

## Orifice plate assemblies Type 90 Orifice Flange Restriction orifice plate

### Application

Orifice plate assemblies for flow measurement · Generation of a defined differential pressure

Restriction orifice plate for mass flow restriction



In combination with a differential pressure meter, for example, Media 6, the orifice flanges measure the flow rates of liquids, gases and vapors. The orifice bore is calculated according to DIN EN ISO 5167-1/A1.

The restriction orifice plate is used to limit the mass flow in process engineering plants.

### Versions

**Type 90** (Fig. 1) · Orifice flange with standard orifice plate and annular chamber DN 32 to 500 · PN 6 to 40

Differential pressure connections: compression fittings for 12 x 1 mm or 12 x 1.5 mm pipes

### Special version

Dimensions according to Class 150/300 · NPS 1¼ to 20  
Without orifice plate · Orifice plate only with concentric bore  
Flange with groove Form D according to DIN EN 1092-1  
Other materials · Other nominal sizes

**Restriction orifice plate** (Fig. 2) · DN 15 to 500 · PN 10 to 40

### Special versions

Dimensions according to Class 150/300 · NPS ½ to 20

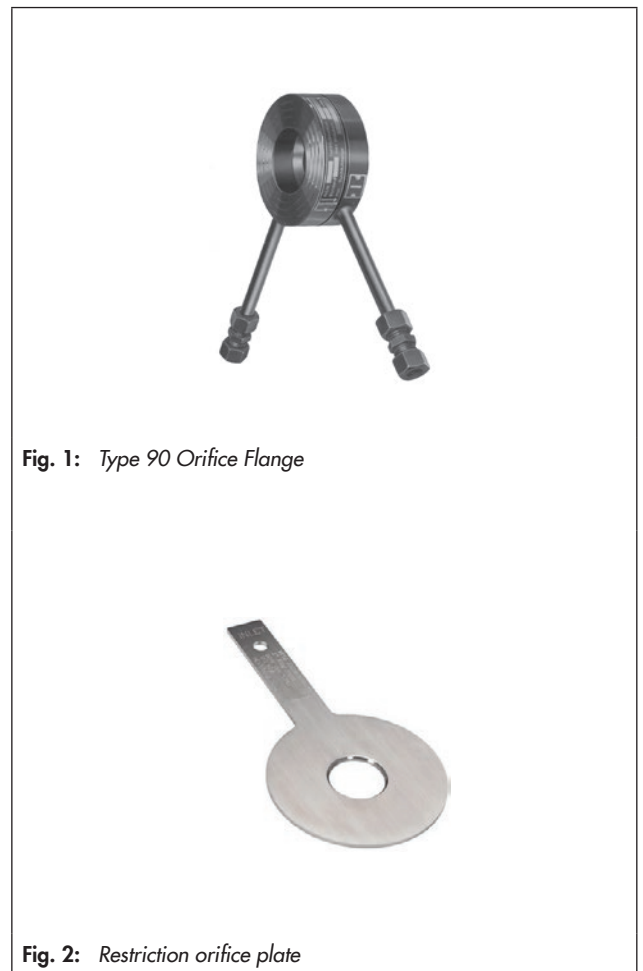


Fig. 1: Type 90 Orifice Flange

Fig. 2: Restriction orifice plate

### Sizing the orifice plate assemblies

To record all the relevant operating data, SAMSON provides the questionnaire ► T 9500-9. Enter the specifications required to calculate the differential pressure.

SAMSON uses these specifications to size the orifice plate assembly correctly when processing the order.

### Installation

The following general points apply:

- Install the **orifice plate assembly** in horizontal pipelines.
- The high pressure must be tapped upstream of the orifice plate and the low pressure downstream of it. The sharp edge of the standard orifice plate must face the oncoming flow.
- The direction of flow is indicated by an arrow. The connections are marked with '+' and '-'.
- Fig. 3 shows the location of the differential pressure lines.
- The **restriction orifice plate** can be installed upstream or downstream of the control equipment (e.g. control valve). The sharp edge of the orifice plate must face the oncoming flow.

