SERIES 08
AIR/AIR PRESSURE MULTIPLIER (BOOSTER)

FLUID FORCE

The air-air pressure multiplier, or booster, is an automatic device that compresses air to give an outlet pressure that is two or four times greater than the inlet pressure. It is normally used to locally intensify the input pressure of one or more actuators. As it is entirely pneumatic, it can be used when electric devices are not recommended.

The novelty is that the booster has built-in non-return valves that maintain the outlet pressure even when the supply of compressed air is cut off. This means it is necessary to interrupt the supply and relieve the circuit before doing anything to the device. It is advisable to install a tank after the booster to prevent fluctuations in outlet pressure.

TECHNICAL DATA		Z5208100500400	Z5208100630400
Chamber 1 bore	mm	100	100
Chamber 2 bore		50	63
Compression ratio		4:1	2.5:1
Inlet pressure	bar	2÷8	2÷8
Noise level	Db	90	89
Operating temperature	°C	-10°÷+60°	-10°÷+60°
Fluid		Filtered air, lubricated or not. If operating with lubricated air the lubrication must be continuous.	

KEY TO CODING

Z52	08	100	50	04	00
	SERIES	**CHAMBER 1 BORE**	**CHAMBER 2 BORE**	**STROKE [cm]**	**RETURN**
	08	100	50 63	04	00 STANDARD 01 WITH REGOLATION 02 WITH REGOLATION

The difference between the pneumatic chamber 1 and pneumatic chamber 2 determines the booster multiplication ratio.

APPLICATIONS

Air-air boosters are used for instance in seal or burst tests, or to increase power in cylinders to avoid having to replace them with ones with a larger diameter.

RECOMMENDED CIRCUIT

①   Air-air booster
②   Tank
③   Pressure regulator
④   Pressure regulator
⑤   FRL units

To achieve the correct booster pressure ratio, regulators 3 and 4 must have the same pressure.

air outlet   air inlet 2   air inlet 1
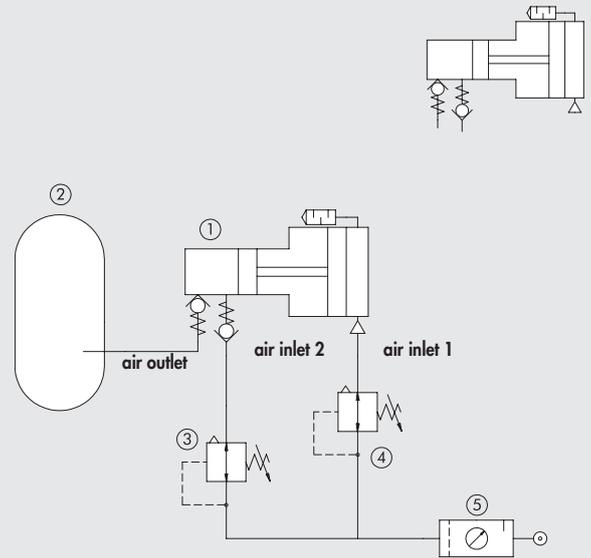
COMPONENTI

