



## WAFER BUTTERFLY VALVE PN10/16

Model/Ref: 1125



*Partnership.  
Without Limits.*

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**WAFER BUTTERFLY VALVE PN10/16**

**Size :** DN 32/40 to DN 1200  
**Ends :** Between flanges PN10/16, ANSI150 up to DN600  
**Min Temperature :** -10°C  
**Max Temperature :** + 110°C ( 130°C temporarily )  
**Max Pressure :** 16 Bars up to DN300  
**Specifications :** Long neck for isolation  
Ductile iron disc  
Vulcanised EPDM seat

**Materials :** Cast iron body

**WAFER BUTTERFLY VALVE PN10/16**
**SPECIFICATIONS :**

- Long neck for isolation
- ISO 5211 mounting pad
- Wafer type
- Between flanges ISO PN10/16 from DN32 to DN600 and ISO PN20 ANSI150 from DN 40 to DN 600
- Between flanges ISO PN10 from DN 700 to DN1200
- Full crossing stem up to DN600
- With 10 positions lever and locking device up to DN150
- Double PTFE seal on stem up to DN600
- Ductile iron disc nicked coated ( 20-30 microns thickness )
- Epoxy painting RAL003 80 microns thickness
- Vulcanised EPDM seat

**USE :**

- Cold and hot water
- Min and max Temperature Ts : - 10°C to + 110°C ( 130°C temporarily )
- Max Pressure Ps : 16 bars up to DN300 , 10 bars over

**FLOW COEFFICIENT Kv ( M3 / h ) :**

| DN            |     | 32/40 | 50   | 65   | 80   | 100  | 125  | 150  | 200  | 250  | 300  | 350   | 400   | 450   | 500   | 600   |
|---------------|-----|-------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|
| Opening angle | 10° | 0,04  | 0,05 | 0,09 | 0,17 | 0,26 | 0,43 | 0,68 | 1,7  | 2,6  | 3,4  | 5,1   | 6,8   | 9,4   | 11,9  | 18,8  |
|               | 20° | 2     | 3    | 5    | 8    | 15   | 25   | 38   | 76   | 129  | 200  | 288   | 396   | 525   | 675   | 1042  |
|               | 30° | 5     | 6    | 10   | 15   | 31   | 52   | 81   | 160  | 273  | 422  | 610   | 839   | 1101  | 1428  | 2207  |
|               | 40° | 10    | 13   | 21   | 33   | 67   | 113  | 175  | 348  | 592  | 914  | 1321  | 1817  | 2407  | 3095  | 4781  |
|               | 50° | 18    | 23   | 38   | 60   | 119  | 202  | 312  | 620  | 1055 | 1630 | 2355  | 3239  | 4289  | 5515  | 8521  |
|               | 60° | 30    | 38   | 64   | 99   | 196  | 334  | 516  | 1025 | 1746 | 2697 | 3897  | 5359  | 7097  | 9125  | 14098 |
|               | 70° | 48    | 60   | 102  | 156  | 310  | 529  | 817  | 1623 | 2764 | 4269 | 6167  | 8481  | 11232 | 14442 | 22312 |
|               | 80° | 72    | 90   | 152  | 235  | 466  | 793  | 1226 | 2434 | 4145 | 6403 | 9250  | 12720 | 16848 | 21662 | 33468 |
|               | 90° | 78    | 98   | 167  | 258  | 512  | 872  | 1347 | 2675 | 4555 | 7037 | 10165 | 13799 | 18514 | 23805 | 36778 |

| DN            |     | 700   | 800   | 900   | 1000   | 1200   |
|---------------|-----|-------|-------|-------|--------|--------|
| Opening angle | 10° | 31    | 39    | 52    | 72     | 104    |
|               | 20° | 1568  | 2064  | 2612  | 3617   | 5172   |
|               | 30° | 3147  | 4143  | 5243  | 7260   | 10379  |
|               | 40° | 5739  | 7555  | 9561  | 13238  | 18932  |
|               | 50° | 8648  | 11925 | 15091 | 20894  | 29879  |
|               | 60° | 12929 | 17827 | 22561 | 31279  | 44730  |
|               | 70° | 19692 | 27153 | 34362 | 47641  | 68126  |
|               | 80° | 30182 | 41615 | 52667 | 73017  | 104415 |
|               | 90° | 42811 | 59028 | 57406 | 103569 | 148105 |

**WAFER BUTTERFLY VALVE PN10/16**

**TORQUE VALUE ( Nm, without safety coefficient ) :**

We recommend a safety coefficient of 30% minimum to determinate the actuator.

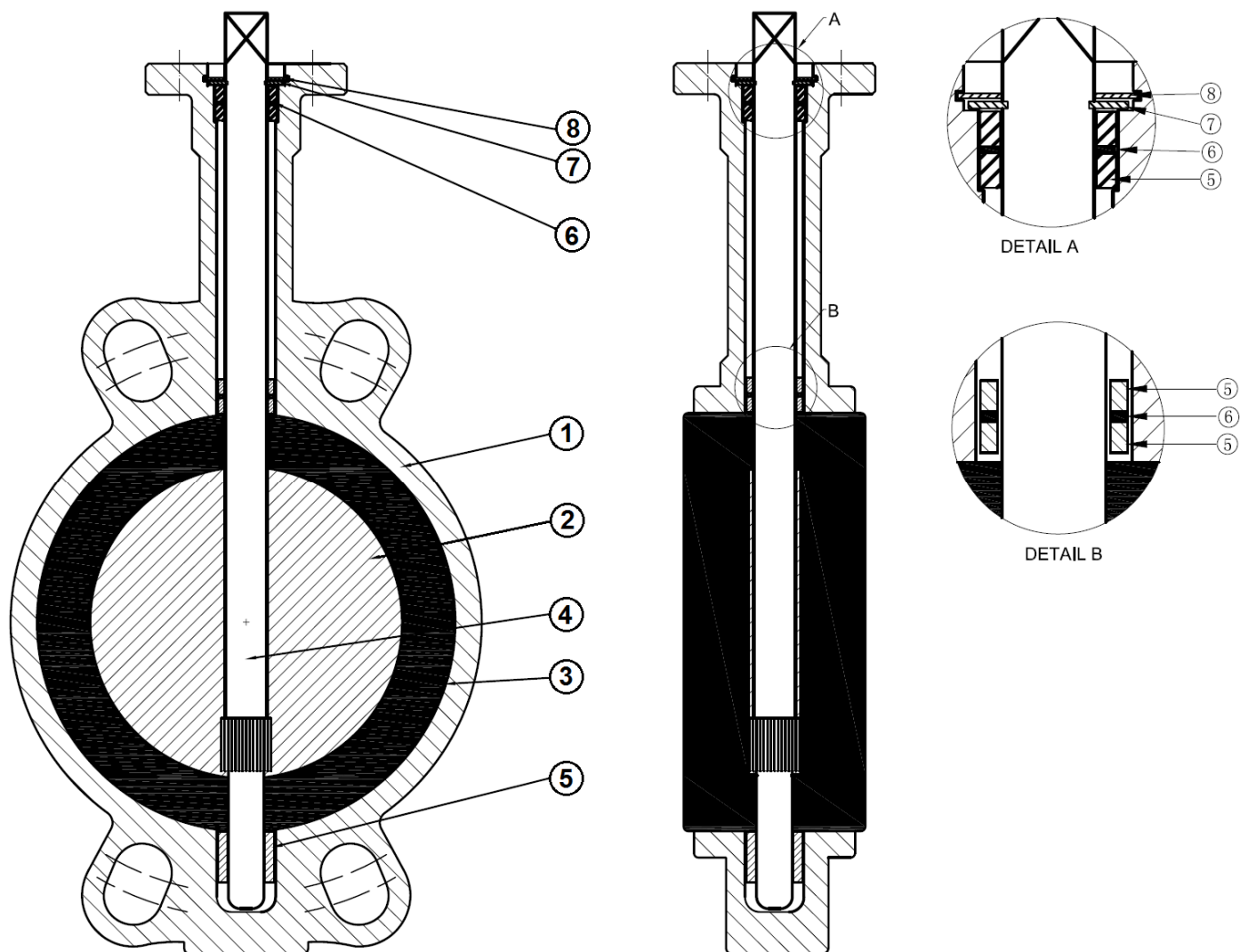
| DN   | 32/40 | 50 | 65 | 80 | 100 | 125 | 150 | 200 | 250 | 300 | 350 | 400 | 450  | 500  | 600  | 700  | 800  | 900  | 1000  | 1200  |
|------|-------|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|-------|-------|
| PN10 | 11    | 15 | 24 | 31 | 48  | 73  | 106 | 177 | 281 | 410 | 475 | 746 | 1112 | 1356 | 2468 | 4908 | 6462 | 7886 | 13389 | 18833 |
| PN16 | 12    | 16 | 26 | 33 | 53  | 81  | 119 | 194 | 308 | 441 | -   | -   | -    | -    | -    | -    | -    | -    | -     | -     |

**RANGE :**

- With lever from DN32/40 to DN300
- With gear box from DN350 to DN1200
- Gear box possible from DN32/40 to DN300 **Ref.1198**

