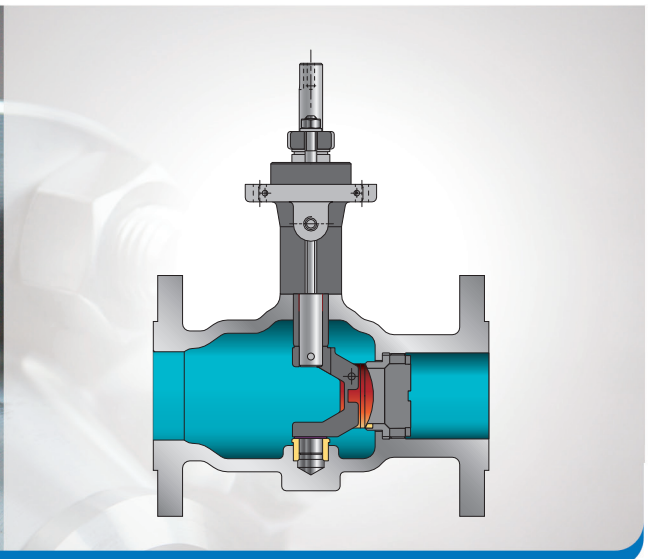
# PNEUMATIC ACTUATOR
# LP0®

VALVEA



version 06/2020

## USE

The multi-spring membrane pneumatic actuators of **LP0** 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 - ejects the stem)-type P,
- reverse action (air – retracts the stem)- type R,
- direct action, handwheel-type PN,
- reverse action, handwheel-type RN

## FEATURES

- completely reversible action, option to change spring range w/o extraparts,
- actuator mounted on the columns,
- wide range of the available forces,
- linear relationship between rod displacement and control pressureas 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,pneumaticor 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 SPECIFICATION

| Input signal range: | spring range marking: |
|---|---|
| 20...100 kPa; | 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 version: | range | 1,3,5, - 3 springs |
| | range | 2,4,6, - 6 springs |
| | range | 7, - 12 springs |
| TANDEM version: | 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 [cm²] | Stroke [mm] | Spring range marking | Max. supply pressure [kPa] |
|---|---|---|---|---|
| 250 | 250 | 20 | 1...6 | 600 |
| 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

