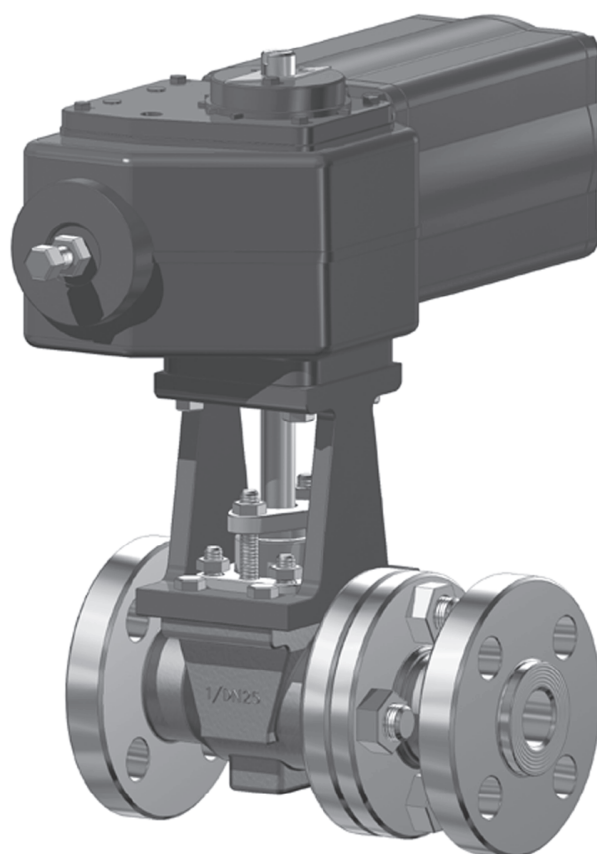


# FLANGED FULL BORE BALL VALVE

**Series XU**

**ASME Class 600 version**

Installation, Maintenance and  
Operating Instructions



## 6 MALFUNCTIONS

The following Table 8 lists malfunctions that might occur after prolonged use.

## 7 TOOLS

In addition to standard tools, the following special tools might be needed.

- ☐ For removal of the actuator:

| Extractor tools (Actuator Series B1C/B1J) |        |
|-------------------------------------------|--------|
| Product:                                  | ID:    |
| B1C/B1J 6                                 | 303821 |
| B1C 8-11 / B1J 8-10                       | 8546-1 |
| B1C 12-17 / B1J 12-16                     | 8546-2 |
| B1C/B1J 20                                | 8546-3 |
| B1C/B1J 25                                | 8546-4 |

- ☐ For removal of the locked seats:

| Seat removal tools |        |
|--------------------|--------|
| Product:           | ID:    |
| DN 25 (1")         | 270073 |
| DN 40 (1½")        | 270075 |
| DN 50 (2")         | 270076 |
| DN 80 (3")         | 270078 |
| DN 100 (4")        | 270079 |

- ☐ For locking of the seats:

| Seat locking tools / Insertion tools |         |
|--------------------------------------|---------|
| Size:                                | ID:     |
| (1")                                 | H018890 |
| (1½")                                | H018889 |
| (2")                                 | H018886 |
| (3")                                 | H018885 |
| (4")                                 | H018881 |

These tools can be ordered from the manufacturer. Always give the valve type designation when ordering.

## 8 ORDERING SPARE PARTS

When ordering spare parts, always include the following information:

- ☐ type code, sales order number, serial number (stamped on a valve body)
- ☐ number of the parts list, part number, name of the part and quantity required

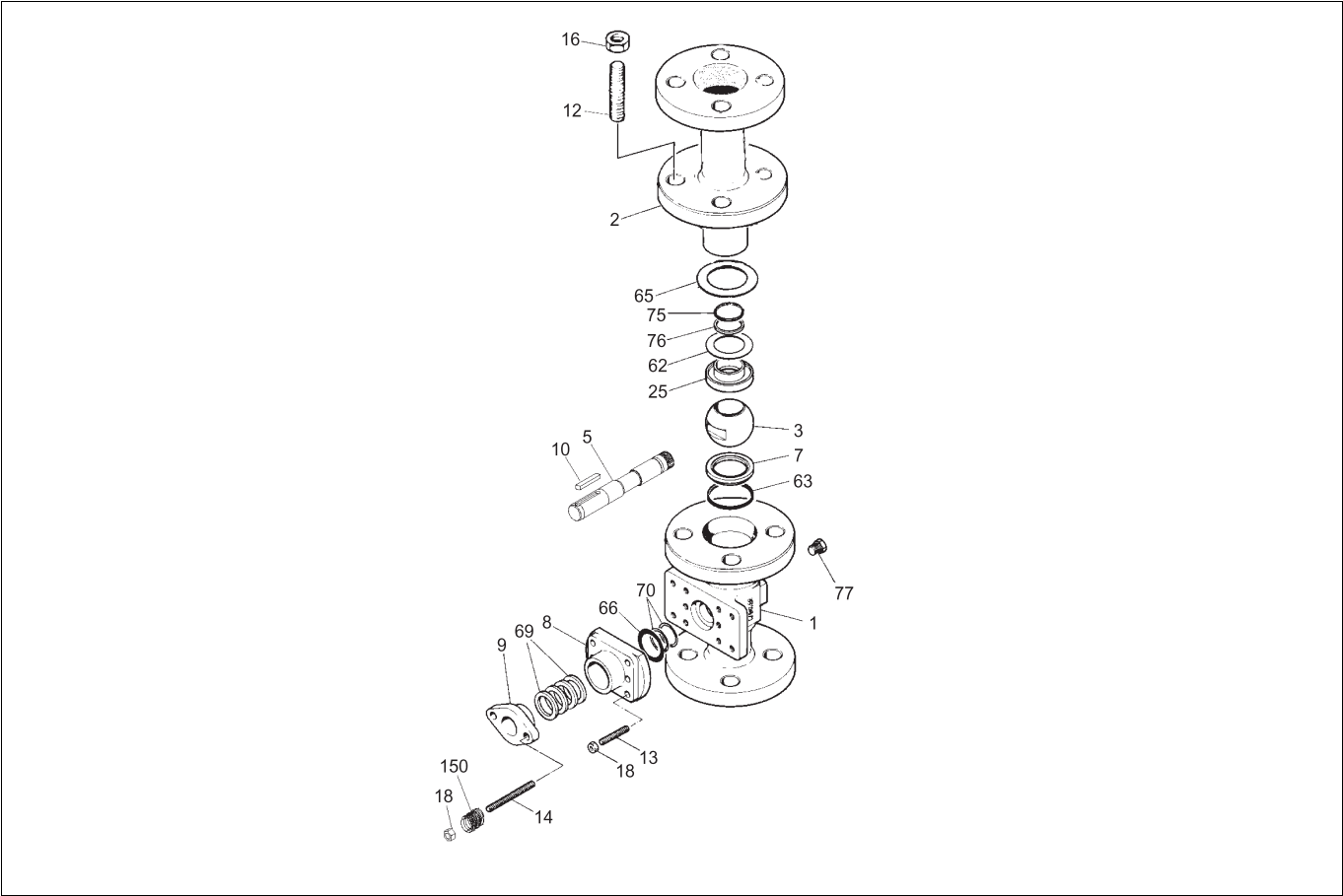
This information can be found from the identification plate or documents.

