

Before introducing the section on hydraulic cylinders, we feel it appropriate to explain in simple terms how to choose a cylinder, possibly combined with a pressure booster.

First we have to know what are the key data that are indispensable to start our calculation:

FORCE (kg) – required to move the load and specified by the customer
AIR PRESSURE (bar) – available and supplied by the air circuit
STROKE (mm) – indispensable for the type of movement to perform
LAYOUT – not to be overlooked at the design stage of the machine.

Then we can start with the mathematical calculation.
A sample calculation is given below.

For example:
Force 3000 kg
Air pressure in a 5 bar circuit
Useful stroke 20 mm
Free layout

We first identify the various cylinders available in the catalogue and analyse their characteristics to select the one appropriate for us.
We can immediately discard the series 21, 22, 23 due to their short strokes, and the series 14 because it cannot develop the force we require.
Let's focus on the series 18.

We can see that cylinders Ø36 and 40 do not generate 3000 kg, not even at 350 bar. We can therefore identify our cylinder and feel safe in choosing the Z5218685725.

The values stated in the catalogue are:

Force at 200 Bar = 5100 kg
Force at 350 Bar = 8925 kg
Surface area = 25.5 cm²
Volume = 63.80 cm³

Let's now choose the associated booster. We calculate the hydraulic pressure we need to achieve 3000 kg and divide it by the surface area of our cylinder, and we get:

$$3000\text{kg} / 25.5 \text{ cm}^2 = 118 \text{ bar}$$

Now let's move to the booster section and identify the models which, when driven by air pressure at 5 bar, can reach 118 bar oil pressure that is useful for our case.

This result should be combined with the oil volume needed by our cylinder to operate and that supplied by the booster.

We see that the boosters in the series 01 can easily reach 118 bar but they do not supply sufficient oil; conversely the oil flow rate in the series 02 is greater but it does not reach the pressure we need.

We are therefore forced to move on to the series 03.

We immediately realise that booster Z52031603210 do the job as it can develop as many as 125 bar of oil at 5 bar and supply 76-80 cm³ of oil, which is sufficient for our cylinder.

Now we only need to opt for a pneumatic or a spring return.

SERIES 18 SINGLE-ACTING SPRING-RETURN CYLINDERS WITH EXTERNAL THREADED BODY

Single-acting clamp cylinders with spring return and threaded outer body. Due to their small overall dimensions and a considerable thrust force, they are used for single or multiple locking of parts. They can be housed directly in the fixtures or in the appropriate threaded rings (see page 38). They are controlled by pressure multipliers or hydraulic pumps and are used only with oil. The 18 Series is available in 8 models.

CAUTIONS:

The cylinders can also be used at the end of the stroke because they have an internal spacer which, in addition to blocking the movement of the piston, allows you to choose the desired intermediate stroke.



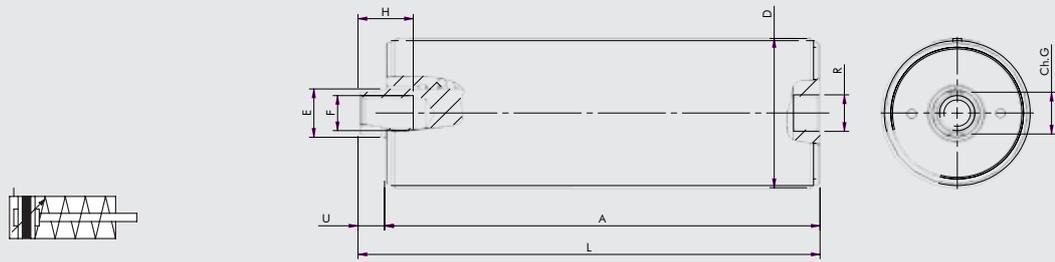
TECHNICAL DATA		SERIES 18
Bore	mm	Ø25; Ø32; Ø40; Ø55
Standard stroke	mm	for bores Ø25 and Ø32 from 1 to 30mm for bores Ø32, Ø40 and Ø55 from 1 to 50mm
Force exercised by pressure	daN	Di 200 bar 980÷4740 Di 350 bar 1715÷8500
Working temperature range	°C	-10°÷+70
Recommended oil		TORQUE O MATIC D II ATF

KEY TO CODES

Z52	14	30	22	05
	SERIES	THREADED OUTSIDE DIAMETER	BORE	STROKE (mm)
	18	36	25	Da 1 a 30
		40	32	Da 1 a 50
		48	40	
		68	55	

The new external chemical nickel plating treatment and the stems stainless steel, allow the new cylinders to be used in the food and pharmaceutical sectors.

CHARACTERISTICS AND DIMENSIONS - SERIES 18



CODE	FORCE [daN]		SURFACE AREA [cm ²]	OIL VOLUME [cm ³]	STROKE [mm]	A	D	E	F	L	H	U	Ch.G	R
	200 bar	350 bar												
Z52183625__	981	1715	4.90	Min 0.49 Max 14.7	D _a 1mm A 30mm	111	M 36 x 1.5	14	M 8	121	15	10	11	G 1/8
Z52184032__	1606	2810.5	8.03	Min 0.80 Max 40.15	D _a 1mm A 50mm	167	M 40 x 1.5	16	M 10	177	20	10	13	G 1/8
Z52184840__	2512	4396	12.56	Min 1.25 Max 62.8	D _a 1mm A 50mm	171	M 48 x 1.5	16	M 10	181	20	10	13	G 1/4
Z52186855__	5749	8309	23.74	Min 2.37 Max 118.7	D _a 1mm A 50mm	197	M 68 x 2	22	M 16	209	25	12	19	G 3/8

FORCE/PRESSURE DIAGRAM

SERIES 18

