# VALVES SERIES 70
# SAFE AIR®



Starting from the robust and reliable valves series 70, we have added a few distinctive features, such as the presence of a valve status diagnostic system and the creation of a double communication channel guaranteeing redundancy of the architecture.

The simplest version is obtained from a pneumatically-operated 3/2 monostable valve. It is well known that when this type of valve is in the idle state (coil de-energized), port 1 is not connected to the downstream pneumatic circuit and port 2 is on relief; when the valve is operated (coil energized), port 1 is connected to port 2. When the coil is de-energized again, the valve is returned to the idle state (and hence port 2 relieves) by means of a spring that returns the spool to the home position.

In the event of a failure, the spool may remain in the actuation position, even when the coil is de-energized, thus leaving port 2 pressurized.
To offset this problem, we have added a Hall-effect sensor that reads the spool position. This means that when the valve is deactivated, the sensor is in the ON state, when the valve is activated, the sensor is in the OFF state.
A status in which the sensor is OFF state and the coil de-energized indicates that there is a problem.
To reduce the probability of risk during plant maintenance, the manual actuator mounted on the electric control is the monostable type.
The sensor inside the valve is available in the standard version with a 2.5m three-wire cable (standard or ATEX certified) or with an M8 connector and 300 mm cable.
This valve, which is available in sizes 1/8", 1/4", 3/8" and 1/2", is a category 2 component, according to ISO EN 13849, and is suitable for use in safety circuits up to PL = c.

For applications requiring higher performance levels, we have also develop a double-channel version (redundant) that requires the use of two valves series 70 with a monitored spool arranged so that port 2 of valve 1 is connected with port 1 of valve 2. If just one of the valves de-energizes, port 2 relieves, so, even if one of the two spools remains blocked, the other guarantees relief of the compressed-air circuit. In this case, too, the presence of spool position sensors can be used to monitor the status.
The double valve, which is available in the size 1/8", 1/4", 3/8" and 1/2" as well, is a category 4 component according to ISO EN 13849 and is suitable for use in safety circuits up to PL = e.
Both the single- and double-channel valves come with:
- a voluntary examination certificate no. TC1248/21/AD/ad, issued by Bureau Veritas in accordance with EN ISO 13849;
- a certificate of compliance examination to the Machinery Directive 2006/42/EC no. CV 013-12-2014 and no. CV 014-12-2014 released by Bureau Veritas.

# SINGLE VALVE SERIES 70 SAFE AIR®

| TECHNICAL DATA | | 1/8" | 1/4" | 3/8" | 1/2" |
|---|---|---|---|---|---|
| Fluid | | Filtered unlubricated air (50µm); lubrication, if used, must be continuous | | | |
| Operation | | 3/2 monostable | | | |
| Operating pressure: | bar | | | | |
| non-assisted | | from 2.5 to 10 | | | |
| pilot-assisted | | from vacuum to 10 | | | |
| Minimum pilot pressure | bar | 2.5 | | | |
| Operating temperature range | °C | from -10 to +60 (from -10 to +45 for Atex version) | | | |
| Nominal diameter | mm | 5 | 7.5 | 13.3 | 15 |
| Conductance C | Nl/min · bar | 121 | 264 | 505 | 969.5 |
| Critical ratio b | bar/bar | 0.32 | 0.27 | 0.32 | 0.5 |
| Flow rate at 6.3 bar Δp 0.5 bar | Nl/min | 390 | 820 | 1600 | 3525 |
| Flow rate at 6.3 bar Δp 1 bar | Nl/min | 530 | 1130 | 2200 | 4800 |
| Conductance C on relief | Nl/min · bar | 128 | 270 | 491 | 969.5 |
| Critical ratio b on relief | bar/bar | 0.23 | 0.29 | 0.40 | 0.62 |
| Flow rate on free exhaust at 6.3 bar | Nl/min | 900 | 2050 | 3550 | 7000 |
| TRA/TRR at 6.3 bar | ms/ms | 15 / 35 | 19 / 45 | 21 / 72 | 38 / 110 |
| Installation | | Any position | | | |
| Assembly | | In-line | | | |
| Manual actuator | | Monostable | | | |
| Recommended lubricant | | ISO and UNI FD 22 | | | |
| Compatibility with oils | | See **chapter Z1** | | | |
| Coils | | 22 mm side, ø 8 hole – EN175301-803 connection, type B | | | |
| | | Certified EN 60204.1 and VDE 0580 | | | |
| | | For the electrical features see page **B1**.60 * | | | |
| Class of protection | | IP65 with coil and connector mounted | | | |
| Noise level | | Max. 78 dBA with silenced relief | | | |
| Max coil ring nut torque | Nm | 1 | | | |
| CE marking | | In accordance with Machinery Directive, Annex V ** | | | |
| ATEX category (only for versions with an ATEX sensor) | | Ⓔx II 3G Ex nA IIC T4 Gc X -10°C<Ta<45°C | | | |
| | | Ⓔx II 3G Ex h IIC T4 Gc X | | | |
| | | Ⓔx II 3D Ex tc IIIC T135°C Dc IP65 | | | |
| Safety function | | Cuts off the power supply and relieves the air circuit connected to port 2 | | | |
| Type of sensor used | | Hall effect (refer to page **B1**.163 for sensor details) | | | |
| B10d | | 50 x $10^6$ cycles | | | |
| Category - ISO EN 13849 | | 2 | | | |
| DC | | Low (80 %) | | | |
| PL - ISO EN 13849 | | Suitable for use in safety circuits up to PL=c | | | |

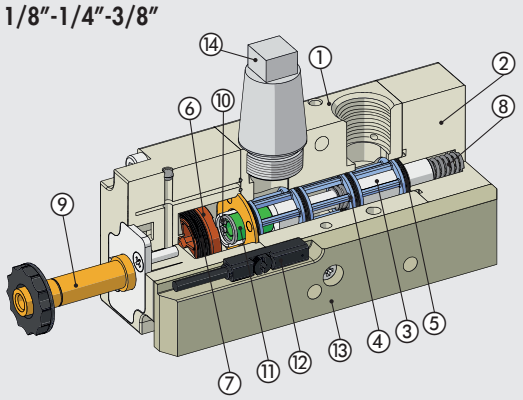
* To avoid malfunctions, we recommend using Metal Work accessories

** The declaration can be downloaded from www.metalwork.it

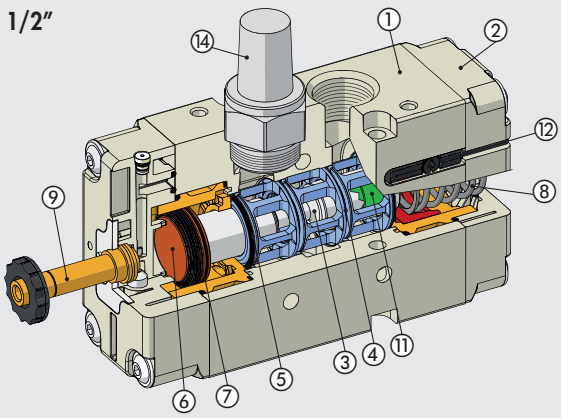
**IMPORTANT**: Do not mount 2 or more SAFE AIR® valves in adjacent positions. When mounting valves side by side, the minimum distance is specified in the user manual. Any ferromagnetic masses must be at least 40 mm from the sensor. Prevent magnetic fields from creating disturbance in the sensor area.

