

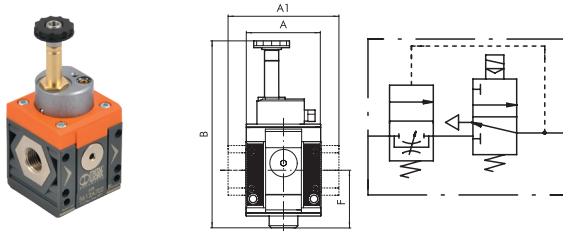
## Progressive starter

»SYNTESI« series

**PLUS** ||

Art. No. 144924

Type No. 5613A703



Exemplary illustration

The progressive starter is a pneumatic component that allows air enter the circuit gradually, thereby avoiding excessive pressure bursts.

A sophisticated system of internal valves allows two separate stages of operation. During the first stage, a quantity of air that can be regulated via a pin flows from the progressive starter.

The second stage starts when the downstream pressure reached 40 to 60% of the upstream pressure, during which full-port flow is achieved. When the mechanism is deactivated, the air flow is cut off and the downstream circuit is relieved.

The progressive starter is particularly useful on machinery where it is important to prevent actuators from moving rapidly and out of control, or where, for safety reasons, the air in-feed needs to be gentle and gradual. It, however, there is a major leak in the downstream system, it may never be possible to achieve the pressure required to open the valve completely.

On the front and back there is a port (G 1/8 for size 1 and G 1/4 for size 2) that can be used with pressure gauges, pressure switches or as an additional air outlet.

Coil, plug and silencer not included in delivery!

## Technical data

Series	Syntesi
Size	1
Min. input pressure	3 bar
Max. input pressure	10 bar
Temperature range	-10 to 50 °C
Input	G 3/8
Output	G 3/8
Flow rate measurement 1	$P_2 = 6,3$ bar and pressure drop $\Delta_p = 0,5$ bar
Flow rate 1	1100 NI/min
Flow rate measurement 2	$P_2 = 6,3$ bar and pressure drop $\Delta_p = 1$ bar
Flow rate 2	1600 NI/min
Medium	Compressed air or other neutral gases
Housing	Technopolymer
Max. temperature range	50 °C
Input pressure	3 - 10 bar
A	42.0 mm
A1	44,0 mm
B	105.0 mm
F	32.2 mm

## Commercial data

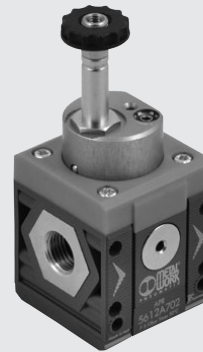
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eCl@ss 9.0	27299290
UNSPSC_Code_v190501	40141616
UNSPSC_CodeDesc_v190501	Valve parts or accessories

# SYNTESI<sup>®</sup> PROGRESSIVE STARTER



The progressive starter is a pneumatic component that allows air enter the circuit gradually, thereby avoiding excessive pressure bursts. A sophisticated system of internal valves allows two separate stages of operation. During the first stage, a quantity of air that can be regulated via a pin flows from the APR. The second stage starts when the downstream pressure reached 40 to 60% of the upstream pressure, during which full-port flow is achieved. When the mechanism is deactivated, the air flow is cut off and the downstream circuit is relieved.

The progressive starter is particularly useful on machinery where it is important to prevent actuators from moving rapidly and out of control, or where, for safety reasons, the air in-feed needs to be gentle and gradual. It, however, there is a major leak in the downstream system, it may never be possible to achieve the pressure required to open the valve completely.