The following special points apply:

- Install the **Type 90 Orifice Flange** between DIN mating flanges (included in the scope of delivery if requested). The undisturbed pipe length must be at least 20 x DN at the inlet and 5 x DN at the outlet.

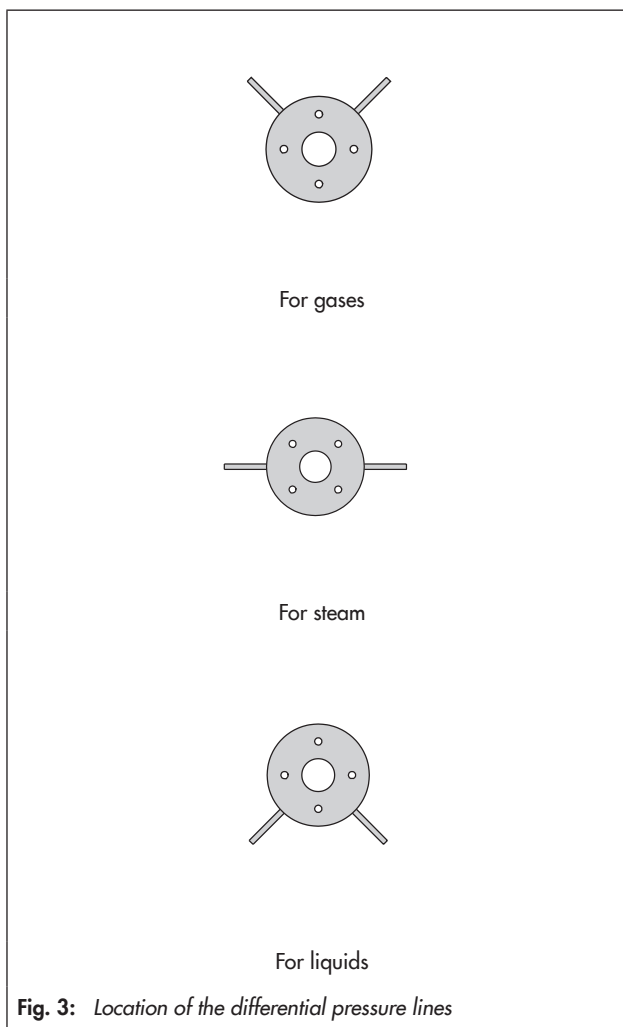


Fig. 3: Location of the differential pressure lines

Table 1: Technical data

| Type             | Type 90 Orifice Flange <sup>1)</sup>          | Restriction orifice plate <sup>1)</sup>      |
|------------------|---|--|
| Nominal pressure | PN 6, 10, 16, 25, and 40<br>Class 150 and 300 | PN 6, 10, 16, 25 and 40<br>Class 150 and 300 |
| Nominal size     | DN 32 to 500 · NPS 1¼ to 20                   | DN 15 to 500 · NPS ½ to 20                   |

<sup>1)</sup> Other nominal sizes/nominal pressures on request

Table 2: Materials and permissible temperature · Material number according to DIN EN and ASME

| Type                              | Type 90 Orifice Flange   |             | Restriction orifice plate |
|-----------------------------------|--------------------------|-------------|---------------------------|
| Annular chamber <sup>1)</sup>     | 1.0460/A105              | 1.4404/316L | –                         |
| Gasket                            | Fiber gasket             | Max. 200 °C |                           |
|                                   | Graphite with metal core | Max. 400 °C | Max. 450 °C               |
| Differential pressure connections | Steel or 1.4404/316L     |             | –                         |
| Standard orifice plate            | 1.4404/316L              |             | 1.4404/316L               |

