

# PNEUMATIC ACTUATORS

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**B**

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# PNEUMATIC ACTUATORS

## Selection of equipment



standards	model						Ø (mm)		standard stroke		detection	type	illustration	series	page
	single acting	double acting		construction			min.	max.	min.	max.					

standards	model		construction	Ø (mm)		standard stroke		detection	type	illustration	series	page
	single acting	double acting		min.	max.	min.	max.					



**Cylinders according to ISO 15552 standard**

ISO15552 AFNOR ISO 15552 DIN ISO 15552				●	●					PES	ISO 15552 standard PES range	450 453	P229-1	
					●		32	100	25	2000	●	PES		453 P229-5
					●		32	100			●	PES	spare parts	453 P229-7
				●			32	250	25	1000	●	PES		450 P232-1
				●			32	200	25	600	●	PES		450 P232-3
				●			32	250			●	PES	spare parts	450 P232-4
				●			32	80	25	2000	●	PES Ω	 for fast or slow speed	450 P234-1
				●	●		32	80			●	PES Ω	spare parts	450 453 P234-4
			Guiding units for ISO 15552 cylinders	●	●		32	100	50	500		U H		010 881 P237-1 P237-4
			Rod lock for ISO 15552 cylinders	●	●		32	100	50	600		static dynamic		463 450 453 P238-1 P238-7
			Options and special versions of ISO 15552 cylinders	●	●		32	200	25	2000	●	PES		450 453 P239-1
			Mountings according to ISO15552 standard	●	●		20	200						434 P242




**Cylinders according to ISO 6431 standard**

ISO6431 CETOP				●		-	250	50	1000	●	PIS		436 P240-1
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






















**Trinorm cylinders**

CNOMO AFNOR NF E 49001				●		25	200	50	1000	●	PCN		437 P245-1
				●		25	200			●	PCN	spare parts	437 P245-9

**Anti-corrosive cylinders**

ISO 6432 CETOP AFNOR NF E 49030				●		12	25	25	160	●	CIX		435 P252-1
ISO 6431				●		32	80	25	1000	●	CIX		435 P258-1

(1) Magnetic position detectors, see page 5

standards	model										Ø (mm)		standard stroke		detection	type	illustration	series	page		
	double acting			guide			construction				min.	max.	min.	max.							
	Non-cushioned	Elastic cushioning	Adjust. pneumatic cushioning	Without	Ball bearings	Plain bearings	Cross rollers	Round cylinder	Profiled barrel	Rotation-proof	Rodless	Rotatable			Equipped for position detection						
<b>Rodless cylinders</b>																					
	●	●	●		●	●					●		6	80			●	selection chart	P259-1		
<b>Rodless cylinders with magnetic couplings</b>																					
				●							●		6	40	50	2000	●	STN		445	P260-3
						●					●		6	40	50	1500	●	STG		445	P260-9
<b>Rodless band cylinders</b>																					
				●							●		16	80	5	6000	●	STBN		448	P267-3
					●						●		25	63	100	3800	●	STB		446	P265-2
					●						●		16	80	5	5500	●	STB		448	P267-9
						●					●		25	50	5	3750	●	STBB		448	P267-19
																		STBN-STB-STBB	Position detectors for cylinder series 448	881	P267-31
<b>Actuators with linear guides</b>																					
					●	●		●					16	63	10	100	●	CGT		CGT	P272-1
					●			●					12	40	25	570	●	CIB		447	P275-2
					●	●		●					16	32	10	160	●	P2L-P2B		447	P275-8
<b>Rotatable cylinders (90°-180°)</b>																					
											●		12	20	-	-	●	R (2 positions)		429	P285-1
											●		16	22	-	-	●	RS (2, 3 and 4 positions)		429	P285-3

(1) Magnetic position detectors, see page 5

model		adaptation on cylinder type					illustration	series	page
Reed-switch type - 2 wires	Magneto-resistive - 3 wires (MIR)	Magneto-inductive	Isoclair cylinders, types C/AS, CC/AS, CIS, CIB	Profiled barrel with T slots, type PES, series 453	Tie rods, type PES, series 450, type PCN	Profiled barrel - dovetail grooves, short-stroke types K, KN, compact type PEC, ISO 15552, type PES, series 453, with linear guides, types P2L, P2B	Rotatable cylinders, types R-RS		
<b>Position detectors - for T-slot grooves</b>									
								REED	P291-1
								PNP NPN	P291-3
			or		integrated		mounting kits	N199	P291-5
<b>Position detectors - compact - for dovetail grooves</b>									
								881	P293-1
								881	P293-3
			or		integrated		mounting kits	881	P293-5
<b>Position detectors - type UNI - for dovetail grooves</b>									
								881	P295-1
								881	P295-3
			or		integrated		kits de fixation sur vérin	881	P295-5
<b>Position detectors - type BIM</b>									
								881	P297-1

**DEFINITION OF THE DIAMETER OF A CYLINDER**

• THE DYNAMIC EFFORT DEVELOPED BY A CYLINDER  
 $F = \text{Pressure} \times \text{piston area} \times \text{efficiency}$   
 The efficiency of a cylinder depends on the diameter of the cylinder, on the pressure and on its mechanical construction. The **graph and chart page 6** show the dynamic effort developed by a cylinder at the piston rod, at various supply pressures.