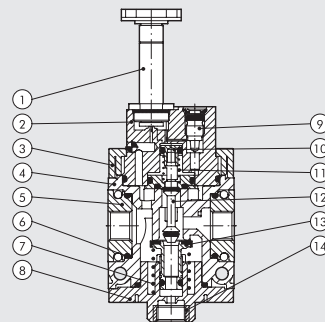
TECHNICAL DATA	APR SY1			APR SY2				
	1/8"	1/4"	3/8"	3/8"	1/2"	3/4"	1"	
Threaded port	1/8"			1/4"				
Threaded discharge port	1/8"			1/4"				
Type of control	Solenoid			Solenoid - Cnomo solenoid				
Inlet pressure	3 - 10 bar 0.3 - 1 MPa			3 - 10 bar 0.3 - 1 MPa				
	43 - 145 psi			43 - 145 psi				
Flow rate at 6.3 bar (0.63 MPa; 91 psi) ΔP 0.5 bar (0.05 MPa; 7 psi)	Nl/min scfm	900 32	1000 39	1100 39	2800 99	3600 127	3600 127	
Flow rate at 6.3 bar (0.63 MPa; 91 psi) ΔP 1 bar (0.1 MPa; 14 psi)	Nl/min scfm	1250 44	1500 53	1600 57	4400 156	4800 170	4800 170	
Drain flow rate at 6.3 bar (0.63 MPa; 91 psi)	Nl/min scfm	500 18			2700 96			
Maximum flow rate start-up, at 6.3 bar (0.63 MPa; 91 psi) with regulation pin completely unscrewed	Nl/min scfm	170 6			700 25			
Min/max temperature at 10 bar; 1 MPa; 145 psi	°C	From -10 to +50			From -10 to +50			
Weight	g	203	198	189	503	476	472	
Fluid		Compressed air or other inert gases						
Mounting position		In any position						
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 (0.63 MPa; 91 psi) ΔP 1 bar (0.1 MPa; 14 psi)	Nl/min scfm	500 18			1500 53			
Wall fixing screws		No. 2 M4 screws			No. 2 M5 screws			
Bobbin capacity for electro-pneumatic version		12 VDC and 24 VDC = 2W; 24 VAC, 110 VAC and 220 VAC = 3.5 VA						
Hand operator		Bistable: horizontal = OFF, vertical = ON						

UNITS

Syntesi<sup>®</sup> PROGRESSIVE STARTER

## COMPONENTS

- ① Sleeve ø8
- ② Anodized aluminium upper block
- ③ Technopolymer flange
- ④ Technopolymer body
- ⑤ IN/OUT bushing made of OT58 nickel-plated brass or passivated aluminium for 3/4" - 1"
- ⑥ O-ring NBR gasket
- ⑦ Stainless steel valve spring
- ⑧ Technopolymer bottom plug
- ⑨ OT58 brass progressive start regulation pin
- ⑩ OT58 brass internal valve
- ⑪ Stainless steel spring stem recoveryng
- ⑫ OT58 brass stem
- ⑬ OT58 brass main valve with vulcanized gasket
- ⑭ OT58 brass threaded insert



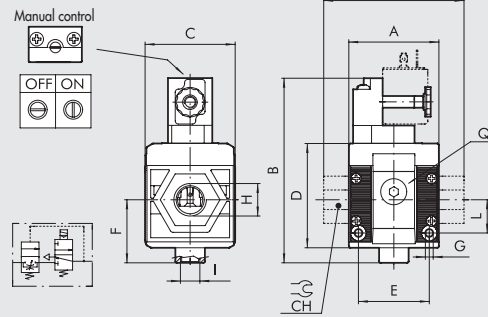
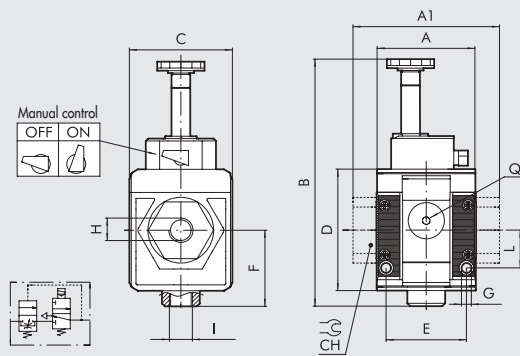
**DIMENSIONS**

**SOLENOID**

**SY1-SY2**

**CNOMO SOLENOID**

**SY2**



N.B.: Before assembling other Syntesi elements after the APR, remember to mount the coil on the APR itself.