Table 8 Possible malfunctions

| Symptom                        | Possible fault                              | Actions                                           |
|--------------------------------|---------------------------------------------|---------------------------------------------------|
| Leakage through a closed valve | Wrong stop screw adjustment of the actuator | Adjust the stop screw for closed position         |
|                                | Damaged ball surface                        | Turn the ball by 180°                             |
|                                | Damaged seat(s)                             | Replace seat(s)                                   |
|                                | Ball cannot move freely                     | Clean the inside of the valve                     |
| Irregular valve movement       | Impurities between the ball and seats       | Flush the valve from the inside                   |
|                                |                                             | Clean the sealing surfaces and seats mechanically |
| Leakage through gland packing  | Loose packing                               | Tighten the nuts                                  |
|                                | Worn-out or damaged packing                 | Replace the gland packing                         |

9 EXPLODED VIEWS AND PARTS LISTS

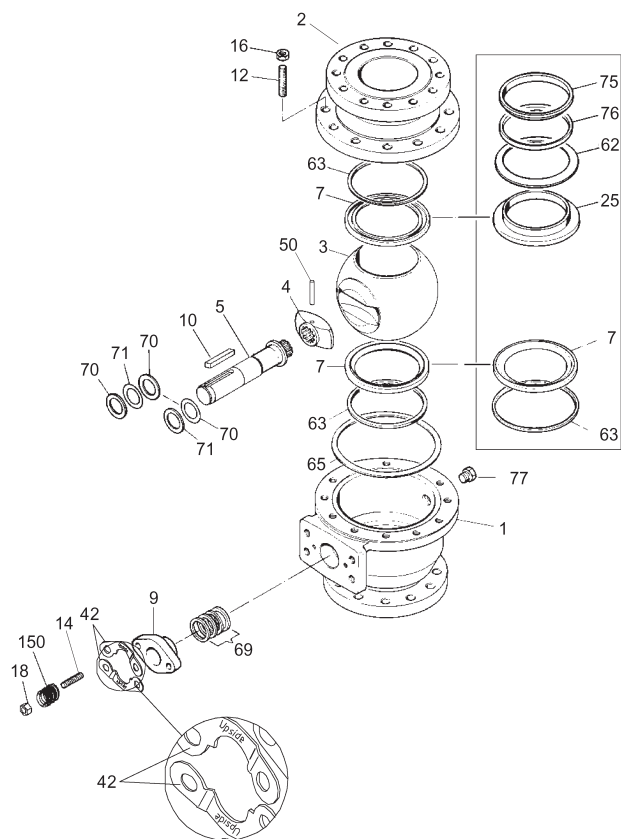
9.1 Sizes 1" - 1 1/2"



| Item | Qty | Description      | Spare part category |
|------|-----|------------------|---------------------|
| 1    | 1   | Body             |                     |
| 2    | 1   | Body cap         |                     |
| 3    | 1   | Ball             | 3                   |
| 5    | 1   | Shaft            | 3                   |
| 7    | 1   | Seat             | 2                   |
|      |     | Seat (H)         | 2                   |
| 8    | 1   | Bonnet           |                     |
| 9    | 1   | Gland            |                     |
| 10   | 1   | Key              | 3                   |
| 12   |     | Stud             |                     |
| 13   |     | Stud             |                     |
| 14   |     | Stud             |                     |
| 16   |     | Hexagon nut      |                     |
| 17   |     | Hexagon nut      |                     |
| 18   |     | Hexagon nut      |                     |
| 25   | 1   | Seat             | 2                   |
| 62   | 1   | Seat spring      | 2                   |
| 63   | 1   | Back seal (H, G) | 1                   |
|      | 2   | Back seal (J)    | 1                   |
| 65   | 1   | Body gasket      |                     |
| 66   | 1   | Gasket           | 1                   |
| 69   | 1   | Packing          | 1                   |
| 70   | 2   | Thrust bearing   | 3                   |
| 75   | 1   | Back seal        |                     |
| 76   | 1   | Back-up ring     | 2                   |
| 77   | 1   | Plug             |                     |
| 150  | 2   | Disc spring set  |                     |

Spare part (Spare Part Set): Recommended soft parts, always needed for the repair. Delivered as a set.  
Spare part category 2: Parts for replacing of the seat. Available also as a set.  
Spare part category 3: Parts for replacing of the closing element.  
Spares for the full overhaul: All parts from the categories 1, 2 and 3.