## COMPONENTS

**1/8"-1/4"-3/8"**



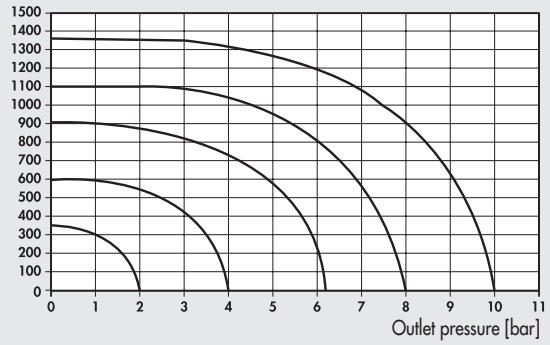

**1/2"**



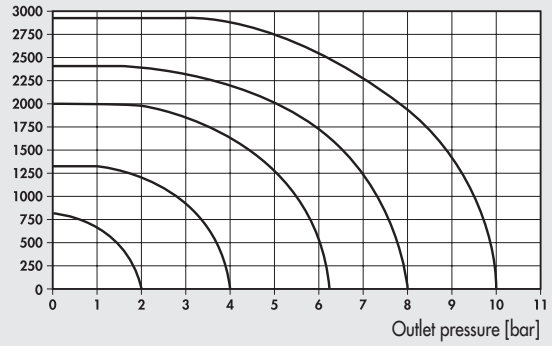

① VALVE BODY: Aluminium
② CONTROL/END CAP: plastic
③ SPOOL: chemically nickel-plated aluminium
④ DISTANCE PLATES: technopolymer
⑤ GASKETS: NBR
⑥ PISTONS: Hostaform®
⑦ PISTON GASKET: NBR
⑧ SPRINGS: special steel
⑨ OPERATOR: Brass pipe – Stainless steel core
⑩ LOCKING RING: special steel
⑪ MAGNET: Neodymium
⑫ SENSOR: Hall effect
⑬ SENSOR SUPPORTING PLATE: Aluminium (for 1/8"-1/4"-3/8" only)
⑭ SILENCER

## FLOW CHARTS ON DELIVERY - SINGLE VALVE

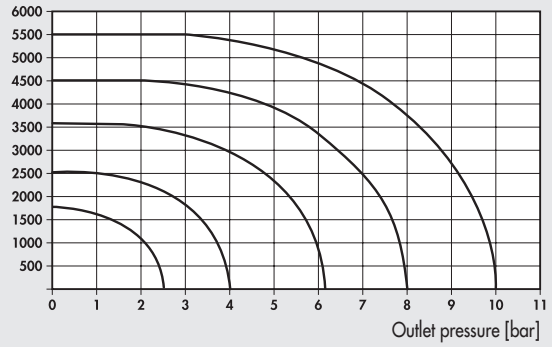
Flow rates [Nl/min] 1/8″



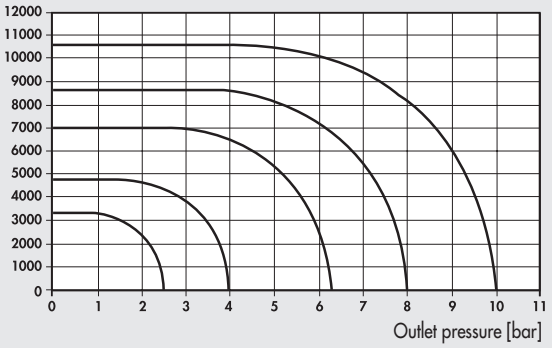

Flow rates [Nl/min] 1/4″




Flow rates [Nl/min] 3/8″

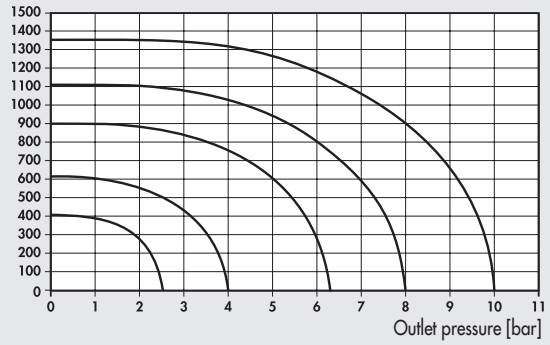



Flow rates [Nl/min] 1/2″

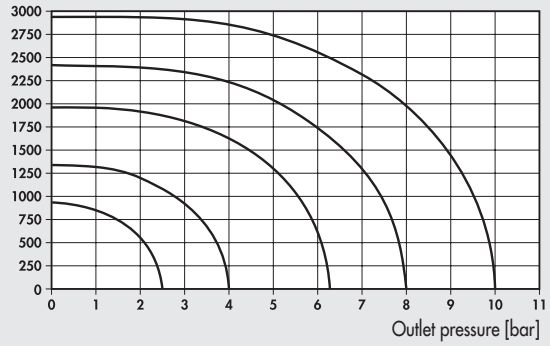



## FLOW CHARTS ON RELIEF - SINGLE VALVE

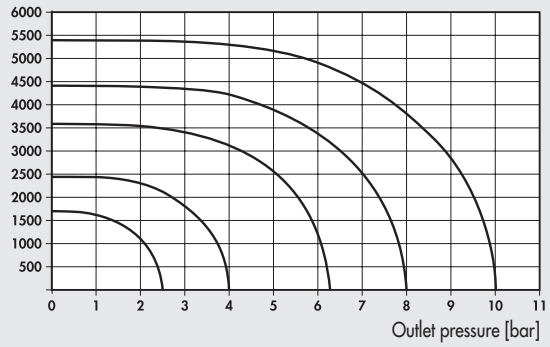
Flow rates [Nl/min] 1/8″



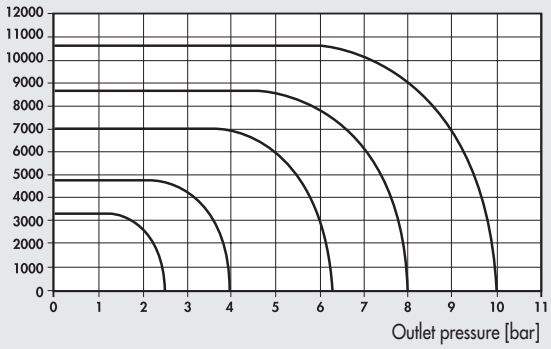

Flow rates [Nl/min] 1/4″




Flow rates [Nl/min] 3/8″




Flow rates [Nl/min] 1/2″



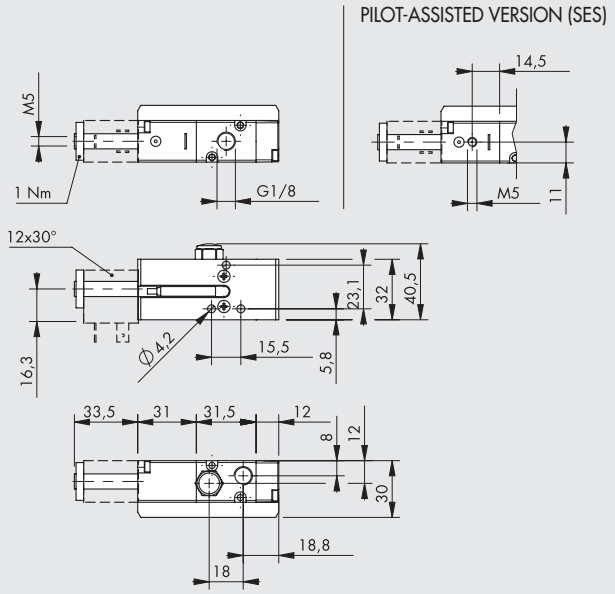

## SYNOPTIC, SIZES AND VERSIONS

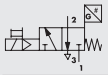
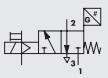
| SOV | 2 | 3 | SO | S | NC | 3F |
|---|---|---|---|---|---|---|
| FAMILY | DIMENSIONS | FUNCTION | OPERATORS 14 | RESETTING 12 | FURTHER DETAILS | SENSOR |
| **SOV** solenoid/ pneumatic | **2** 1/8″<br>**3** 1/4″<br>**C** 3/8″<br>**4** 1/2″ | **3** 3/2 | **SO** solenoid<br>**SE** solenoid assisted | **S** mechanical springs | **NC** Normally-Closed | **3F** 2.5 m 3 wires<br>**M8** 0.3 m M8<br>**AT** 2 m ATEX |

