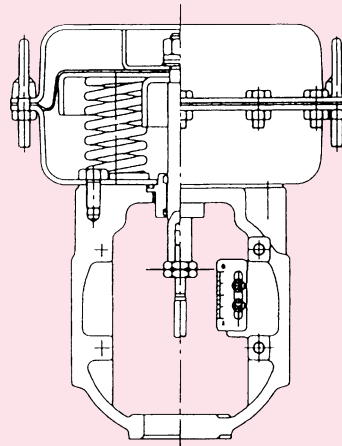


**Model 3800****MULTI-SPRING TYPE DIAPHRAGM ACTUATORS**

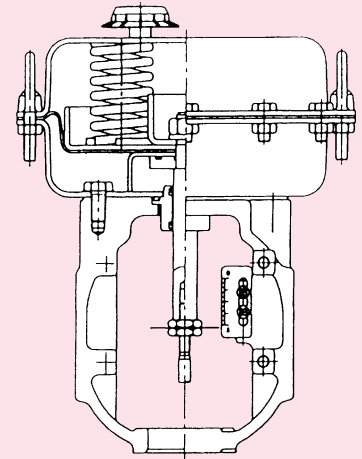
**Model 3800** diaphragm actuator is capable of controlling valve travel precisely by adjusting input air pressure resulting in balance of the diaphragm force and the spring force.

**Model 3800** diaphragm actuator is new-type actuator which is designed to be compact and light weight by adopting multi-spring structure.

**Direct Action (DA)**  
(Air-to stem down)



**Reverse Action (RA)**  
(Air-to stem up)

**1. SPECIFICATIONS**

| Type                                                                    |                       | Model 3800 Pneumatic single action diaphragm actuator                                                                                                                                                           |            |            |            |
|-------------------------------------------------------------------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------|------------|
| Action                                                                  |                       | Direct action (DA) , Reverse action (RA)                                                                                                                                                                        |            |            |            |
| Actuator Sizes                                                          |                       | N24                                                                                                                                                                                                             | N28        | N33S       | N40 (3)    |
| Max Stroke (mm)                                                         |                       | 25                                                                                                                                                                                                              | 38         | 38         | 65         |
| Power thrust N (kgf)<br>at off-balance 80kPa (0.8kgf/cm <sup>2</sup> G) |                       | 2120 (216)                                                                                                                                                                                                      | 2750 (280) | 4040 (412) | 5690 (580) |
| Hysteresis Error (With positioner)                                      |                       | Max. 1% F.S. ... PTFE V Ring    Max. 2% F.S. .... Other Gland Packing                                                                                                                                           |            |            |            |
| Linearity (With positioner)                                             |                       | Max. ± 1% F.S. ... PTFE V Ring    Max. ± 2% F.S. .... Other Gland Packing                                                                                                                                       |            |            |            |
| Materials                                                               | Diaphragm             | Cloth reinforced chloroprene rubber (※ Ethylene propylene rubber)                                                                                                                                               |            |            |            |
|                                                                         | Yoke                  | FC200 (※ SCPH2)                                                                                                                                                                                                 |            |            |            |
| Supply Air Pressure kPa (kgf/cm <sup>2</sup> G)                         |                       | 140 (1.4) , 240 (2.4) , 280 (2.8) , 300 (3.0) , (5) ※ 400 (4.0)                                                                                                                                                 |            |            |            |
| Spring Range kPa (kgf/cm <sup>2</sup> G)                                |                       | 20 ~ 100 (0.2 ~ 1.0) , 40 ~ 200 (0.4 ~ 2.0) , 80 ~ 200 (0.8 ~ 2.0) , (5) ※ 120 ~ 280 (1.2 ~ 2.8) , ※ 40 ~ 120 (0.4 ~ 1.2)                                                                                       |            |            |            |
| Air Connection                                                          |                       | Rc 1/4 (※ NPT 1/4)                                                                                                                                                                                              |            |            |            |
| Ambient Temperature                                                     |                       | - 20 °C ~ + 70 °C (※ - 50 °C ~ - 20 °C , + 70 °C ~ + 100 °C) (4)                                                                                                                                                |            |            |            |
| Dimensions, Mass                                                        |                       | See page 2 Table 1.                                                                                                                                                                                             |            |            |            |
| Painting Color                                                          |                       | Silver                                                                                                                                                                                                          |            |            |            |
| Options ※                                                               | Additional Mechanisms | Top-mounted handwheel, Side-mounted handwheel, Travel stop.                                                                                                                                                     |            |            |            |
|                                                                         | Accessories           | Pneumatic positioner (PA92A) , Electro-pneumatic positioner (EA91A, EA90A) , Air Filter regulator (MR2000) , Limit switch, Solenoid valve, Booster relay, Speed controller, Lock up valve, Position Transmitter |            |            |            |

[Notes] (1) ※ Manufactured and attached as option by customer's request.

