

## How to Order

**Series ZPT**  
**Without buffer**

Pad dia. (mm)
Pad type
Material
Vacuum entry port

**ZPT 02 U N A5**

**Pad diameter (mm)**

|      |         |
|------|---------|
| 2004 | 2 x 4   |
| 3507 | 3.5 x 7 |
| 4010 | 4 x 10  |
| 02   | ø2      |
| 04   | ø4      |
| 06   | ø6      |
| 08   | ø8      |
| 10   | ø10     |
| 13   | ø13     |
| 16   | ø16     |
| 20   | ø20     |
| 25   | ø25     |
| 32   | ø32     |
| 40   | ø40     |
| 50   | ø50     |

**Vacuum entry/Mounting thread diameter**

| Connection    | Symbol | Thread diameter | ø2 to ø8<br>2 x 4, 3.5 x 7,<br>4 x 10<br>ø10 to ø16<br>(Thin section series) | ø10 to ø16 | ø20 to ø32 | ø40, ø50 |
|---------------|--------|-----------------|------------------------------------------------------------------------------|------------|------------|----------|
| Male thread   | A5     | M5 x 0.8        | ●                                                                            | ●          | —          | —        |
|               | A6     | M6 x 1          | ●                                                                            | ●          | ●          | ●        |
|               | A8     | M8 x 1          | —                                                                            | —          | ●          | ●        |
| Female thread | B4     | M4 x 0.7        | ●                                                                            | —          | —          | —        |
|               | B5     | M5 x 0.8        | ●                                                                            | ●          | ●          | —        |
|               | B6     | M6 x 1          | —                                                                            | ●          | ●          | ●        |
|               | B8     | M8 x 1.25       | —                                                                            | —          | ●          | ●        |
|               | B01    | Rc 1/8          | —                                                                            | ●          | ●          | ●        |

**Material**

|      |                                       |
|------|---------------------------------------|
| N    | NBR                                   |
| S    | Silicon rubber                        |
| U    | Urethane rubber                       |
| F    | Fluoro rubber                         |
| GN * | Conductive NBR (ø2 to ø16)            |
| GS * | Conductive silicon rubber (ø2 to ø16) |

\* ø20 and larger are manufactured upon a receipt of order.

**Pad type**

(Refer to "Table (1)" for applications.)

|    |                     |
|----|---------------------|
| U  | Flat                |
| C  | Flat with ribs      |
| D  | Deep                |
| B  | Bellows             |
| UT | Thin flat           |
| CT | Thin flat with ribs |

**Table (1) Pad Diameter/Pad Type**

| Diameter (mm)       | 2 x 4 | 3.5 x 7 | 4 x 10 | 2 | 4 | 6 | 8 | 10 | 13 | 16 | 20 | 25 | 32 | 40 | 50 |
|---------------------|-------|---------|--------|---|---|---|---|----|----|----|----|----|----|----|----|
| Type                |       |         |        |   |   |   |   |    |    |    |    |    |    |    |    |
| Flat                | ●     | ●       | ●      | ● | ● | ● | ● | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| Flat with ribs      | —     | —       | —      | — | — | — | — | —  | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| Deep                | —     | —       | —      | — | — | — | — | —  | ●  | —  | —  | —  | —  | —  | —  |
| Bellows             | —     | —       | —      | — | — | ● | ● | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| Thin flat           | —     | —       | —      | — | — | — | — | —  | —  | —  | —  | —  | —  | —  | —  |
| Thin flat with ribs | —     | —       | —      | — | — | — | — | —  | ●  | ●  | ●  | —  | —  | —  | —  |

## ⚠ Precautions

**Be sure to read before handling. Refer to pages 13-15-3 to 13-15-4 for Safety Instructions and Common Precautions on the products mentioned in this catalog, and refer to page 13-1-5 for Precautions on every series.**

### Caution on Design

#### ⚠ Warning

1. In cases where workpieces are heavy or dangerous, etc., take measures to address a possible loss of adsorption force (installation of drop prevention guides, etc.).

In the case of transportation by vacuum adsorption using vacuum pads, adsorption force is lost when there is a drop in vacuum pressure. Furthermore, since vacuum pressure can also deteriorate due to wear and cracking of pads, and vacuum leakage from piping, etc., be certain to perform maintenance on vacuum equipment.

### Selection

#### ⚠ Caution

1. The pad materials differ depending upon the operating environment.  
An appropriate pad material should be selected. Furthermore, since vacuum pads are manufactured for use with industrial products, they should not have direct contact with pharmaceuticals or food products, etc.
2. Depending upon the weight and shape of the workpieces, the diameter, quantity and shape of pads will vary.  
Use the pad lifting force table for reference. Also, the pads selected will differ based upon conditions other than the above, such as the condition of the workpiece surface (presence or absence of oil or water), the workpiece material and its gas permeability. Confirmation is necessary by actually performing vacuum adsorption testing on the subject workpieces.
3. Use a buffer for adsorption on fragile workpieces.  
The cushioning by the buffer is necessary when there is variation in the height of workpieces. When further positioning of pads and workpieces is desired, a detent buffer can be used.

4. The life of a buffer will be reduced if the lateral force is applied to the buffer shaft.  
Note that sometimes a load is applied to the buffer by a piping tube (pulling or pressing, etc. in a lateral direction).

5. Do not apply an impact or large forces to a pad when adsorbing a workpiece.

This will cause deformation, cracking and wear of the pad to be accelerated. The stiffening ribs, etc. should touch lightly, while staying within the pad skirt's deformation range. Positioning should be performed accurately. Especially in the case of small diameter pads.

6. When transporting in an upward direction, factors such as acceleration, wind pressure and impact force must be considered in addition to a workpiece weight.

Use caution particularly when lifting items such as glass plates and circuit boards, because a large force will be applied by the wind pressure. When a workpiece which is oriented vertically is transported horizontally, large forces are applied by acceleration when movement is started and stopped. Further, in cases where the pad and a workpiece can slip easily, accelerations and decelerations of horizontal movement should be kept low.

7. When transporting flat workpieces that have large surface areas using multiple pads, care must be taken when arranging the pads to balance the workpiece.

### Maintenance

#### ⚠ Caution

1. Perform pad maintenance regularly.

Since pads are essentially rubber, deterioration is unavoidable. The rate of deterioration depends upon factors such as conditions of use, environment and temperature. Regular maintenance should be performed. If any damage, splitting, cracking or abrasion has occurred in a pad which appears to be harmful, replace it immediately. Also, take care not to damage the outside of the pad.