METAL WORK PNEUMATIC

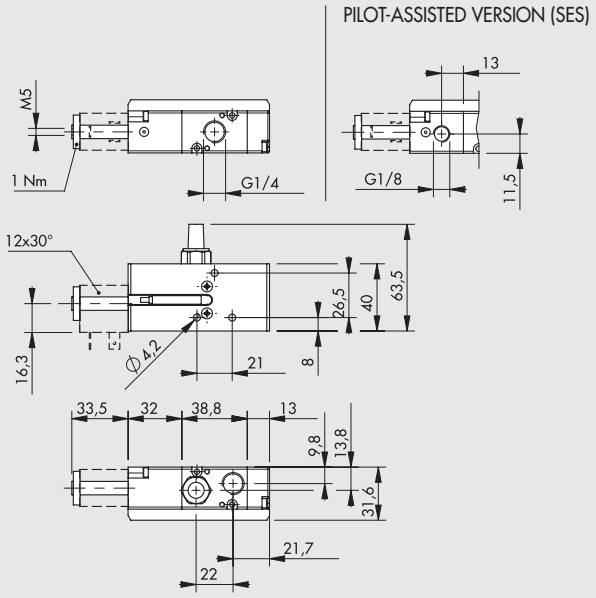


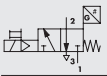
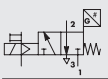
## 3/2 MONOSTABLE – 1/8"



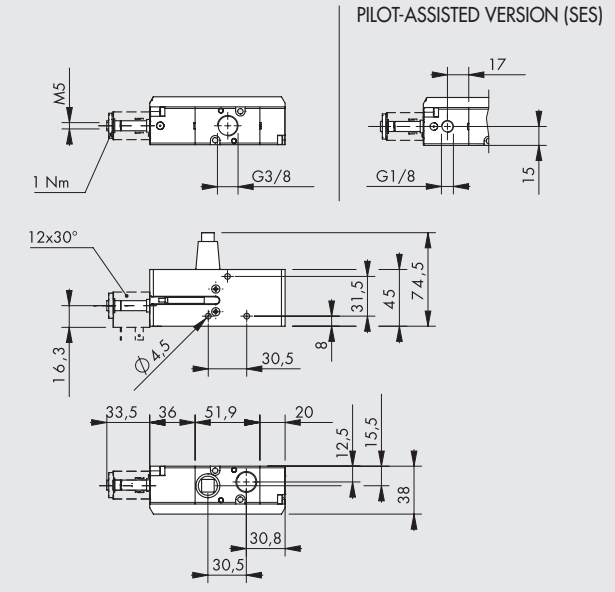

| Symbol | Code | Abbrev. | Sensor | Weight [g] |
|---|---|---|---|---|
|  | **7015020200** | SOV 23 SOS NC 3F | 2.5 m 3 wires | 182 |
| | **7015120200** | SOV 23 SOS NC M8 | 0.3 m M8 | 178 |
| | **7015220200** | SOV 23 SOS NC AT | 2 m ATEX | 174 |
|  | **7015020500** | SOV 23 SES NC 3F | 2.5 m 3 wires | 182 |
| | **7015120500** | SOV 23 SES NC M8 | 0.3 m M8 | 178 |
| | **7015220500** | SOV 23 SES NC AT | 2 m ATEX | 174 |

## 3/2 MONOSTABLE - 1/4"




| Symbol | Code | Abbrev. | Sensor | Weight [g] |
|---|---|---|---|---|
|  | **7025020200** | SOV 33 SOS NC 3F | 2.5 m 3 wires | 252 |
| | **7025120200** | SOV 33 SOS NC M8 | 0.3 m M8 | 248 |
| | **7025220200** | SOV 33 SOS NC AT | 2 m ATEX | 244 |
|  | **7025020500** | SOV 33 SES NC 3F | 2.5 m 3 wires | 252 |
| | **7025120500** | SOV 33 SES NC M8 | 0.3 m M8 | 248 |
| | **7025220500** | SOV 33 SES NC AT | 2 m ATEX | 244 |

## 3/2 MONOSTABLE - 3/8"




| Symbol | Code | Abbrev. | Sensor | Weight [g] |
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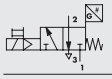
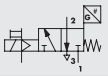
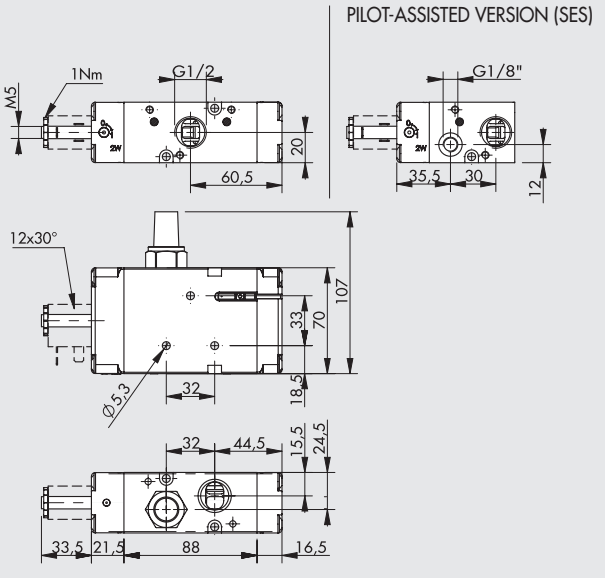
|  | **7045020200** | SOV C3 SOS NC 3F | 2.5 m 3 wires | 402 |
| | **7045120200** | SOV C3 SOS NC M8 | 0.3 m M8 | 398 |
| | **7045220200** | SOV C3 SOS NC AT | 2 m ATEX | 394 |
|  | **7045020500** | SOV C3 SES NC 3F | 2.5 m 3 wires | 402 |
| | **7045120500** | SOV C3 SES NC M8 | 0.3 m M8 | 398 |
| | **7045220500** | SOV C3 SES NC AT | 2 m ATEX | 394 |

## 3/2 MONOSTABLE - 1/2"




| Symbol | Code | Abbrev. | Sensor | Weight [g] |
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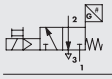
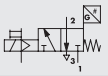
|  | **7035020200** | SOV 43 SOS NC 3F | 2.5 m 3 wires | 705 |
| | **7035120200** | SOV 43 SOS NC M8 | 0.3 m M8 | 705 |
| | **7035220200** | SOV 43 SOS NC AT | 2 m ATEX | 705 |
|  | **7035020500** | SOV 43 SES NC 3F | 2.5 m 3 wires | 700 |
| | **7035120500** | SOV 43 SES NC M8 | 0.3 m M8 | 700 |
| | **7035220500** | SOV 43 SES NC AT | 2 m ATEX | 700 |

## EXAMPLE OF A SAFETY CIRCUIT WITH A SINGLE VALVE

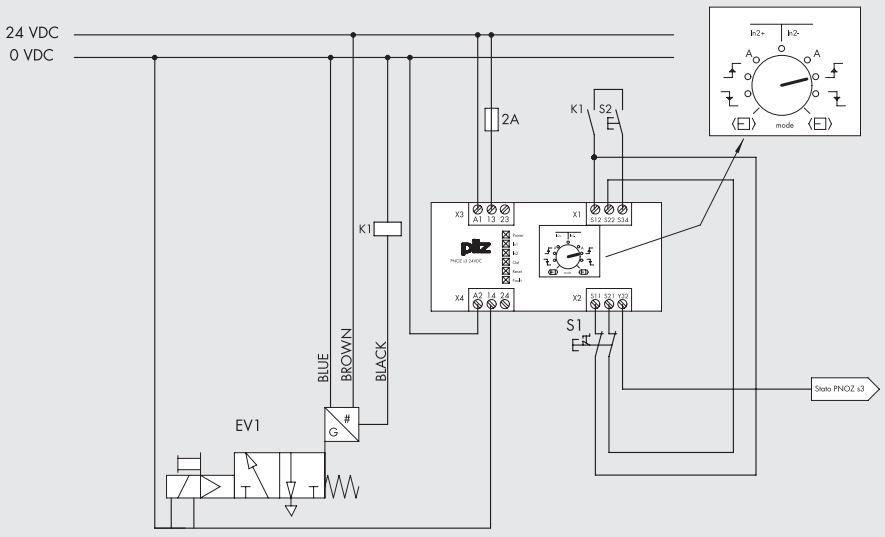
Below is an example of a wiring diagram for controlling Metal Work SAFE AIR® single valves using Pilz® components.
Circuit components:

- a Pilz® safety module PNOZ® s3 for controlling the emergency stop button; terminal Y32 indicates the status of the module, which can be relayed to the machine control logic
- an emergency stop button S1 (Pilz® - PIT® es Set) linked to terminals S11-S12-S22-S23 of the PNOZ® s3
- a Metal Work SAFE AIR® solenoid valve, the 24 VDC coil of which is fed by terminal 14 of the PNOZ® s3 (the other terminal of the coil is 0 V); the valve's Hall-effect sensor is 24 VDC
- a start/reset button S2
- a relay K1, controlled by the valve sensor; an NO contact of the relay is in series with button S2 of the PNOZ® s3.