## 9.2 Size 2"



| Item | Qty | Description          | Spare part category |
|------|-----|----------------------|---------------------|
| 1    | 1   | Body                 |                     |
| 2    | 1   | Body cap             |                     |
| 3    | 1   | Ball                 | 3                   |
| 4    | 1   | Spline driver        | 3                   |
| 5    | 1   | Shaft                | 3                   |
| 7    | 2   | Seat (S, K)          | 2                   |
|      | 1   | Seat (H, G)          | 2                   |
|      | 2   | Seat (J)             | 2                   |
| 9    | 1   | Gland                |                     |
| 10   | 1   | Key                  | 3                   |
| 12   |     | Stud                 |                     |
| 14   |     | Stud                 |                     |
| 16   |     | Hexagon nut          |                     |
| 18   |     | Hexagon nut          |                     |
| 25   | 1   | Seat                 | 2                   |
| 42   | 2   | Retaining plate      |                     |
| 50   | 1   | Locking pin          |                     |
| 62   | 1   | Spring (H, G)        | 2                   |
| 63   | 2   | Back seal (S, K)     | 1                   |
|      | 1   | Back seal (H, G)     | 1                   |
|      | 2   | Back seal (J)        | 1                   |
| 65   | 1   | Body gasket          | 1                   |
| 69   | 1   | Packing / V-ring set | 1                   |
| 70   | 1   | Thrust bearing       | 3                   |
| 71   | 1   | Thrust bearing       | 3                   |
| 75   | 1   | Back seal (H, G)     | 1                   |
| 76   | 1   | Back-up ring (H, G)  | 2                   |
| 77   | 1   | Plug                 |                     |
| 150  | 2   | Disc spring set      |                     |

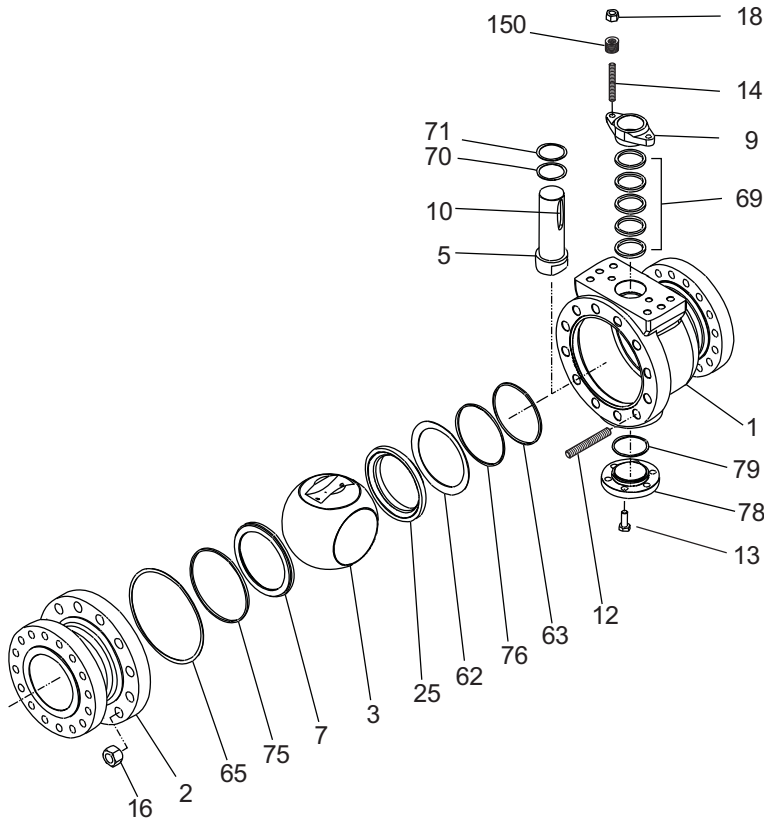
Spare part (Spare Part Set): Recommended soft parts, always needed for the repair. Delivered as a set.

Spare part category 2: Parts for replacing of the seat. Available also as a set.

Spare part category 3: Parts for replacing of the closing element.

Spares for the full overhaul: All parts from the categories 1, 2 and 3.

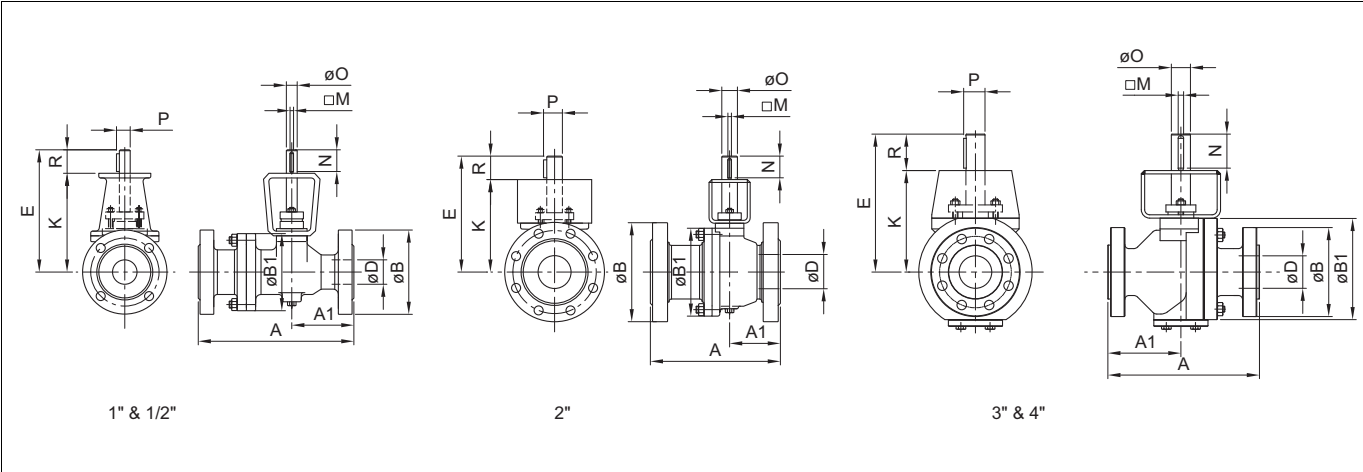
9.3     Sizes 3" and 4"



| Item | Qty | Description         | Spare part category |
|------|-----|---------------------|---------------------|
| 1    | 1   | Body                | 3                   |
| 2    | 1   | Body cap            |                     |
| 3    | 1   | Ball                |                     |
| 5    | 1   | Shaft               | 3                   |
| 7    | 1   | Seat                | 2                   |
| 9    | 1   | Gland               |                     |
| 10   | 1   | Key                 | 3                   |
| 12   |     | Stud                |                     |
| 13   |     | Screw               |                     |
| 14   |     | Stud                |                     |
| 16   |     | Hexagon nut         |                     |
| 18   |     | Hexagon nut         |                     |
| 25   | 1   | Seat                | 2                   |
| 62   |     | Spring              | 2                   |
| 63   | 1   | Back seal           | 1                   |
| 65   | 1   | Body gasket         | 1                   |
| 69   | 5   | Packing ring        | 1                   |
| 70   | 1   | Thrust bearing      | 3                   |
| 71   | 1   | Thrust bearing      | 3                   |
| 75   | 1   | Back seal (H, G)    | 1                   |
| 76   | 1   | Back-up ring (H, G) | 2                   |
| 78   | 1   | Bottom flange       |                     |
| 79   | 1   | Gasket              |                     |
| 150  | 2   | Disc spring set     |                     |

Spare part (Spare Part Set): Recommended soft parts, always needed for the repair. Delivered as a set.  
Spare part category 2: Parts for replacing of the seat. Available also as a set.  
Spare part category 3: Parts for replacing of the closing element.  
Spares for the full overhaul: All parts from the categories 1, 2 and 3.