(2) Material designation is represented by new JIS (SI unit) . Please consent in advance that approval drawings and other documents may represent with old material designation.

(3) The actuator for size N40, stroke 65 mm and spring range 80 ~ 200kPa (0.8 ~ 2.0kgf/cm<sup>2</sup>G) is not available.

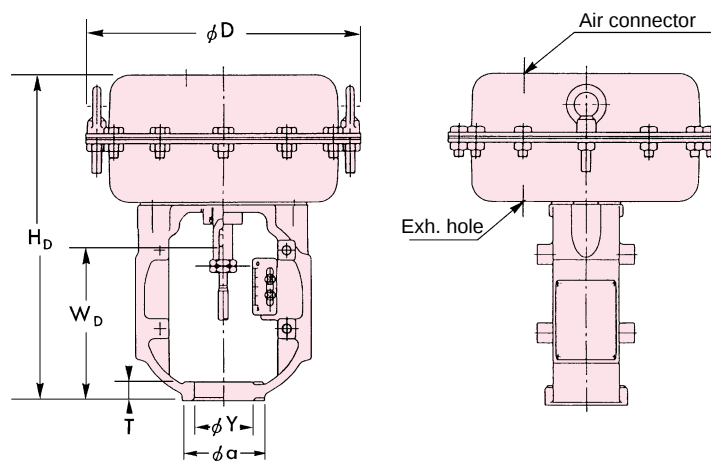
(4) For ambient temperature, denoted the extended temperature range as option.

(5) Supply Air Pressure 400kPa (4.0kgf/cm<sup>2</sup>G) & Spring Range 120 ~ 280kPa (1.2 ~ 2.8kgf/cm<sup>2</sup>G) are available for only Actuator Size N33S & N40.

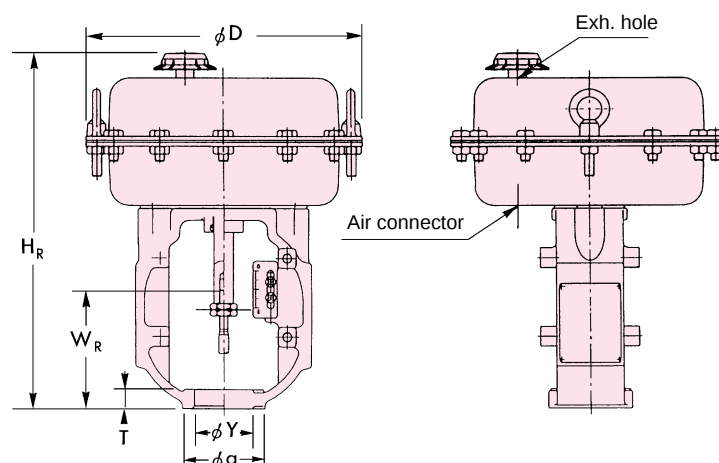
Table 1. Dimensions and Mass

| Actuator Size                                             |                                           | N 24                | N 28 | N 33 S      | N 40                              |
|-----------------------------------------------------------|-------------------------------------------|---------------------|------|-------------|-----------------------------------|
| Effective Diaphragm Area (cm <sup>2</sup> )               |                                           | 270                 | 350  | 515         | 725                               |
| Max. Diaphragm Chamber Volume (DA, RA) (cm <sup>3</sup> ) |                                           | 1550                | 2820 | 4510        | 9090                              |
|                                                           | Outside Dia. of Diaphragm Casing $\phi D$ | 240                 | 280  | 330         | 400                               |
|                                                           | Height                                    | DA ; H <sub>D</sub> | 297  | 336         | 391                               |
|                                                           |                                           | RA ; H <sub>R</sub> | 321  | 360         | 415                               |
|                                                           | Stem Length                               | DA ; W <sub>D</sub> | 158  | 171         | 183                               |
|                                                           |                                           | RA ; W <sub>R</sub> | 133  | 133         | 145                               |
|                                                           | Thread of valve stem                      | M 9 × 1.25          |      | M 12 × 1.75 | M 18 × 2.0                        |
|                                                           | Yoke Insertion Dia. $\phi Y$              | 60                  |      |             | 100                               |
|                                                           | Yoke Thickness T                          | 20                  |      |             | 40                                |
|                                                           | Yoke Mounted by                           | Yoke nut            |      |             | Yoke bolt<br>6- $\phi 19$ PCD 135 |
| Yoke Seat Dia. $\phi a$                                   |                                           | 85                  | 85   | 85          | 170                               |
| Approximate Mass (kg)                                     |                                           | 12                  | 15   | 24          | 51                                |