Expected behaviour with the system operating correctly:

- system deactivated:
  - contact 14 is OFF
  - the coil is de-energized
  - the sensor is ON
  - relay K1 is energized
  - contact K1 is closed
  - contact Y32 is OFF
- with the system activated via the start/reset button S2:
  - contact 14 is ON
  - the coil is energized
  - the sensor is OFF
  - relay K1 is de-energized
  - contact K1 is open
  - contact Y32 is ON

In the event of a malfunction (e.g. spool jam), the coil is de-energized but the sensor remains OFF, relay K1 remains de-energized, contact K1 remains open (preventing subsequent restarts) and contact Y32 is OFF.
In the event of a valve fault, the circuit in the diagram below does not allow relief of the compressed air system. Sensor status must be monitored to assess valve operation. Contact Y32 indicates the status of the PNOZ® s3, not the status of the sensor.
All the electrical connections between the various components must comply with the applicable safety regulations.
If the emergency button is operated at a frequency of 1 actuation per hour, the circuit activates a safety function with PL = c (calculations made with the PAScal programme by Pilz®). Responsibility for final checking that PL lies with the person assembling the circuit.

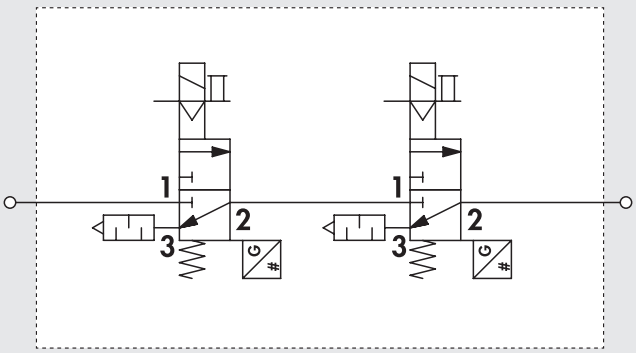


# DOUBLE VALVE SERIES 70 SAFE AIR®

| TECHNICAL DATA | | 1/8" | 1/4" | 3/8" | 1/2" |
|---|---|---|---|---|---|
| Fluid | | Filtered unlubricated air (50µm); lubrication, if used, must be continuous | | | |
| Operation | | double 3/2 monostable | | | |
| Operating pressure: | bar | | | | |
| non-assisted | | from 2.5 to 10 | | | |
| pilot-assisted | | from vacuum to 10 | | | |
| Minimum pilot pressure | bar | 2.5 | | | |
| Operating temperature range | °C | from -10 to +60 (from -10 to +45 for Atex version) | | | |
| Conductance C | Nl/min · bar | 80 | 202 | 346 | 782.5 |
| Critical ratio b | bar/bar | 0.35 | 0.11 | 0.24 | 0.25 |
| Flow rate at 6.3 bar Δp 0.5 bar | Nl/min | 261 | 561 | 1038 | 2355 |
| Flow rate at 6.3 bar Δp 1 bar | Nl/min | 358 | 778 | 1433 | 3250 |
| Conductance C on relief | Nl/min · bar | 132 | 228 | 491 | 969.5 |
| Critical ratio b on relief | bar/bar | 0.27 | 0.21 | 0.21 | 0.54 |
| Flow rate on free exhaust at 6.3 bar | Nl/min | 930 | 1700 | 3550 | 7000 |
| TRA/TRR a 6.3 bar | ms/ms | 28 / 35 | 38 / 45 | 50 / 72 | 85/110 |
| Installation | | Any position | | | |
| Assembly | | In-line | | | |
| Manual actuator | | Monostable | | | |
| Recommended lubricant | | ISO e UNI FD 22 | | | |
| Compatibility with oils | | See **chapter Z1** | | | |
| Coils | | 22 mm side, ø 8 hole – EN175301-803 connection, type B | | | |
| | | Certified EN 60204.1 and VDE 0580 | | | |
| | | For the electrical features see page **B1**.60 * | | | |
| Class of protection | | IP65 with coil and connector mounted | | | |
| Noise level | | Max. 78 dBA with silenced relief | | | |
| Max coil ring nut torque | Nm | 1 | | | |
| CE marking | | In accordance with Machinery Directive, Annex V ** | | | |
| ATEX category (only for versions with an ATEX sensor) | | Ⓔx II 3G Ex nA IIC T4 Gc X -10°C<Ta<45°C | | | |
| | | Ⓔx II 3G Ex h IIC T4 Gc X | | | |
| | | Ⓔx II 3D Ex tc IIIC T135°C Dc IP65 | | | |
| Safety function | | Cuts off the power supply and relieves the air circuit connected to port 2 | | | |
| Type of sensor used | | Hall effect (refer to page **B1**.163 for sensor details) | | | |
| B10d | | 50 x $10^6$ cycles | | | |
| Category - ISO EN 13849 | | 4 | | | |
| DC | | High (≥ 99 %) | | | |
| CCF | | 80 | | | |
| PL - ISO EN 13849 | | Suitable for use in safety circuits up to PL = e | | | |

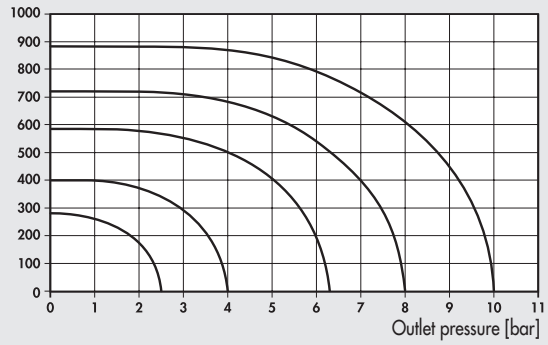
* To avoid malfunctions, we recommend using Metal Work accessories
** The declaration can be downloaded from www.metalwork.it
**IMPORTANT**: Any ferromagnetic masses must be at least 40 mm from the sensor.
Prevent magnetic fields from creating disturbance in the sensor area.