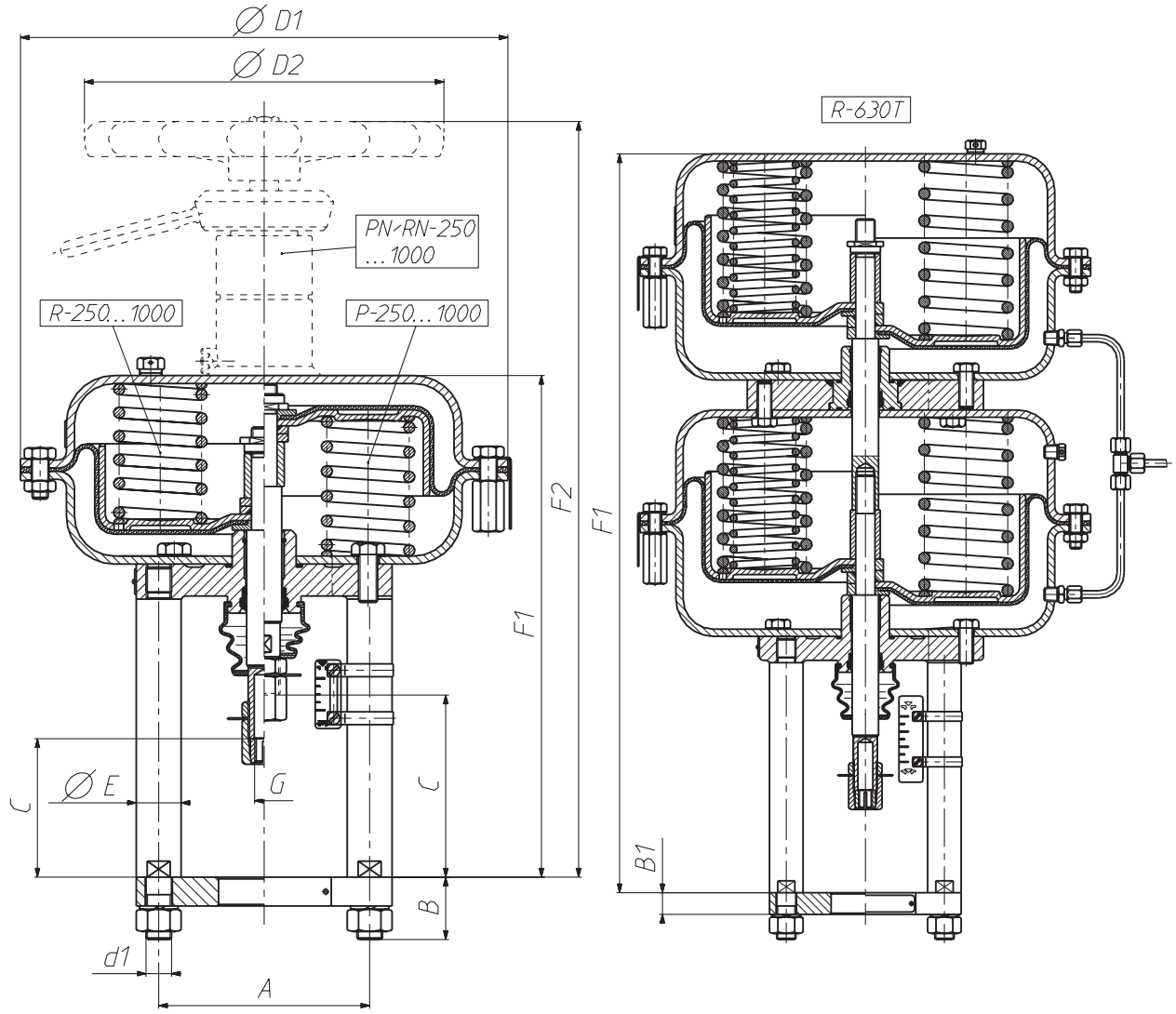



**Table 2. Dimensions and weight of the actuators P/R-250…1000**

| 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] | |
| 250 | 110 | 31 | 18 | 112 | 86 | 240 | 225 | M12 | 22 | 306 | 468 | M12x1,25 | 10 | 14,5 |
| 400 | 132 | 39 | | 116 | | 305 | | M16 | 28 | 312 | 474 | | 16 | 20,5 |
| 630 | | | 20 | 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

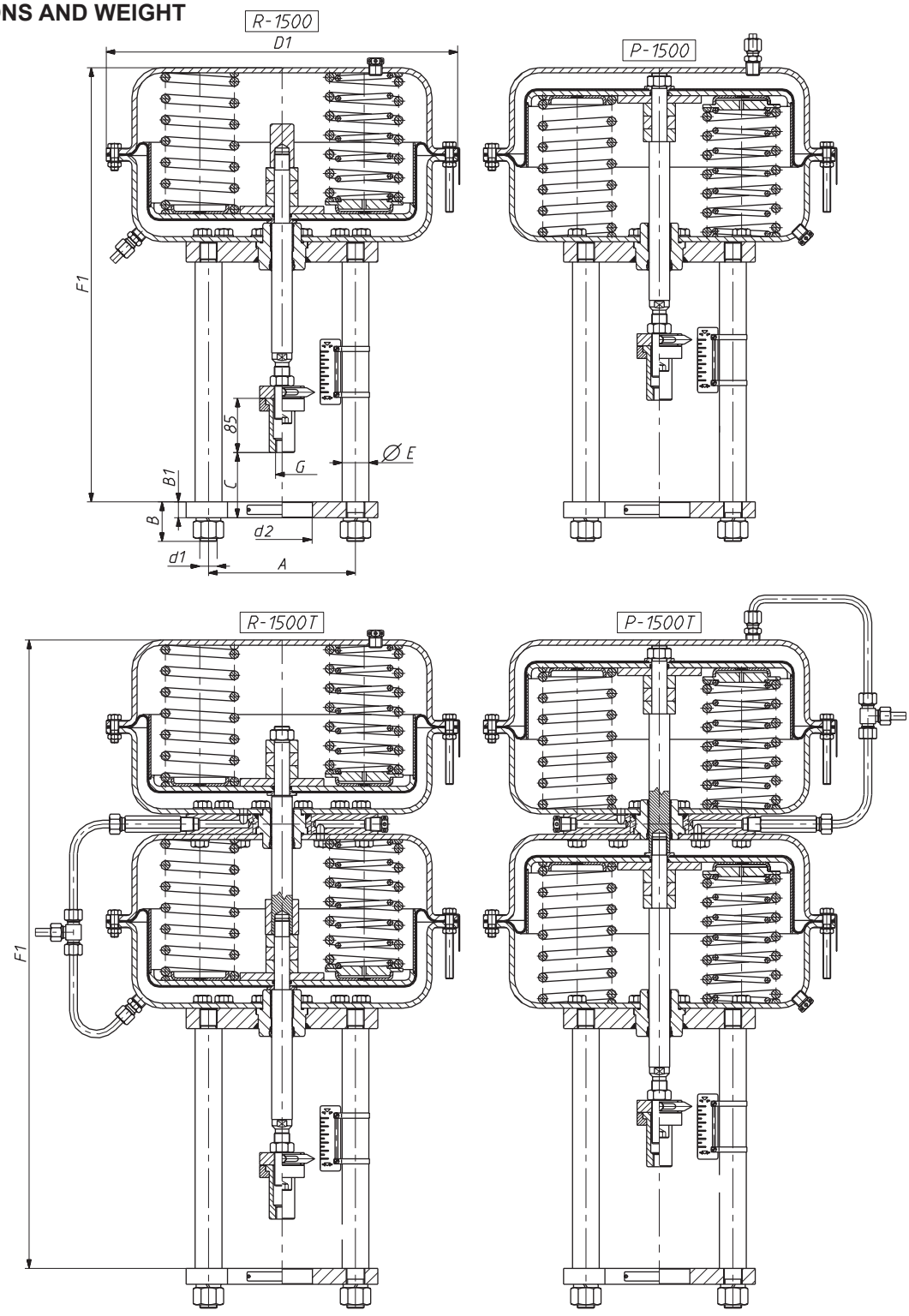



Table 3. Dimensions and weight of the actuators LP0-1500; 1500T.

| 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<br>M20x1,5<br>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<br>40…200 | 60…140 | 80…240 | 120…280 | 180…380 |
| 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”.

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