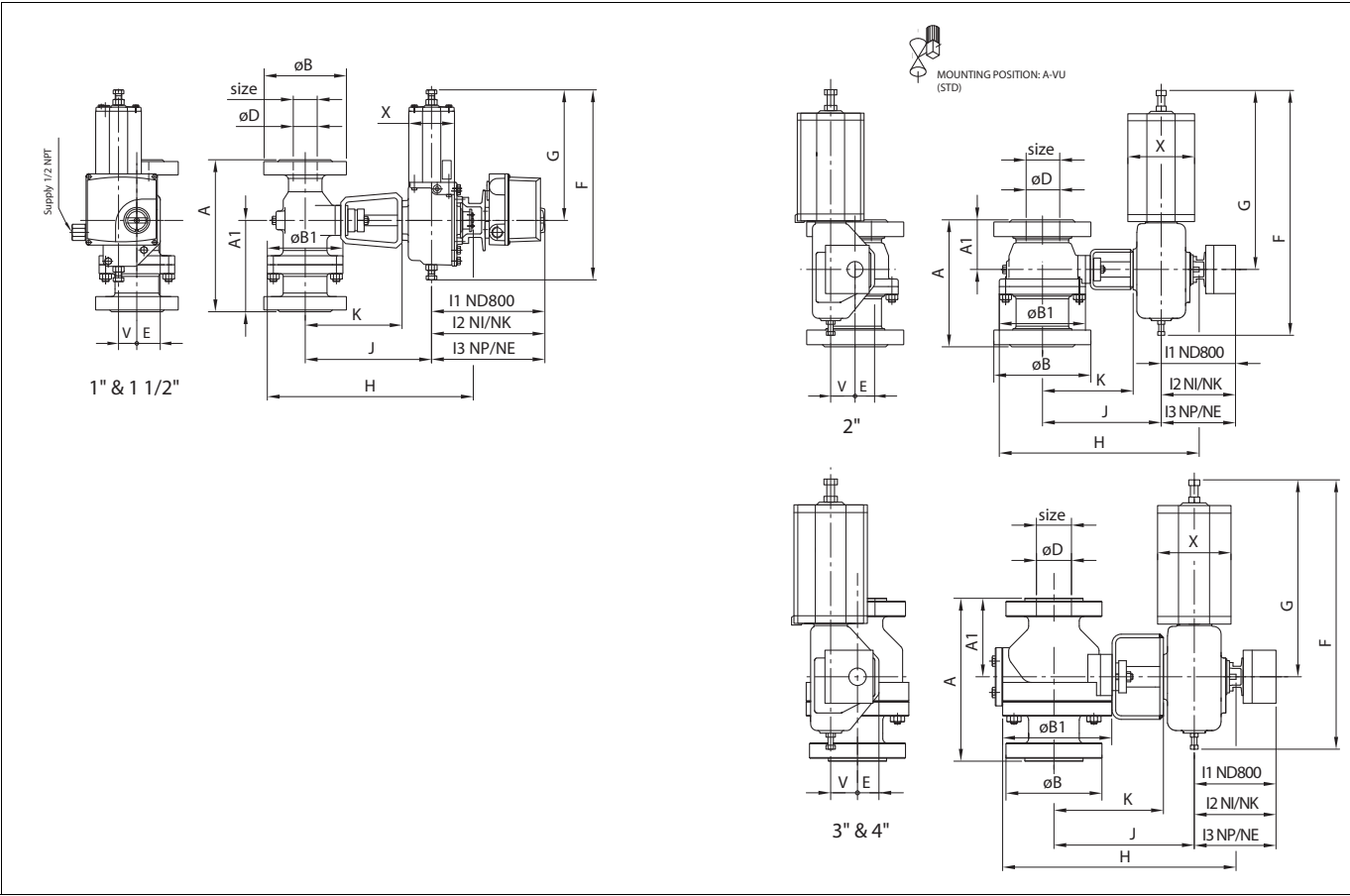
10 DIMENSIONS AND WEIGHTS



| TYPE | SIZE  | ISO FLANGE         | Dimensions in mm |     |     |     |       |     |     |       |    |    |      |    | NPTF U1 | kg  |
|------|-------|--------------------|------------------|-----|-----|-----|-------|-----|-----|-------|----|----|------|----|---------|-----|
|      |       |                    | A                | A1  | ØB  | ØB1 | ØD    | E   | K   | M     | N  | ØO | P    | R  |         |     |
| XU_F | 1     | F07                | 216              | 79  | 125 | 119 | 25.4  | 170 | 145 | 4.76  | 25 | 15 | 17   | 25 | 1/4     | 17  |
|      | 1 1/2 | F07, F10           | 241              | 86  | 155 | 148 | 38.1  | 202 | 172 | 4.76  | 35 | 20 | 22.2 | 30 | 1/4     | 26  |
|      | 2     | F07, F10, F12, F14 | 292              | 98  | 165 | 153 | 50.8  | 215 | 168 | 6.35  | 46 | 25 | 27.8 | 47 | 1/2     | 35  |
|      | 3     | F14, F16           | 356              | 172 | 210 | 239 | 76.2  | 327 | 246 | 12.70 | 80 | 45 | 50.4 | 81 | -       | 64  |
|      | 4     | F14, F16, F25      | 432              | 213 | 275 | 294 | 101.6 | 383 | 292 | 12.70 | 90 | 55 | 60.6 | 91 | -       | 141 |

