

Translated English of Chinese Standard: GB/T12221-2005

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NATIONAL STANDARD OF THE  
PEOPLE'S REPUBLIC OF CHINA

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## GB/T 12221-2005

Replacing GB/T 12221-1989, GB/T 15188.1~15188.4-1994

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### Metal Valves - Face to Face, End to End, Center to Face and Center to End Dimensions

金属阀门 结构长度

(ISO 5752:1982, Metal Valves for Use in Flanged Pipe Systems -  
Face-to-face and centre-to-face Dimensions, MOD)

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## Table of Contents

|                                                    |          |
|----------------------------------------------------|----------|
| <b>Foreword .....</b>                              | <b>3</b> |
| <b>1 Scope .....</b>                               | <b>5</b> |
| <b>2 Normative References .....</b>                | <b>5</b> |
| <b>3 Definitions .....</b>                         | <b>5</b> |
| <b>4 Structure Dimensions and Tolerances .....</b> | <b>6</b> |

## Foreword

This Standard modifies and adopts ISO 5752:1982 "Metal Valves for Use in Flanged Pipe Systems - Face-to-face and centre-to-face Dimensions". Compared with ISO 5752:1982, the main differences in this Standard are as follows:

- Structure and drafting rules of this Standard are in accordance with GB/T 1.1-2000;
- This Standard adopts some definitions in Chapter 2 of ISO 5752:1982;
- Chapter 4 "Terminology" of ISO 5752:1982 was deleted from this Standard.

Compared with GB/T 12221-1989, the main changes in this Standard are as follows:

- Standard name is changed; the scope of application is extended from flange connection to welded end, wafer type, female thread and male thread.
- Add the basic structural lengths of welded ends, wafer type valves, female threads and male threads, AND structural length dimensions of various valves;
- Valve dimensions with flanged joint adopt ISO 5752:1982;
- Basic series dimensions in Table 1 of original standard were modified: series 6 and 17 (no available data) were deleted; series 25, which is not applicable to flanged joint, was placed to the basic series dimensions of wafer type connecting valves;
- Dimension list of same-type series gate valves in Table 2 of original standard was deleted.

This Standard replaces GB/T 12221-1989 "Metal Valves for Use in Flanged Pipe Systems - Face-to-Face, and Center-to-Face Dimensions" and GB/T 15188.1 ~ 15188.4-1994 "Face-to-Face, Centre-to-Face, End-to-End and Centre-to-End Dimensions of Valves".

This Standard was proposed by China Machinery Industry Federation.

This Standard shall be under the jurisdiction of the National Technical Committee on Valves of Standardization Administration of China (SAC/TC 188).

Drafting organizations of this Standard: Hefei General Machinery Research Institute, Hubei Hongcheng General Machinery Co., Ltd., Shanghai Research Institute of General Machinery Co., Ltd., CNNC SUFA Technology Industry Co., Ltd., Zhejiang Wuzhou Valve Co., Ltd. AND Shenyang Shengshi High & Medium Pressure Valve Co., Ltd.

Drafting staffs of this Standard: Wang Xiaojun, Wang Hongyun, Kong Biaolong, Chen

Jianping, Zheng Zuhui, Zheng Yunhai, Liu Xiaochun and Ye Qin.

The previous editions replaced by this Standard are as follows:

— GB/T 12221-1989, GB/T 15188.1 ~ 15188.4-1994.

# Metal Valves - Face to Face, End to End, Center to Face and Center to End Dimensions

## 1 Scope

This Standard specifies the basic series of face-to-face, centre-to-face, end-to-end and centre-to-end dimensions of flanged joint valves, welded end valves, wafer type connection valves, female thread connection valves, male thread connection valves, and the permissible variations of structural dimensions.

This Standard is applicable to the face-to-face, centre-to-face, end-to-end and centre-to-end dimensions of gate valves, stop valves, ball valves, butterfly valves, plug valves, diaphragm valves and check valves with nominal pressure (PN)  $\leq 42.0$  MPa and nominal diameter of DN 3 mm ~ DN 4 000 mm.

