



# ORIFICE PLATES

Simple, Predictable and Reliable Differential Flow Measurement

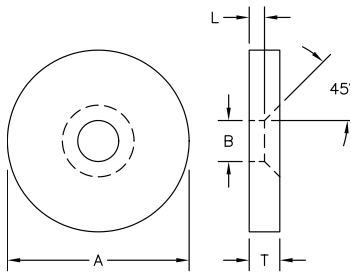
## SERIES 500 (UNIVERSAL) / 520 (PADDLE TYPE) SERIES 560 (RTJ TYPE) / 590 (RTJ PLATE HOLDERS) RESTRICTION UNIONS



USA Industries manufactures a full range of flow measurement components—including universal orifice plates, paddle plates, ring type joint (RTJ) plates, and restriction unions—engineered to meet or exceed AGA, ISA, ANSI, ASME, and API standards. We stock plates in 304 and 316 stainless steel, offered in 1/8" and 1/4" thicknesses. Additional materials and custom thicknesses are available upon request. Each plate is precision-bored to align with customer-supplied sizing calculations. For added convenience, USA Industries also provides sizing calculation services for a nominal fee.

### Series 500 Orifice Plates

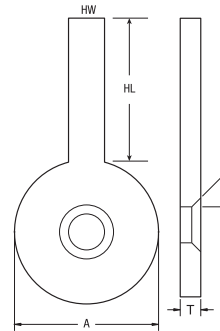
USA Industries' Universal Orifice Plates are engineered for compatibility with all standard orifice fitting assemblies and RTJ plate holders. They can be used with both dual- and single-chambered orifice fittings, offering maximum versatility across various applications.



| Nominal Pipe Size (in) | A (in) | L (in) | T (in) |
|------------------------|--------|--------|--------|
| 1                      | 1.312  | 1.02   | 1/8    |
| 1-1/2                  | 2      | 0.03   | 1/8    |
| 2                      | 2.437  | 0.03   | 1/8    |
| 2-1/2                  | 2.812  | 0.03   | 1/8    |
| 3                      | 3.437  | 0.03   | 1/8    |
| 4                      | 4.406  | 0.06   | 1/8    |
| 5                      | 6      | 0.06   | 1/8    |
| 6                      | 6.437  | 0.06   | 1/8    |
| 8                      | 8.437  | 0.125  | 1/4    |
| 10                     | 10.687 | 0.125  | 1/4    |
| 12                     | 12.593 | .25    | 1/4    |
| 14                     | 14     | .25    | 1/4    |
| 16                     | 16     | .25    | 3/8    |
| 18                     | 18     | .25    | 3/8    |
| 20                     | 20     | 0.375  | 3/8    |
| 24                     | 24     | 0.375  | 3/8    |

### Series 520 Paddle Orifice Plates

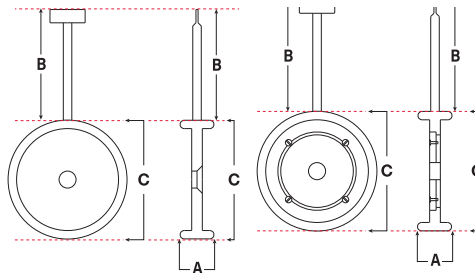
USA Industries' Paddle-Type Orifice Plates are specifically designed for use with Raised Face Orifice Flanges and Holding Blocks. Each plate is manufactured to meet or exceed the rigorous standards set by AGA, ISA, ANSI, ASME, and API, ensuring reliable performance and precision.