UNITS

Syntesi® PROGRESSIVE STARTER

	SOLENOID SIZE 1			SOLENOID / CNOMO SOLENOID SIZE 2			
	1/8"	1/4"	3/8"	3/8"	1/2"	3/4"	1"
H (threaded port)	1/8"	1/4"	3/8"	3/8"	1/2"	3/4"	1"
A	-	42	-	-	60.5	-	-
A1	-	-	44	-	-	95	95
B	-	105	-	-	131	-	-
C	Cnomo			-	125	-	-
	-	44	-	-	61	-	-
CH	-	-	-	-	-	32	36
D	-	51.5	-	-	70.5	-	-
E	-	33.5	-	-	47.5	-	-
F	-	32.2	-	-	42.7	-	-
G	Hole for M4 screws			Hole for M5 screws			
I (exhaust)	1/8"	-	-	1/4"	-	-	-
L	-	16	-	-	22.5	-	-
Q (no. 2 additional air takes-off)	1/8"	-	-	1/4"	-	-	-

**KEY TO CODES**

56	1	1	A	70	1
SYNTESI	SIZE	THREADED INPUT CONNECTION	ELEMENT	TYPE	THREADED OUTPUT CONNECTION
56 Syntesi	1 Size 1	0 Without bushing 1 1/8" port 2 1/4" port 3 3/8" port	A Progressive starter APR	70 Solenoid * 71 Cnomo solenoid	0 Without bushing 1 1/8" port 2 1/4" port 3 3/8" port
	2 Size 2	0 Without bushing 3 3/8" port 4 1/2" port 5 3/4" port 6 1" port			0 Without bushing 3 3/8" port 4 1/2" port 5 3/4" port 6 1" port

\* Only for size 2

**PURCHASE ORDER CODES HAVING A MORE FREQUENT USE**

N.B. Besides the below mentioned codes, you can order elements composed at your will according to the key to codes.

Code	Description	Code	Description	Code	Description
Syntesi SY1 PROGRESSIVE STARTER		Syntesi SY2 PROGRESSIVE STARTER		Syntesi SY2 PROGRESSIVE STARTER	
5610A700	APR SY1 elpn without bushings	5620A700	APR SY2 elpn without bushings	5620A710	APR SY2 elpn Cnomo without bushings
5611A701	APR SY1 1/8 elpn	5623A703	APR SY2 3/8 elpn	5623A713	APR SY2 3/8 elpn Cnomo
5612A702	APR SY1 1/4 elpn	5624A704	APR SY2 1/2 elpn	5624A714	APR SY2 1/2 elpn Cnomo
5613A703	APR SY1 3/8 elpn	5625A705	APR SY2 3/4 elpn	5625A715	APR SY2 3/4 elpn Cnomo
		5626A706	APR SY2 1 elpn	5626A716	APR SY2 1 elpn Cnomo

## 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®-treated ones (regulator springs).



UNITS

GENERAL TECHNICAL DATA Syntesi®

TECHNICAL DATA	SIZE 1			SIZE 2			
	1/8"	1/4"	3/8"	3/8"	1/2"	3/4"	1"
Threaded port							
Max. input pressure	bar	15			13		
	MPa	1.5			1.3		
	psi	217			188		
Flow rate	See catalogue of the various elements						
Min/max temperature at 10 bar; 1 MPa; 145 psi	°C from -10 to +50			°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 ATEX 2014/34/EU rule	 II 3G Ex h IIC T5 Gc -10°C < Ta < 50°C II 3D Ex h IIIC T100 °C Dc						

### ANTI-CORROSION VERSION

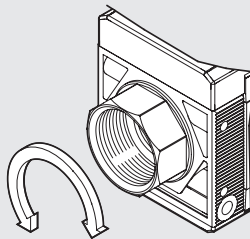
- Differences compared to the standard version:
- stainless steel screws
  - stainless steel plate for R, FR, V3V knobs
  - Geomet®-treated regulator spring and filter-regulator

### FIXING TO FRONT PORTS



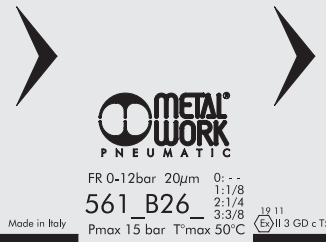
Do not use a spanner for fixing taper threaded elements to the front ports. Mount by hand and apply a liquid sealant (not teflon®).