**WAFER BUTTERFLY VALVE PN10/16**

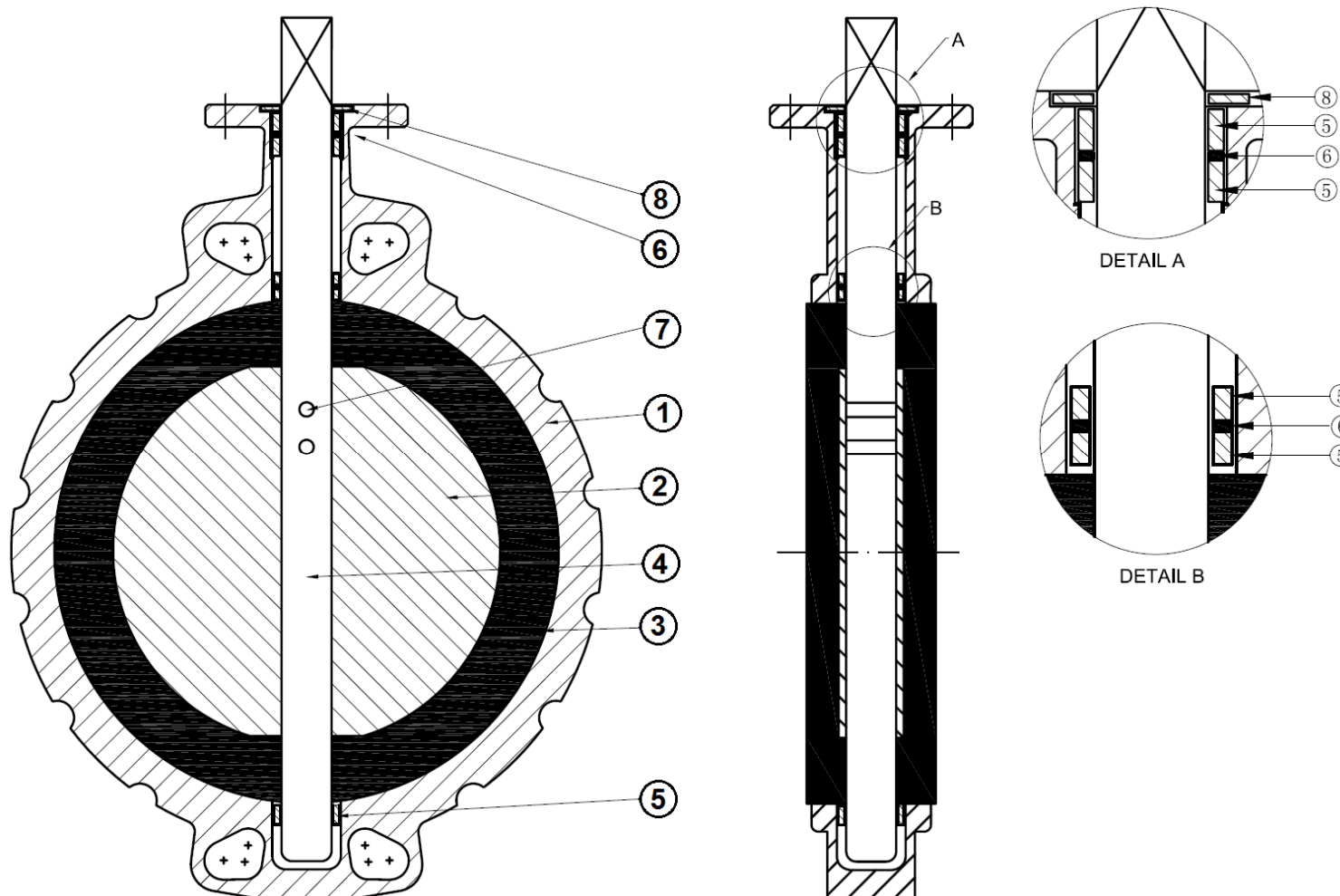
MATERIALS DN 32/40 – 300 :



| Item | Designation  | Materials                                  |
|------|--------------|--------------------------------------------|
| 1    | Body         | Cast iron EN GJL-250                       |
| 2    | Disc         | Ductile iron EN GJS-400-15 nicketed coated |
| 3    | Elastic ring | EPDM                                       |
| 4    | Stem         | SS 416                                     |
| 5    | Bearing      | PTFE                                       |
| 6    | O ring       | EPDM                                       |
| 7    | Circlip      | Steel                                      |
| 8    | Circlip      | Steel                                      |
|      | Lever        | Aluminium                                  |

**WAFER BUTTERFLY VALVE PN10/16**

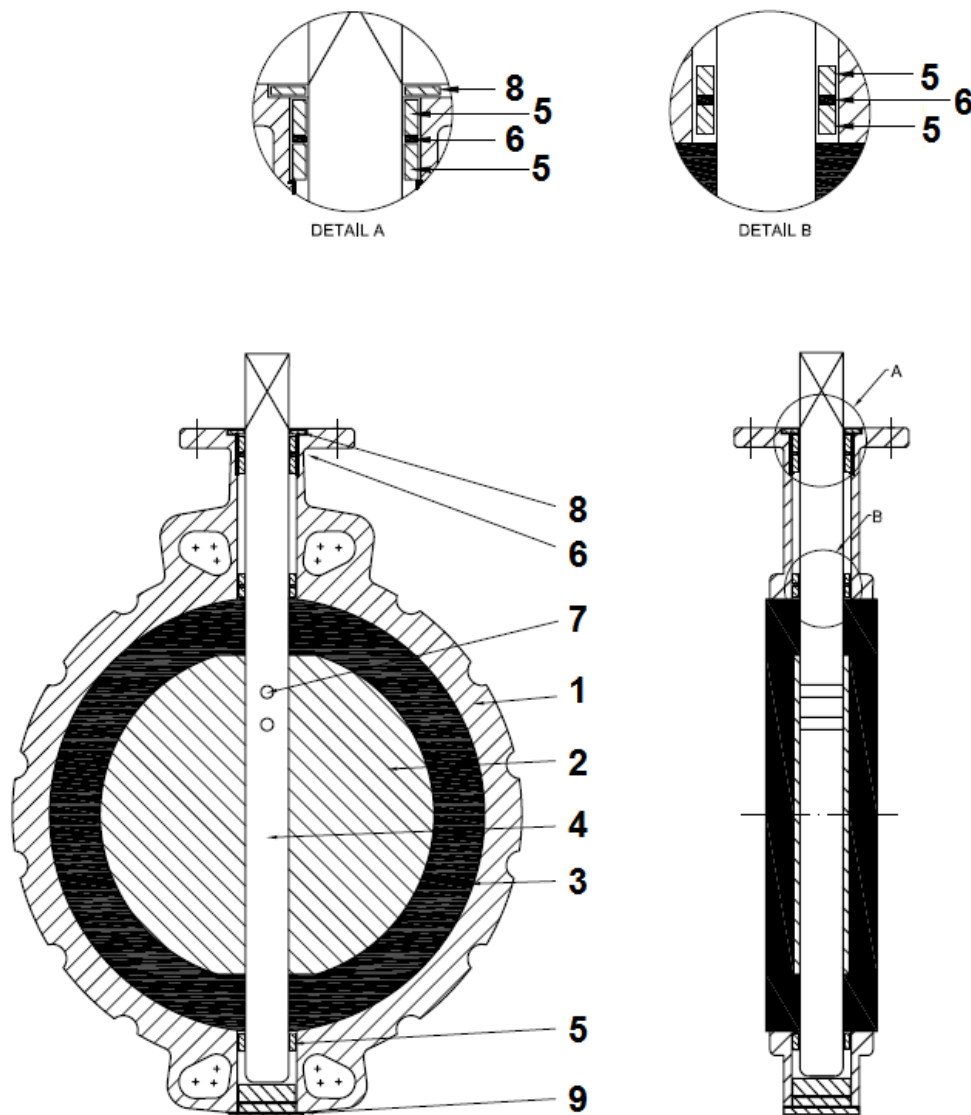
MATERIALS DN 350 :



| Item | Designation  | Materials                                  |
|------|--------------|--------------------------------------------|
| 1    | Body         | Cast iron EN GJL-250                       |
| 2    | Disc         | Ductile iron EN GJS-400-15 nicketed coated |
| 3    | Elastic ring | EPDM                                       |
| 4    | Stem         | SS 431                                     |
| 5    | Bearing      | PTFE                                       |
| 6    | O ring       | EPDM                                       |
| 7    | Pin          | SS 316                                     |
| 8    | Gasket       | EPDM                                       |

**WAFER BUTTERFLY VALVE PN10/16**

MATERIALS DN 400-600 :