## WIRING DIAGRAM

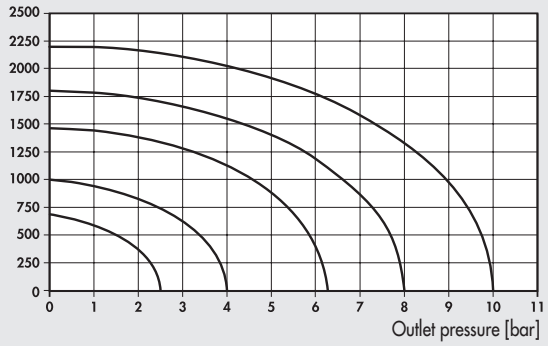


## FLOW CHARTS ON DELIVERY - DOUBLE VALVE

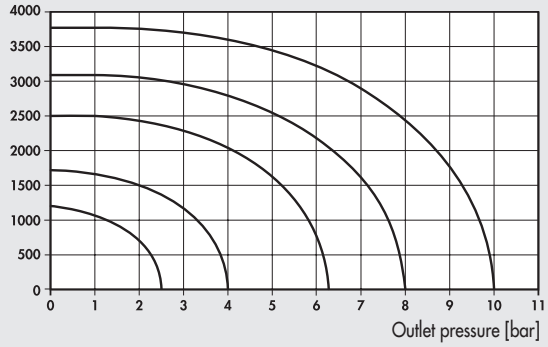
Flow rates [Nl/min] 1/8″



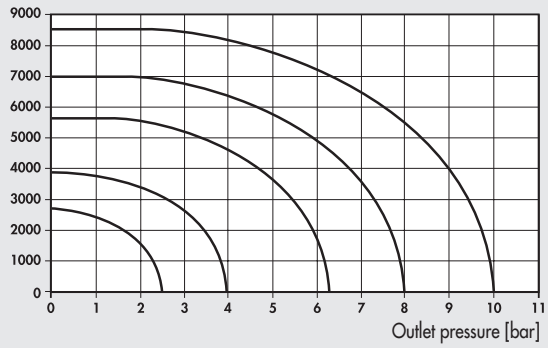

Flow rates [Nl/min] 1/4″




Flow rates [Nl/min] 3/8″

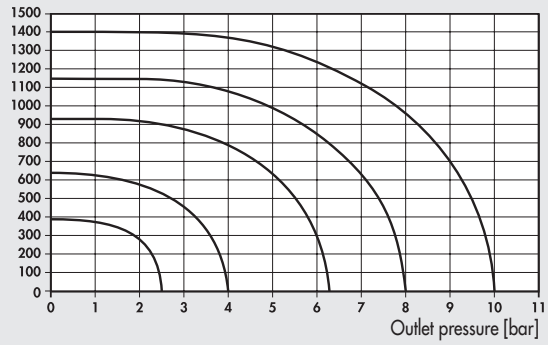



Flow rates [Nl/min] 1/2″

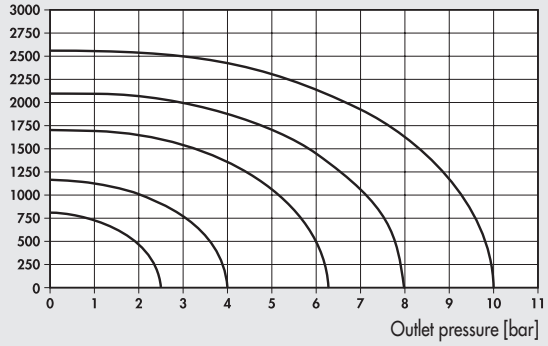



## FLOW CHARTS ON RELIEF - DOUBLE VALVE

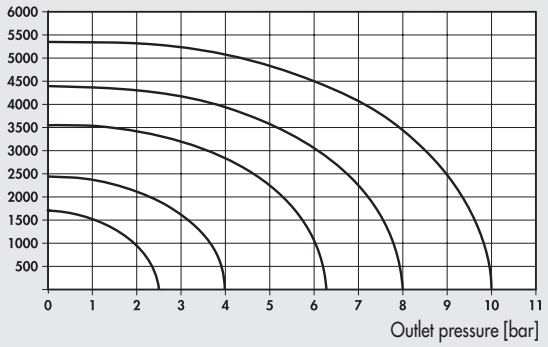
Flow rates [Nl/min] 1/8″



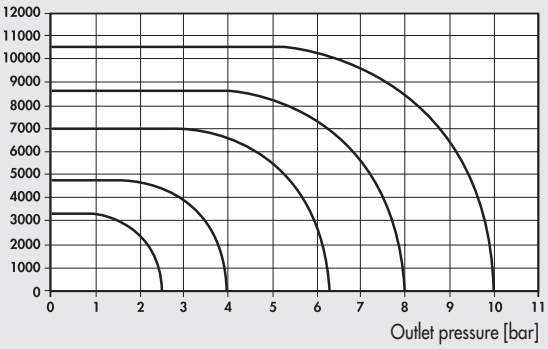

Flow rates [Nl/min] 1/4″




Flow rates [Nl/min] 3/8″




Flow rates [Nl/min] 1/2″

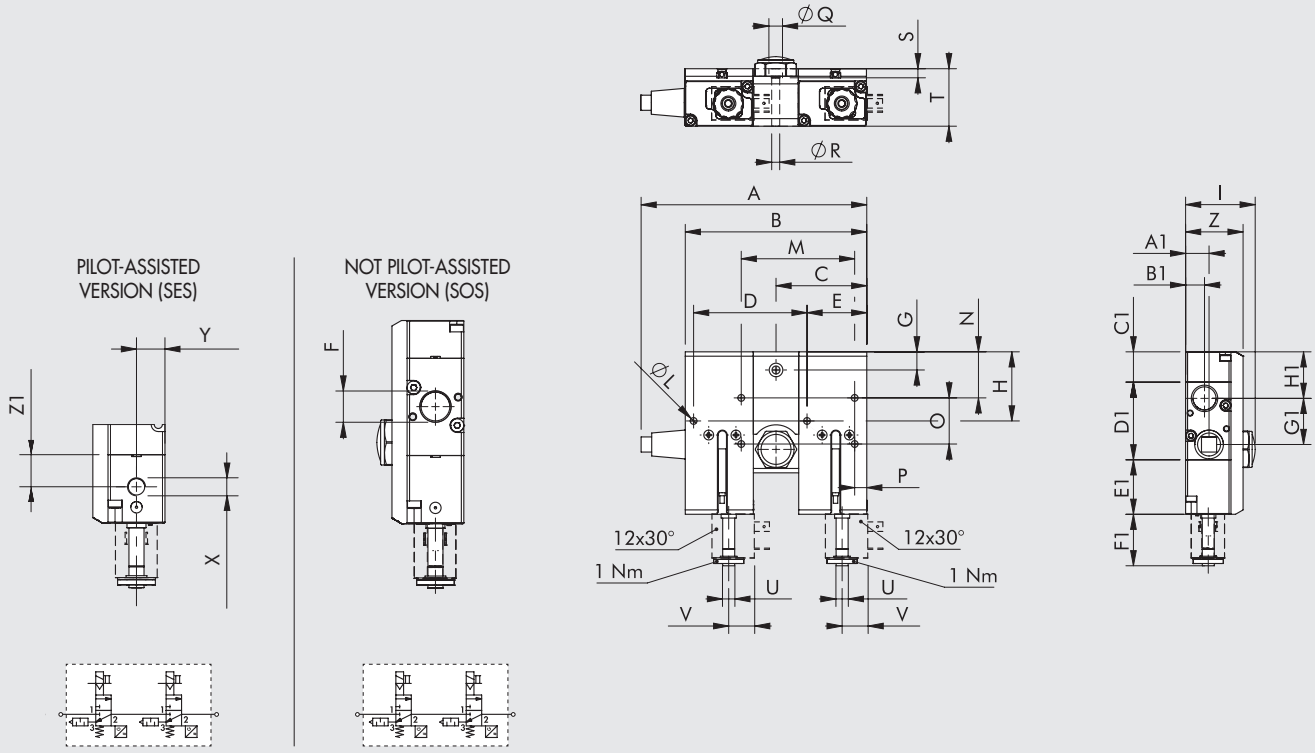



## SYNOPTIC, SIZES AND VERSIONS

| SOV | 2 | 3 | SO | S | DD | 3F |
|---|---|---|---|---|---|---|
| **FAMILY** | **DIMENSIONS** | **FUNCTION** | **OPERATORS 14** | **RESETTING 12** | **FURTHER DETAILS** | **SENSOR** |
| **SOV** solenoid/ pneumatic | **2** 1/8″<br>**3** 1/4″<br>**C** 3/8″<br>**4** 1/2″ | **3** 3/2 | **SO** solenoid<br>**SE** solenoid assisted | **S** mechanical springs | **DD** double 3/2 | **3F** 2.5 m 3 wires<br>**M8** 0.3 m M8<br>**AT** 2 m ATEX |