### 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

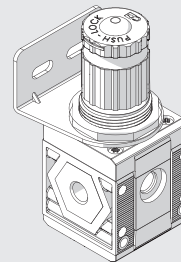
#### On the wall, using two screws



#### On a panel



#### Using knob bracket

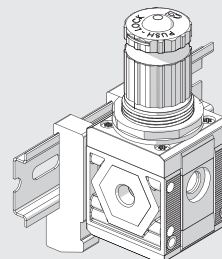


#### Using a bracket



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



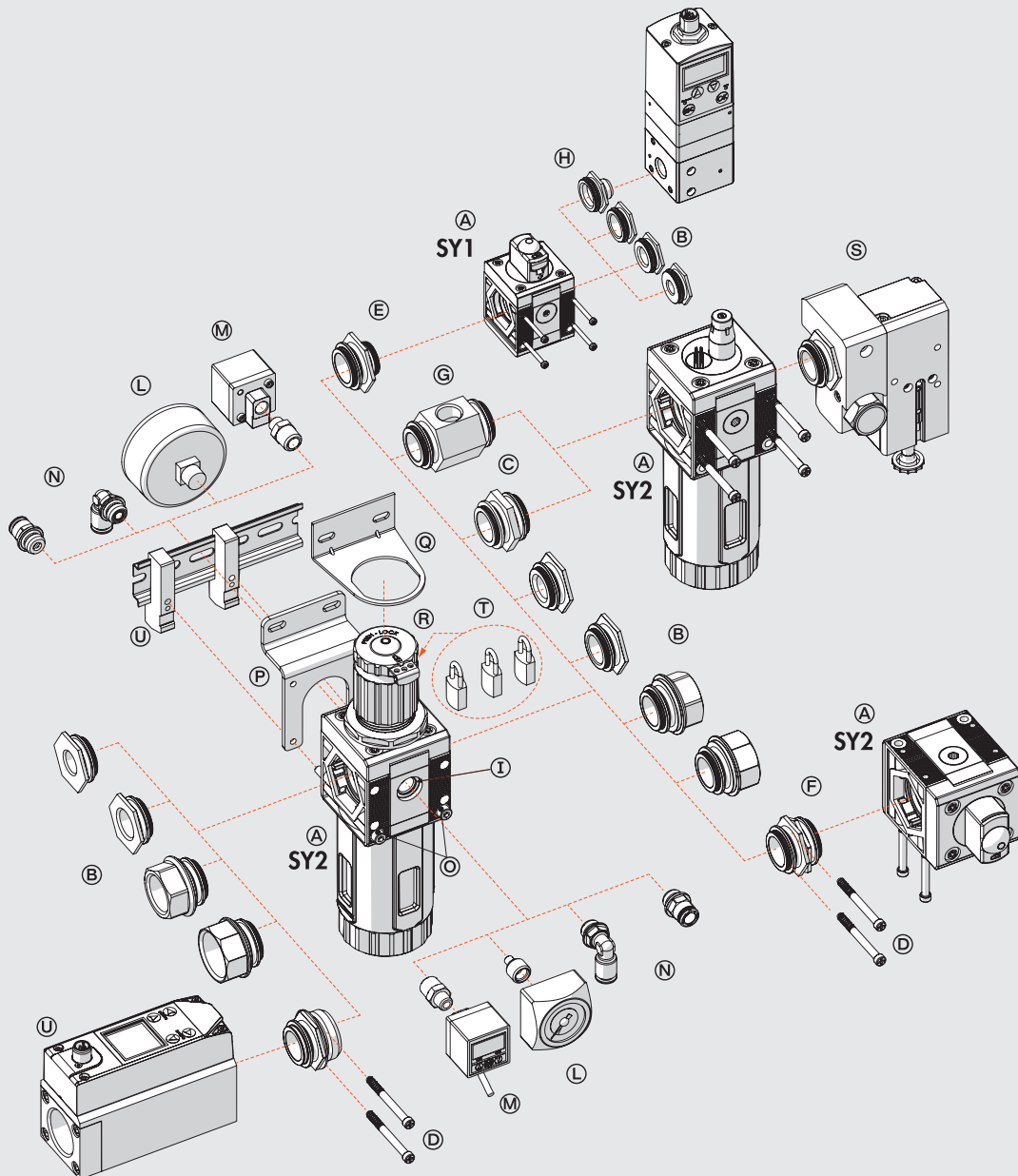
UNITS

GENERAL TECHNICAL DATA Synthesis®

MODULARITY AND FLEXIBILITY

UNITS

GENERAL TECHNICAL DATA Syntesi®



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

The nipples and ports are easy to remove by unscrewing the two front screws®. 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® joins two elements of the same size together.
- Size adaptor® can be used to connect an element in the Syntesi® 2 series with one in the Syntesi® 1 series.
- The 90° adaptor® 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® is a simple and cost-effective system which, besides connecting two elements together, has 2 opposing threaded air intakes.
- The adaptor for Regtronic® can be used to fix the Regtronic 1/4" proportional valve to a Syntesi® size 1 element.

**Additional ports®.** 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®, pressure switches® or, given the high flow rate, as additional air take-off®. 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® are needed. No bulky brackets or additional flanges are required. The bracket® 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®.

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

**Padlockable knob®.** 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® 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®.** The unit can incorporate a series 70 SAFE AIR® safety valve.

**Flowmeter series FLUX 1-2®.** The unit can incorporate a series FLUX 1 or FLUX 2 flow meter.



C1

