POLNACORP

DIAPHRAGM MULTI-SPRING PNEUMATIC ACTUATORS **TYPE P/R**

APPLICATION AREA

The multi-spring membrane pneumatic actuators of P/R type are applied for control operation of control valves and other positioning elements in industrial automatic systems.
There are three following design options of the acutator:

- direct action (air - advances the steam) - type P,
- reverse action (air – retracts the steam) - type R,
- direct action, handwheel - type PN,
- reverse action, handwheel - type RN

FEATURES

- completely reversible action, option to change spring range w/o extra parts,
- actuator mounted on the columns,
- wide range of the available forces,
- linear relationship between rod displacement and control pressure as a result of using membranes with constant active area,
- various ranges of spring pressures due to changeability of spring number and /or dislocation of distance fencers,
- capability of the actuator o incorporate side-mounted handwheel,pneumatic or electro-pneumatic positioners, limit switches, air sets, three-way pneumatic solenoid valves, lockup valves, position transducers,
- possibility to equip with accessories allowing to decrease or increase distortion time,
- high strength of diaphragms, springs and packings,
- small size and weight

TECHNICAL PARAMETERS

input signal range:	20...100 kPa;	spring range marking:	1
	40...200 kPa;		2
	40...120 kPa		3
	80...240 kPa;		4
	60...140 kPa;		5
	120...280 kPa		6
	180...380 kPa		7
Number of springs:	standard wersion:		
	range	1, 3, 5	- 3 springs
	range	2, 4, 6	- 6 springs
	range	7	- 12 springs
version TANDEM:	range	1, 3, 5	- 6 springs
	range	2, 4, 6	- 12 springs
	range	7	- 24 springs
- working temperature:	- 40...+80°C		
- relative humidity:	max. 98%		

Table 1. Technical parameters.

Size	Diaphragm effective area	Stroke	Spring range marking	Max. supply pressure
	[cm^2]	[mm]		[kPa]
160	160	20	1...6	600
250	250			
400	400			
630	630	20; 38	1...7	500
R-630T	2x630			
1000	1000	38; 50; 63		
1500	1500	38; 50; 63; 80; 100		
1500T	2x1500	50; 63; 80; 100		

