

# GENERAL TECHNICAL DATA SYNTESI®

Syntesi® is an important milestone achieved by Metal Work, the result of thirty years' experience producing air-treatment units. It has been studied in minute detail to obtain the best possible performance in a reduced space and with limited weight. The capacity is much higher than that of other units of the same size.

This modular unit features a very simple yet effective system that requires no brackets, stay bolts or yoke for assembling the elements.

The basic version of Syntesi® incorporates numerous functions that are not provided or are only optional with traditional units. Examples are padlockable knobs, additional pneumatic ports on the front and back, flow options from left to right or vice versa, regulators with compensation system - which are accurate even when the upstream pressure changes, with rapid downstream pressure relief - full indelible marking, automatic condensate drain even in size 1, and 360° visual inspection of oil and condensate levels. The basic materials, technopolymer and nickel-plated brass have excellent corrosion resistance. An anti-corrosion version is available with stainless steel components (screws, plates) or Geomet®-reated ones (regulator springs).



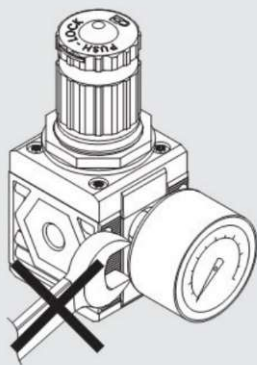
TECHNICAL DATA	SIZE 1			SIZE 2			
	1/8"	1/4"	3/8"	3/8"	1/2"	3/4"	1"
Threaded port	1/8"	1/4"	3/8"	3/8"	1/2"	3/4"	1"
Max. input pressure	bar			13			
	MPa			1.3			
	psi			188			
Flow rate	See catalogue of the various elements						
Min/max temperature at 10 bar; 1 MPa; 145 psi	°C			from -10 to +50			
Padlockable knob	The knobs of the regulators, filter regulators and standard sectioning valves can all be padlocked						
Fluid	Compressed air or other inert gases						
Mounting position	See catalogue of the various elements						
Direction of flow	Flow options right to left or vice versa						
Additional air take-off, for pressure gauges or fittings	1/8", front and rear, on all modules			1/4", front and rear, on all modules			
Wall fixing screws	No. 2 M4 screws			No. 2 M5 screws			
Certification for potentially explosive atmosphere according to 94/9/CE	Ex II 3 GD c T5 T 100°C -20°C < Ta < 50°C						

## ANTI-CORROSION VERSION

Differences compared to the standard version:

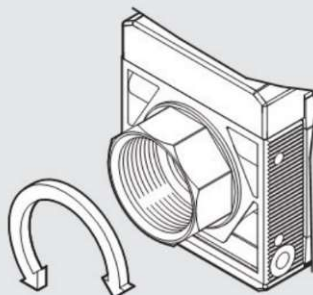
- stainless steel screws
- stainless steel plate for R, FR, V3V knobs
- Geomet®-treated regulator spring and filter-regulator

## FIXING TO FRONT PORTS



Do not use a spanner for fixing taper threaded elements to the front ports. Mount by hand and apply a liquid sealant (not teflon®).

## ROTARY BUSHINGS



3/4" and 1" bushings in Size 2 rotate freely to facilitate assembly operations.

## LASER MARKING

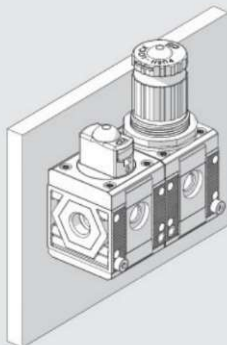


The following is marked indelibly on the body:

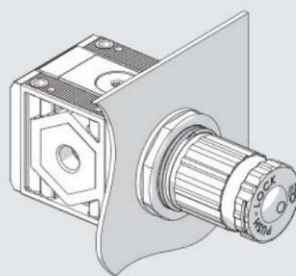
- Metal Work trademark
- Code
- Maximum pressure and temperature
- Degree of filtration or pressure range, where relevant
- Week and year of manufacture
- Atex category
- Made in Italy