METAL WORK PNEUMATIC

## DOUBLE 3/2 MONOSTABLE 1/8"-1/4"-3/8"

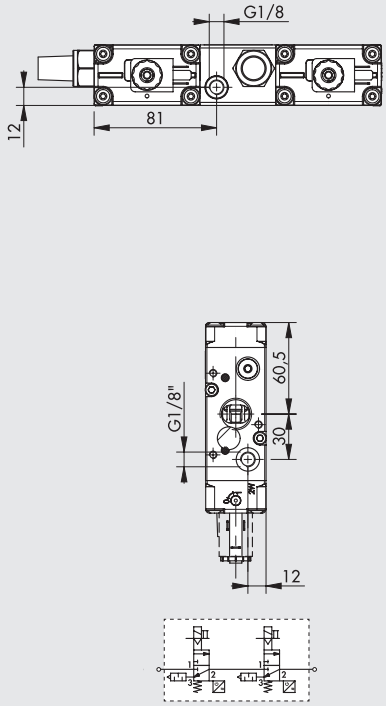



| Code | Size | Abbrev. | A | B | C | D | E | F | G | H | I | ØL | M | N | O | P | ØQ | ØR | S | T |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7015020210 | 1/8" | SOV 23 SOS DD 3F | 102.5 | 94 | - | 62 | 28.9 | 1/8" | - | 27.8 | 35.5 | 4.2 | - | - | - | - | - | - | - | - |
| 7015120210 | 1/8" | SOV 23 SOS DD M8 | 102.5 | 94 | - | 62 | 28.9 | 1/8" | - | 27.8 | 35.5 | 4.2 | - | - | - | - | - | - | - | - |
| 7015220210 | 1/8" | SOV 23 SOS DD AT | 102.5 | 94 | - | 62 | 28.9 | 1/8" | - | 27.8 | 35.5 | 4.2 | - | - | - | - | - | - | - | - |
| 7015020510 | 1/8" | SOV 23 SES DD 3F | 102.5 | 94 | - | 62 | 28.9 | 1/8" | - | 27.8 | 35.5 | 4.2 | - | - | - | - | - | - | - | - |
| 7015120510 | 1/8" | SOV 23 SES DD M8 | 102.5 | 94 | - | 62 | 28.9 | 1/8" | - | 27.8 | 35.5 | 4.2 | - | - | - | - | - | - | - | - |
| 7015220510 | 1/8" | SOV 23 SES DD AT | 102.5 | 94 | - | 62 | 28.9 | 1/8" | - | 27.8 | 35.5 | 4.2 | - | - | - | - | - | - | - | - |
| 7025020210 | 1/4" | SOV 33 SOS DD 3F | 133.5 | 110 | 55 | 70 | 34.5 | 1/4" | 9 | 32.7 | 37.5 | 4.2 | - | - | - | - | 7.5 | 4.3 | 5 | 31.5 |
| 7025120210 | 1/4" | SOV 33 SOS DD M8 | 133.5 | 110 | 55 | 70 | 34.5 | 1/4" | 9 | 32.7 | 37.5 | 4.2 | - | - | - | - | 7.5 | 4.3 | 5 | 31.5 |
| 7025220210 | 1/4" | SOV 33 SOS DD AT | 133.5 | 110 | 55 | 70 | 34.5 | 1/4" | 9 | 32.7 | 37.5 | 4.2 | - | - | - | - | 7.5 | 4.3 | 5 | 31.5 |
| 7025020510 | 1/4" | SOV 33 SES DD 3F | 133.5 | 110 | 55 | 70 | 34.5 | 1/4" | 9 | 32.7 | 37.5 | 4.2 | - | - | - | - | 7.5 | 4.3 | 5 | 31.5 |
| 7025120510 | 1/4" | SOV 33 SES DD M8 | 133.5 | 110 | 55 | 70 | 34.5 | 1/4" | 9 | 32.7 | 37.5 | 4.2 | - | - | - | - | 7.5 | 4.3 | 5 | 31.5 |
| 7025220510 | 1/4" | SOV 33 SES DD AT | 133.5 | 110 | 55 | 70 | 34.5 | 1/4" | 9 | 32.7 | 37.5 | 4.2 | - | - | - | - | 7.5 | 4.3 | 5 | 31.5 |
| 7045020210 | 3/8" | SOV C3 SOS DD 3F | 149.5 | 120 | 60 | 75 | 39.5 | 3/8" | 12 | 45.7 | 46 | 4.5 | 75 | 30.45 | 30.5 | 8 | 9 | 5.3 | 6 | 38 |
| 7045120210 | 3/8" | SOV C3 SOS DD M8 | 149.5 | 120 | 60 | 75 | 39.5 | 3/8" | 12 | 45.7 | 46 | 4.5 | 75 | 30.45 | 30.5 | 8 | 9 | 5.3 | 6 | 38 |
| 7045220210 | 3/8" | SOV C3 SOS DD AT | 149.5 | 120 | 60 | 75 | 39.5 | 3/8" | 12 | 45.7 | 46 | 4.5 | 75 | 30.45 | 30.5 | 8 | 9 | 5.3 | 6 | 38 |
| 7045020510 | 3/8" | SOV C3 SES DD 3F | 149.5 | 120 | 60 | 75 | 39.5 | 3/8" | 12 | 45.7 | 46 | 4.5 | 75 | 30.45 | 30.5 | 8 | 9 | 5.3 | 6 | 38 |
| 7045120510 | 3/8" | SOV C3 SES DD M8 | 149.5 | 120 | 60 | 75 | 39.5 | 3/8" | 12 | 45.7 | 46 | 4.5 | 75 | 30.45 | 30.5 | 8 | 9 | 5.3 | 6 | 38 |
| 7045220510 | 3/8" | SOV C3 SES DD AT | 149.5 | 120 | 60 | 75 | 39.5 | 3/8" | 12 | 45.7 | 46 | 4.5 | 75 | 30.45 | 30.5 | 8 | 9 | 5.3 | 6 | 38 |