| TYPE | SIZE  | ISO FLANGE         | Dimensions in inch |      |       |       |     |       |       |      |      |      |      |      | NPTF U1 | lbs |
|------|-------|--------------------|--------------------|------|-------|-------|-----|-------|-------|------|------|------|------|------|---------|-----|
|      |       |                    | A                  | A1   | ØB    | ØB1   | ØD  | E     | K     | M    | N    | ØO   | P    | R    |         |     |
| XU_F | 1     | F07                | 8.50               | 3.11 | 4.88  | 4.69  | 1   | 6.69  | 5.71  | 0.19 | 0.98 | 0.59 | 0.67 | 0.98 | 1/4     | 37  |
|      | 1 1/2 | F07, F10           | 9.49               | 3.39 | 6.12  | 5.83  | 1.5 | 7.95  | 6.77  | 0.19 | 1.38 | 0.79 | 0.87 | 1.18 | 1/4     | 57  |
|      | 2     | F07, F10, F12, F14 | 11.50              | 3.86 | 6.50  | 6.02  | 2   | 8.46  | 6.61  | 0.25 | 1.81 | 0.98 | 1.09 | 1.85 | 1/2     | 77  |
|      | 3     | F14, F16           | 14.02              | 6.77 | 8.25  | 9.41  | 3   | 12.87 | 9.69  | 0.5  | 3.15 | 1.77 | 1.98 | 3.19 | -       | 141 |
|      | 4     | F14, F16, F25      | 17.01              | 8.39 | 10.75 | 11.57 | 4   | 15.08 | 11.50 | 0.5  | 3.54 | 2.16 | 2.39 | 3.58 | -       | 311 |