## MOUNTING OPTIONS

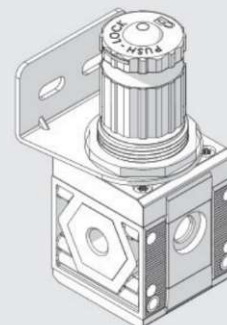
## On the wall, using two screws



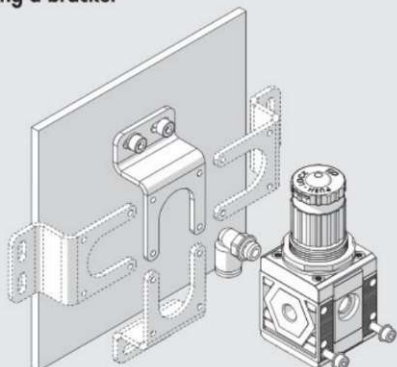
## On a panel



## Using knob bracket

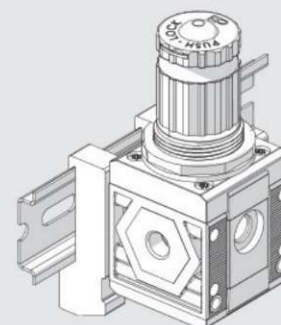


## Using a bracket



The bracket can be secured in any position, and the fittings can be mounted on the pressure gauge air intake at the back of the unit.

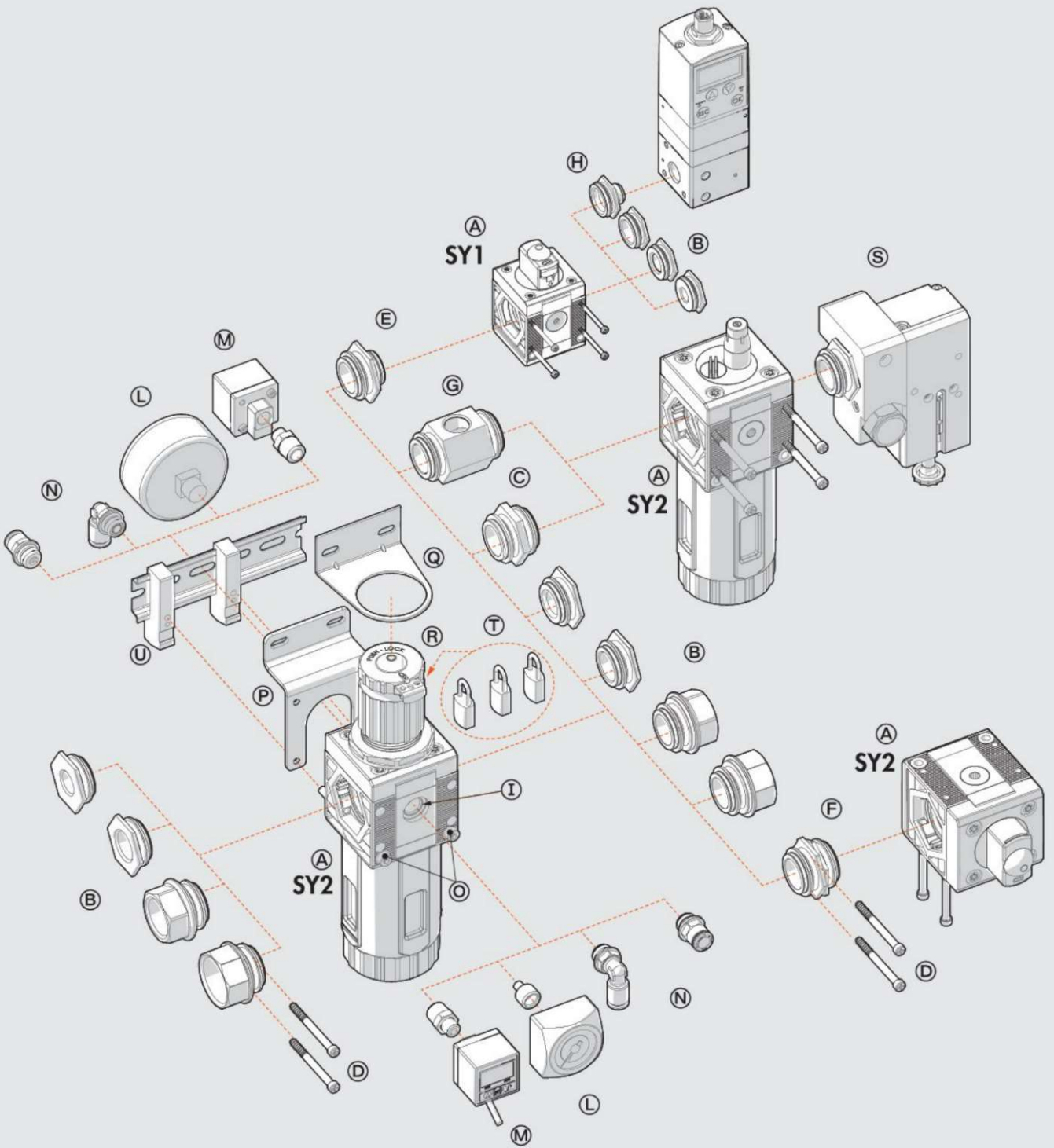
## On a DIN EN50022 bar with the opposite adaptor



