

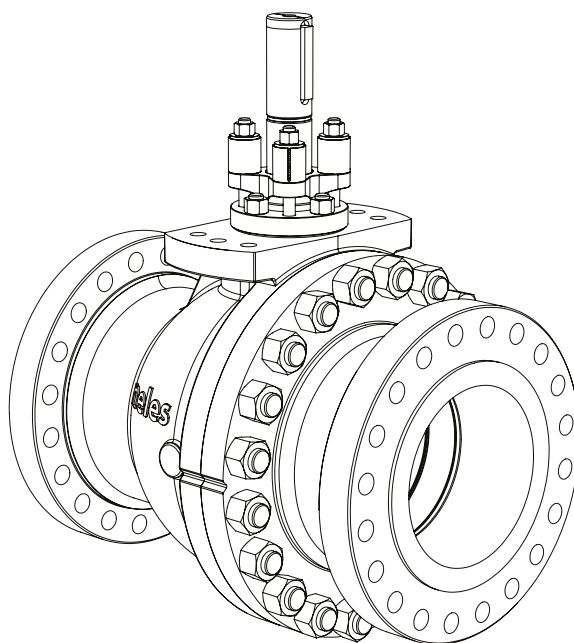
# Neles™ trunnion mounted ball valves

## ASME Class 600

### Series XH

We have over 50 years experience of trunnion mounted ball valves. Based on this experience we have designed this ball valve to comply with latest product specifications and performance standards. Valve performance complies with ISO 15848 fugitive emissions providing sustainable valve performance. Enhanced reliability and cycle life to meet the industry target extended maintenance interval.

The trunnion mounted XH valve can be used for safety, high cycle shut-off and throttling service with high pressure differentials. The modular design incorporates two large, low-friction trunnion bearings, with the spring-loaded seat in continuous contact with the ball surface.



#### Applications

- Chemical and petrochemical plants.
- Oil and gas production.
- Power plants.
- Natural gas.
- Crude oil.
- Coal gasification
- Hydrocarbons.
- Polymers.
- Catalyst handling.
- Liquids, gas and steam.
- High temperature services.
- Control and shut-off.

#### Trunnion mounted

- Low operating torque.
- Fully rated seats.
- Smooth control.
- Double block & bleed.
- Quick operations.
- High cycle capability.
- Full bore
- Maximum Cv per nominal size.
- Cylindrical flow path allows low flow resistance.
- Full bore design for API requirements.

#### Pressure classes

- ASME Class 600 / EN PN 63, 100

#### Increased safety

- Live-loaded construction as standard.
- Spiral wound body joint gasket.
- Anti-blowout shaft.