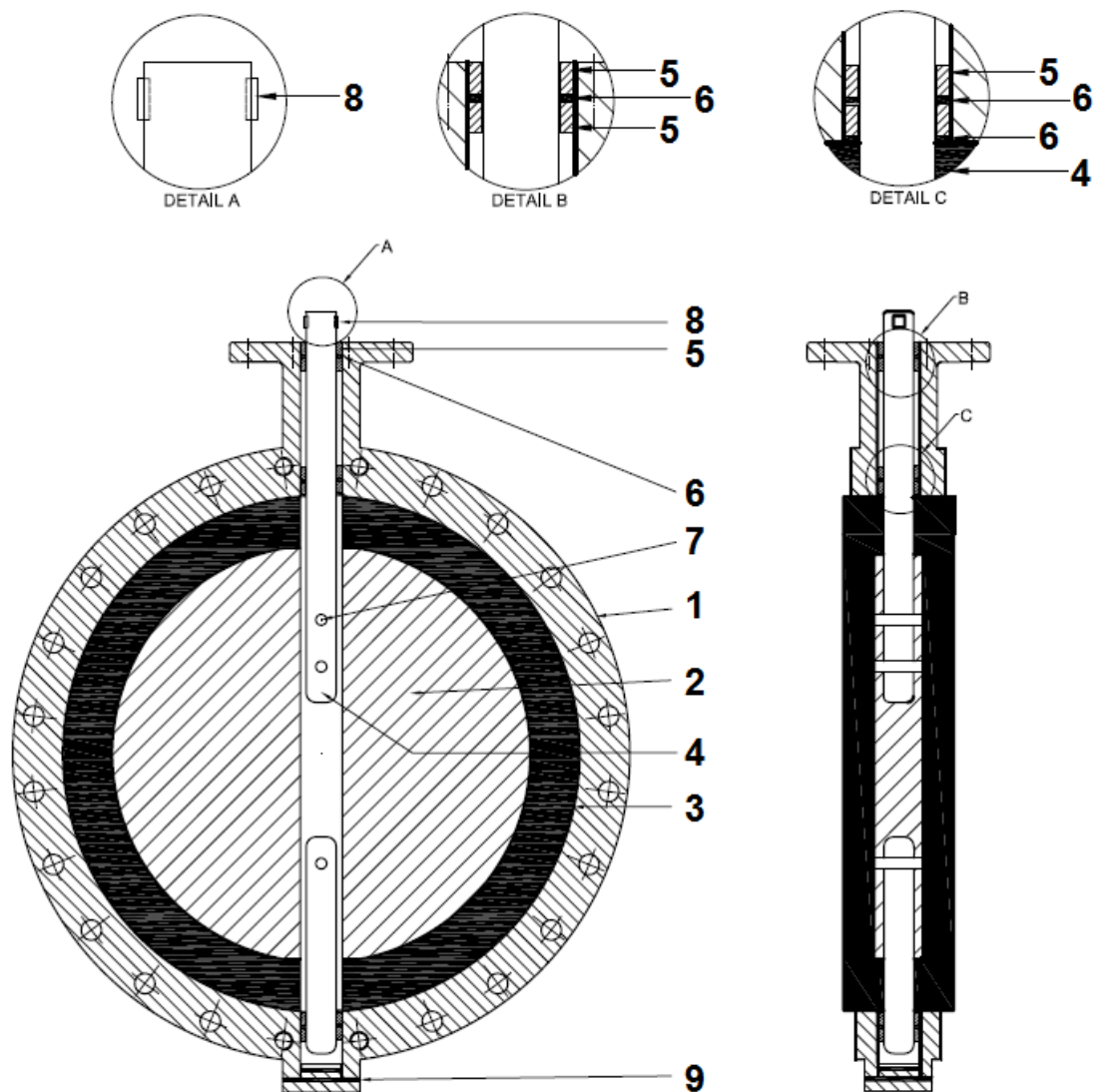


| Item | Designation  | Materials                                  |
|------|--------------|--------------------------------------------|
| 1    | Body         | Cast iron EN GJL-250                       |
| 2    | Disc         | Ductile iron EN GJS-400-15 nicketed coated |
| 3    | Elastic ring | EPDM                                       |
| 4    | Stem         | SS 431                                     |
| 5    | Bushing      | PTFE                                       |
| 6    | O ring       | EPDM                                       |
| 7    | Pin          | SS 316                                     |
| 8    | Gasket       | EPDM                                       |
| 9    | Gasket       | EPDM                                       |



**WAFER BUTTERFLY VALVE PN10/16**

MATERIALS DN 700 – 1200 :

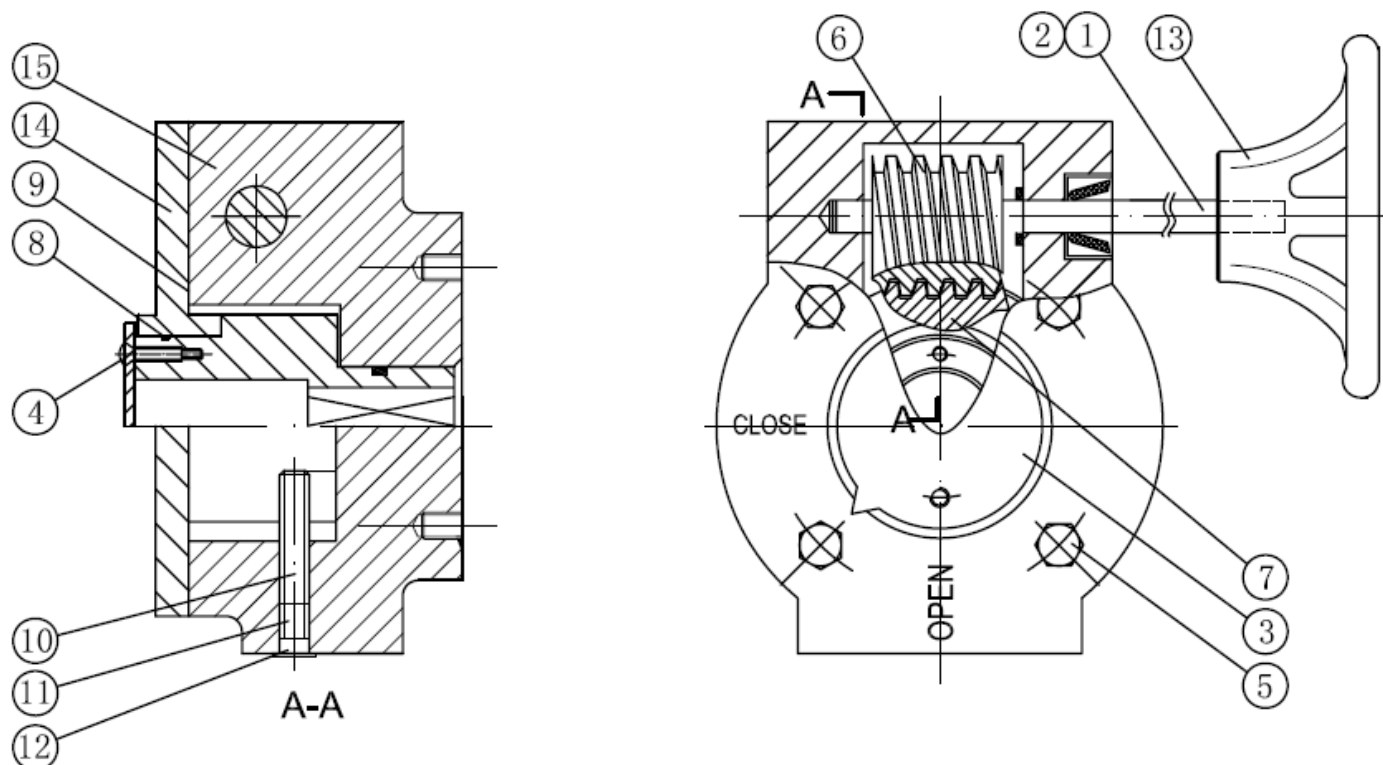


| Item | Designation  | Materials                                   |
|------|--------------|---------------------------------------------|
| 1    | Body         | Cast iron EN GJL-250                        |
| 2    | Disc         | Ductile iron EN GJS-400-15 nickerled coated |
| 3    | Elastic ring | EPDM                                        |
| 4    | Stem         | SS 431                                      |
| 5    | Bushing      | Aluminium + Bronze                          |
| 6    | O ring       | EPDM                                        |
| 7    | Pin          | SS 316                                      |
| 8    | Pin          | SQ 719                                      |
| 9    | Gasket       | EPDM                                        |