• LOAD FACTOR  
 This is the relationship expressed as a percentage between the actual load being moved by the cylinder and the dynamic effort available at the end of the piston rod.

$$\text{Load factor (in \%)} = \frac{\text{Actual load}}{\text{Dynamic effort}} \times 100$$

For an optimum installation of a cylinder, we recommend a cylinder with a load factor **inferior to or equal to 75%**.

EXAMPLE: calculate a cylinder to lift a load of 130 daN with a pressure of 7 bar (gauge pressure).

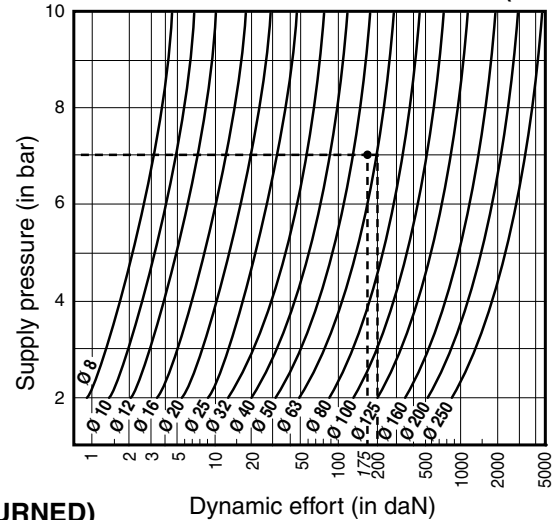
$$\text{Theoretical dynamic effort} = \frac{\text{actual load}}{\text{load factor}} = \frac{130}{0,75} = 175 \text{ daN}$$

The graph below shows the cross over point between the dynamic effort and the supply pressure. The cylinder diameter required will be that where the curve passes this point or the cylinder giving a force immediately above that required.

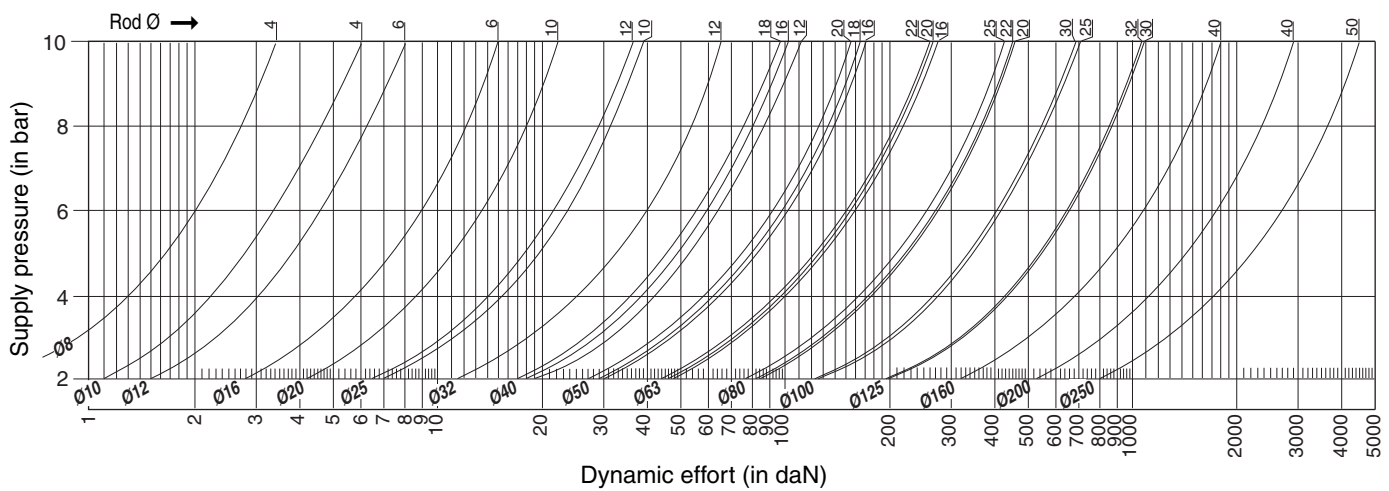
In the example above: 175 daN is between Ø 50 and Ø 63. The cylinder recommended is the Ø 63 mm which will develop a force of 200 daN at 7 bar and the actual load factor is :