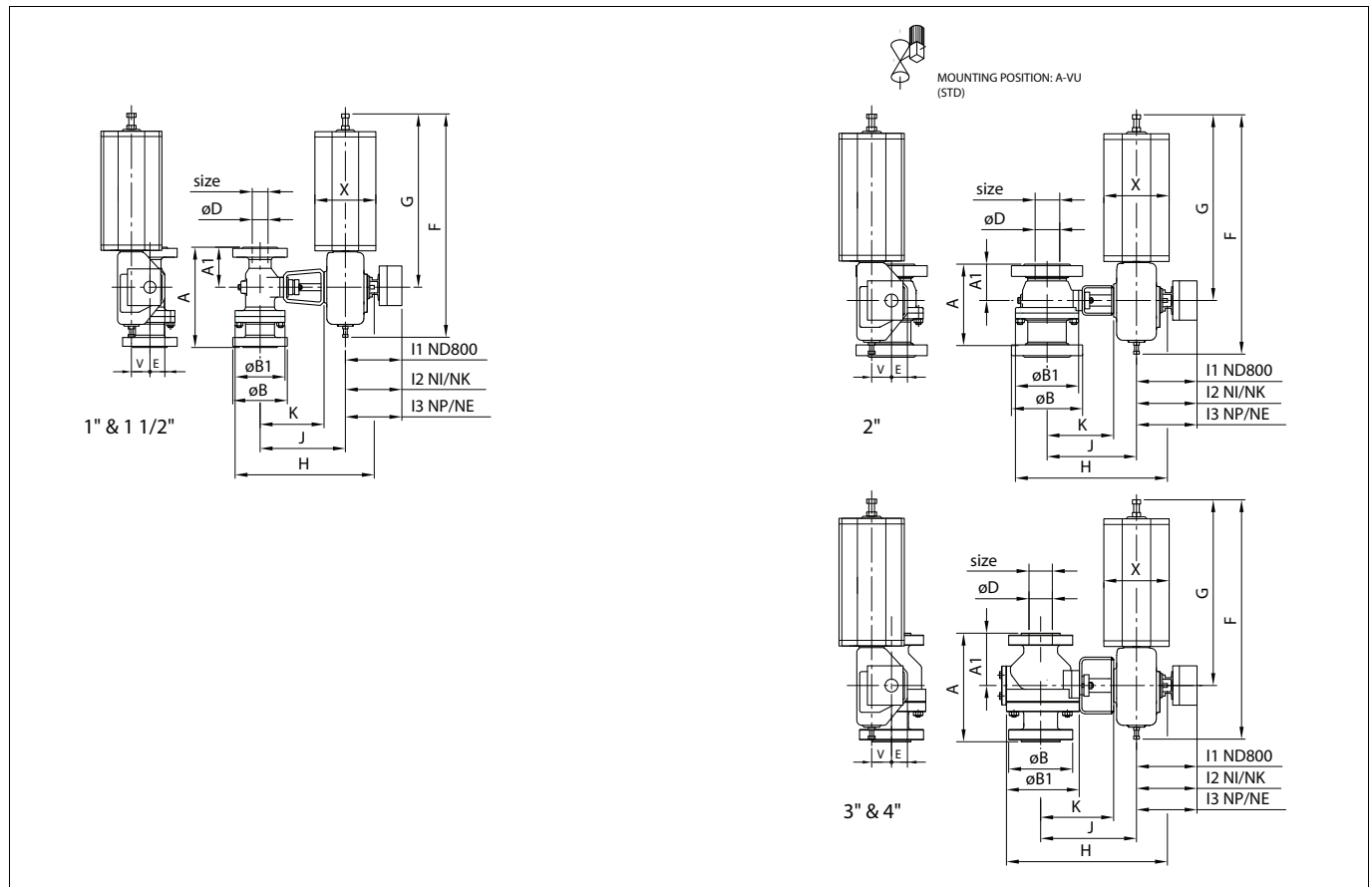
Valve and B1C actuator



| Valve | DN  | Actuator | Dimensions in mm |     |     |     |       |     |      |     |     |     |     |     |     |     |     |     | NPTF | NPT | kg  |
|-------|-----|----------|------------------|-----|-----|-----|-------|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|
|       |     |          | A                | A1  | ØB  | ØB1 | ØD    | E   | F    | G   | H   | I1  | I2  | I3  | J   | K   | V   | X   |      |     |     |
| XU01F | 25  | B1CU6    | 216              | 79  | 125 | 119 | 25.4  | 46  | 395  | 270 | 343 | 225 | 210 | 215 | 203 | 145 | 36  | 90  | 1/4  | 1/4 | 23  |
| XU1HF | 40  | B1CU9    | 241              | 86  | 155 | 148 | 38.1  | 50  | 450  | 315 | 386 | 225 | 210 | 215 | 231 | 172 | 43  | 110 | 1/4  | 1/4 | 38  |
|       |     | B1CU11   | 241              | 86  | 155 | 148 | 38.1  | 50  | 535  | 375 | 410 | 230 | 215 | 225 | 237 | 172 | 51  | 135 | 1/4  | 3/8 | 44  |
| XU02F | 50  | B1CU11   | 292              | 98  | 165 | 153 | 50.8  | 50  | 535  | 375 | 409 | 230 | 215 | 225 | 233 | 168 | 51  | 135 | 1/2  | 3/8 | 53  |
|       |     | B1CU13   | 292              | 98  | 165 | 153 | 50.8  | 65  | 640  | 445 | 435 | 250 | 235 | 245 | 249 | 168 | 65  | 175 | 1/2  | 3/8 | 68  |
| XU03F | 80  | B1CU13   | 356              | 172 | 210 | 239 | 76.2  | 65  | 640  | 445 | 556 | 250 | 235 | 245 | 327 | 246 | 65  | 175 | -    | 3/8 | 97  |
|       |     | B1CU17   | 356              | 172 | 210 | 239 | 76.2  | 70  | 785  | 555 | 588 | 270 | 255 | 260 | 342 | 246 | 78  | 215 | -    | 1/2 | 120 |
| XU04F | 100 | B1CU20   | 432              | 213 | 275 | 294 | 101.6 | 80  | 880  | 590 | 701 | 290 | 275 | 280 | 407 | 292 | 97  | 215 | -    | 1/2 | 216 |
|       |     | B1CU25   | 432              | 213 | 275 | 294 | 101.6 | 110 | 1075 | 725 | 743 | 310 | 295 | 300 | 430 | 292 | 121 | 265 | -    | 1/2 | 274 |

| Valve | DN    | Actuator | Dimensions in inch |      |       |       |      |      |       |       |       |       |       |       |       |       |      |       | NPTF | NPT | LBS |
|-------|-------|----------|--------------------|------|-------|-------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|------|-----|-----|
|       |       |          | A                  | A1   | ØB    | ØB1   | ØD   | E    | F     | G     | H     | I1    | I2    | I3    | J     | K     | V    | X     |      |     |     |
| XU01F | 1     | B1CU6    | 8.50               | 3.11 | 4.88  | 4.69  | 1.00 | 1.81 | 15.55 | 10.63 | 13.50 | 8.86  | 8.27  | 8.46  | 7.99  | 5.71  | 1.42 | 3.54  | 1/4  | 1/4 | 51  |
| XU1HF | 1 1/2 | B1CU9    | 9.49               | 3.39 | 6.10  | 5.83  | 1.50 | 1.97 | 17.72 | 12.40 | 15.20 | 8.86  | 8.27  | 8.46  | 9.09  | 6.77  | 1.69 | 4.33  | 1/4  | 1/4 | 83  |
|       |       | B1CU11   | 9.49               | 3.39 | 6.10  | 5.83  | 1.50 | 1.97 | 21.06 | 14.76 | 16.14 | 9.06  | 8.46  | 8.86  | 9.33  | 6.77  | 2.01 | 5.31  | 1/4  | 3/8 | 97  |
| XU02F | 2     | B1CU11   | 11.50              | 3.86 | 6.50  | 6.02  | 2.00 | 1.97 | 21.06 | 14.76 | 16.10 | 9.06  | 8.46  | 8.86  | 9.17  | 6.61  | 2.01 | 5.31  | 1/2  | 3/8 | 117 |
|       |       | B1CU13   | 11.50              | 3.86 | 6.50  | 6.02  | 2.00 | 2.56 | 25.20 | 17.52 | 17.13 | 9.84  | 9.25  | 9.65  | 9.80  | 6.61  | 2.56 | 6.89  | 1/2  | 3/8 | 150 |
| XU03F | 3     | B1CU13   | 14.02              | 6.77 | 8.25  | 9.41  | 3.00 | 2.56 | 25.20 | 17.52 | 21.89 | 9.84  | 9.25  | 9.65  | 12.87 | 9.69  | 2.56 | 6.89  | -    | 3/8 | 214 |
|       |       | B1CU17   | 14.02              | 6.77 | 8.25  | 9.41  | 3.00 | 2.76 | 30.91 | 21.85 | 23.15 | 10.63 | 10.04 | 10.24 | 13.46 | 9.69  | 3.07 | 8.46  | -    | 1/2 | 265 |
| XU04F | 4     | B1CU20   | 17.01              | 8.39 | 10.75 | 11.57 | 4.00 | 3.15 | 34.65 | 23.23 | 27.60 | 11.42 | 10.83 | 11.02 | 16.02 | 11.50 | 3.82 | 8.46  | -    | 1/2 | 476 |
|       |       | B1CU25   | 17.01              | 8.39 | 10.75 | 11.57 | 4.00 | 4.33 | 42.32 | 28.54 | 29.25 | 12.20 | 11.61 | 11.81 | 16.93 | 11.50 | 4.76 | 10.43 | -    | 1/2 | 604 |