<sup>1)</sup> Other materials on request

## Dimensions and weights

**Table 3:** Type 90 Orifice Flange · Dimensions in mm

### DIN

| Nominal size <sup>1)</sup>        | DN    | 32  | 40 | 50  | 65  | 80  | 100 | 125 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
|-----------------------------------|-------|-----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Length                            | L     | 65  |    |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Mounting ring<br>ØD               | PN 6  | 76  | 86 | 96  | 116 | 132 | 152 | 182 | 207 | 262 | 317 | 373 | 423 | 473 | 528 | 577 |
|                                   | PN 10 | 82  | 92 | 107 | 127 | 142 | 162 | 192 | 218 | 273 | 328 | 378 | 438 | 489 | 539 | 594 |
|                                   | PN 16 | 82  | 92 | 107 | 127 | 142 | 162 | 193 | 218 | 273 | 329 | 384 | 444 | 495 | 555 | 617 |
|                                   | PN 25 | 82  | 92 | 107 | 127 | 142 | 168 | 194 | 224 | 290 | 340 | 400 | 457 | 514 | 564 | 624 |
|                                   | PN 40 | 82  | 92 | 107 | 127 | 142 | 168 | 194 | 224 | 290 | 352 | 417 | 474 | 546 | 571 | 628 |
| Mounting ring Ød                  |       | 35  | 41 | 53  | 69  | 83  | 105 | 129 | 156 | 204 | 256 | 305 | 348 | 396 | 428 | 495 |
| Weight <sup>2)</sup> , approx. kg |       | 2.3 | 2. | 3.6 | 4.5 | 5.4 | 7   | 9   | 11  | 17  | 24  | 33  | 42  | 57  | 51  | 60  |

<sup>1)</sup> Other nominal sizes on request

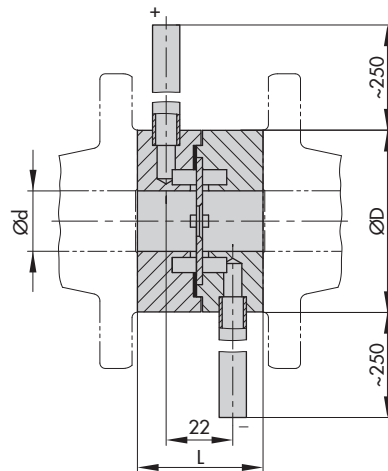
<sup>2)</sup> Based on PN 40

### ANSI

| Valve size <sup>1)</sup>          | NPS       | 1¼  | 1½  | 2   | 2½  | 3   | 4   | 5   | 6   | 8   | 10  | 12  | 14  | 16  | 18  | 20  |
|-----------------------------------|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Length                            | L         | 65  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Mounting<br>ring ØD               | Class 150 | 73  | 83  | 102 | 121 | 133 | 171 | 194 | 219 | 276 | 337 | 406 | 448 | 511 | 546 | 603 |
|                                   | Class 300 | 80  | 92  | 108 | 127 | 146 | 178 | 213 | 248 | 305 | 359 | 419 | 483 | 536 | 594 | 651 |
| Mounting ring Ød                  |           | 34  | 40  | 51  | 60  | 75  | 98  | 123 | 148 | 195 | 245 | 293 | 333 | 381 | 428 | 477 |
| Weight <sup>2)</sup> , approx. kg |           | 2.3 | 2.9 | 3.8 | 5   | 6.4 | 9   | 12  | 16  | 22  | 28  | 36  | 49  | 57  | 68  | 78  |