$$\frac{130 \text{ daN}}{200 \text{ daN}} \times 100 = 65 \%$$

#### EFFORTS DEVELOPED AT THE END OF THE ROD (ROD OUT)



#### EFFORTS DEVELOPED AT THE END OF THE ROD (ROD RETURNED)



#### EFFORTS DEVELOPED BY A CYLINDER (in daN)

Cylinder Ø (mm)	Rod Ø (mm)	Cylinder types						Piston cross-section area (cm²)		Dynamic effort developed (in daN) at various supply pressures (in bar)									
		Isoclair		PEC	PES	PCN	PIS			2		4		6		8		10	
		C-CC-OIS	CIX					●	○	●	○	●	○	●	○	●	○		
8	4	x						0,5	0,4	1,0	0,5	1,5	1,5	2,5	2,0	3,5	2,5	4,5	3,5
10	4	x						0,8	0,6	1,5	1,0	2,5	2,5	4,0	3,5	5,5	4,5	7,5	6,0
12	6	x	x					1,1	0,8	2,0	1,5	4,0	3,0	6,0	4,5	8,5	6,0	10,5	8,0
16	6	x	x					2,0	1,7	3,5	3,0	7,5	6,0	10,0	9,0	15,0	12,0	19,0	15,0
20	10	x	x	x				3,1	2,3	5,5	4,0	12,0	9,0	16,0	13,5	23,0	18,0	30,0	22,0
25	10	x	x	x				4,9	4,1	8,5	7,0	18,0	15,0	27,0	24,0	38,0	31,0	48,0	39,0
32	12	x	x	x	x			8,0	6,9	13,0	11,5	30,0	25,0	46,0	40,0	62,0	52,0	77,0	66,0
40	12	x	x	x				8,0	6,9	13,0	11,5	30,0	25,0	46,0	40,0	62,0	52,0	77,0	66,0
	16	x		x				12,6	10,6	21,0	18,0	46,0	39,0	70,0	59,0	95,0	80,0	122,0	102,5
50	18	x		x				10,0	8,0	17,0	15,0	36,5	30,0	56,0	47,0	75,5	63,0	97,0	81,0
	20	x		x				17,6	15,0	30,0	27,0	64,0	56,0	100,5	87,0	134,0	115,0	170,5	145,0
63	20	x		x				19,6	17,0	33,0	29,0	70,0	62,0	110,0	97,0	150,0	130,0	190,0	165,0
	22	x		x				16,5	14,0	27,0	24,0	58,0	50,0	92,0	80,0	124,0	108,0	155,0	135,0
80	22	x		x				29,1	25,0	47,5	41,0	101,5	89,0	159,5	140,0	218,5	190,0	273,5	235,0
	25	x		x				31,2	28,1	53,0	46,0	110,0	98,0	170,0	154,0	230,0	211,0	290,0	264,0
100	25	x		x				27,4	24,0	44,0	39,0	97,0	85,0	150,0	134,0	200,0	178,0	260,0	230,0
	30			x				47,2	41,0	82,0	72,0	172,5	152,0	266,0	232,0	365,5	320,0	457,0	400,0
125	30			x				50,3	46,5	88,0	81,0	185,0	170,0	285,0	262,0	385,0	360,0	480,0	450,0
	32			x				16,5	14,0	27,0	24,0	58,0	50,0	92,0	80,0	124,0	108,0	155,0	135,0
160	32			x				78,5	73,6	135,0	126,5	290,0	272,0	440,0	412,5	600,0	562,5	750,0	703,0
	40			x				123,0	115,0	210,0	196,5	460,0	430,0	700,0	654,5	925,0	865,0	1150,0	1075,0
200	40			x				123,0	115,0	210,0	196,5	460,0	430,0	700,0	654,5	925,0	865,0	1150,0	1075,0
	50			x				201,0	188,0	350,0	320,0	750,0	700,0	1150,0	1100,0	1550,0	1500,0	1900,0	1800,0
250	40			x				314,0	302,0	550,0	530,0	1150,0	1100,0	1800,0	1700,0	2400,0	2300,0	3000,0	2900,0
	50			x				491,0	471,0	825,0	800,0	1800,0	1700,0	2800,0	2750,0	3700,0	3600,0	4800,0	4500,0

● Efforts developed with rod out (bottom side)      ○ Efforts developed with rod returned (rod side)

Note : Cylinders with double crossbar develop identical efforts in both working directions. Their values are the ones defined here-above for efforts developed with rod returned.

All leaflets are available on: [www.asconumatics.eu](http://www.asconumatics.eu)