| Line Size (in) | Flange Rating A |        |        |        |        |        |        | HL (in) | HW (in) | T (in) |
|----------------|-----------------|--------|--------|--------|--------|--------|--------|---------|---------|--------|
|                | 150#            | 300#   | 400#   | 600#   | 900#   | 1500#  | 2500#  |         |         |        |
| 0.5            | 1.875           | 2.125  | 2.125  | 2.125  | 2.5    | 2.5    | 2.75   | 4       | 1       | 1/8    |
| 0.75           | 2.25            | 2.625  | 2.625  | 2.625  | 2.75   | 2.75   | 3      |         |         |        |
| 1              | 2.625           | 2.875  | 2.875  | 2.875  | 3.125  | 3.125  | 3.375  |         |         |        |
| 1.25           | 3               | 3.25   | 3.25   | 3.25   | 3.5    | 3.5    | 4.125  |         |         |        |
| 1.5            | 3.375           | 3.75   | 3.75   | 3.75   | 3.875  | 3.875  | 4.625  |         |         |        |
| 2              | 4.125           | 4.375  | 4.375  | 4.375  | 5.625  | 5.625  | 5.75   |         |         |        |
| 2.5            | 4.875           | 5.125  | 5.125  | 5.125  | 6.5    | 6.5    | 6.625  |         |         |        |
| 3              | 5.375           | 5.875  | 5.875  | 5.875  | 6.625  | 6.875  | 7.75   |         |         |        |
| 4              | 6.875           | 7.125  | 7      | 7.625  | 8.125  | 8.25   | 9.25   |         |         |        |
| 5              | 7.75            | 8.5    | 8.375  | 9.5    | 9.75   | 10     | 11     |         |         |        |
| 6              | 8.75            | 9.875  | 9.75   | 10.5   | 11.375 | 11.125 | 12.125 | 6       | 1-1/2   | 1/4    |
| 8              | 11              | 12.125 | 12     | 12.625 | 14.125 | 13.875 | 15.25  |         |         |        |
| 10             | 13.375          | 14.25  | 14.125 | 15.75  | 17.125 | 17.125 | 18.75  |         |         |        |
| 12             | 16.125          | 16.625 | 16.5   | 18     | 19.625 | 20.5   | 21.625 |         |         |        |
| 14             | 17.75           | 19.125 | 19     | 19.375 | 20.5   | 22.75  | -      |         |         |        |
| 16             | 20.25           | 21.25  | 21.125 | 22.25  | 22.625 | 25.25  | -      |         |         |        |
| 18             | 21.5            | 23.375 | 23.25  | 24     | 25     | 27.625 | -      |         |         |        |
| 20             | 23.75           | 25.625 | 25.375 | 26.75  | 27.375 | 29.625 | -      |         |         |        |
| 22             | 26              | 27.75  | 27.5   | 28.875 | -      | -      | -      |         |         |        |
| 24             | 28.125          | 30.735 | 30.125 | 31     | 32.875 | 35.5   | -      |         |         |        |
| 30             | 34.625          | 37.375 | 37.25  | 38.125 | -      | -      | -      | 6       | 1-1/2   | 3/8    |
| 36             | 41.125          | 43.875 | 43.875 | 44.375 | -      | -      | -      |         |         |        |
|                |                 |        |        |        |        |        |        |         |         | 1/2    |

### Series 560 Plates & 590 Plate Holders

The RTJ-Type Orifice Plate includes an integrated gasket for direct installation between RTJ flanges. With no moving parts, it's well-suited for high-pressure, high-temperature service. Plate thickness depends on line size and differential pressure, and plates can be made as a solid piece or a two-piece assembly with a carrier ring or gasket.