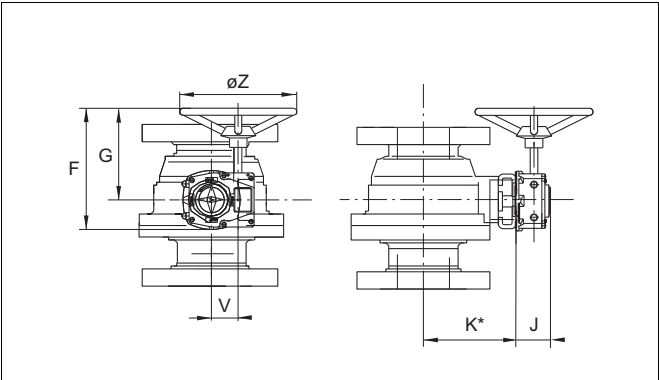
## Valve and B1J/JA actuator



| Valve | DN  | Actuator     | Dimensions in mm |     |     |     |       |     |      |      |     |     |     |     |     |     |     |     | NPTF | NPT | kg  |
|-------|-----|--------------|------------------|-----|-----|-----|-------|-----|------|------|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|
|       |     |              | A                | A1  | ØB  | ØB1 | ØD    | E   | F    | G    | H   | I1  | I2  | I3  | J   | K   | V   | X   |      |     |     |
| XU01F | 25  | B1JU/B1JAU8  | 216              | 79  | 125 | 119 | 25.4  | 50  | 555  | 420  | 336 | 225 | 210 | 215 | 204 | 145 | 43  | 135 | 1/4  | 3/8 | 36  |
| XU1HF | 40  | B1JU/B1JAU10 | 241              | 86  | 155 | 148 | 38.1  | 50  | 640  | 480  | 391 | 230 | 215 | 225 | 237 | 172 | 51  | 175 | 1/4  | 3/8 | 58  |
| XU02F | 50  | B1JU/B1JAU12 | 292              | 98  | 165 | 153 | 50.8  | 65  | 815  | 620  | 420 | 250 | 235 | 245 | 249 | 168 | 65  | 215 | 1/2  | 1/2 | 94  |
| XU03F | 80  | B1JU/B1JAU16 | 356              | 172 | 210 | 239 | 76.2  | 70  | 990  | 760  | 573 | 270 | 255 | 260 | 342 | 246 | 78  | 265 | -    | 166 |     |
|       |     | B1JU/B1JAU20 | 356              | 172 | 210 | 239 | 76.2  | 80  | 1230 | 940  | 606 | 290 | 275 | 280 | 361 | 246 | 97  | 395 | -    | 3/4 | 241 |
| XU04F | 100 | B1JU/B1JAU20 | 432              | 213 | 275 | 294 | 101.6 | 80  | 1230 | 940  | 679 | 290 | 275 | 280 | 407 | 292 | 97  | 395 | -    | 3/4 | 318 |
|       |     | B1JU/B1JAU25 | 432              | 213 | 275 | 294 | 101.6 | 110 | 1490 | 1140 | 739 | 310 | 295 | 300 | 430 | 292 | 121 | 505 | -    | 3/4 | 493 |

| Valve | DN    | Actuator     | Dimensions in inch |      |       |       |      |      |       |       |       |       |       |       |       |       |      |       | NPTF | NPT | lbs  |
|-------|-------|--------------|--------------------|------|-------|-------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|------|-----|------|
|       |       |              | A                  | A1   | ØB    | ØB1   | ØD   | E    | F     | G     | H     | I1    | I2    | I3    | J     | K     | V    | X     |      |     |      |
| XU01F | 1     | B1JU/B1JAU8  | 8.50               | 3.11 | 4.88  | 4.69  | 1.00 | 1.97 | 21.85 | 16.54 | 13.23 | 8.86  | 8.27  | 8.46  | 8.03  | 5.71  | 1.69 | 5.31  | 1/4  | 3/8 | 80   |
| XU1HF | 1 1/2 | B1JU/B1JAU10 | 9.49               | 3.39 | 6.10  | 5.83  | 1.50 | 1.97 | 25.20 | 18.90 | 15.39 | 9.06  | 8.46  | 8.86  | 9.33  | 6.77  | 2.01 | 6.89  | 1/4  | 3/8 | 128  |
| XU02F | 2     | B1JU/B1JAU12 | 11.50              | 3.86 | 6.50  | 6.02  | 2.00 | 2.56 | 32.09 | 24.41 | 16.54 | 9.84  | 9.25  | 9.65  | 9.80  | 6.61  | 2.56 | 8.46  | 1/2  | 1/2 | 207  |
| XU03F | 3     | B1JU/B1JAU16 | 14.02              | 6.77 | 8.25  | 9.41  | 3.00 | 2.76 | 38.98 | 29.92 | 22.56 | 10.63 | 10.04 | 10.24 | 13.46 | 9.69  | 3.07 | 10.43 | -    | 366 |      |
|       |       | B1JU/B1JAU20 | 14.02              | 6.77 | 8.25  | 9.41  | 3.00 | 3.15 | 48.43 | 37.01 | 23.86 | 11.42 | 10.83 | 11.02 | 14.21 | 9.69  | 3.82 | 15.55 | -    | 3/4 | 532  |
| XU04F | 4     | B1JU/B1JAU20 | 17.01              | 8.39 | 10.75 | 11.57 | 4.00 | 3.15 | 48.43 | 37.01 | 26.73 | 11.42 | 10.83 | 11.02 | 16.02 | 11.50 | 3.82 | 15.55 | -    | 3/4 | 701  |
|       |       | B1JU/B1JAU25 | 17.01              | 8.39 | 10.75 | 11.57 | 4.00 | 4.33 | 58.66 | 44.88 | 29.09 | 12.20 | 11.61 | 11.81 | 16.93 | 11.50 | 4.76 | 19.88 | -    | 3/4 | 1087 |

Valve and M-series gear operator



\*) See K dimension from tables on page 19

| Type | Dimensions, mm |     |     |      |     | kg |
|------|----------------|-----|-----|------|-----|----|
|      | F              | G   | J   | V    | ØZ  |    |
| M07  | 196            | 152 | 58  | 38.5 | 125 | 3  |
| M10  | 297            | 239 | 67  | 52.0 | 200 | 5  |
| M12  | 357            | 282 | 81  | 67   | 250 | 10 |
| M14  | 435            | 345 | 94  | 90   | 457 | 18 |
| M15  | 532            | 406 | 106 | 123  | 457 | 31 |
| M16  | 642            | 466 | 127 | 154  | 610 | 45 |

| Type | Dimensions, inch |       |      |      |       | lbs |
|------|------------------|-------|------|------|-------|-----|
|      | F                | G     | J    | V    | ØZ    |     |
| M07  | 7.72             | 5.98  | 2.28 | 1.52 | 4.92  | 6   |
| M10  | 11.69            | 9.41  | 2.64 | 2.05 | 7.87  | 11  |
| M12  | 14.06            | 11.10 | 3.19 | 2.63 | 9.84  | 21  |
| M14  | 17.13            | 13.58 | 3.68 | 3.52 | 17.99 | 40  |
| M15  | 20.94            | 15.98 | 4.15 | 4.84 | 17.99 | 68  |
| M16  | 25.28            | 18.35 | 4.98 | 6.06 | 24.02 | 99  |