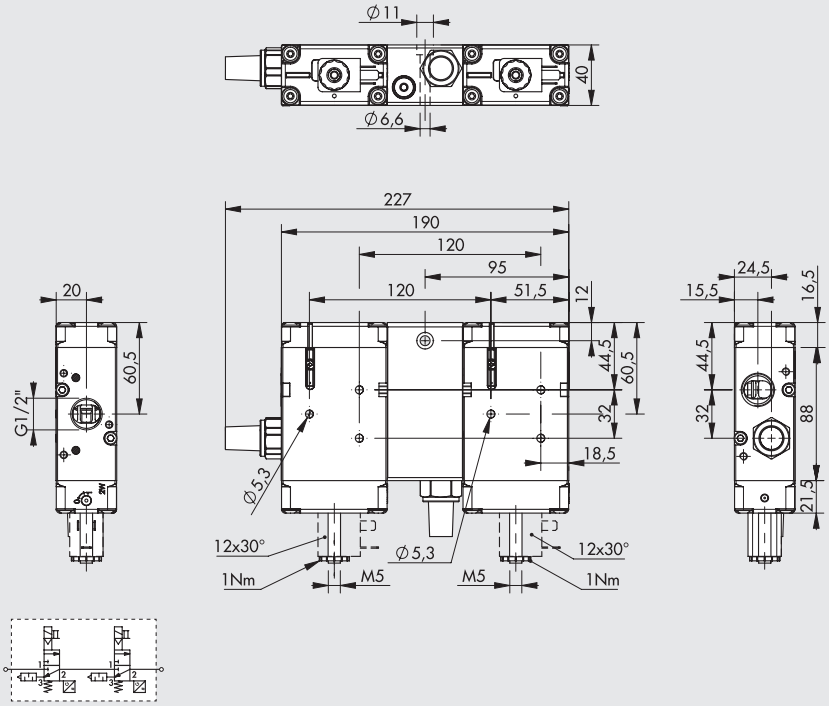
| Code | Size | Abbrev. | U | V | Z | X | Y | Z1 | A1 | B1 | C1 | D1 | E1 | F1 | G1 | H1 | Sensor | Weight [g] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7015020210 | 1/8" | SOV 23 SOS DD 3F | M5 | 16.3 | - | - | - | 14.5 | 12 | 8 | 12 | 31.6 | 31 | 33.5 | 18 | 18.8 | 2.5 m 3 wires | 482 |
| 7015120210 | 1/8" | SOV 23 SOS DD M8 | M5 | 16.3 | - | - | - | 14.5 | 12 | 8 | 12 | 31.6 | 31 | 33.5 | 18 | 18.8 | 0.3 m M8 | 479 |
| 7015220210 | 1/8" | SOV 23 SOS DD AT | M5 | 16.3 | - | - | - | 14.5 | 12 | 8 | 12 | 31.6 | 31 | 33.5 | 18 | 18.8 | 2 m ATEX | 466 |
| 7015020510 | 1/8" | SOV 23 SES DD 3F | M5 | 16.3 | 30 | M5 | 11 | 14.5 | 12 | 8 | 12 | 31.6 | 31 | 33.5 | 18 | 18.8 | 2.5 m 3 wires | 482 |
| 7015120510 | 1/8" | SOV 23 SES DD M8 | M5 | 16.3 | 30 | M5 | 11 | 14.5 | 12 | 8 | 12 | 31.6 | 31 | 33.5 | 18 | 18.8 | 0.3 m M8 | 474 |
| 7015220510 | 1/8" | SOV 23 SES DD AT | M5 | 16.3 | 30 | M5 | 11 | 14.5 | 12 | 8 | 12 | 31.6 | 31 | 33.5 | 18 | 18.8 | 2 m ATEX | 466 |
| 7025020210 | 1/4" | SOV 33 SOS DD 3F | M5 | 16.3 | - | - | - | 13 | 13.8 | 9.8 | 13.25 | 38.9 | 32 | 33.5 | 22 | 21.7 | 2.5 m 3 wires | 632 |
| 7025120210 | 1/4" | SOV 33 SOS DD M8 | M5 | 16.3 | - | - | - | 13 | 13.8 | 9.8 | 13.25 | 38.9 | 32 | 33.5 | 22 | 21.7 | 0.3 m M8 | 624 |
| 7025220210 | 1/4" | SOV 33 SOS DD AT | M5 | 16.3 | - | - | - | 13 | 13.8 | 9.8 | 13.25 | 38.9 | 32 | 33.5 | 22 | 21.7 | 2 m ATEX | 616 |
| 7025020510 | 1/4" | SOV 33 SES DD 3F | M5 | 16.3 | 31.6 | 1/8" | 11.5 | 13 | 13.8 | 9.8 | 13.25 | 38.9 | 32 | 33.5 | 22 | 21.7 | 2.5 m 3 wires | 632 |
| 7025120510 | 1/4" | SOV 33 SES DD M8 | M5 | 16.3 | 31.6 | 1/8" | 11.5 | 13 | 13.8 | 9.8 | 13.25 | 38.9 | 32 | 33.5 | 22 | 21.7 | 0.3 m M8 | 624 |
| 7025220510 | 1/4" | SOV 33 SES DD AT | M5 | 16.3 | 31.6 | 1/8" | 11.5 | 13 | 13.8 | 9.8 | 13.25 | 38.9 | 32 | 33.5 | 22 | 21.7 | 2 m ATEX | 616 |
| 7045020210 | 3/8" | SOV C3 SOS DD 3F | M5 | 16.3 | - | - | - | 17 | 15.5 | 12.5 | 20 | 51.9 | 36 | 33.5 | 30.5 | 30.8 | 2.5 m 3 wires | 972 |
| 7045120210 | 3/8" | SOV C3 SOS DD M8 | M5 | 16.3 | - | - | - | 17 | 15.5 | 12.5 | 20 | 51.9 | 36 | 33.5 | 30.5 | 30.8 | 0.3 m M8 | 964 |
| 7045220210 | 3/8" | SOV C3 SOS DD AT | M5 | 16.3 | - | - | - | 17 | 15.5 | 12.5 | 20 | 51.9 | 36 | 33.5 | 30.5 | 30.8 | 2 m ATEX | 956 |
| 7045020510 | 3/8" | SOV C3 SES DD 3F | M5 | 16.3 | 38 | 1/8" | 15 | 17 | 15.5 | 12.5 | 20 | 51.9 | 36 | 33.5 | 30.5 | 30.8 | 2.5 m 3 wires | 972 |
| 7045120510 | 3/8" | SOV C3 SES DD M8 | M5 | 16.3 | 38 | 1/8" | 15 | 17 | 15.5 | 12.5 | 20 | 51.9 | 36 | 33.5 | 30.5 | 30.8 | 0.3 m M8 | 964 |
| 7045220510 | 3/8" | SOV C3 SES DD AT | M5 | 16.3 | 38 | 1/8" | 15 | 17 | 15.5 | 12.5 | 20 | 51.9 | 36 | 33.5 | 30.5 | 30.8 | 2 m ATEX | 956 |

## DOUBLE 3/2 MONOSTABLE 1/2"

PILOT-ASSISTED VERSION (SES)




NOT PILOT-ASSISTED VERSION (SOS)




| Code | Abbrev. | Sensor | Weight [g] |
|---|---|---|---|
| **7035020210** | SOV 43 SOS DD 3F | 2.5 m 3 wires | 1920 |
| **7035120210** | SOV 43 SOS DD M8 | 0.3 m M8 | 1920 |
| **7035220210** | SOV 43 SOS DD AT | 2 m ATEX | 1920 |
| **7035020510** | SOV 43 SES DD 3F | 2.5 m 3 wires | 1915 |
| **7035120510** | SOV 43 SES DD M8 | 0.3 m M8 | 1915 |
| **7035220510** | SOV 43 SES DD AT | 2 m ATEX | 1915 |

## NOTES

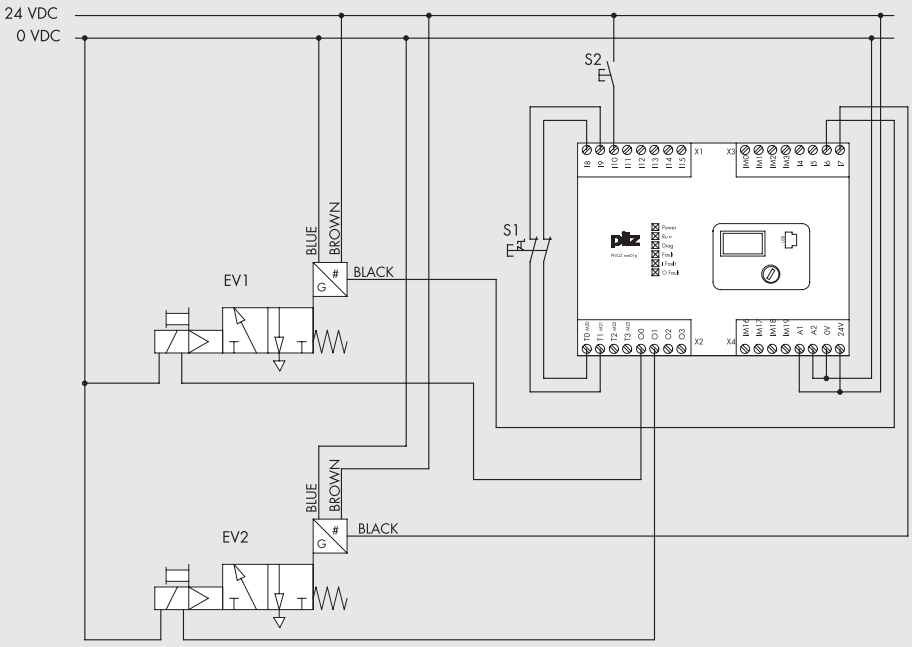
## EXAMPLE OF A SAFETY CIRCUIT WITH A DOUBLE VALVE

Below is an example of a wiring diagram for controlling double valves SAFE AIR® a Metal Work using Pilz® components.
Circuit components:
- a Pilz® PNOZ® mm 0.1p modular safety system
- an emergency stop button S1 (Pilz® - PIT® es Set) linked to terminals T0-T1-I8-I9 of the PNOZ® mm 0.1p
- a Metal Work double solenoid valve SAFE AIR®, the 24 VDC coils of which are fed by terminals O0 (SV1) and O1 (SV2) of the PNOZ® mm 0.1p (the other terminals of the coils are OV); the valves' Hall-effect sensors are 24 VDC
- the sensor signals are relayed to terminals 16 (SV1) and 17 (SV2) of the PNOZ® mm 0.1p
- a start/reset button S2

Expected behaviour with the system operating correctly:
- system deactivated:
  - contacts O0 and O1 are OFF
  - the coils are de-energized
  - the sensors are ON (and hence signals to terminals 16 and 17)
  - if one of the sensors is OFF, the Pilz® module does not allow subsequent start/reset
- with the system activated via the start/reset button:
  - contacts O0 and O1 are ON
  - the coils are energized
  - the sensors are OFF (and hence signals to terminals 16 and 17)

The PNOZ® mm 0.1p module is programmed so that:
- when either sensor is OFF, and the coils are de-energized, the module does not allow subsequent restarts.
- when the valves are energized, the 2 sensors must go off within the valve actuation time (28 ms for Series 70 1/8", 38 ms for Series 70 1/4" and 50 ms for Series 70 3/8" and 85 ms Serie 70 1/2"), otherwise the 2 valves are switched off again.
  The programme can be downloaded from www.metalwork.it (the licence for programming Pilz® modules is not included).