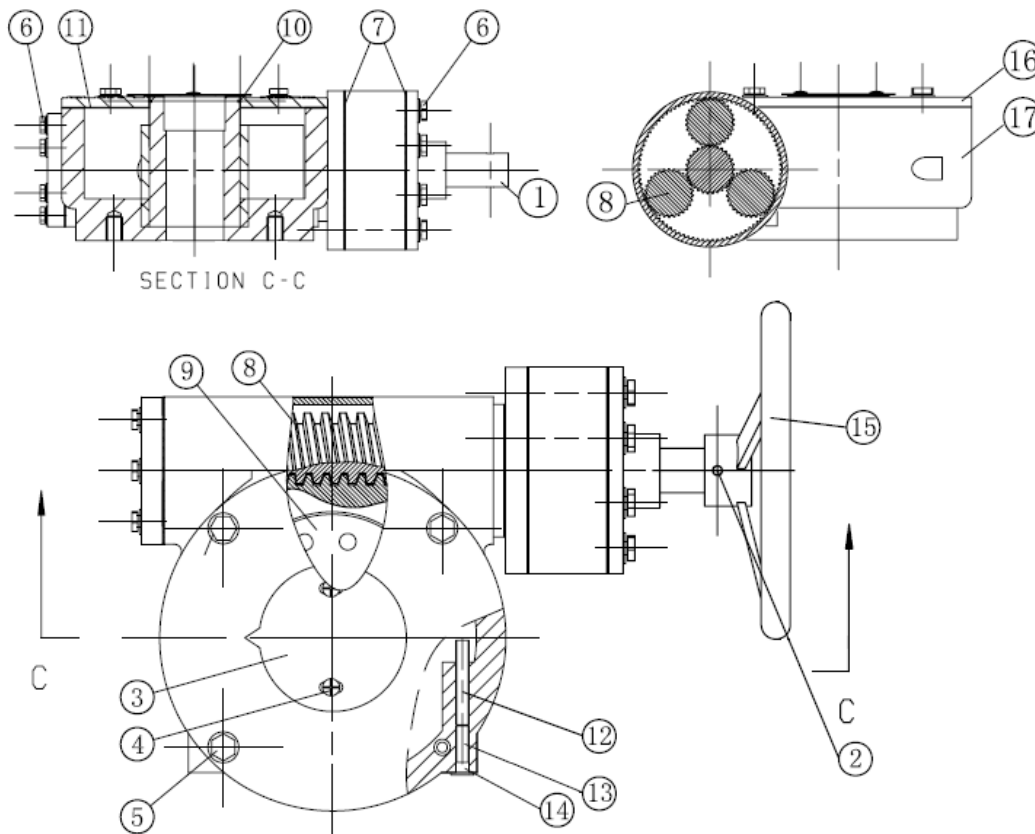


**WAFER BUTTERFLY VALVE PN10/16**

**MATERIALS GEARBOX DN40-450 :**



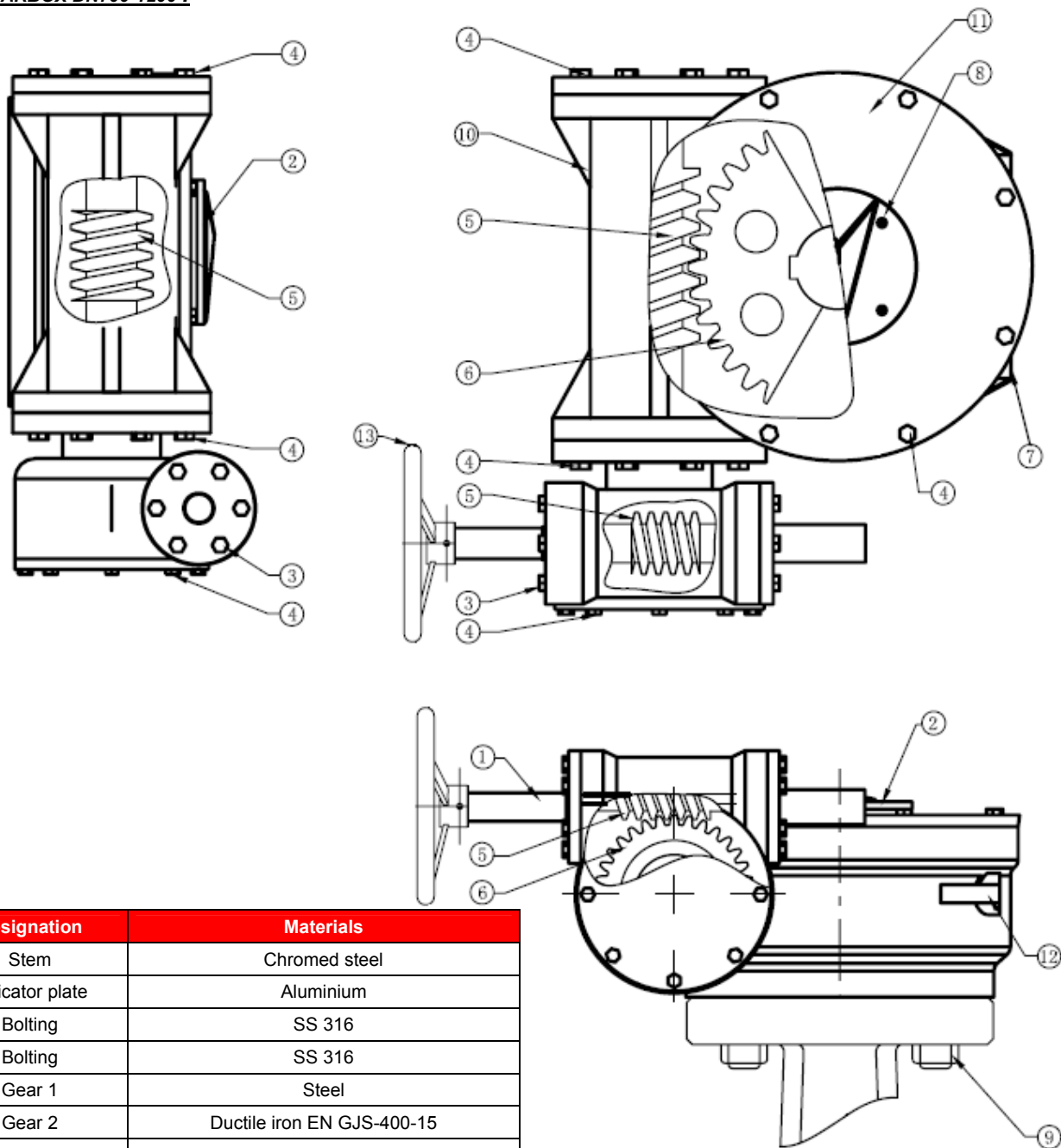
| Item | Designation             | Materials                          |
|------|-------------------------|------------------------------------|
| 1    | Stem                    | Chromed steel                      |
| 2    | Pin                     | SS 316                             |
| 3    | Indicator plate         | Aluminium + NBR gasket             |
| 4    | Indicator bolt, washer  | SS 316                             |
| 5    | Bolt, washer            | SS 316                             |
| 6    | Gear 1                  | Steel                              |
| 7    | Gear 2                  | Ductile iron EN GJS-400-15         |
| 8    | O ring                  | NBR                                |
| 9    | Bonnet gasket           | NBR                                |
| 10   | Internal set screw      | Carbon steel                       |
| 11   | External set screw      | SS 316                             |
| 12   | Plastic cap             | Plastic                            |
| 13   | Handwheel               | Cast iron EN GJL-250 epoxy coating |
| 14   | Bonnet                  | Cast iron EN GJL-250 epoxy coating |
| 15   | Body                    | Cast iron EN GJL-250 epoxy coating |
|      | Bolting to fix on valve | SS 304                             |

**WAFER BUTTERFLY VALVE PN10/16**
**MATERIALS GEARBOX DN500-600 :**


| Item | Designation             | Materials                          |
|------|-------------------------|------------------------------------|
| 1    | Stem                    | Chromed steel                      |
| 2    | Pin                     | SS 316                             |
| 3    | Indicator plate         | Aluminium + NBR                    |
| 4    | Indicator bolt, washer  | SS 316                             |
| 5    | Bolt, washer            | SS 316                             |
| 6    | Bolting                 | SS 316                             |
| 7    | Body gasket             | NBR                                |
| 8    | Gear 1                  | Steel                              |
| 9    | Gear 2                  | Ductile iron EN GJS-400-15         |
| 10   | O ring                  | NBR                                |
| 11   | Bonnet gasket           | NBR                                |
| 12   | Internal set screw      | Acier                              |
| 13   | External set screw      | SS 316                             |
| 14   | Cap                     | Plastic                            |
| 15   | Handwheel               | Cast iron EN GJL-250 epoxy coating |
| 16   | Bonnet                  | Cast iron EN GJL-250 epoxy coating |
| 17   | Body                    | Cast iron EN GJL-250 epoxy coating |
|      | Bolting to fix on valve | SS 304                             |