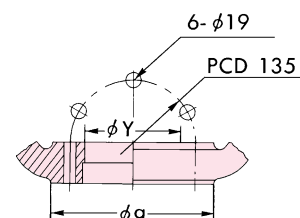
DA



RA



Actuator Size N40



## 2. ADDITIONAL MECHANISMS

### 1 Top-mounted Handwheels

Table 2. Dimensions and Mass for DA type with Top-mounted Handwheel

Unit : mm

| Actuator Size           | N24 | N28 | N33S | N40 |
|-------------------------|-----|-----|------|-----|
| Handwheel Dia. $\phi B$ | 200 |     | 250  | 300 |
| Max. Height $H_D$       | 469 | 535 | 626  | 795 |
| Max. Stroke             | 25  | 38  | 38   | 65  |
| Turns for Max. Stroke   | 17  | 25  | 25   | 43  |
| Approximate Mass (kg)   | 16  | 20  | 31   | 65  |

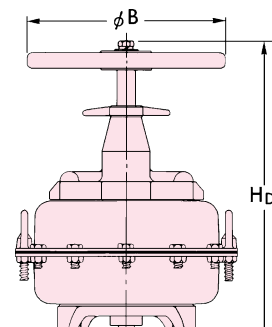
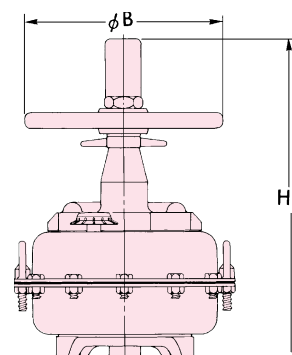


Table 3. Dimensions and Mass for RA type with Top-mounted Handwheel

Unit : mm

| Actuator Size           | N24 | N28 | N33S | N40 |
|-------------------------|-----|-----|------|-----|
| Handwheel Dia. $\phi B$ | 250 |     | 300  | 400 |
| Max. Height $H_R$       | 562 | 628 | 706  | 922 |
| Max. Stroke             | 25  | 38  | 38   | 65  |
| Turns for Max. Stroke   | 8   | 13  | 13   | 22  |
| Approximate Mass (kg)   | 18  | 22  | 34   | 71  |

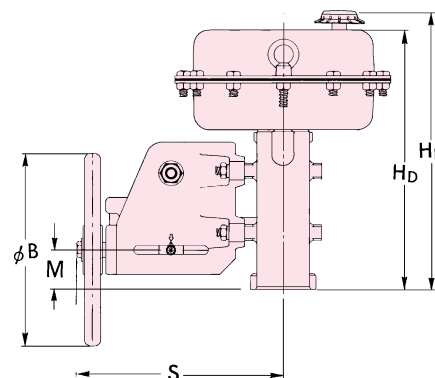


### 2 Side-mounted Handwheels

Table 4. Dimensions and Mass for units with Side-mounted Handwheel

Unit : mm

| Actuator Size               | N24              | N28 | N33S | N40 |
|-----------------------------|------------------|-----|------|-----|
| Handwheel Dia. $\phi B$     | 250              | 300 |      | 400 |
| Handwheel Projection S      | 235              | 271 | 271  | 402 |
| Stem Length                 | DA ; $W_D^{(2)}$ | 138 | 151  | 163 |
|                             | RA ; $W_R^{(2)}$ | 113 |      | 125 |
| Center-to-center distance M | 63               | 51  | 59   | 65  |
| Max. Stroke                 | 25               | 38  | 38   | 65  |
| Turns for Max. Stroke       | 4.7              | 8.7 | 8.7  | 19  |
| Approximate Mass (kg)       | 21               | 28  | 37   | 77  |



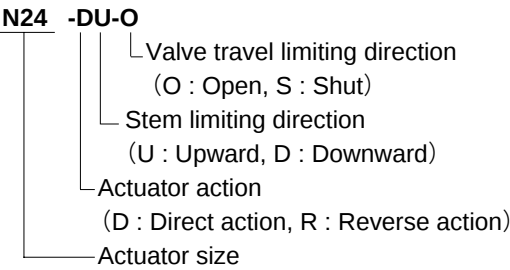
[Notes] (1) Height  $H_D$  and  $H_R$  is coincident with the standard actuator.  
(2) Symbol  $W_D$  and  $W_R$  denote the same dimension of attached figure on table 1.

3 Travel Stops

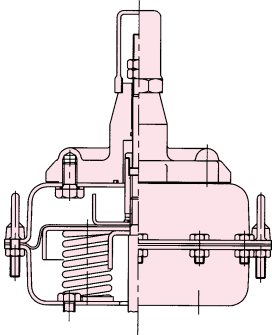
Travel stops are used to limit the valve travel if necessary.