<sup>1)</sup> Other valve sizes on request

<sup>2)</sup> Based on Class 300

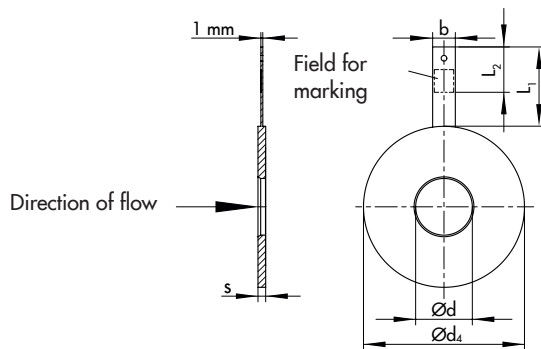


**Fig. 4:** Type 90 Orifice Flange

**Table 4:** Restriction orifice plate · Dimensions in mm

| Nominal size |     | Orifice plate no. | b  | Ød  | Ød <sub>4</sub> |       |       |       | L <sub>1</sub> | L <sub>2</sub> | s    | Weight, approx. |
|--------------|-----|-------------------|----|-----|-----------------|-------|-------|-------|----------------|----------------|------|-----------------|
| DN           | NPS |                   |    |     | PN 10           | PN 16 | PN 25 | PN 40 |                |                |      |                 |
| 15           | ½   | 1099-4201         | 30 | 51  |                 |       |       | 130   | 80             | 3              | 1 kg |                 |
| 20           | ¾   | 1099-4202         | 40 | 61  |                 |       |       | 130   | 80             | 3              | 1 kg |                 |
| 25           | 1   | 1099-4203         | 40 | 71  |                 |       |       | 130   | 80             | 3              | 1 kg |                 |
| 32           | 1¼  | 1099-4204         | 40 | 82  |                 |       |       | 130   | 80             | 3              | 1 kg |                 |
| 40           | 1½  | 1099-4205         | 40 | 92  |                 |       |       | 130   | 80             | 3              | 1 kg |                 |
| 50           | 2   | 1099-4206         | 40 | 107 |                 |       |       | 140   | 80             | 3              | 1 kg |                 |
| 65           | 2¼  | 1099-4207         | 40 | 127 |                 |       |       | 140   | 80             | 3              | 1 kg |                 |
| 80           | 3   | 1099-4208         | 40 | 127 |                 | 142   |       | 140   | 80             | 4              | 1 kg |                 |
| 100          | 4   | 1099-4209         | 40 | 162 |                 | 168   |       | 140   | 80             | 4              | 1 kg |                 |
| 125          | 5   | 1099-4210         | 40 | 192 |                 | 194   |       | 140   | 80             | 4              | 2 kg |                 |
| 150          | 6   | 1099-4211         | 40 | 218 |                 | 224   |       | 140   | 80             | 4              | 2 kg |                 |
| 200          | 8   | 1099-4212         | 40 | 273 |                 | 284   |       | 140   | 80             | 4              | 2 kg |                 |
| 250          | 10  | 1099-4213         | 40 | 319 |                 | 340   | 352   | 140   | 80             | 4              | 2 kg |                 |
| 300          | 12  | 1099-4214         | 40 | 378 | 384             | 400   | 417   | 140   | 80             | 4              | 3 kg |                 |
| 350          | 14  | 1099-4215         | 40 | 438 | 444             | 457   | 474   | 140   | 80             | 4              | 3 kg |                 |
| 400          | 16  | 1099-4216         | 40 | 489 | 495             | 514   | 546   | 140   | 80             | 4              | 3 kg |                 |
| 500          | 20  | 1099-4217         | 50 | 594 | 617             | 624   | 628   | 180   | 100            | 6              | 5 kg |                 |

Sizing based on the operating parameters



**Fig. 5:** Restriction orifice plate

**Ordering text**

**Type 90 Orifice Flange**

DN ..., PN ...

Material ...

Specifications to size the orifice bore according to DIN EN ISO 5167-1/A1 (enter data in ► T 9500-9)

Orifice bore Ø in mm ... (according to customer specifications)

Optionally, special version

**Restriction orifice plate**

DN ..., PN ...

Specifications to size the restriction orifice plate according to DIN EN ISO 5167-1/A1 (enter data in ► T 9500-9)

Orifice bore Ø in mm ... (according to customer specifications)

Optionally, special version

Specifications subject to change without notice