**WAFER BUTTERFLY VALVE PN10/16**

**MATERIALS GEARBOX DN700-1200 :**

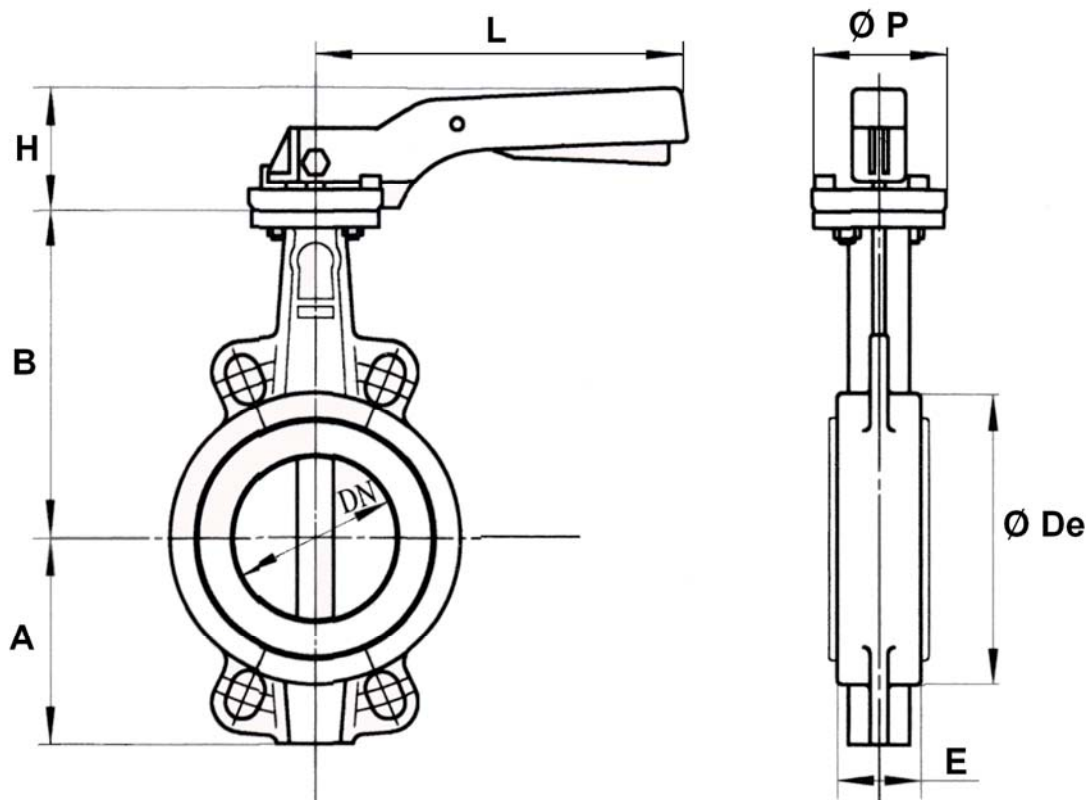


| Item | Designation        | Materials                                |
|------|--------------------|------------------------------------------|
| 1    | Stem               | Chromed steel                            |
| 2    | Indicator plate    | Aluminium                                |
| 3    | Bolting            | SS 316                                   |
| 4    | Bolting            | SS 316                                   |
| 5    | Gear 1             | Steel                                    |
| 6    | Gear 2             | Ductile iron EN GJS-400-15               |
| 7    | External set screw | SS 316                                   |
| 8    | Screw              | SS 316                                   |
| 9    | Bolting            | SS 304                                   |
| 10   | Body               | Cast iron EN GJL-250 epoxy coating       |
| 11   | Bonnet             | Cast iron EN GJL-250 epoxy coating       |
| 12   | Internal set screw | Steel                                    |
| 13   | Handwheel          | Ductile iron EN GJS-400-15 epoxy coating |

**WAFLER BUTTERFLY VALVE PN10/16**

VALVES SIZE ( in mm ) :

- VALVES WITH LEVER DN 32/40 - 300 :

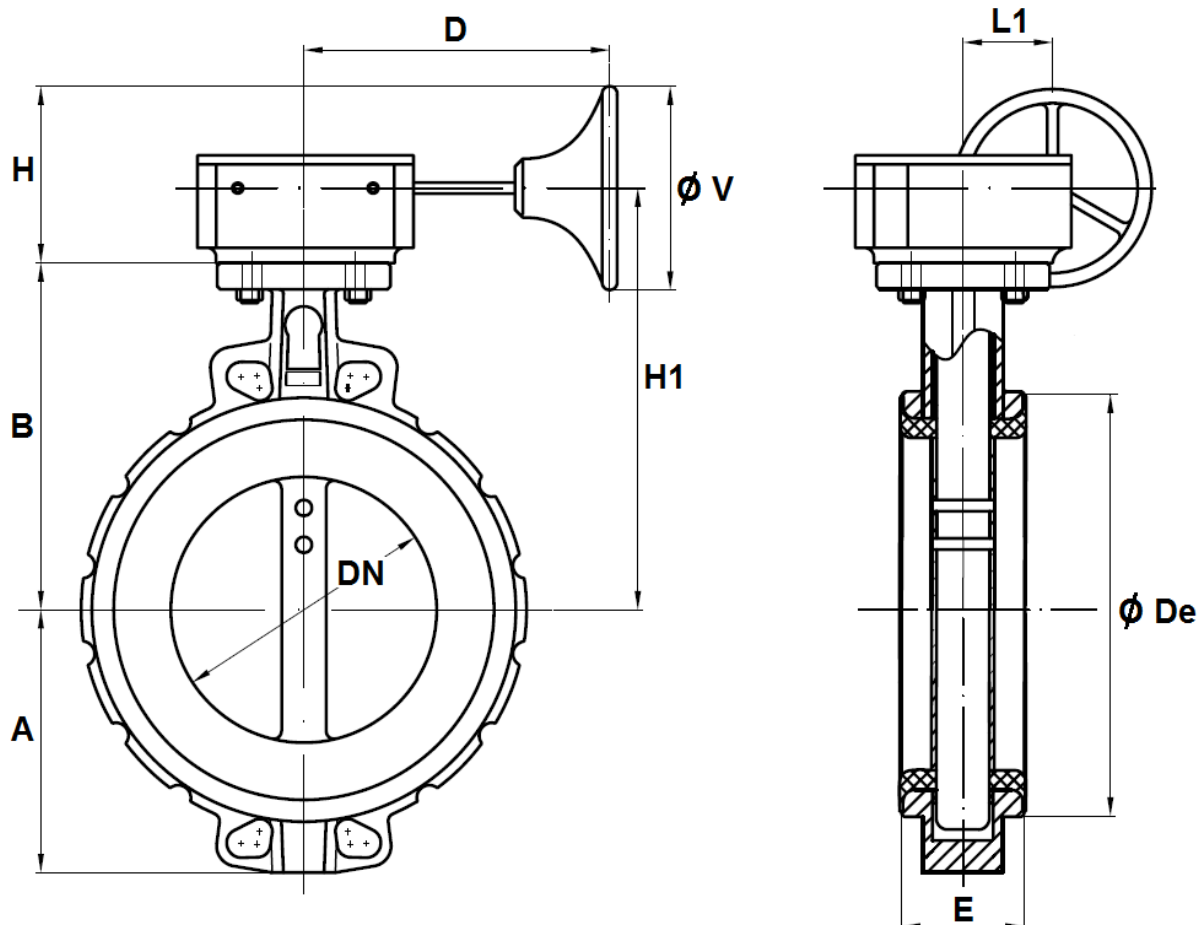


| Ref. | DN         | 32/40 | 50    | 65   | 80   | 100  | 125   | 150  | 200   | 250  | 300  |
|------|------------|-------|-------|------|------|------|-------|------|-------|------|------|
| 1125 | A          | 61    | 77    | 87,5 | 95   | 107  | 121,5 | 144  | 171   | 205  | 235  |
|      | B          | 130   | 136,5 | 142  | 158  | 180  | 192   | 215  | 242   | 280  | 310  |
|      | Ø De       | 82    | 95    | 109  | 127  | 152  | 180   | 207  | 260   | 315  | 370  |
|      | E          | 33    | 43    | 46   | 46   | 52   | 56    | 56   | 60    | 68   | 78   |
|      | H          | 70    | 70    | 70   | 70   | 70   | 71    | 71   | 40    | 44   | 44   |
|      | L          | 195   | 195   | 195  | 195  | 195  | 278   | 278  | 355   | 507  | 507  |
|      | Ø P        | 65    | 65    | 65   | 65   | 65   | 90    | 90   | 125   | 150  | 150  |
|      | Weig. (Kg) | 1.85  | 2.53  | 2.86 | 3.16 | 4.21 | 6.67  | 7.66 | 14.67 | 23.4 | 33.8 |

**WAFER BUTTERFLY VALVE PN10/16**

VALVES SIZE ( in mm ) :

- VALVES WITH GEAR BOX DN 350 :