< Example >

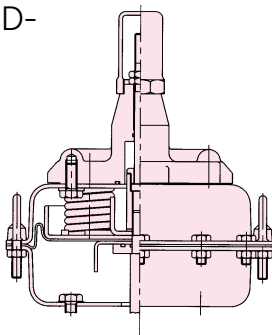
Actuator size N24, direct action, push-down close, to limit full open



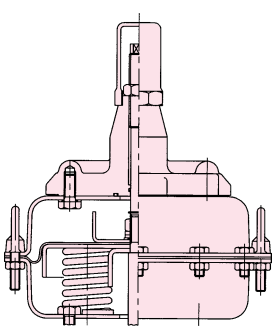
-DD-



-RD-



-DU-



-RU-

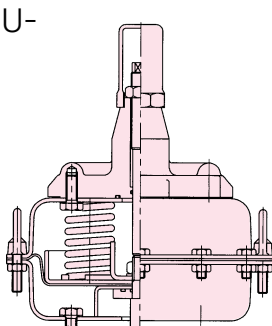


Table 5. Classification of Travel Stop and Heights

Unit : mm

| Actuator Action     | Stem Limiting Direction | Symbol | Valve Travel Limiting Direction | Application                     | Height         | Actuator Size |     |      |     |
|---------------------|-------------------------|--------|---------------------------------|---------------------------------|----------------|---------------|-----|------|-----|
|                     |                         |        |                                 |                                 |                | N24           | N28 | N33S | N40 |
| Direct Action (DA)  | Downward-D              | -DD    | Shut-S                          | Travel limit of push-down close | H <sub>D</sub> | 478           | 531 | 609  | 778 |
|                     |                         |        | Open-O                          | Travel limit of push-down open  |                |               |     |      |     |
|                     | Upward -U               | -DU    | Shut-S                          | Travel limit of push-down open  |                |               |     |      |     |
|                     |                         |        | Open-O                          | Travel limit of push-down close |                |               |     |      |     |
| Reverse Action (RA) | Downward-D              | -RD    | Shut-S                          | Travel limit of push-down close | H <sub>R</sub> | 478           | 531 | 609  | 778 |
|                     | Upward -U               | -RU    | Open-O                          | Travel limit of push-down open  |                |               |     |      |     |

3. POSITIONER MOUNTING DIMENSIONS

1 Pneumatic Positioner Model PA92A

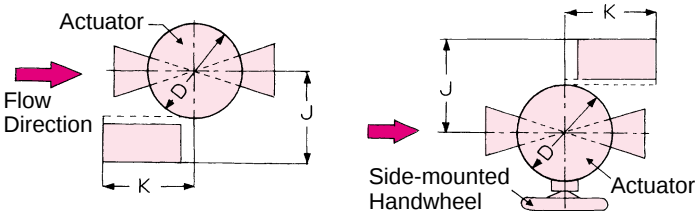


Table 6. Mounting Dimensions for Model PA92A

Unit : mm

| Actuator Size                  | N24 |    | N28 |    | N33S |    | N40 |    |
|--------------------------------|-----|----|-----|----|------|----|-----|----|
| Actuator outside Dia. $\phi D$ | 240 |    | 280 |    | 330  |    | 400 |    |
| Action                         | DA  | RA | DA  | RA | DA   | RA | DA  | RA |
| J                              | 210 |    |     |    |      |    | 250 |    |
| K                              | 330 |    |     |    |      |    | 270 |    |

[Note] The mounting dimensions for other positioner may be different from the above mentioned.

2 Electro-pneumatic Positioner Model EA91A, EA90A

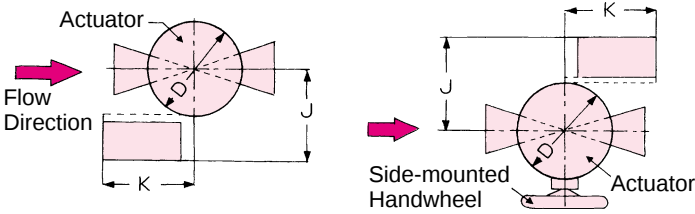


Table 7. Mounting Dimensions for Model EA91A and EA90A

Unit : mm

| Actuator Size                  | N24 |    | N28 |    | N33S |    | N40 |    |
|--------------------------------|-----|----|-----|----|------|----|-----|----|
| Actuator outside Dia. $\phi D$ | 240 |    | 280 |    | 330  |    | 400 |    |
| Action                         | DA  | RA | DA  | RA | DA   | RA | DA  | RA |
| J                              | 220 |    |     |    |      |    | 230 |    |
| K                              | 320 |    |     |    |      |    | 360 |    |



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