## 2 Normative References

The following normative documents contain provisions which, through reference in this text, constitute provisions of this Standard. For dated references, the subsequent amendments or revisions of these publications do not apply. However, parties who enter into agreements based on this Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below.

GB/T 1047 Pipework Components - Definition and Selection of DN (Nominal Size)  
(GB/T 1047-2005, ISO 6708:1995, MOD)

GB/T 1048 Pipework Components - Definition and Selection of PN (GB/T 1048-2005, ISO 7268:1996, MOD)

## 3 Definitions

### 3.1 Through way type of valves face to face, end to end, center to face and center to end dimensions

The distance between the two planes perpendicular to the valve axis, located at the extremities of the valve-body end ports.

### 3.2 Angle type of valves face to face, end to end, center to face and center to end dimensions [Translator: for ease of reading, hereafter “face to face, end to end, center to face and center to end dimensions” is abbreviated as structure dimensions]

**4.3.5** The basic series of female thread valves' structure dimensions are given in Table 5.

**Table 5 Female Thread Valves' Structure Dimensions — Basic Series**

Dimensions in millimetres

| Nominal size<br>DN                                                  | Basic series         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|---------------------------------------------------------------------|----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|                                                                     | N1                   | N2  | N3  | N4  | N5  | N6  | N7  | N8  | N9  | N10 | N11 | N12 | N13 | N14 | N15 | N16 | N17 | N18 |
|                                                                     | Structure dimensions |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 6                                                                   | —                    | —   | —   | —   | 46  | —   | —   | —   | 48  | —   | —   | —   | —   | —   | —   | —   | —   | —   |
| 8                                                                   |                      |     |     |     | 50  |     |     | 48  |     |     |     |     |     |     |     |     |     |     |
| 10                                                                  |                      |     |     |     | 56  |     |     | 80  | 80  |     |     |     |     |     |     |     |     |     |
| 15                                                                  | 42                   | 50  | 52  | 56  | 60  | 65  | 65  | 65  | 68  | 80  | 90  | 90  | 90  | 90  | 90  | 90  | 90  | 90  |
| 20                                                                  | 45                   | 60  | 60  | 67  | 65  | 70  | 75  | 85  | 78  | 90  | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 25                                                                  | 52                   | 65  | 70  | 78  | 75  | 80  | 90  | 110 | 86  | 110 | 115 | 120 | 110 | 120 | 120 | 110 | 120 | 120 |
| 32                                                                  | 55                   | 75  | 80  | 88  | 85  | 90  | 105 | 120 | 100 | 130 | 130 | 140 | 120 | 130 | 140 | 120 | 140 | 130 |
| 40                                                                  | 60                   | 85  | 86  | 104 | 95  | 100 | 120 | 140 | 106 | 150 | 150 | 170 | 135 | 140 | 170 | 135 | 170 | 150 |
| 50                                                                  | 70                   | 95  | 104 | 120 | 110 | 110 | 140 | 165 | 130 | 170 | 180 | 200 | 170 | 170 | 200 | 155 | 180 | 170 |
| 65                                                                  | 82                   | 115 | —   | —   | 120 | 130 | 165 | 203 | —   | 220 | 190 | 260 | —   | —   | —   | —   | —   | —   |
| 80                                                                  | 90                   | 130 |     |     | —   | —   | —   | 254 |     | 250 | 290 |     |     |     |     |     |     |     |
| 100                                                                 | 110                  | 145 |     |     | —   | —   | —   | —   |     | 300 | —   |     |     |     |     |     |     |     |
| Note 1: It is applicable to through way type and angle type valves. |                      |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Note 2: Tolerances of structure dimensions is ±1.6 mm.              |                      |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