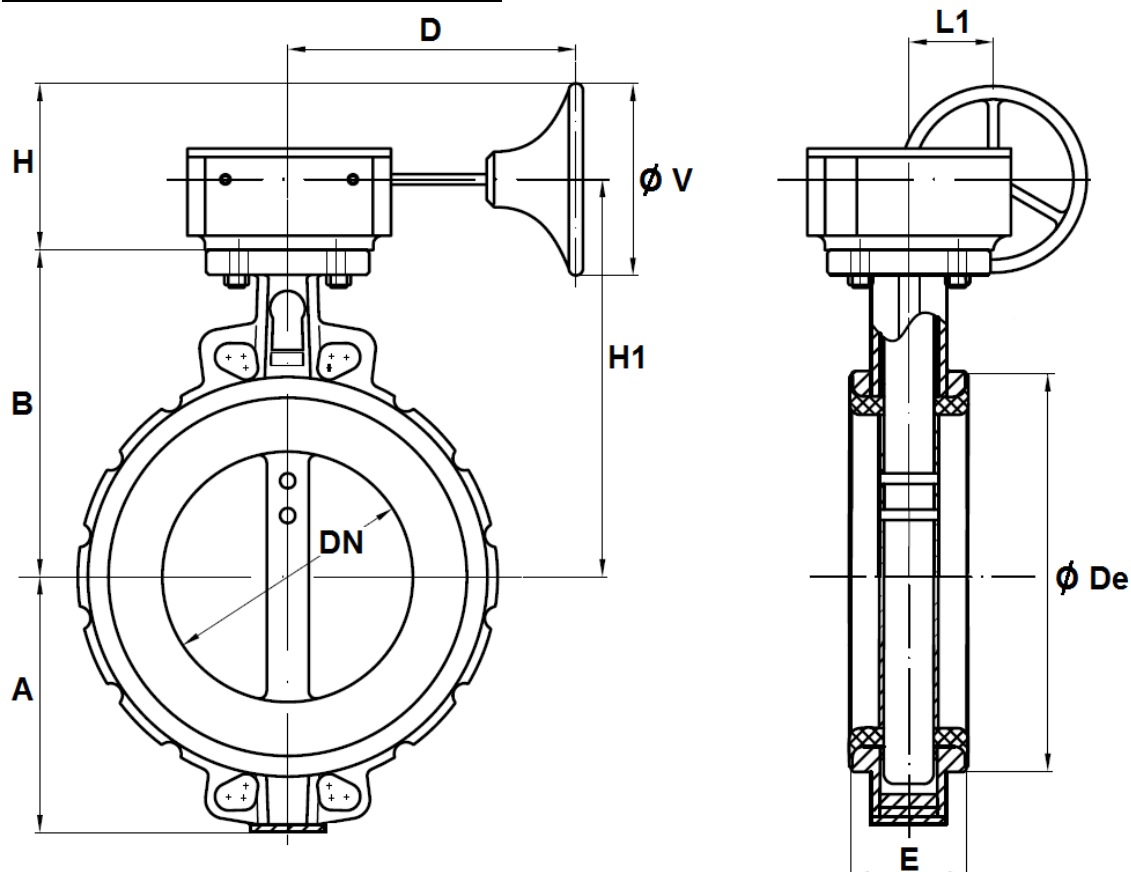


| Ref. | DN          | 350  |
|------|-------------|------|
| 1125 | A           | 260  |
|      | B           | 334  |
|      | D           | 223  |
|      | Ø De        | 418  |
|      | E           | 78   |
|      | H           | 190  |
|      | H1          | 379  |
|      | L1          | 78   |
|      | Ø V         | 300  |
|      | Weight (Kg) | 54.5 |

**WAFER BUTTERFLY VALVE PN10/16**

VALVES SIZE ( in mm ) :

- VALVES WITH GEAR BOX DN 400-600 :

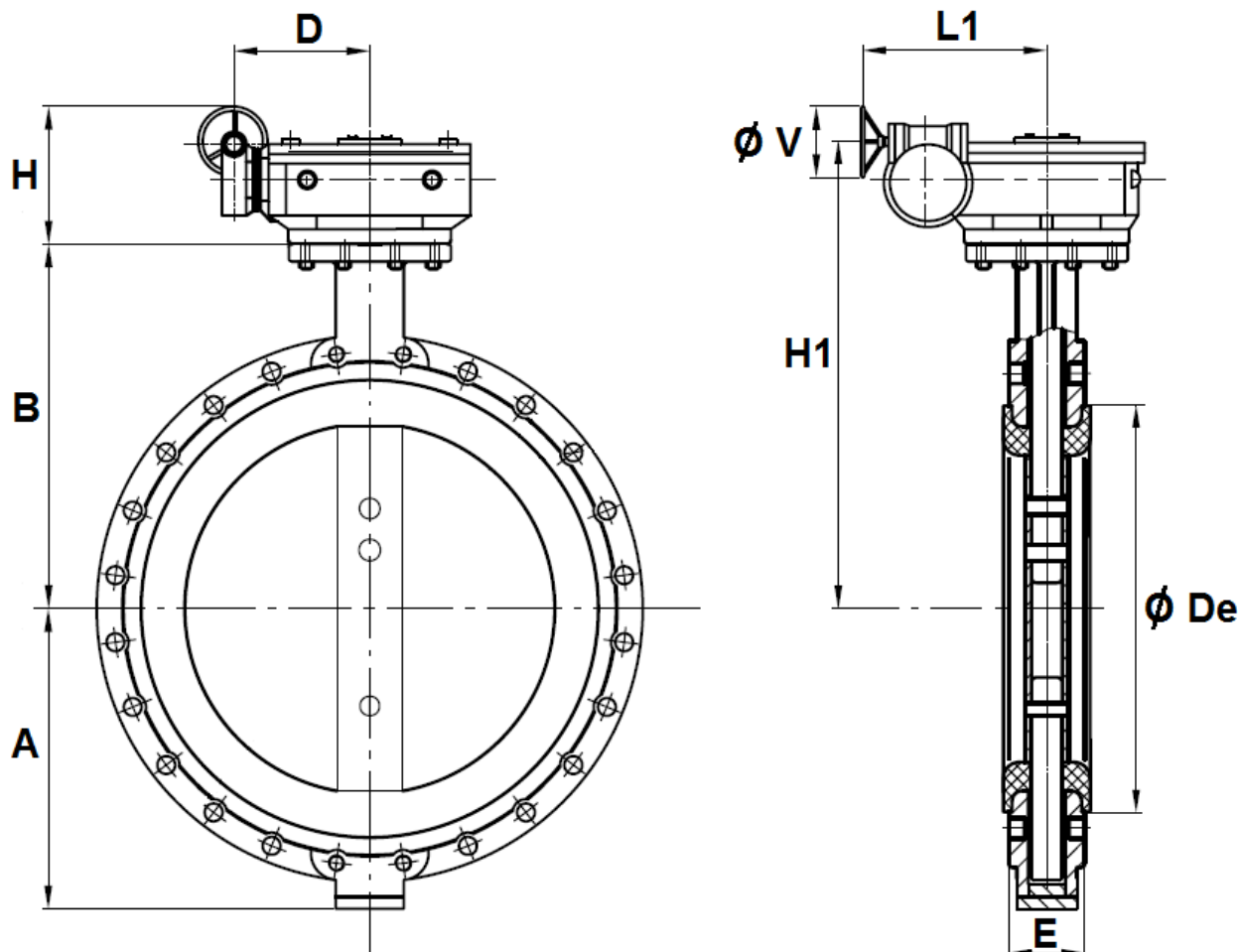


| Ref. | DN          | 400   | 450   | 500   | 600   |
|------|-------------|-------|-------|-------|-------|
| 1125 | A           | 307   | 339   | 368   | 459   |
|      | B           | 361   | 401   | 480   | 565   |
|      | D           | 270   | 270   | 339   | 339   |
|      | Ø De        | 470   | 525   | 570   | 697   |
|      | E           | 102   | 114   | 127   | 154   |
|      | H           | 208   | 258   | 222   | 222   |
|      | H1          | 423   | 463   | 545   | 630   |
|      | L1          | 120   | 120   | 120   | 120   |
|      | Ø V         | 400   | 400   | 300   | 300   |
|      | Weight (Kg) | 89.85 | 107.4 | 155.8 | 231.1 |

**WAFLER BUTTERFLY VALVE PN10/16**

VALVES SIZE ( in mm ) :

- VALVES WITH GEAR BOX DN 700-1200 :