MODULARITY AND FLEXIBILITY

UNITS

GENERAL TECHNICAL DATA Syntesis®



The various elements of Syntesi® ④ can be connected to the air feed and delivery circuit using pneumatic nickel brass or passivated aluminium ports ⑤ and can be fixed together using nipples ⑥.

The nipples and ports are easy to remove by unscrewing the two front screws ⑦. This solution has numerous advantages:

- Reduced overall dimensions.
- Free composition of multiple elements, without the need for brackets, stay bolts or yoke.
- The threads for the fittings are metallic, allowing high tightening torques, also for tapered threads.
- Maximum flexibility: a unit can be transformed at any time by adding an element or replacing a port with another one, e.g. 1/4" instead of 1/8".
- The air intake port can be the same or different from the outlet port, as desired.

Standard Syntesi® ports are: 1/8", 1/4", 3/8" for size 1; 3/8", 1/2", 3/4", 1" for size 2.

It may be necessary to use a vice to insert the bushes into size 2.

The nipples have different functions:

- Nipple ⑥ joins two elements of the same size together.
- Size adaptor ⑧ can be used to connect an element in the Syntesi® 2 series with one in the Syntesi® 1 series.
- The 90° adaptor ⑨ can be used to connect two 90° angled elements. For example, it can help directing the regulator knob or the control knob of a sectioning valve towards the user.
- The two-way air intake ⑩ is a simple and cost-effective system which, besides connecting two elements together, has 2 opposing threaded air intakes.
- The adaptor for Regtronic ⑪ can be used to fix the Regtronic 1/4" proportional valve to a Syntesi® size 1 element.

**Additional ports ⑫.** On the front and back of ALL Syntesi® elements there is a port (1/8" for size 1, 1/4" for size 2) that can be used for pressure gauges ⑬, pressure switches ⑭ or, given the high flow rate, as additional air take-off ⑮. These ports are downstream of the element, so, for example, a regulator port can supply air at a set pressure or a filter port can supply filtered air (not valid for activated carbon filter and depurator).

**Wall fixing.** Only two through screws ⑯ are needed. No bulky brackets or additional flanges are required. The bracket ⑰ can be used to separate the unit from the fixing wall, e.g. to mount a fitting to the rear port.

**Fixing on a DIN EN50022 bar.** Can be done using the bracket kit ⑱.

**Regulator fixing bracket ⑲.** Regulators and filter-regulators can also be fixed using a steel bracket ⑲ that embraces the bell.