①   FRONT CYLINDER HEAD: 2011 neutral anodised aluminium
②   FRONT LINING: Ø50/Ø63 profiled anodised aluminium
③   INTERMEDIATE CYLINDER HEAD: 2011 neutral anodised aluminium
④   REAR LINING: Ø100 profiled anodised aluminium
⑤   SILENCER: nickel-plated brass
⑥   BOLT: white galvanised steel
⑦   REAR CYLINDER HEAD: 2011 neutral anodised aluminium
⑧   EXCHANGER PISTON: brass
⑨   EXCHANGER GASKET: NBR rubber
⑩   PISTON GASKET: NBR rubber
⑪   GUIDE BANDS: phenolic resin
⑫   PISTON Ø50/Ø63: 2011 aluminium
⑬   PISTON ROD Ø16: C45 ground chrome steel
⑭   FILTER: sintered bronze
⑮   PISTON GASKET Ø100: NBR OR compound and plastoferrite band
⑯   PISTON Ø100: 2011 aluminium
⑰   VNR RING NUT: nickel-plated brass
⑱   VNR SPRING: stainless steel
⑲   VNR PISTON: brass
⑳   VNR SOLID GASKET: CSC polyurethane
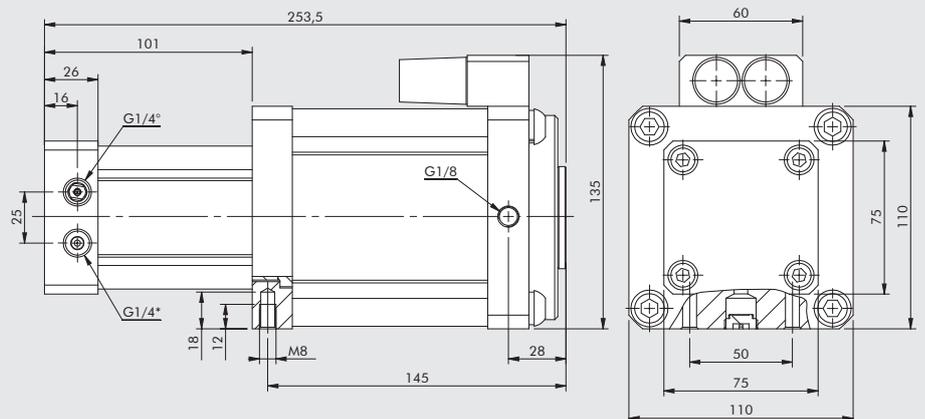
Detail on scale 1:1
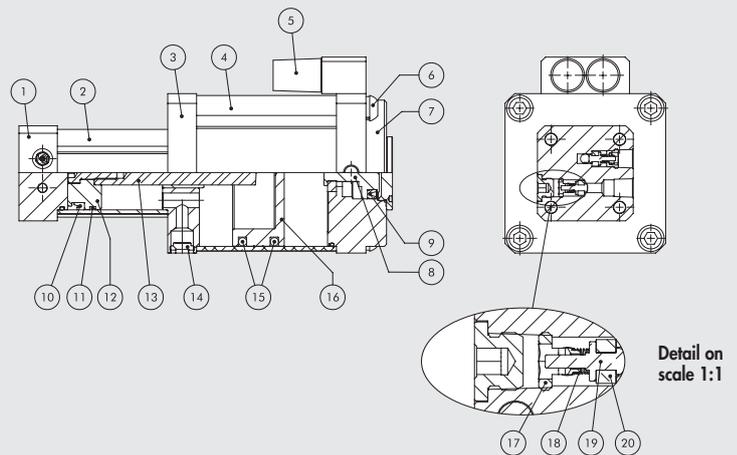
DIMENSIONS: Z5208100500400

G1/8 = air inlet 1
G1/4* = air inlet 2
G1/4° = boosted air outlet
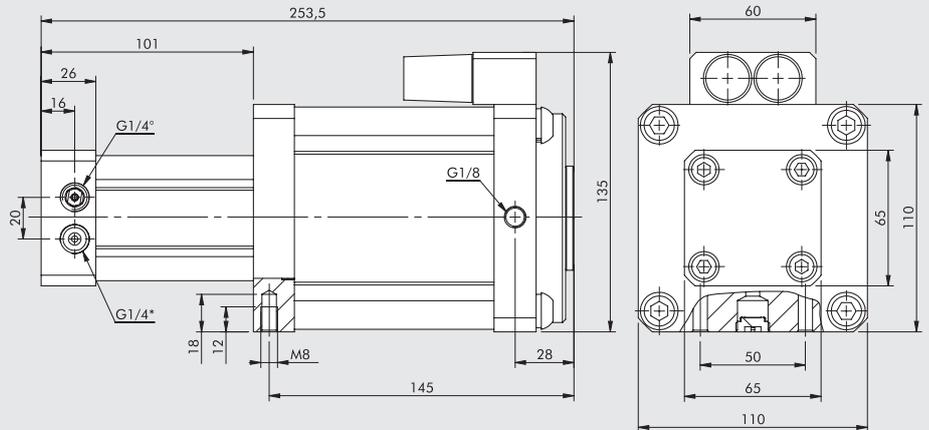