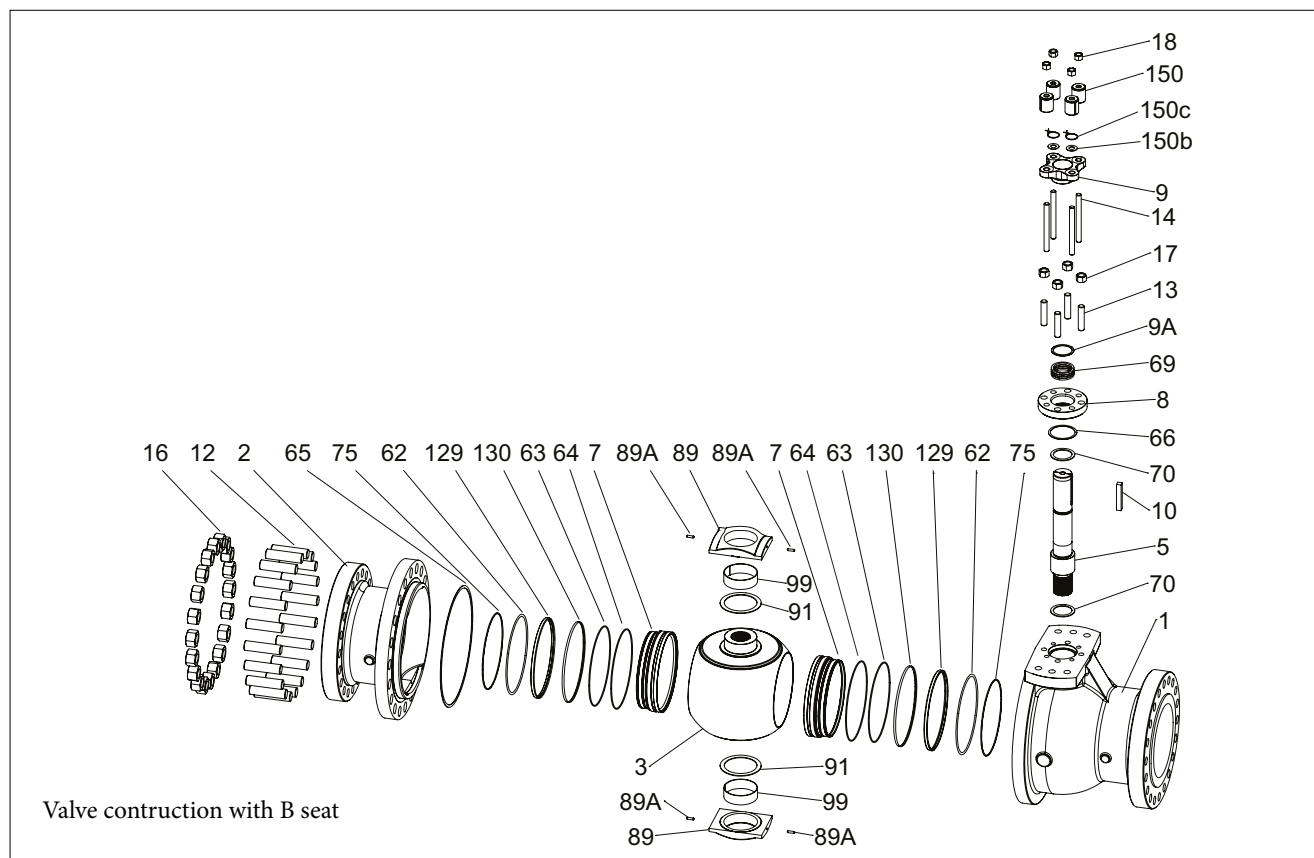
#### Tightness

- Durable two-way ISO 5208 Rate C or FCI 70.2 class V tightness as standard with spring-loaded metal seats.
- Available with improved tightness rates up to FCI Class V/API 598.

#### Minimized emissions

- Live-loaded gland packing.
  - ISO 15848 with graphite packing.
- Side entry, two-piece bolted body.
  - Uninterrupted circular spiral wound body gasket.
  - No bending forces to gland packing.

## Exploded view



## Parts list (B-seat)

| Item | Part description        | Stainless steel                                                                         | Carbon steel WCB                                                                        |
|------|-------------------------|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1    | BODY                    | Stainless Steel CF8M                                                                    | Carbon steel WCB                                                                        |
| 2    | BODY CAP                | Stainless Steel CF8M                                                                    | Carbon steel WCB                                                                        |
| 3    | BALL                    | Stainless Steel AISI 316 / CF8M                                                         | Stainless Steel AISI 316 / CF8M                                                         |
| 5    | SHAFT                   | Stainless Steel 17-4PH / XM-19                                                          | Stainless Steel 17-4PH / XM-19                                                          |
| 7    | (B-seat)                | Stainless steel AISI 316 + cobalt based alloy /<br>Stainless steel AISI 316 + CrC / TC2 | Stainless steel AISI 316 + cobalt based alloy /<br>Stainless steel AISI 316 + CrC / TC2 |
| 8    | BONNET                  | Stainless Steel CF8M                                                                    | Stainless Steel CF8M                                                                    |
| 9    | GLAND                   | Stainless Steel CF8M                                                                    | Stainless Steel CF8M                                                                    |
| 9A   | ANTI-EXTRUSION RING     | Stainless Steel AISI 316                                                                | Stainless Steel AISI 316                                                                |
| 10   | KEY                     | Stainless Steel AISI 329 / UNS S31803                                                   | Stainless Steel AISI 329 / UNS S31803                                                   |
| 12   | STUD                    | ASTM A 193 gr. B8M                                                                      | ASTM A 320 gr. L7M                                                                      |
| 13   | STUD                    | ASTM A 193 gr. B8M                                                                      | ASTM A 320 gr. L7M                                                                      |
| 14   | STUD                    | ASTM A 193 gr. B8M                                                                      | ASTM A 320 gr. L7M                                                                      |
| 16   | HEXAGON NUT             | ASTM A 193 gr. 8M                                                                       | ASTM A 320 gr. 7M                                                                       |
| 17   | HEXAGON NUT             | ASTM A 193 gr. 8M                                                                       | ASTM A 320 gr. 7M                                                                       |
| 18   | HEXAGON NUT             | ASTM A 193 gr. 8M                                                                       | ASTM A 320 gr. 7M                                                                       |
| 19   | IDENTIFICATION PLATE    | AISI 316                                                                                | AISI 316                                                                                |
| 62   | SPRING                  | UNS N06625                                                                              | UNS N06625                                                                              |
| 63   | BRAIDED SEAL SQUARE     | Graphite                                                                                | Graphite                                                                                |
| 64   | BACK-UP RING            | PTFE                                                                                    | PTFE                                                                                    |
| 65   | BODY SEAL SPIRAL WOUND  | Stainless steel AISI 316 + PTFE / graphite                                              | Stainless steel AISI 316 + PTFE / graphite                                              |
| 66   | SHEET RING              | Graphite / PTFE                                                                         | Graphite / PTFE                                                                         |
| 69   | PACKING RING/V-RING SET | Graphite / PTFE                                                                         | Graphite / PTFE                                                                         |
| 70   | THRUST BEARING          | AISI 316 + PTFE / Coated metal                                                          | AISI 316 + PTFE / Coated metal                                                          |
| 75   | BRAIDED SEAL SQUARE     | Graphite                                                                                | Graphite                                                                                |
| 89   | TRUNNION PLATE          | Stainless steel CF8M                                                                    | Stainless steel CA15                                                                    |
| 89A  | PIN                     | A564 gr. 630 H1150D / ASTM A479 gr. XM-19                                               | A564 gr. 630 H1150D / ASTM A479 gr. XM-19                                               |
| 91   | THRUST BEARING          | AISI 316 + PTFE / Coated metal                                                          | AISI 316 + PTFE / Coated metal                                                          |
| 99   | TRUNNION BEARING        | AISI 316 + PTFE / Coated metal                                                          | AISI 316 + PTFE / Coated metal                                                          |
| 129  | SUPPORT RING            | AISI 316                                                                                | AISI 316                                                                                |
| 130  | BACK SEAL               | Graphite                                                                                | Graphite                                                                                |
| 150  | DISC SPRING SET         | AISI 303 / 50CrV4 + ENP                                                                 | AISI 303 / 50CrV4 + ENP                                                                 |
| 150B | WASHER                  | AISI 304                                                                                | AISI 304                                                                                |
| 150C | ANTI-STATIC SPRING      | DIN 17224-1.4310                                                                        | DIN 17224-1.4310                                                                        |