**Padlockable knob ⑳.** The knobs of regulators, filter-regulator and sectioning valves can all be padlocked. The steel plate is included in the supply. You can insert up to two 3 mm diameter padlocks ㉑ on size 1 and three padlocks on size 2. As an alternative, the sectioning valve can have a steel plate suitable for a single 6 mm diameter padlock.

**Safety valve ㉒.** The unit can incorporate a series 70 SAFE AIR® safety valve.

# SYNTESI® KEY TO CODES

## KEY TO CODES SINGLE ELEMENT

56	1	1	F	10	1
SYNTESI	SIZE	THREADED INPUT CONNECTION	ELEMENT	TYPE	THREADED OUTPUT CONNECTION
56 Syntesi 5X Syntesi anti-corrosion	1 Size 1  2 Size 2	0 Without bushing 1 1/8" port 2 1/4" port 3 3/8" port  0 Without bushing 3 3/8" port 4 1/2" port 5 3/4" port 6 1" port	F Filter D Depurator C Active carbon filter R Pressure regulator B Filter-regulator L Lubricator ● V Shut off valve ▲ A Progressive starter ▲ S Pressure switches P Air take-off	Varies from element to element	0 Without bushing 1 1/8" port 2 1/4" port 3 3/8" port  0 Without bushing 3 3/8" port 4 1/2" port 5 3/4" port 6 1" port

- The anti-corrosion version of this element is only available with manual actuation.
- ▲ Not available in the anti-corrosion version.

## KEY TO CODES UNIT COMPOSED OF TWO OR THREE ELEMENTS

56	1	1	V	10	B	24	L	10	1
SYNTESI	SIZE	THREADED INPUT CONNECTION	ELEMENT 1	TYPE	ELEMENT 2	TYPE	ELEMENT 3	TYPE	THREADED OUTPUT CONNECTION
56 Syntesi 5X Syntesi anti-corrosion	1 Size 1  2 Size 2	1 1/8" port 2 1/4" port 3 3/8" port  3 3/8" port 4 1/2" port 5 3/4" port 6 1" port	F Filter D Depurator C Active carbon filter R Pressure regulator B Filter-regulator L Lubricator ● V Shut off valve ▲ A Progressive starter ▲ S Pressure switches P Air Take-off	Varies from element to element	F Filter D Depurator C Active carbon filter R Pressure regulator B Filter-regulator L Lubricator ● V Shut off valve ▲ A Progressive starter ▲ S Pressure switches P Air Take-off	Varies from element to element	F Filter D Depurator C Active carbon filter R Pressure regulator B Filter-regulator L Lubricator ● V Shut off valve ▲ A Progressive starter ▲ S Pressure switches P Air Take-off	Varies from element to element	1 1/8" port 2 1/4" port 3 3/8" port 3 3/8" port 4 1/2" port 5 3/4" port 6 1" port

- The anti-corrosion version of this element is only available with manual actuation.
- ▲ Not available in the anti-corrosion version.

# SYNTESI® FILTER-REGULATOR

This device combines in a single unit the functions of filtration, condensate separation and pressure regulation.

It is made up of the same elements forming the filter and the regulator, so the performance and advantages are the same:

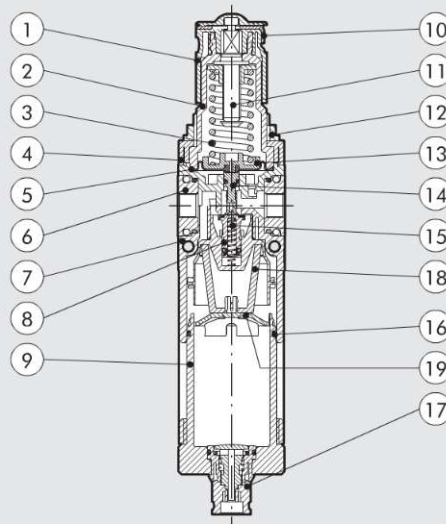
- Separation of condensate and larger liquid and solid particles by centrifugation.
- Three condensate drain options (RMSA, RA and SAC).
- 360° visually inspection of the condensate level, via transport spy-holes.
- Rolling diaphragm regulator, allowing maximum precision and flow rate, and minimal friction.
- Compensation for upstream pressure changes.
- Pressure relief valve.
- Quick downstream pressure relief.
- Padlockable push-lock knob.
- Front and rear ports for pressure gauges, pressure switches or, considering the high flow rate, for use as additional filtered and regulated air take-off.