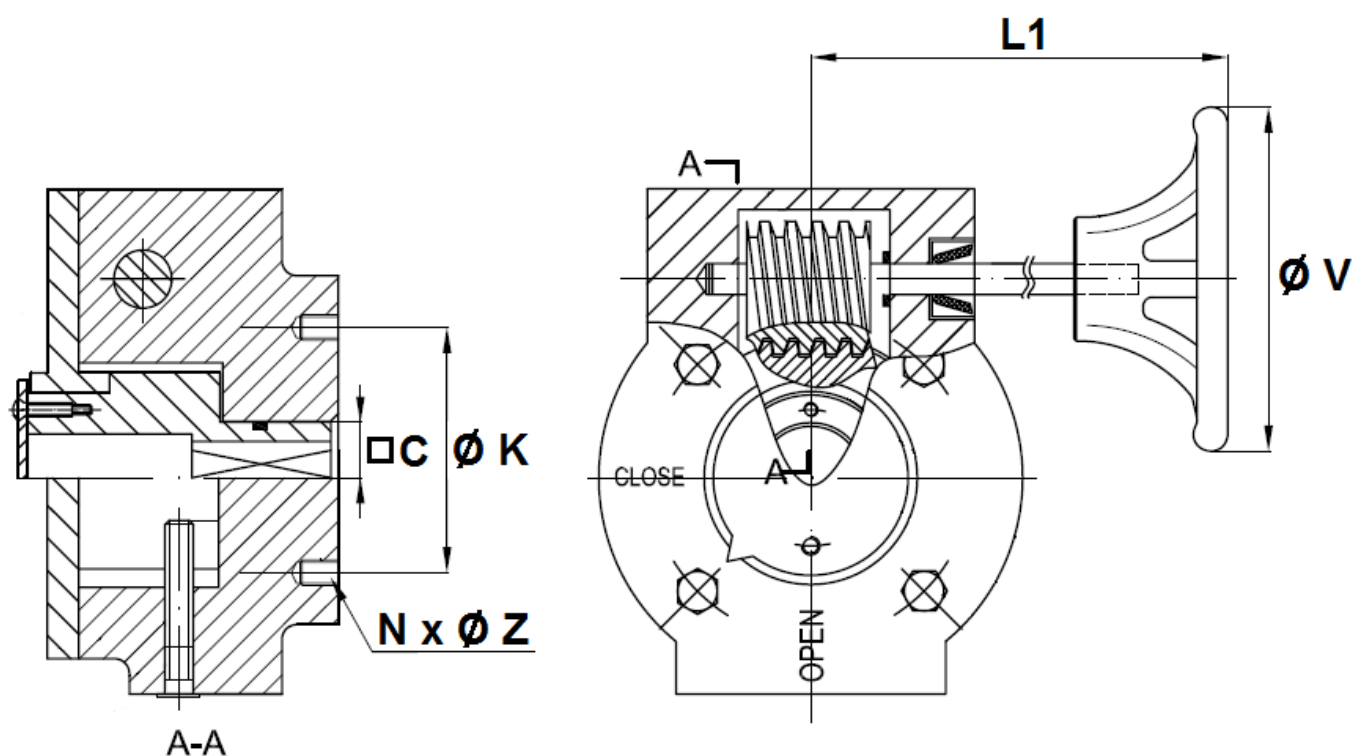


| Ref. | DN          | 700 | 800 | 900  | 1000 | 1200 |
|------|-------------|-----|-----|------|------|------|
| 1125 | A           | 520 | 591 | 656  | 721  | 860  |
|      | B           | 624 | 672 | 720  | 800  | 941  |
|      | D           | 367 | 367 | 410  | 410  | 500  |
|      | Ø De        | 800 | 906 | 1015 | 1134 | 1331 |
|      | E           | 163 | 188 | 203  | 216  | 276  |
|      | H           | 382 | 382 | 476  | 476  | 528  |
|      | H1          | 725 | 785 | 944  | 994  | 1228 |
|      | L1          | 243 | 243 | 278  | 278  | 458  |
|      | Ø V         | 400 | 400 | 450  | 450  | 450  |
|      | Weight (Kg) | 372 | 456 | 831  | 982  | 1510 |



**WAFER BUTTERFLY VALVE PN10/16**

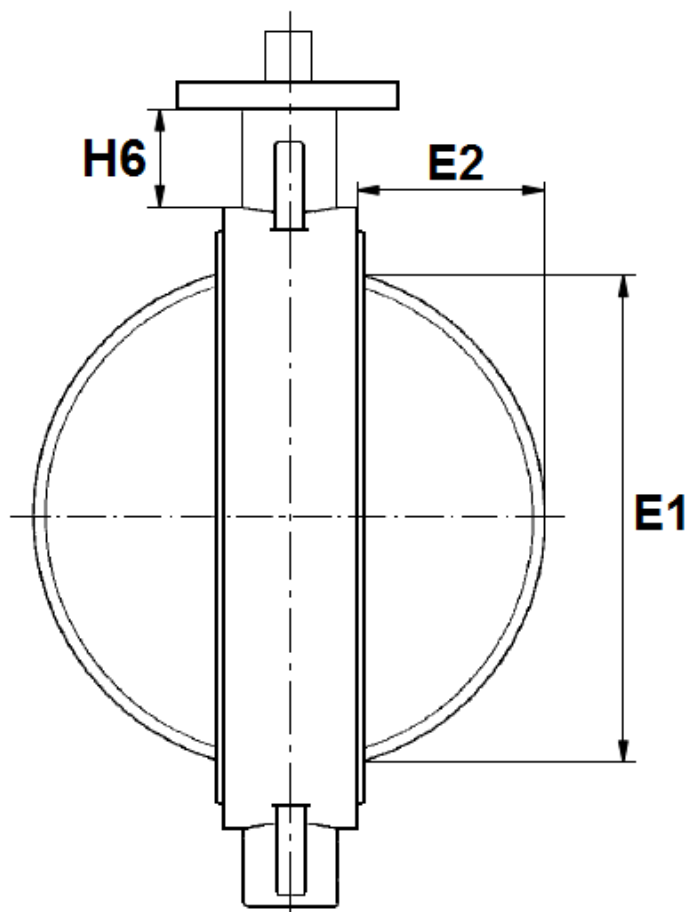
GEAR BOX SIZE DN32/40-300 ( in mm ) :



| DN          | 32/80   | 100     | 125/150 | 200     | 250     | 300     |
|-------------|---------|---------|---------|---------|---------|---------|
| C           | 9       | 11      | 14      | 17      | 22      | 27      |
| Ø K         | 50      | 50      | 70      | 102     | 125     | 125     |
| N x Ø Z     | 4 x M6  | 4 x M6  | 4 x M8  | 4 x M10 | 4 x M12 | 4 x M12 |
| L1          | 156     | 156     | 156     | 241     | 223     | 223     |
| Ø V         | 150     | 150     | 250     | 300     | 300     | 300     |
| Weight (kg) | 3.51    | 4.22    | 3.53    | 6.99    | 7.42    | 9.6     |
| Ref.        | 1198001 | 1198002 | 1198003 | 1198004 | 1198005 | 1198006 |

**WAFER BUTTERFLY VALVE PN10/16**

DISC AND NECK SIZE ( in mm ) :

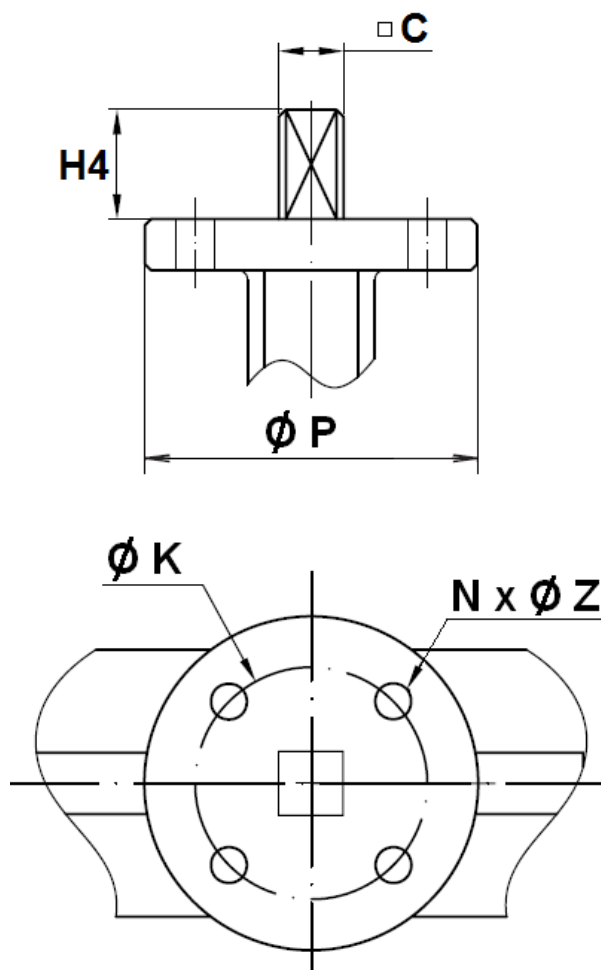


| DN    | 32/40 | 50 | 65   | 80   | 100  | 125   | 150  | 200   | 250   | 300   | 350   | 400   | 450   | 500   | 600   |
|-------|-------|----|------|------|------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| E1 ±1 | 22.8  | 26 | 41.2 | 61.1 | 88   | 109.2 | 144  | 192.3 | 240   | 290.5 | 323.4 | 375   | 424.5 | 473.7 | 570.9 |
| E2 ±2 | 4.9   | 5  | 9.4  | 16.5 | 26.1 | 33.9  | 49.7 | 71.2  | 91.2  | 111.8 | 127.8 | 143.9 | 163.3 | 182.3 | 219.3 |
| H6 ±2 | 76.7  | 79 | 79   | 87.5 | 92.3 | 90.3  | 99.2 | 99.5  | 103.8 | 105.8 | 105.8 | 109.5 | 113   | 172   | 192   |

| DN    | 700   | 750   | 800   | 900   | 1000  | 1200   |
|-------|-------|-------|-------|-------|-------|--------|
| E1 ±1 | 672.8 | 723.5 | 770.1 | 838.5 | 937   | 1122.1 |
| E2 ±2 | 265.3 | 288.5 | 303.2 | 330.8 | 373.7 | 441    |
| H6 ±2 | 200   | 201   | 190   | 179   | 206.5 | 228    |