# 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	0 Without bushing 1 1/8" port 2 1/4" port 3 3/8" 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
	2 Size 2	0 Without bushing 3 3/8" port 4 1/2" port 5 3/4" port 6 1" 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	1 1/8" port 2 1/4" port 3 3/8" 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
	2 Size 2	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.

UNITS

Syntesi® KEY TO CODES

C1.8

## Accessories

	Art. No.	Type No.
Mounting bracket, size 1, standard and anti-corr.	145658	9200716X
Adapter for DIN rail, size 1 and size 2	145660	9200718X
Connecting nipple kit, size 1	144695	9210000
Connecting element 90°, size 1	145502	9210009
Size adapter, size 1 - size 2, incl. 4 screws	145504	9210006
Fastening screw, size 1	145507	9210030
Solenoid, 30 mm x Ø 8 mm, 24 V DC, 4 W	145478	W0210010100
Solenoid, 30 mm x Ø 8 mm, 24 V AC, 50/60 Hz	145479	W0210011100
Solenoid, 30 mm x Ø 8 mm, 110 V AC, 50/60 Hz	145480	W0210012100
Solenoid, 30 mm x Ø 8 mm, 230 V AC, 50/60 Hz	145481	W0210013100
Plug connector, 30 mm, type A	145490	W0970520033
Plug connector LED, 24 V, 30 mm, type A	145491	W0970520034
Plug connector LED, 110 V, 30 mm, type A	145492	W0970520035
Plug connector LED, 230 V, 30 mm, type A	145493	W0970520036
Plug connector LED, varistor 24 V, 30 mm, type A	145494	W0970520037
Plug connector LED, varistor 110 V, 30 mm, type A	145495	W0970520038
Plug connector LED, varistor 230 V, 30 mm, type A	145496	W0970520039
Knurled nut, for coil 22 mm, IP 65	145501	0222100100
Solenoid kit 30 mm, 24 V DC, ATEX II 2 GD	145482	0227606913
Solenoid kit 30 mm, 24 V DC, ATEX II 2 GD	145483	0227606915
Solenoid kit 30 mm, 24 V AC, ATEX II 2 GD	145484	0227608013
Solenoid kit 30 mm, 24 V AC, ATEX II 2 GD	145485	0227608015
Solenoid kit 30 mm, 110 V AC, ATEX II 2 GD	145486	0227608023
Solenoid kit 30 mm, 110 V AC, ATEX II 2 GD	145487	0227608025
Solenoid kit 30 mm, 230 V AC, ATEX II 2 GD	145488	0227608033
Solenoid kit 30 mm, 230 V AC, ATEX II 2 GD	145489	0227608035

## Spareparts

	Art. No.	Type No.
Threaded port bushing, size 1, G 3/8	144690	9210003