**4.3.8** Wafer knife gate valves' structure dimensions are given in Table 8.

**Table 8 Wafer Knife Gate Valves' Structure Dimensions**

Dimensions in millimetres

| Nominal size<br>DN | Nominal pressure PN ≤ 2.0 MPa |     |     |
|--------------------|-------------------------------|-----|-----|
|                    | Structure dimensions          |     |     |
| 50                 | 48                            | 40  | 40  |
| 65                 | —                             |     |     |
| 80                 | 51                            | 50  | 50  |
| 100                |                               |     |     |
| 125                | 57                            | 60  | 60  |
| 150                | —                             |     |     |
| 200                | 70                            | 70  | 70  |
| 250                |                               |     |     |
| 300                | 76                            | 80  | 80  |
| 350                |                               |     |     |
| 400                | 89                            | 90  | 120 |
| 450                |                               |     |     |
| 500                | 114                           | 100 | 132 |
| 600                |                               |     |     |
| Basic series       | J16                           | J17 | J18 |

Note: Tolerances of structure dimensions is ±1.6 mm.

**4.3.9** Welded end gate valves' structure dimensions are given in Table 9.

**Table 9 Welded End Gate Valves' Structure Dimensions**

Dimensions in millimetres

| Nominal size<br>DN | Nominal pressure PN (MPa) |           |     |       |            |       |            |                      |      |       |      |
|--------------------|---------------------------|-----------|-----|-------|------------|-------|------------|----------------------|------|-------|------|
|                    | 1.0 ~ 2.0                 | 2.5 ~ 5.0 | 6.3 | 10.0  | 15.0, 16.0 | 25.0  | 32.0, 42.0 | Structure dimensions |      |       |      |
|                    |                           |           |     | Short | Long       | Short | Long       | Short                | Long | Short | Long |
| 6                  | 102                       | —         | —   | —     | —          | —     | —          | —                    | —    | —     | —    |
| 10                 |                           |           |     |       |            |       |            |                      |      |       |      |
| 15                 | 108                       | 140       | 165 | —     | 165        | —     | —          | —                    | —    | —     | 264  |
| 20                 | 117                       | 152       | 190 |       | 190        |       |            |                      |      |       | 273  |
| 25                 | 127                       | 165       | 216 | 133   | 216        | 140   | 254        | 140                  | 254  | 186   | 308  |
| 32                 | 140                       | 178       | 229 | 146   | 229        | 165   | 279        | 165                  | 279  | 232   | 349  |
| 40                 | 165                       | 190       | 241 | 152   | 241        | 178   | 305        | 178                  | 305  |       | 384  |
| 50                 | 216                       | 216       | 292 | 178   | 292        | 216   | 368        | 216                  | 368  | 279   | 451  |
| 65                 | 241                       | 241       | 330 | 216   | 330        | 254   | 419        | 254                  | 419  | 330   | 508  |
| 80                 | 283                       | 283       | 356 | 254   | 356        | 305   | 381        | 305                  | 470  | 368   | 578  |
| 100                | 305                       | 305       | 406 | 305   | 432        | 356   | 457        | 406                  | 546  | 457   | 673  |
| 125                | 381                       | 381       | 457 | 381   | 508        | 432   | 559        | 483                  | 673  | 533   | 794  |

|              |     |      |      |     |      |      |     |      |      |      |      |      |      |
|--------------|-----|------|------|-----|------|------|-----|------|------|------|------|------|------|
| 300          | 502 | 635  | 850  | 502 | 635  | 850  | 502 | 850  | 762  | 838  | 965  | 1130 | 1422 |
| 350          | 572 | 762  | 980  | 572 | 762  | 980  | 762 | 980  | 826  | 889  | 1029 | 1257 | —    |
| 400          | 610 | 838  | 1100 | 610 | 838  | 1100 | 838 | 1100 | 902  | 991  | 1130 | 1384 |      |
| 450          | 660 | 914  | —    | 660 | 914  | —    | —   | —    | 978  | 1092 | 1219 | —    |      |
| 500          | 711 | 991  |      | 711 | 991  |      |     |      | 1054 | 1194 | 1321 |      |      |
| 550          | —   | 1092 |      | —   | 1092 |      |     |      | 1143 | 1295 | —    |      |      |
| 600          | 813 | 1143 |      | 813 | 1143 |      |     |      | 1232 | 1397 | 1549 |      |      |
| 650          | —   | 1245 | —    | —   | 1245 | —    | —   | —    | 1308 | 1448 | —    | —    |      |
| 700          |     | 1346 |      |     | 1346 |      |     |      | 1397 | 1549 |      |      |      |
| 750          |     | 1397 |      |     | 1397 |      |     |      | 1524 | 1651 |      |      |      |
| 800          |     | 1524 |      |     | 1524 |      |     |      | 1651 | 1778 |      |      |      |
| 850          |     | 1626 |      |     | 1626 |      |     |      | 1778 | 1930 |      |      |      |
| 900          |     | 2083 |      |     | 2083 |      |     |      | 1880 | 2083 |      |      |      |
| Basic series | H16 | H17  | H18  | H16 | H17  | H18  | H2  | H18  | H3   | H5   | H7   | H9   | H11  |