DIMENSIONS: Z5208100630400

G1/8 = air inlet 1
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TANK FILLING CURVES

The graphs below refer to the filling of a 10-litre tank and show the pressure increase ratio P2:P1 as a function of time [s].
When calculating the tank filling time, the ratio P2:P1 must have 2 values. The first value is the ratio of the initial tank pressure "Pi" to the booster supply pressure "Pa"; the second value is the ratio of the final tank pressure "Pf" to the supply pressure "Pa".
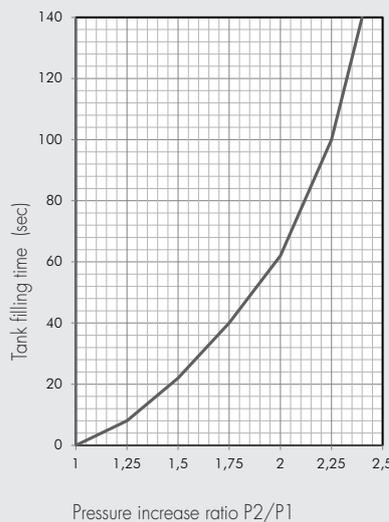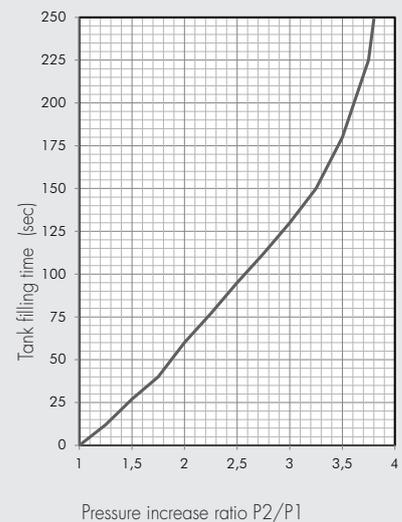
The data required to calculate the tank filling time are thus:

Pa = air-air booster supply pressure
Pi = nitial pressure in the tank
Pf = Final pressure in the tank
V = Volume of the tank

Z5208100630400

Tank filling time (sec)

Pressure increase ratio P2/P1

Z5208100500400

Tank filling time (sec)

Pressure increase ratio P2/P1

EXAMPLE OF CALCULATION

Let us assume we need to fill a 50 litre tank with our booster ratio 4:1 (Z5208100500400) at a pressure of 5 bar.
The tank has an initial pressure of 6 bar, which needs to be increased to 15 bar.
In short,

• Pa = 5 bar
• Pi = 6 bar
• Pf = 15 bar
• V = 50 l

Now let us calculate the initial and final ratios P2:P1.

P2:P1(i) = Pi:Pa = 6/5 = 1.2

P2:P1(f) = Pf:Pa = 15/5 = 3

Now let us go to the relevant booster graph and read the time value in relation to the pressure ratios we have just calculated.