DIMENSIONS AND WEIGHT

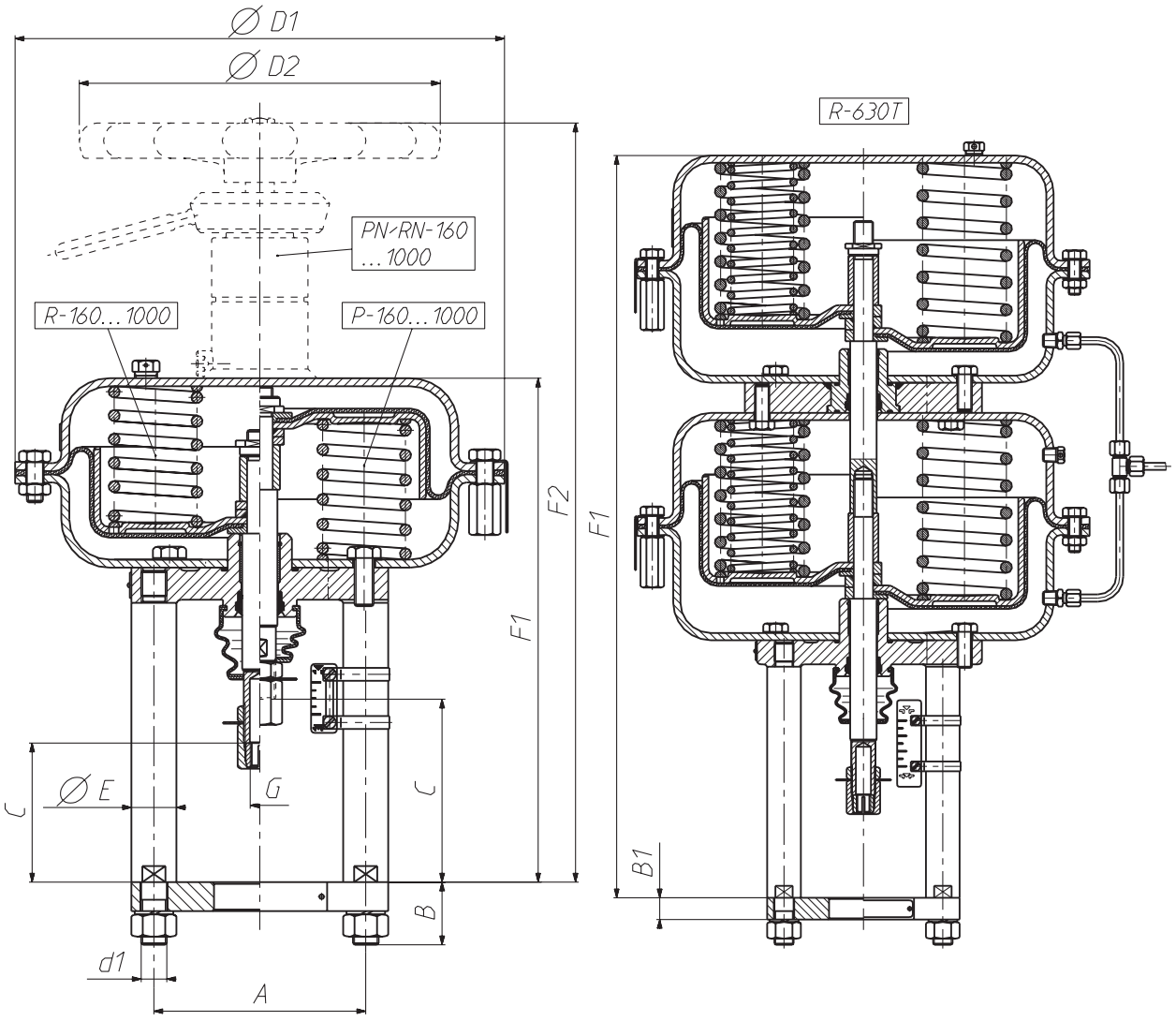


Table 2. Dimensions and weight of the actuators P/R-160…1000 .

Actuator size	A	B	B_1	C		D_1	D_2	d_1	E	F_1	F_2	G	Weight	
				P, PN	R, RN								P,R	PN, RN
	[mm]												[kg]	
160	110	31	18	110	84	210	225	M12	22	288	450	M12x1,25	9	13,5
250				112	86	240	225			306	468		10	14,5
400	132	39	20	116		305		M16	28	312	474		16	20,5
630			22	134		375	305			402	564		30	37
R-630T				-			-			616	-		45	52
1000	216	50		210	127	477	450	M24	42	585	825	M16x1,5	74	100