## 11 TYPE CODE

|           |           |          |          |           |           |           |          |          |          |          |
|-----------|-----------|----------|----------|-----------|-----------|-----------|----------|----------|----------|----------|
| 1.        | 2.        | 3.       | 4.       | 5.        | 6.        | 7.        | 8.       | 9.       | 10.      | 11.      |
| <b>XU</b> | <b>02</b> | <b>F</b> | <b>W</b> | <b>TA</b> | <b>S6</b> | <b>SJ</b> | <b>S</b> | <b>A</b> | <b>A</b> | <b>D</b> |

| 1.        | Valve series & style, face-to-face length                                                                 |
|-----------|-----------------------------------------------------------------------------------------------------------|
| <b>XU</b> | Full bore, seat supported, face-to-face length according to ASME B16.10, Table 4, long pattern, ASME 600. |

| 2.         | Size   |        | 2.        |
|------------|--------|--------|-----------|
|            | DIN    | ASME   |           |
| <b>025</b> | 25 mm  | 1"     | <b>01</b> |
| <b>040</b> | 40 mm  | 1 1/2" | <b>1H</b> |
| <b>050</b> | 50 mm  | 2"     | <b>02</b> |
| <b>080</b> | 80 mm  | 3"     | <b>03</b> |
| <b>100</b> | 100 mm | 4"     | <b>04</b> |

| 3.       | Pressure rating, flanges, flange drilling |
|----------|-------------------------------------------|
| <b>F</b> | ASME Class 600                            |
| <b>N</b> | PN 64                                     |
| <b>P</b> | PN 100                                    |

| 4.       | End connection style                                             |
|----------|------------------------------------------------------------------|
| <b>W</b> | raised face, ASME B 16.5, "smooth finish" (Ra 3.2-6.3), standard |
| <b>C</b> | PN 63 and PN 100 rated valves ; EN 1092-1 Type B2 (Ra 0,8 - 3.2) |

| 5.        | Application and/or construction                                                                                                                                                                                      |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>TA</b> | Standard construction. Live loaded packing                                                                                                                                                                           |
| <b>TU</b> | Special solids proof seat design, pressure area 0 - <10 bar (ambient)                                                                                                                                                |
| <b>T1</b> | Special solids proof seat design, pressure area 10 - <20 bar (ambient)                                                                                                                                               |
| <b>T2</b> | Special solids proof seat design, pressure area 20 - 30 bar (ambient)                                                                                                                                                |
| <b>TZ</b> | BAM tested non-metallic parts, for oxygen service. Double seated. Metal bearings. Live loaded graphite packing. Temperature range -50 ... +200 °C. Oxygen cleaning acc. to Metso internal procedure T-2115 included. |
| <b>XU</b> | series does not comply to API 608 currently and is not covered with ISO 15848-1 certifications.                                                                                                                      |

| 6.        | Body material and body related parts material |        |       |
|-----------|-----------------------------------------------|--------|-------|
|           | Body and body cap                             | Bonnet | Gland |
| <b>S6</b> | CF8M                                          | CF8M   | CF8M  |
| <b>J2</b> | WCB                                           | WCB    | CF8M  |
| <b>J5</b> | C5                                            | C5     | CF8M  |

NOTE! Bonnet is used only in sizes 1" and 1 1/2"

| 7.        | Ball / coating and shaft material |
|-----------|-----------------------------------|
|           | Standard                          |
| <b>SJ</b> | 316SS / Hard Chrome & XM-19       |
| <b>RX</b> | 316SS / Chrome carbide & XM-19    |
| <b>RR</b> | 316SS / WC-CO & XM-19             |
| <b>SL</b> | 316SS / NiBo & XM-19              |

| 8.       | Seat type, back seal and spring material |           |             |
|----------|------------------------------------------|-----------|-------------|
|          | Seat type                                | Back seal | Spring      |
| <b>S</b> | Metal, S                                 | PTFE      | -           |
| <b>K</b> | Metal, K (locked)                        | PTFE      | -           |
| <b>H</b> | Metal, H                                 | Graphite  | Incoloy 825 |
| <b>G</b> | Metal, H                                 | Graphite  | Incoloy 825 |
| <b>J</b> | Metal                                    | Graphite  | -           |

| 9.       | Seat and coating material |                          |
|----------|---------------------------|--------------------------|
|          | Seat material             | Coating                  |
| <b>A</b> | 316 Stainless steel       | Cobalt based hard facing |
| <b>B</b> | 316 Stainless steel       | CrC + LF                 |
| <b>R</b> | 316 Stainless steel       | Tungsten carbide, WC-CO  |

| 10.      | Gasket and packing material |              |                                        |
|----------|-----------------------------|--------------|----------------------------------------|
|          | Body gasket                 | Packing      | Thrust bearing                         |
| <b>A</b> | PTFE                        | PTFE V-rings | Filled PTFE                            |
| <b>B</b> | Graphite                    | Graphite     | Filled PTFE                            |
| <b>C</b> | PTFE                        | PTFE V-rings | Cobalt based alloy and stainless steel |
| <b>D</b> | Graphite                    | Graphite     | Cobalt based alloy and stainless steel |

| 11.        | Bolting materials  |            |                       |            |                 |
|------------|--------------------|------------|-----------------------|------------|-----------------|
|            | Pressure retaining |            | Packing gland bolting |            |                 |
|            | Studs              | Nuts       | Studs                 | Nuts       | Temp range      |
| <b>E*</b>  | B8M                | 8M         | gr. 660               | gr. 660    | -200°C...+538°C |
| <b>T**</b> | L7M                | 2HM        | B7                    | 2H         | -40°C...+538°C  |
| <b>S**</b> | L7M                | 2HM        | gr. 660               | gr. 660    | -46°C...+538°C  |
| <b>U</b>   | UNS S31803         | UNS S31803 | UNS S31803            | UNS S31803 | -46°C...+315°C  |

\*) with stainless steel body

\*\*) with carbon steel body