**WAFER BUTTERFLY VALVE PN10/16**

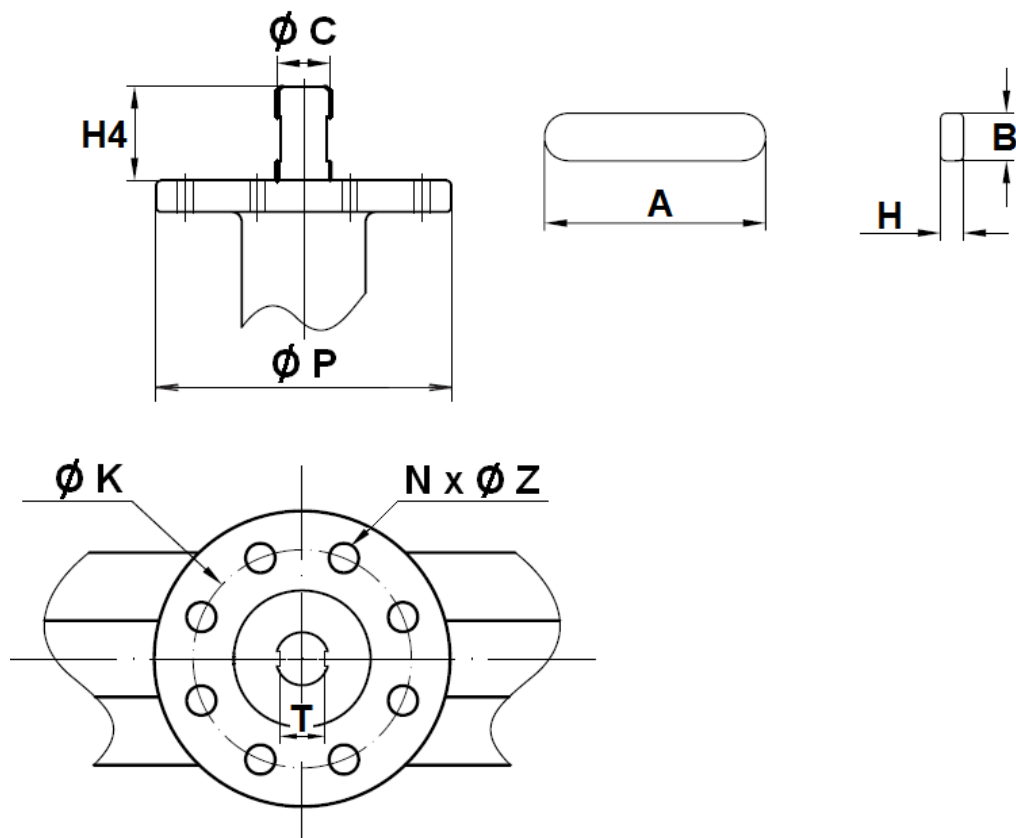
ISO MOUNTING PAD SIZE ( in mm ) DN 32 – 600 :



| DN                | 32/40 | 50    | 65    | 80    | 100   | 125   | 150   | 200    | 250    | 300    | 350    | 400    | 450    | 500    | 600    |
|-------------------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|
| C                 | 9     | 9     | 9     | 9     | 11    | 14    | 14    | 17     | 22     | 27     | 27     | 27     | 30     | 36     | 46     |
| $\phi K$          | 50    | 50    | 50    | 50    | 50    | 70    | 70    | 102    | 125    | 125    | 125    | 125    | 165    | 165    | 165    |
| ISO               | F05   | F05   | F05   | F05   | F05   | F07   | F07   | F10    | F12    | F12    | F12    | F12    | F16    | F16    | F16    |
| $N \times \phi Z$ | 4 x 7 | 4 x 7 | 4 x 7 | 4 x 7 | 4 x 7 | 4 x 9 | 4 x 9 | 4 x 11 | 4 x 13 | 4 x 13 | 4 x 14 | 4 x 14 | 4 x 22 | 4 x 22 | 4 x 22 |
| H4                | 32    | 32    | 32    | 32    | 32    | 42    | 42    | 36     | 38     | 38     | 45     | 50     | 50     | 65     | 70     |
| $\phi P$          | 65    | 65    | 65    | 65    | 65    | 90    | 90    | 125    | 150    | 150    | 150    | 150    | 210    | 210    | 300    |

**WAFER BUTTERFLY VALVE PN10/16**

ISO MOUNTING PAD SIZE ( in mm ) DN 700 – 1200 :



| DN                | 700    | 800    | 900    | 1000   | 1200   |
|-------------------|--------|--------|--------|--------|--------|
| $\phi C$          | 63.35  | 63.35  | 75     | 85     | 105    |
| $\phi K$          | 254    | 254    | 254    | 254    | 298    |
| ISO               | F25    | F25    | F25    | F25    | F30    |
| $N \times \phi Z$ | 8 x 18 | 8 x 18 | 8 x 18 | 8 x 18 | 8 x 22 |
| H4                | 80     | 80     | 118    | 142    | 150    |
| $\phi P$          | 300    | 300    | 300    | 300    | 350    |
| A                 | 60     | 60     | 100    | 110    | 110    |
| B                 | 18     | 18     | 20     | 22     | 28     |
| H                 | 11     | 11     | 12     | 14     | 16     |

**WAFER BUTTERFLY VALVE PN10/16**
**GEARBOX SPECIFICATIONS :**

| DN                 | 32/80   | 100     | 125/150 | 200     | 250     | 300     |
|--------------------|---------|---------|---------|---------|---------|---------|
| Ref.               | 1198001 | 1198002 | 1198003 | 1198004 | 1198005 | 1198006 |
| Ratio factor       | 24 :1   | 24 :1   | 24 :1   | 30 :1   | 30 :1   | 50 :1   |
| Input torque (Nm)  | 18      | 18      | 18      | 58      | 58      | 60      |
| Output torque (Nm) | 170     | 170     | 170     | 700     | 700     | 1200    |

| DN                 | 350   | 400   | 450   | 500    | 600    | 700    | 800    | 900    | 1000   | 1200    |
|--------------------|-------|-------|-------|--------|--------|--------|--------|--------|--------|---------|
| Ratio factor       | 50 :1 | 80 :1 | 80 :1 | 260 :1 | 300 :1 | 704 :1 | 704 :1 | 832 :1 | 832 :1 | 1056 :1 |
| Input torque (Nm)  | 60    | 78    | 78    | 30     | 45     | 95     | 95     | 178    | 178    | 260     |
| Output torque (Nm) | 1200  | 2500  | 2500  | 2500   | 4000   | 8000   | 8000   | 15000  | 15000  | 25000   |

**STANDARDS :**

- Fabrication according to ISO 9001 :2008
- Designing according to API 609
- DIRECTIVE 97/23/CE : CE N° 0035  
Risk category I-III module H
- Tests according to API 598
- Length according to ISO 5752 series 20, EN 558 series 20 ( NF 29305 )
- ISO 5211 mounting pad
- Between flanges according to EN 1092-2 PN10/16 and ASME B16.5 ISO PN20 ANSI150

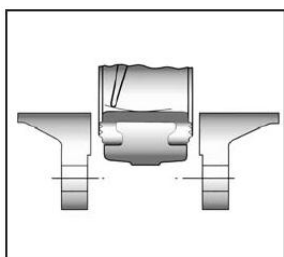
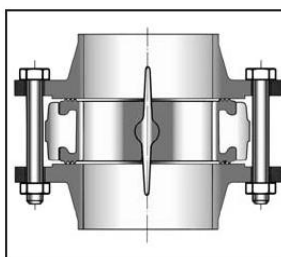
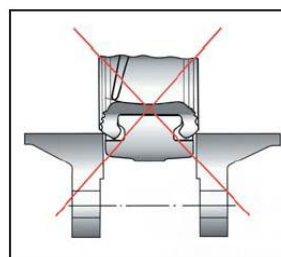
ADVICE :Our opinion and our advice are not guaranteed and Lauridsen Industri shall not be liable for the consequences of damages.

**WAFFER BUTTERFLY VALVE PN10/16**
**INSTALLATION INSTRUCTIONS**
**GENERAL GUIDELINES :**

- Ensure that the valves to be used are appropriate for the conditions of the installation (type of fluid, pressure and temperature).
- Be sure to have enough valves to be able to isolate the sections of piping as well as the appropriate equipment for maintenance and repair.
- Ensure that the valves to be installed are of correct strength to be able to support the capacity of their usage.
- **Installation of all circuits should ensure that their function can be automatically tested on a regular basis (at least two times a year).**

**INSTALLATION INSTRUCTIONS :**

- **Before installing the valves, clean and remove any objects from the pipes** (in particular bits of sealing and metal) which could obstruct and block the valves.
- **Ensure that both connecting pipes either side of the valve (upstream and downstream) are aligned (if they're not, the valves may not work correctly).**
- **Make sure that the two sections of the pipe (upstream and downstream) match, the valve unit will not absorb any gaps. Any distortions in the pipes may affect the tightness of the connection, the working of the valve and can even cause a rupture.** To be sure, place the kit in position to ensure the assembling will work.
- **If sections of piping do not have their final support in place, they should be temporarily fixed. This is to avoid unnecessary strain on the valve.**
- The valve must be inserted between flanges with disc half opened but the disc must not overpass the valve thickness. Position the bolts to keep centered the valve. Then open fully the valve and tighten the bolts. **See graph under.**


**Half open valve introduction**

**Complete opened disc valves  
when screw tightening**


- Tighten the bolts in cross.
- The disc must move easily inside the pipe.
- Valves must be opened during cleaning operation.
- Tests must be done with a cleaned pipe.
- Tests must be done with opened valve. Test pressure must not be higher than the valve specification according to API 598.
- Then open slowly the valve.
- **Do not mount butterfly valves with stainless steel pressed collars and turning flanges without strias.**
- **And not on flat face flanges without strias ( example : painted cast iron fittings )**

**WAFFER BUTTERFLY VALVE PN10/16****MAINTENANCE :**

- We recommend to operate fully the valve 1 to 2 times per year.
- During maintenance operation, ensure that the pipe isn't under pressure, that there's no fluid in the pipe and that the valve is isolated. If there's a fluid in the pipe , evacuate it. Ensure that there are no risks due to the temperature or the fluid ( like acids ). If the fluid is corrosive , inert the installation before maintenance operation.