With P2:P1(i), time Ti = 15 s
With P2:P1(f), time Tf = 130 s

The difference between the final time and the initial time gives the value T to be inserted in the final formula:
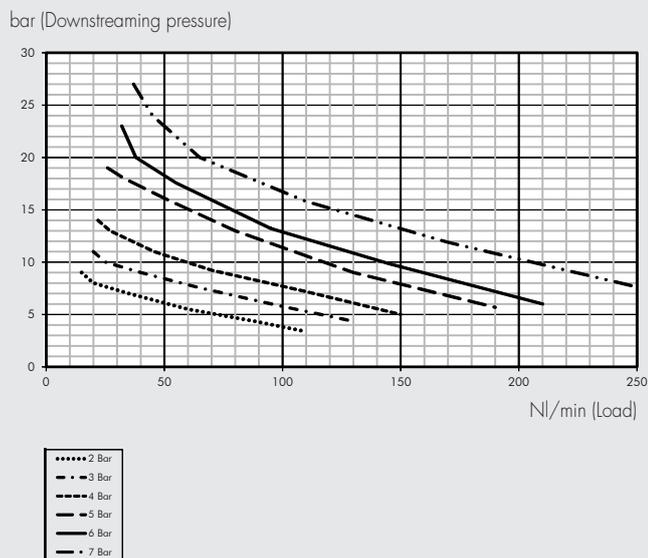
T = Tf - Ti = 130 − 15 = 115 s

The filling time Tr for a 50 litre tank will be:

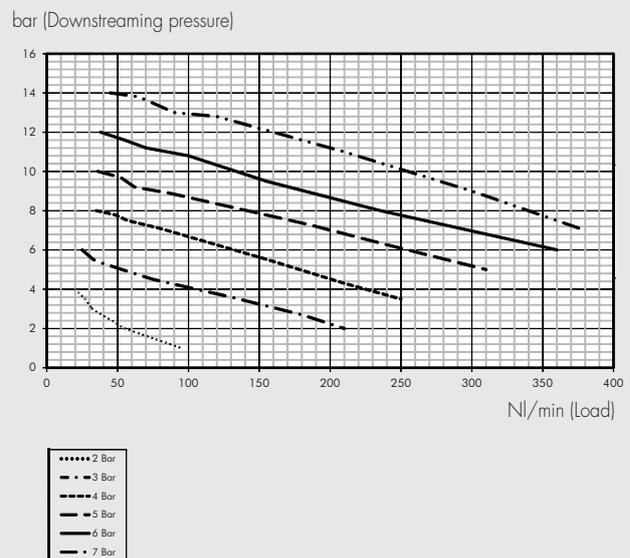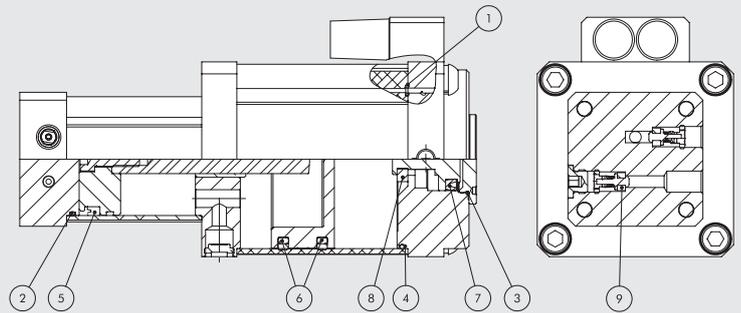Tr = T * V / 10 = 115 * 50 / 10 = 575 s

FLOW RATE CHARTS

Z5208100500400

Z5208100630400

bar (Downstreaming pressure)

bar (Downstreaming pressure)

SET OF SPARE GASKETS
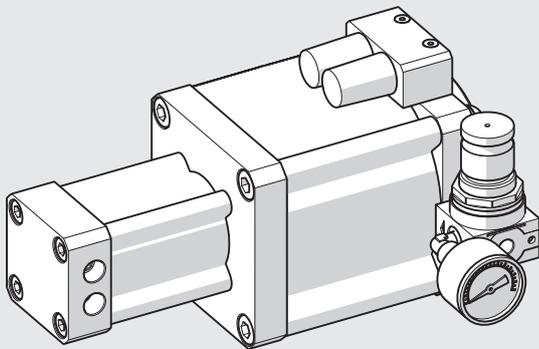
Code	Bore	Refer
Z5208K_ _100	50-63	① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

_ _ = Bore

ACCESSORES

The air-air booster is available with 1 or 2 regulators, complete with G1/8 or G1/4 male-male fittings, pressure gauge and 12 bar bit.

Z5208100_ _0401

Z5208100_ _0402