**4.3.13** Welded end plug valves' structure dimensions are given in Table 13.

**Table 13 Welded End Plug Valves' Structure Dimensions**

Dimensions in millimetres

| Nominal<br>size<br>DN | Nominal pressure PN (MPa) |               |      |       |      |      |      |      |               |     |     |
|-----------------------|---------------------------|---------------|------|-------|------|------|------|------|---------------|-----|-----|
|                       | 1.0 ~<br>2.0              | 2.5, 4.0, 5.0 |      | 6.3   |      | 10.0 | 15.0 | 25.0 | 32.0,<br>42.0 |     |     |
|                       | Structure dimensions      |               |      |       |      |      |      |      |               |     |     |
|                       |                           | Short         | Long | Short | Long |      |      |      |               |     |     |
| 15                    | —                         | —             | —    | —     | —    | 165  | —    | —    | —             |     |     |
| 20                    |                           |               |      |       |      | 190  |      |      |               |     |     |
| 25                    |                           |               | 190  | 216   |      | 216  | 254  | 254  | 308           |     |     |
| 32                    |                           |               | —    | 229   |      | 229  | 279  | 279  | 349           |     |     |
| 40                    |                           |               | 241  | 241   |      | 241  | 305  | 305  | 384           |     |     |
| 50                    |                           |               | 267  | 267   |      | 283  | 292  | 292  | 368           | 368 | 451 |
| 65                    |                           |               | 305  | 305   |      | 330  | 330  | 330  | 419           | 419 | 508 |
| 80                    |                           |               | 330  | 330   |      | 387  | 356  | 356  | 381           | 470 | 578 |
| 100                   | 356                       | 356           | 457  | 406   | 559  | 432  | 457  | 546  | 673           |     |     |
| 125                   | 381                       | 381           | —    | 457   | —    | 508  | 559  | 673  | 794           |     |     |
| 150                   | 457                       | 457           | 559  | 495   | 711  | 559  | 610  | 705  | 914           |     |     |
| 200                   | 521                       | 521           | 686  | 597   | 845  | 660  | 737  | 832  | 1022          |     |     |
| 250                   | 559                       | 559           | 826  | 673   | 889  | 787  | 838  | 991  | 1270          |     |     |
| 300                   | 635                       | 635           | 965  | 762   | 1016 | 838  | 965  | 1130 | 1422          |     |     |
| 350                   | —                         | 762           | —    | 826   | —    | 889  | —    | 1257 | —             |     |     |
| 400                   |                           | 838           |      | 902   |      | 991  | 1130 | 1384 |               |     |     |
| 450                   |                           | 914           |      | 978   |      | 1092 | —    | 1537 |               |     |     |
| 500                   |                           | 991           |      | 1054  |      | 1194 | 1321 | 1664 |               |     |     |

