	**e: EN 50295**	*Low voltage switchgear and controlgear – Controller and device interface systems – Actuator Sensor Interface (AS-i)*

Die Produkte werden mit dem CE - Zeichen gemäß der Niederspannungsrichtlinie gekennzeichnet

The products will be marked with the CE - mark according to the low voltage switchgear directive

Produkt ***Product***	**Type** ***Type***	**Konformität mit EN-Normen** ***Conform with European Standards***
Einbaugrenztaster	EGT1.../EGT2.../EGT3.../EGM12...	a
(elektromechanisch)	EGT1/4.../EGT11.../EGT12...	a (< 50 V)
Precision Single Hole Fixing Limit Switches (electromechanical)		
Einzelgrenztaster	N01...	a
(elektromechanisch)	NB01.../ SN01...	a
	N1... / N1A...	a
Single Plunger Limit Switches (electromechanical)	N10... / N11...	a
	N101...	a
	N1A...-508/514, NB01...-588	a, b
	NG...	a, d
	NM...	a, b, c
	NZ...	a, b, c, d

CE CONFORMITY DECLARATION

UNIVER S.p.A.

Via Eraclito, 31 - 20128 *MILANO*
Tel.:02.25298.1 - Fax.:02.2575254

CONTROL DEVICE, TYPE: ***ELECTRIC ACTUATOR***

MODEL: ***U1 - U2 - U3 - U4 - U-5***

SERIES: _____

MANUFACTORING YEAR: ***2002***

It is hereby certified that the above-mentioned control device, correspond with the Directive' precepts 73/23/CEE, 93/68/CEE, according to the European Standards and international advises.

This device being an electric component designed to be included into an installation, its start up is not allowed until the whole system has been stated corresponding to the enforced Directives. (89/392/CEE, All.to II B)

The Electric Actuators, type U1-U2-U3, are also Certified according the CSA standards N° LR 113373-1.

HARMONISED REFERENCE STANDARDS:

UNI EN 983	Safety of machinery - Safety requirements for fluid power systems and their components: Pneumatics.
CEI EN 60204-1	Safety of machinery - Electrical equipment of machines, Part 1: General requirements.
CEI EN 60730-1	Automatic electrical Control Devices, for household use and similar. Part 1: General requirements
CEI EN 60529	Standard protection of the shells (code **IP**)
IEC 536	Standard insulation

Milano, 11-03-2002 **Signature,** _____

Certificate of Compliance

Certificate Number: LR 113373-1

Revision: LR 113373-1 **Date Issued:** November 19, 1998

Issued to: **UNIVER S.p.A.**
Via Eraclito, 31
I-20128 Milano
Italy

The products listed below are eligible to bear the CSA Mark shown

Issued by: Gabriel Raymond, Eng.
Pointe Claire, QC, Canada

Signature: G Raymond

PRODUCTS

CLASS 3221 02 - VALVES - Actuators

Electrically solenoid valves, Series U1, U2, U3 associate, with actuators for the control of pneumatic circuit, with pressure range fromm 0.01MPa to 0.1MPa and ambient temperature from - 10° C to 45°C and fluid temperature equal to 25°C.

Serie U1 Type reference: **DA0050**, rated input 12V c.c., 3.5W, 100%
Type reference: DA0051, rated input 24V c.c., 3.5W, 100%
Type reference: **DA0103**, rated input 48V c.c., 6W, 100%
Type reference: **DA0104**, rated input 110V c.c., 6W, 100%
Type reference: DA0106, rated input 24V, 50/60Hz, 5VA, 100%
Type reference: DA0108, rated input 110V, 50/60Hz, 5VA, 100%
Type reference: **DA0124**, rated input 220V, 50/60Hz, 5VA, 100%

Serie U2 Type reference: DB0501, rated input 12V c.c., 11W, 100%
Type reference: DB0502, rated input 24V c.c., 11W, 100%
Type reference: **DB0503**, rated input 48V c.c., 11W, 100%
Type reference: DB0504, rated input 110V c.c., 11W, 100%
Type reference: DB0507, rated input 24V, 50/60Hz, 10VA, 100%
Type reference: **DB0509**, rated input 110V, 50/60Hz, 10VA, 100%
Type reference: DB0510, rated input 220V, 50/60Hz, 10VA, 100%