TECHNICAL DATA	FR SY1			FR SY2			
	1/8"	1/4"	3/8"	3/8"	1/2"	3/4"	1"
Threaded port							
Degree of filtration	5 (yellow) - output air purity class ISO8573-1: 3.7.4 20 (white) - output air purity class ISO8573-1: 4.7.4 50 (blue) - output air purity class ISO8573-1: 5.7.4						
Max. inlet pressure	bar			bar			
	MPa			MPa			
	psi			psi			
Flow rate at 6.3 bar (0.63 MPa; 91 psi) ΔP 0.5 bar (0.05 MPa; 7 psi)	NI/min	500	800	2200	3200	4300	5200
(inlet pressure 10 bar)	scfm	18	28	78	113	152	184
Flow rate at 6.3 bar (0.63 MPa; 91 psi) ΔP 1 bar (0.1 MPa; 14 psi)	NI/min	1300	2000	3000	5800	7200	7400
(inlet pressure 10 bar)	scfm	46	71	106	205	255	262
Relief valve flow rate at 6.3 bar (0.63 MPa; 91 psi)	NI/min	70			100		
	scfm	2.5			3.5		
Min/max temperature at 10 bar; 1 MPa; 145 psi	°C			°C			
Full outflow with zero inlet pressure	From -10 to +50			From -10 to +50			
Padlockable knob				Included			
Upstream pressure compensation				Included, via balanced valve			
Weight	g	244	239	230	623	596	592   580
Fluid	Compressed air or other inert gases						
Mounting position	Vertical						
Additional air take-off, for pressure gauges or fittings	1/8", front and rear			1/4", front and rear			
Additional air take-off flow rate at 6.3 bar	NI/min	500			1400		
(0.63 MPa; 91 psi) ΔP 1 bar (0.1 MPa; 14 psi)	scfm	18			50		
Bowl capacity	cm <sup>3</sup>	30			70		
Condensate drain	RMSA: drain with manual condensate discharge and automatic discharge at zero pressure RA: automatic drain with condensate discharge, independent of pressure and flow rate SAC: automatic drain with condensate discharge. <b>Operates by depression – requires variable air take-offs.</b> Nota d'uso: <b>the maximum input pressure for the RA version must not exceed 10 bar</b> No. 2 M4 screws   No. 2 M5 screws The pressure must always be set upwards. For increased sensitivity, use a pressure regulator with a rated pressure as close as possible to the required value. On request version without overpressure exhaust.						
Wall fixing screws							
Notes on use							