**Table 17 Wafer Type Swing Check Valves' Structure Dimensions**

Dimensions in millimetres

| Nominal size<br>DN | Nominal pressure PN (MPa) |           |     |      |            |      |            |
|--------------------|---------------------------|-----------|-----|------|------------|------|------------|
|                    | 1.0 ~ 2.0                 | 2.5 ~ 5.0 | 6.3 | 10.0 | 15.0, 16.0 | 25.0 | 32.0, 42.0 |
|                    | Structure dimensions      |           |     |      |            |      |            |
| 50                 | 60                        | 60        | 60  | 60   | 70         | 70   | 70         |
| 65                 | 66                        | 66        | 66  | 66   | 83         | 83   | 83         |
| 80                 | 73                        | 73        | 73  | 73   |            |      | 86         |
| 100                |                           |           | 79  | 79   | 102        | 102  | 105        |
| 150                | 98                        | 98        | 137 | 137  | 159        | 159  | 159        |
| 200                | 127                       | 127       | 161 | 161  | 206        | 206  | 206        |
| 250                | 146                       | 146       | 213 | 213  | 241        | 248  | 254        |
| 300                | 181                       | 181       | 229 | 229  | 292        | 305  | 305        |
| 350                | 184                       | 222       | 273 | 273  | 356        | 356  | —          |
| 400                | 190                       | 232       | 305 | 305  | 384        | 384  |            |
| 450                | 203                       | 264       | 362 | 362  | 451        | 468  |            |
| 500                | 219                       | 292       | 368 | 368  |            | 533  |            |
| 600                | 222                       | 317       | 394 | 438  | 495        | 559  |            |
| 750                | 305                       | 368       | 460 | 505  | —          | —    |            |
| 900                | 368                       | 483       | 635 | 635  |            |      |            |
| 1200               | 524                       | 629       | —   | —    |            |      |            |
| Basic series       | J5                        | J6        | J7  | J8   | J9         | J10  | J11        |

**4.3.18** Wafer type lift check valves' structure dimensions are given in Table 18.

**Table 18 Wafer Type Lift Check Valves' Structure Dimensions**

Dimensions in millimetres

| Nominal size<br>DN | Structure dimensions |      |     |     |
|--------------------|----------------------|------|-----|-----|
| 10                 | —                    | —    | —   | 60  |
| 15                 | 16                   | 25   | 60  | 65  |
| 20                 | 19                   | 31.5 | —   | —   |
| 25                 | 22                   | 35.5 | 65  | 80  |
| 32                 | 28                   | 40   | 80  | 90  |
| 40                 | 31.5                 | 45   | 90  | 115 |
| 50                 | 40                   | 56   | 115 | 140 |
| 65                 | 46                   | 63   | 140 | 160 |
| 80                 | 50                   | 71   | 160 | 180 |
| 100                | 60                   | 80   | —   | —   |
| 125                | 90                   | 110  |     |     |
| 150                | 106                  | 125  |     |     |
| 200                | 140                  | 160  |     |     |

|              |     |     |     |
|--------------|-----|-----|-----|
| 20           | 57  | 90  | 117 |
| 25           | 68  | 100 | 127 |
| 32           | 73  | 110 | 146 |
| 40           | 77  | 120 | 159 |
| 50           | 84  | 135 | 190 |
| 65           | 100 | 165 | 216 |
| 80           | 120 | 185 | 254 |
| 100          | 140 | —   | —   |
| Basic series | —   | 18  | 7   |

**4.3.21** Tolerances of flanged valves' structure dimensions are given in Table 21.

**Table 21 Tolerances of Flanged Valves' Structure Dimensions**

Dimensions in millimetres

| Structure dimensions | Tolerances |
|----------------------|------------|
| $\leq 250$           | $\pm 2$    |
| $> 250 \sim 500$     | $\pm 3$    |
| $> 500 \sim 800$     | $\pm 4$    |
| $> 800 \sim 1000$    | $\pm 5$    |
| $> 1000 \sim 1600$   | $\pm 6$    |
| $> 1600 \sim 2250$   | $\pm 8$    |
| $\geq 2250$          | $\pm 10$   |

**4.3.22** Tolerances of welded end valves' structure dimensions are given in Table 22.

**Table 22 Tolerances of Welded End Valves' Structure Dimensions**

Dimensions in millimetres

| Nominal size<br>DN | Type of valves   |            |
|--------------------|------------------|------------|
|                    | Through way type | Angle type |
|                    | Tolerances       |            |
| $\leq 250$         | $\pm 1.5$        | $\pm 0.75$ |
| $\geq 275$         | $\pm 3.0$        | $\pm 1.5$  |

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