All the electrical connections between the various components must comply with the applicable safety regulations.
If the emergency button is operated at a frequency of 1 actuation per hour, the circuit activates a safety function with PL = e (calculations made with the PAScal programme by Pilz®).
Responsibility for final checking that PL lies with the person assembling the circuit.



# ACCESSORIES

## COILS AND CONNECTORS

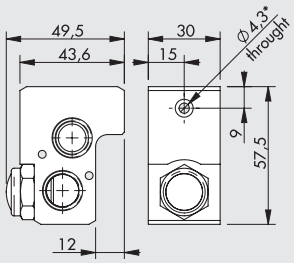
Refer to page **B1**.60 for coils and connectors

## CONNECTORS FOR SENSORS M8

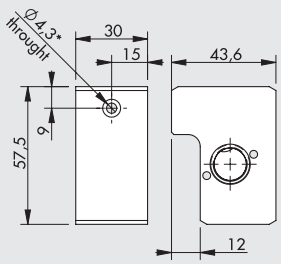
See page **A6**.9

## KIT FOR CONNECTION 1/4 VALVES TO SYNTES 1

**IN**




**OUT**



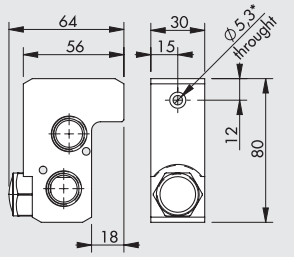

* Wall fixing

| Code | Description | Weight [g] |
|---|---|---|
| **9210015** | IN 1/4 SY1 block accessory | 175 |
| **9210016** | OUT 1/4 SY1 block accessory | 180 |

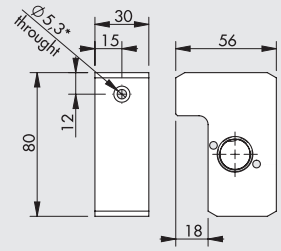
Note: Individually packed with bushing, screws and gaskets.

## KIT FOR CONNECTION 3/8 VALVES TO SYNTES 1 - SYNTESI 2

**IN**




**OUT**



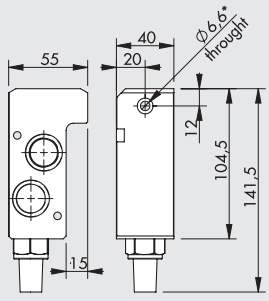

* Wall fixing

| Code | Description | Weight [g] |
|---|---|---|
| **9210022** | IN 3/8 SY1 block accessory | 297 |
| **9210023** | OUT 3/8 SY1 block accessory | 302 |
| **9210017** | IN 3/8 SY2 block accessory | 325 |
| **9210018** | OUT 3/8 SY2 block accessory | 330 |

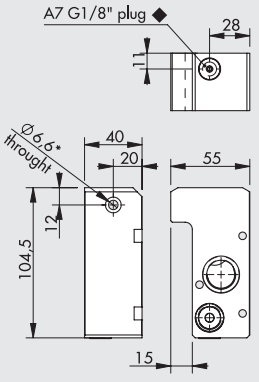
Note: Individually packed with bushing, screws and gaskets.

## KIT FOR CONNECTION 1/2 VALVES TO SYNTESI 2

**IN**




**OUT**



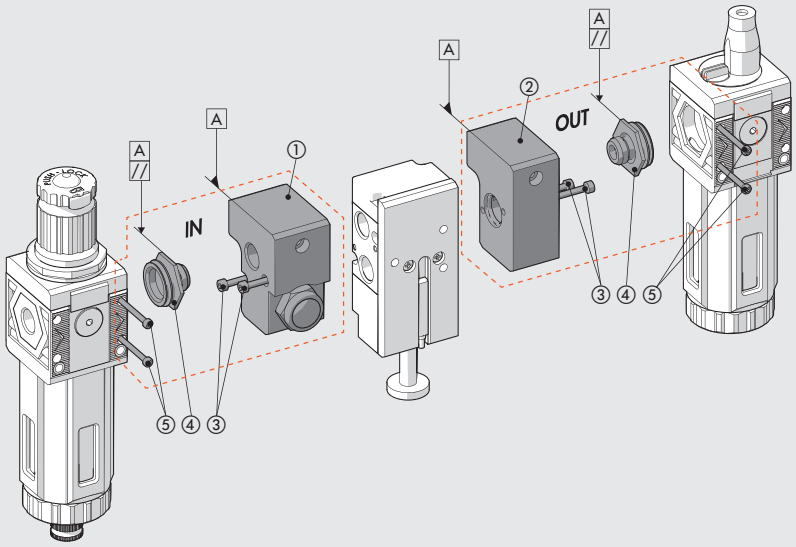

* Wall fixing
◆ For pilot assisted version remove the G1/8 plug

| Code | Description | Weight [g] |
|---|---|---|
| **9210020** | IN 1/2 SY2 block accessory | 515 |
| **9210021** | OUT 1/2 SY2 block accessory | 503 |

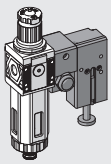
Note: Individually packed with bushing, screws and gaskets.

METAL WORK PNEUMATIC

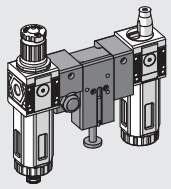
## ASSEMBLY DIAGRAM WITH SYNTESI®



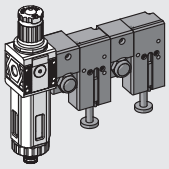

IN + SINGLE VALVE



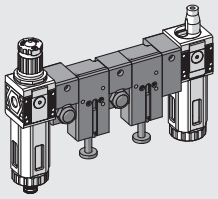
IN + SINGLE VALVE + OUT



IN + DOUBLE VALVE

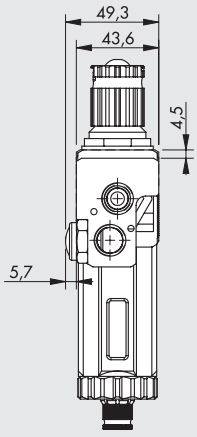


IN + DOUBLE VALVE + OUT

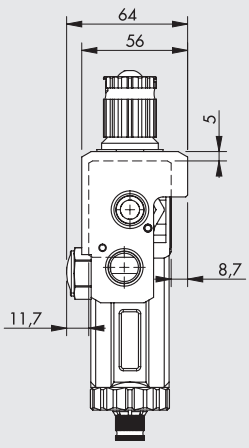


1) Connect the inlet ① or outlet ② plate to the safety component SAFE AIR® valve using the two TCE screws ③.
2) Screw the connecting bushing onto the input or output plate as far as it will go.
   (Use sealant on the G1/4", G3/8" or G1/2" thread to provide a further seal).
3) Unscrew the bushing slightly until two surfaces of the hexagon are parallel to the body of plate ① or ② (see diagram).
4) Insert the bushing ④ into the Syntesi® unit.
5) Tighten the two self-tapping screws ⑤ in the Syntesi® unit to a torque of 0.4 Nm max (SY1) and 2.5 Nm max (SY2).

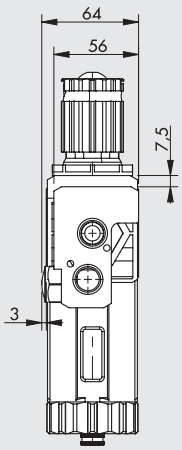
**SYNTESI® 1 with valves of 1/4**



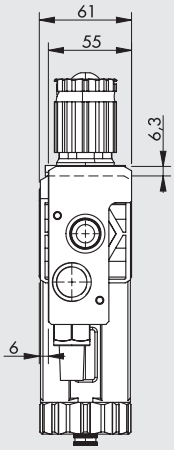

**SYNTESI® 1 with valves of 3/8**




**SYNTESI® 2 with valves of 3/8**




**SYNTESI® 2 with valves of 1/2**




**N.B.** The output accessory for Syntesi® is optional. It should be used when you intend to mount a Syntesi® component downstream the SAFE AIR® safety device. The **REG**, **FR**, **V3V**, **APR** elements **cannot be mounted** downstream the safety valves because if the elements are blocked, safety relief is not guaranteed.