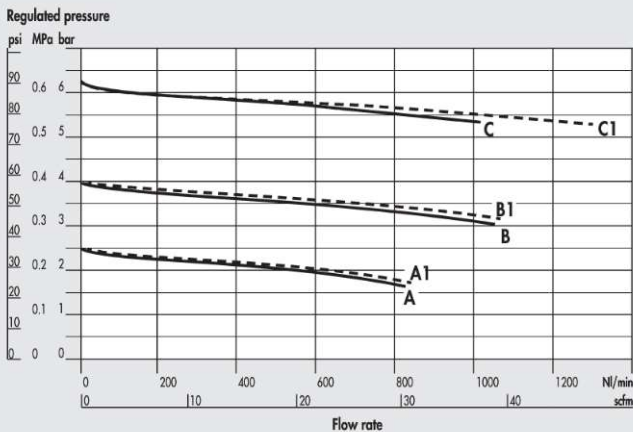
**COMPONENTS**

- ① Technopolymer adjusting knob
- ② Technopolymer bell
- ③ Steel adjusting spring (with Geomet® treatment for anti-corrosion version)
- ④ Technopolymer flange
- ⑤ Rolling diaphragm
- ⑥ IN/OUT bushing made of OT58 nickel-plated brass or passivated aluminium for 3/4" - 1"
- ⑦ Technopolymer body
- ⑧ OT58 brass valve, with NBR vulcanized gasket
- ⑨ Clear technopolymer bowl
- ⑩ Galvanised steel plate for knob locking (stainless steel for anti-corrosion version)
- ⑪ OT58 brass adjusting screw
- ⑫ Technopolymer ring nut
- ⑬ Technopolymer plate
- ⑭ Technopolymer rod
- ⑮ Stainless steel valve spring
- ⑯ O-ring NBR gaskets
- ⑰ Drain (RMSA)
- ⑱ Sintered HDPE filter cartridge
- ⑲ Technopolymer screen

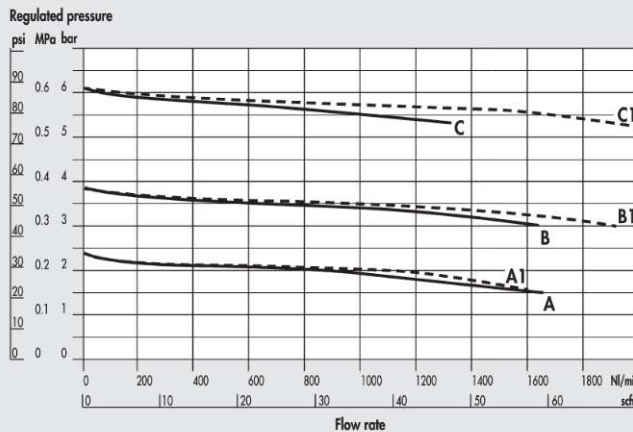


**FLOW CHARTS**

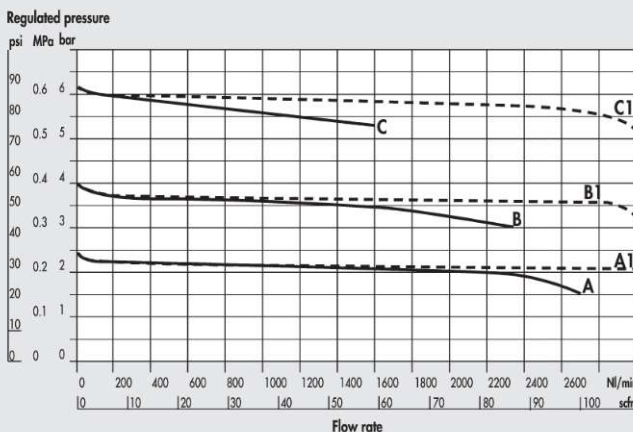
FR Syntesi® SY1 1/8"



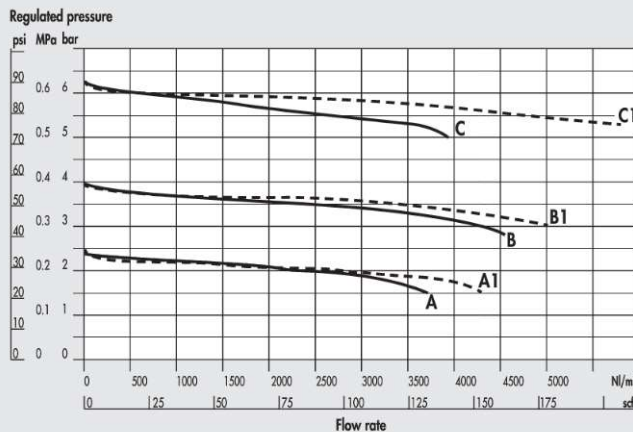
FR Syntesi® SY1 1/4"



FR Syntesi® SY1 3/8"



FR Syntesi® SY2 3/8"