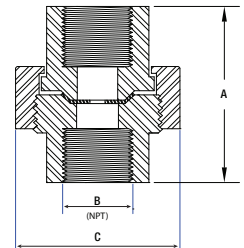
| LINE SIZE (in.)           | .5    | .75   | 1     | 1.5   | 2     | 2.5   | 3     | 4     | 6     | 8      | 10     | 12     | 14     | 16     | 18     | 20    | 24     |
|---------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|-------|--------|
| API Ring No.              | R-11  | R-13  | R-16  | R-20  | R-23  | R-26  | R-31  | R-37  | R-45  | R-49   | R-53   | R-57   | R-61   | R-65   | R-69   | R-73  | R-77   |
| ANSI 300 Gap 1 (in.)      |       | .625  |       |       |       |       | .655  |       |       | .78    |        |        |        | .905   |        | 1.03  |        |
| ANSI 600 Gap 1 (in.)      |       |       | .625  |       |       |       |       |       |       | .75    |        |        |        | .875   |        | 1     |        |
| A (in.)                   | .945  |       | 1.025 |       |       | 1.125 |       |       |       | 1.25   |        |        |        | 1.375  |        | 1.66  |        |
| B (in.)                   |       | .425  |       |       |       | .525  |       |       | .625  |        |        | .725   |        |        |        |       |        |
| C Ring OD (in.)           | 1.593 | 2     | 2.313 | 3     | 3.688 | 4.438 | 5.313 | 6.313 | 8.75  | 11.063 | 13.188 | 15.438 | 16.938 | 18.938 | 21.438 | 23.5  | 27.875 |
| 560 Plate Blank Wt. (lb.) | .3    | .5    | .6    | .9    | 1.9   | 2.5   | 3.3   | 4.3   | 7.2   | 10.6   | 14.3   | 18.7   | 21.9   | 35.6   | 45.9   | 56.2  | 80.8   |
| 590 Plate Blank Wt. (lb.) |       |       |       |       | 1.7   | 2.1   | 2.6   | 3.2   | 4.6   | 5.9    | 7.2    | 8.4    | 9.3    | 12.3   | 14     | 17.7  | 26.1   |
| API Ring No.              | R-12  | R-14  | R-16  | R-20  | R-23  | R-27  | R-31  | R-37  | R-45  | R-49   | R-53   | R-57   | R-61   | R-65   | R-69   | R-73  | R-77   |
| ANSI 900 Gap 1 (in.)      |       |       | .625  |       |       |       |       |       | .75   |        |        |        |        | .875   |        | 1     |        |
| A (in.)                   |       |       | 1.025 |       |       | 1.195 | 1.155 |       | 1.28  | 1.47   | 1.595  | 1.685  | 2.09   |        |        |       |        |
| B (in.)                   |       | .425  |       |       |       | .525  |       |       | .625  |        | .725   |        | 9.25   |        |        |       |        |
| C Ring OD (in.)           | 1.875 | 2.063 | 2.313 | 3     | 4.188 | 4.688 | 5.313 | 6.313 | 8.75  | 11.063 | 13.188 | 15.438 | 17.125 | 19.125 | 21.75  | 23.75 | 28.25  |
| 560 Plate Blank Wt. (lb.) | .4    | .5    | .6    | .9    | 2     | 2.7   | 3.3   | 4.3   | 7.2   | 10.6   | 14.3   | 18.7   | 27.1   | 42.6   | 57.8   | 65.2  | 102.8  |
| 590 Plate Blank Wt. (lb.) |       |       |       |       | 1.8   | 2.3   | 2.6   | 3.2   | 4.6   | 5.9    | 7.2    | 8.4    | 14.8   | 18.9   | 26.9   | 27.5  | 49.7   |
| API Ring No.              | R-12  | R-14  | R-16  | R-20  | R-24  | R-27  | R-31  | R-35  | R-39  | R-46   | R-50   | R-54   | R-58   | R-63   | R-67   | R-71  | R-75   |
| ANSI 1500 Gap 1 (in.)     |       |       | .625  |       |       |       |       |       | .565  | .75    |        |        |        | .875   |        | 1     |        |
| A (in.)                   |       |       | 1.025 |       |       | 1.195 |       |       | 1.47  | 1.69   | 1.84   |        |        | 2.005  |        | 2.31  |        |
| B (in.)                   |       | .425  |       |       |       | .525  |       |       | .625  | .725   | .825   |        |        | 9.25   |        | 10.25 |        |
| C Ring OD (in.)           | 1.875 | 2.063 | 2.313 | 3     | 4.188 | 4.688 | 5.313 | 6.313 | 8.813 | 11.25  | 13.375 | 15.875 | 17.5   | 19.625 | 22.125 | 24.25 | 28.625 |
| 560 Plate Blank Wt. (lb.) | .4    | .5    | .6    | .9    | 2     | 2.7   | 3.3   | 4.3   | 8.2   | 14     | 18.3   | 30.8   | 40.8   | 64.4   | 77.5   | 93.7  | 132.8  |
| 590 Plate Blank Wt. (lb.) |       |       |       |       | 1.8   | 2.3   | 2.9   | 3.5   | 5.6   | 9.5    | 11.4   | 21.2   | 29.1   | 42.1   | 47.8   | 57.8  | 81.2   |
| API Ring No.              | R-13  | R-16  | R-18  | R-23  | R-26  | R-28  | R-32  | R-38  | R-47  | R-51   | R-55   | R-60   |        |        |        |       |        |
| ANSI 2500 Gap 1 (in.)     |       |       | .625  |       |       |       |       |       | .75   |        |        |        |        |        |        |       |        |
| A (in.)                   |       |       | 1.025 |       |       | 1.195 | 1.255 | 1.345 | 1.465 | 1.69   | 1.94   | 2      |        |        |        |       |        |
| B (in.)                   |       | .425  |       |       |       | .525  |       | .625  | .725  | .825   |        |        |        |        |        |       |        |
| C Ring OD (in.)           | 2     | 2.313 | 2.688 | 3.688 | 4.438 | 4.875 | 5.5   | 6.813 | 9.75  | 11.875 | 14.625 | 17.25  |        |        |        |       |        |
| 560 Plate Blank Wt. (lb.) | .5    | .6    | .7    | 1.5   | 2.5   | 3.3   | 4.5   | 6.6   | 13.1  | 20.1   | 37.6   | 49.8   |        |        |        |       |        |
| 590 Plate Blank Wt. (lb.) |       |       |       |       | 2.1   | 2.9   | 3.7   | 5.5   | 10.2  | 15.5   | 26.6   | 39.3   |        |        |        |       |        |

### Restriction Unions

Restriction Orifice Unions (RSUs) are stocked in carbon steel and stainless steel bodies, rated to 3,000 PSIG, and available in line sizes from 1/4" to 2" with female NPT or socket-weld connections. Non-standard sizes and materials can be produced quickly upon request.

Plates can be configured to suit your needs as:

- Recessed
- Pressed
- Pressed with a tab for easy size identification—no need to break the union



| Line Size (in) | A OAL (in) | B NPT or SW (in) | C Hex Size (in) |
|----------------|------------|------------------|-----------------|
| 1/4            | 1-3/4      | 1/4              | 1-3/8           |
| 3/8            | 1-7/8      | 3/8              | 1-5/8           |
| 1/2            | 2          | 1/2              | 1-3/4           |
| 3/4            | 2-1/4      | 3/4              | 2-3/16          |
| 1              | 2-9/16     | 1                | 2-9/16          |
| 1-1/4          | 2-7/8      | 1-1/4            | 3-1/6           |
| 1-1/2          | 3-1/8      | 1-1/2            | 3-7/16          |
| 2              | 3-1/2      | 2                | 4               |