DIMENSIONS AND WEIGHT

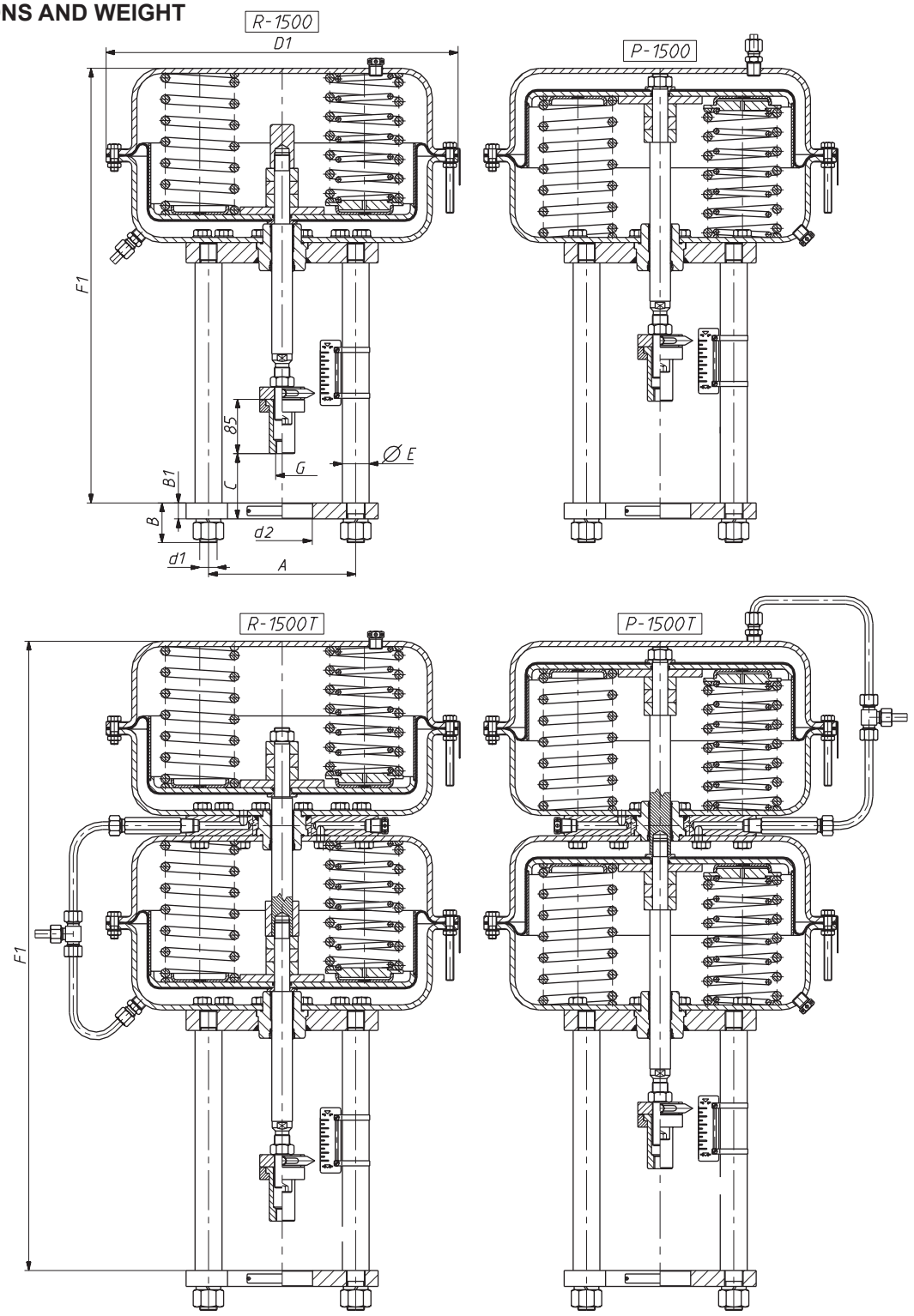


Table 3. Dimensions and weight of the actuators P/R-1500; 1500T.

Actuator size	A	B	B_1	d_2	D_1	d_1	E	F_1	G	Weight P,R
	[mm]									[kg]
1500	230	62	18	57,15	550	M27	42	679	M16x1,5 M20x1,5 M24x1,5	95
			22	84,15						
			25	70						
				95,25						
1500T			18	57,15				983		200
			22	84,15						
			25	70						
				95,25						

Actuator size	Stroke	C	
		P	R
	[mm]		
1500	38	142	102
	50	154	
	63	167	
	80	184	
	100	204	
1500T	50	154	
	63	167	
	80	184	
	100	204	

Disposition forces:

Disposition actuator forces Fs [kN]:

Pneumatic actuator type P: $Fs = 10^{-4} \cdot A \cdot (p_z - p_2)$,

Pneumatic actuator type R: $Fs = 10^{-4} \cdot A \cdot p_1$

where:

A - Diaphragm effective area [cm^2] - acc. table 1,

p_z - supply pressure [kPa] - acc. table 4

p_1; p_2 - Opening and closing spring range [kPa] - acc. table 4.