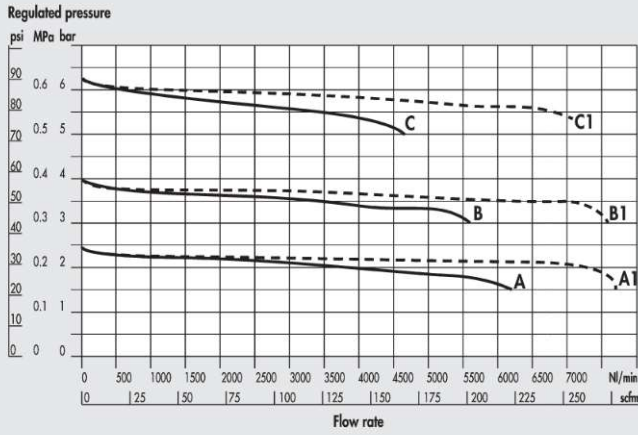


A = P In 7 bar - P Out 2.5 bar  
 B = P In 7 bar - P Out 4 bar

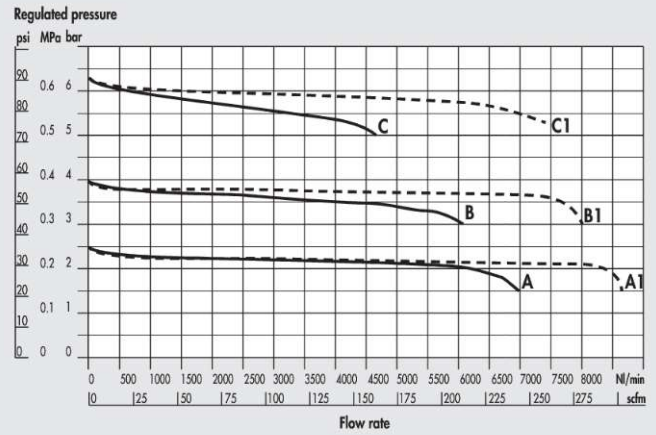
C = P In 7 bar - P Out 6.3 bar  
 A1 = P In 10 bar - P Out 2.5 bar

B1 = P In 10 bar - P Out 4 bar  
 C1 = P In 10 bar - P Out 6.3 bar

FR Syntesi® SY2 1/2"



FR Syntesi® SY2 3/4" - 1"



A = P In 7 bar - P Out 2.5 bar  
B = P In 7 bar - P Out 4 bar

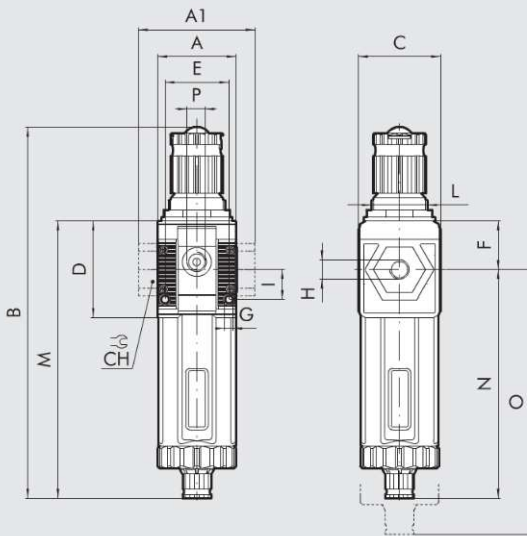
C = P In 7 bar - P Out 6.3 bar  
A1 = P In 10 bar - P Out 2.5 bar

B1 = P In 10 bar - P Out 4 bar  
C1 = P In 10 bar - P Out 6.3 bar

UNITS

Syntesi® FILTER-REGULATOR

DIMENSIONS



	SIZE 1			SIZE 2			
H (threaded port)	1/8"	1/4"	3/8"	3/8"	1/2"	3/4"	1"
A	42			61			
A1	-	-	44	-	-	95	95
B	RMSA 198 RA/SAC 202			246 250			
C	44			61			
CH	-			-		32	36
D	51.5			70.5			
E	33.5			47.5			
F	25.8			38.2			
G	Hole for M4 screws			Hole for M5 screws			
I	16			22.5			
L	M30x1.5			M38x2			
M	RMSA 148 RA/SAC 152			178 182			
N	RMSA 122.2 RA/SAC 126.2			139.8 143.8			
O	RMSA 202 RA/SAC 206			245 249			
P (pressure gauge port or additional air takes-off)	1/8"			1/4"			

NOTES



## KEY TO CODES

56	1	1	B	24	1
SYNTESI	SIZE	THREADED INPUT CONNECTION	ELEMENT	DEGREE OF FILTRATION, TYPE OF CONDENSATE DRAIN AND SETTING RANGE	THREADED OUTPUT CONNECTION
56 Syntesi 5X Syntesi anti-corrosion	1 Size 1  2 Size 2	0 Without bushing 1 1/8" port 2 1/4" port 3 3/8" port  0 Without bushing 3 3/8" port 4 1/2" port 5 3/4" port 6 1" port	B Filter-regulator	<ul style="list-style-type: none"> <li>● 10 5 µm, RMSA, 0 to 2 bar</li> <li>● 20 20 µm, RMSA, 0 to 2 bar</li> <li>● 30 50 µm, RMSA, 0 to 2 bar</li> <li>● 40 5 µm, RA, 0 to 2 bar</li> <li>● 50 20 µm, RA, 0 to 2 bar</li> <li>● 60 50 µm, RA, 0 to 2 bar</li> <li>● 11 5 µm, SAC, 0 to 2 bar</li> <li>● 21 20 µm, SAC, 0 to 2 bar</li> <li>● 31 50 µm, SAC, 0 to 2 bar</li> <li>+ 12 5 µm, RMSA, 0 to 4 bar</li> <li>+ 22 20 µm, RMSA, 0 to 4 bar</li> <li>+ 32 50 µm, RMSA, 0 to 4 bar</li> <li>+ 42 5 µm, RA, 0 to 4 bar</li> <li>+ 52 20 µm, RA, 0 to 4 bar</li> <li>+ 62 50 µm, RA, 0 to 4 bar</li> <li>+ 13 5 µm, SAC, 0 to 4 bar</li> <li>+ 23 20 µm, SAC, 0 to 4 bar</li> <li>+ 33 50 µm, SAC, 0 to 4 bar</li> <li>14 5 µm, RMSA, 0 to 8 bar</li> <li>24 20 µm, RMSA, 0 to 8 bar</li> <li>34 50 µm, RMSA, 0 to 8 bar</li> <li>44 5 µm, RA, 0 to 8 bar</li> <li>54 20 µm, RA, 0 to 8 bar</li> <li>64 50 µm, RA, 0 to 8 bar</li> <li>15 5 µm, SAC, 0 to 8 bar</li> <li>25 20 µm, SAC, 0 to 8 bar</li> <li>35 50 µm, SAC, 0 to 8 bar</li> <li>16 5 µm, RMSA, 0 to 12 bar</li> <li>26 20 µm, RMSA, 0 to 12 bar</li> <li>36 50 µm, RMSA, 0 to 12 bar</li> <li>46 5 µm, RA, 0 to 12 bar</li> <li>56 20 µm, RA, 0 to 12 bar</li> <li>66 50 µm, RA, 0 to 12 bar</li> <li>17 5 µm, SAC, 0 to 12 bar</li> <li>27 20 µm, SAC, 0 to 12 bar</li> <li>37 50 µm, SAC, 0 to 12 bar</li> </ul>	0 Without bushing 1 1/8" port 2 1/4" port 3 3/8" port 0 Without bushing 3 3/8" port 4 1/2" port 5 3/4" port 6 1" port

● Not available in the anti-corrosion version.

+ Anti-corrosion version available only in size 1.

RMSA: drain with manual condensate discharge and automatic discharge at zero pressure.

RA: automatic drain with condensate discharge, independent of pressure and flow rate.

SAC: automatic drain with condensate discharge. **Operates by depression – requires variable air take-offs.**

## NOTES