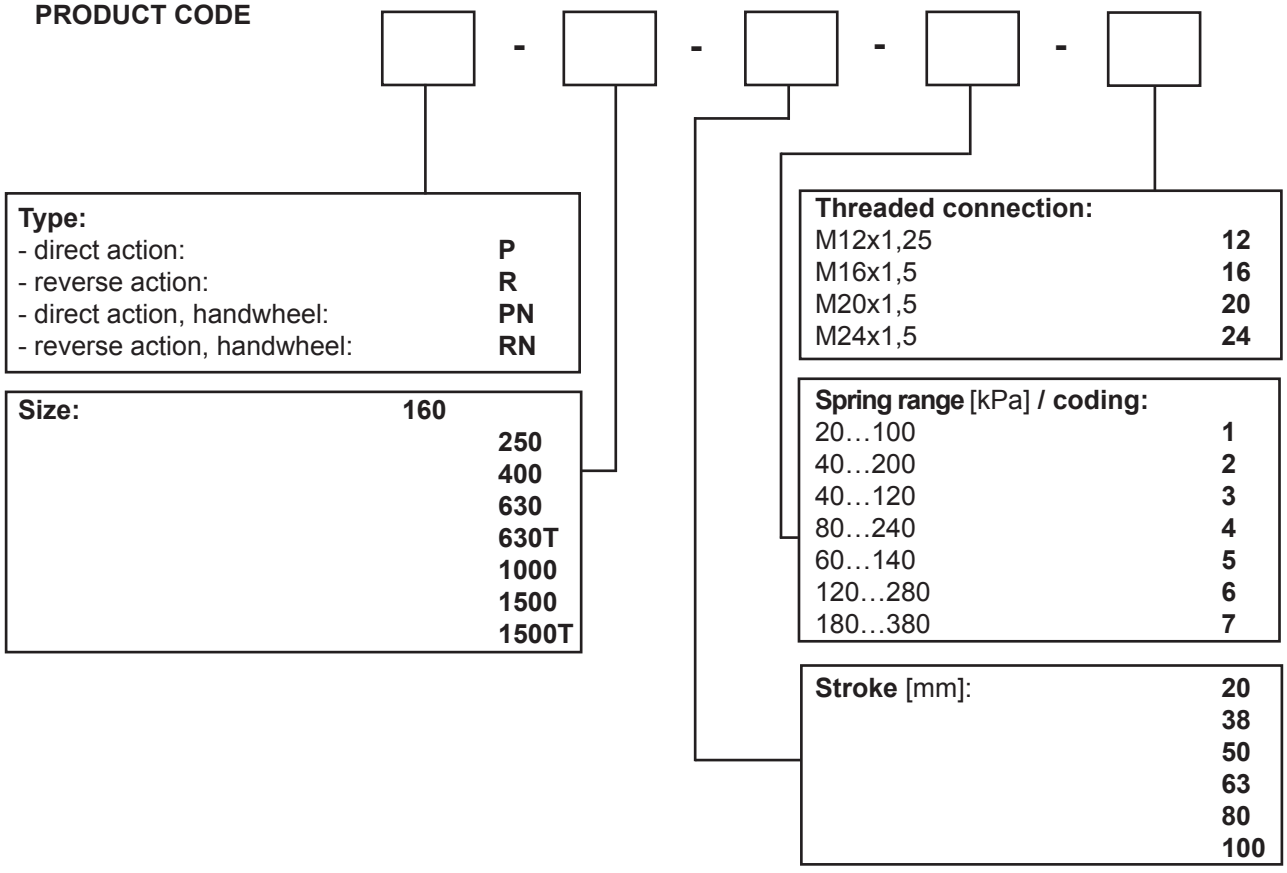
Table 4. Disposition forces for actuators Fs [kN].

Size	Actuator P			Actuator R					
	Supply pressure [kPa]			Spring range [kPa]					
	140	250	400	20…100	40…120 40…200	60…140	80…240	120…280	180…380
160	0,64	2,4	4,8	0,32	0,64	0,96	1,28	1,92	-
250	1,0	3,8	7,5	0,5	1,0	1,5	2,0	3,0	-
400	1,6	6,0	12,0	0,8	1,6	2,4	3,2	4,8	-
630	2,5	9,5	18,9	1,3	2,5	3,8	5,0	7,6	11,3
R-630T	-	-	-	2,6	5,0	7,6	10,0	15,2	22,6
1000	4,0	15,0	30,0	2,0	4,0	6,0	8,0	12,0	18,0
1500	6,0	22,5	45,0	3,0	6,0	9,0	12,0	18,0	27,0
1500T	12,0	45,0	90,0	6,0	12,0	18,0	24,0	36,0	54,0

Note:

1. For actuators ”P” assumed spring range 20…100 kPa and standard supply pressure.
2. Disposition forces calculated with the use of formulas or given in the table do not take into consideration friction or manufacture tolerances so the forces should be assumed as 15...20% lower than those values.
3. Actuator 630T occure only in type „R”.

PRODUCT CODE



Example of the product code:

The pneumatic actuator of inversed action, with a handwheel, size – 400, threaded connection M12x1,25, stroke 20 mm, spring range 40...200:

RN - 400 - 20 - 2 - 12

POLNACORP

POLNA corp. s.r.o.

Head office:

Oldřichovice 1044
739 61 Třinec
Czech Republic
tel.: +420 737 238 406
fax: +420 558 338 330
e-mail: info@polnacorp.ru
web: www.polnacorp.ru