## Technical specification

### Product type

Full bore trunnion mounted ball valve.  
Side entry, two-piece bolted body.  
Flanged.

### Pressure ratings

ASME Class 600 / EN PN63, 100

### Size range

6"...24" / DN 150 - 600.

### Standard temperature range

-50 ... +425 °C, consult factory for higher temperature applications

### Material and test certification

EN10204-3.1 material certificates for body and bonnet.

### Design standard

|                   |                           |
|-------------------|---------------------------|
| Valve body        | ASME B16.34.              |
| Valve flanges     | ASME B16.5.               |
| Face-to-face      | ASME B16.10 long pattern. |
| Actuator mounting | ISO 5211.                 |

### Compliance to other standards

API 608  
API 607

### Standard materials

|      |                                                                           |
|------|---------------------------------------------------------------------------|
| Body | ASTM A216 gr. WCB<br>ASTM A351 gr. CF8M.                                  |
| Ball | CF8M/AISI 316 + Hard chrome or<br>other coating options with metal seats. |

|               |                                                                     |
|---------------|---------------------------------------------------------------------|
| Bearings      | RPTFE or AISI 316 + hard facing.                                    |
| Seats         | AISI 316 + cobalt based alloy or other<br>coating options.          |
| Seals/gaskets | PTFE or Graphite.                                                   |
| Body gaskets  | Spiral wound with PTFE or graphite<br>filler.                       |
| Gland packing | Graphite or PTFE with live loaded<br>construction.                  |
| Bolting       | B8M/8M with stainless steel body.<br>L7M/7M with carbon steel body. |

### Standard options

High temperature linkages.  
High temperature design.  
Hard chrome or carbide ball coating.  
NACE MR 0103 and MR 0175.

### Valve testing

Each valve is tested for body integrity and seat tightness.  
The body test pressure is 1,5 x pressure class. The seat test is done according to selected standard. Test medium is inhibited water or air depending on standard.

### Standard tightness

ISO 5208 Rate C or Class V for metal seats.  
Optional API 598 and ISO 5208 Rate B or FCI 70.2 Class VI  
Other tightness rates upon request.

## Actuator selection

XH series valve can be equipped with the following Neles brand actuator types:

|                |                                                                                |
|----------------|--------------------------------------------------------------------------------|
| <b>B1C/B1J</b> | Pneumatic double acting or spring return actuator with ISO 5211 mounting face. |
| <b>N1</b>      | Spring return scotch yoke actuator with ISO 5211 mounting face.                |

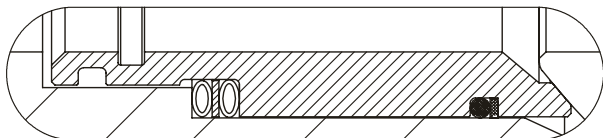
When selecting other actuators, please contact your local Valmet representative.

For the correct actuator selection in on-off service, you need to know the following process data:

- valve size and seat type
- supply pressure for the actuator
- maximum shut-off pressure across the valve

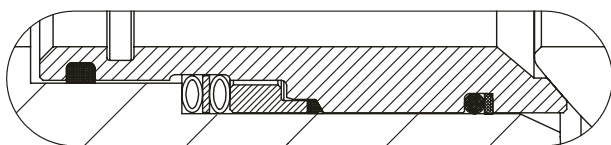
## Standard seat constructions and materials

### S Metal seat



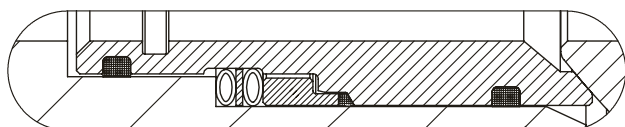
Ball seat: Stainless steel + hard facing  
 Seat seal: FKM O-ring  
 Spring: Inconel 625  
 Temp. range: -30 °C... +200 °C

### B Solids proof metal seat



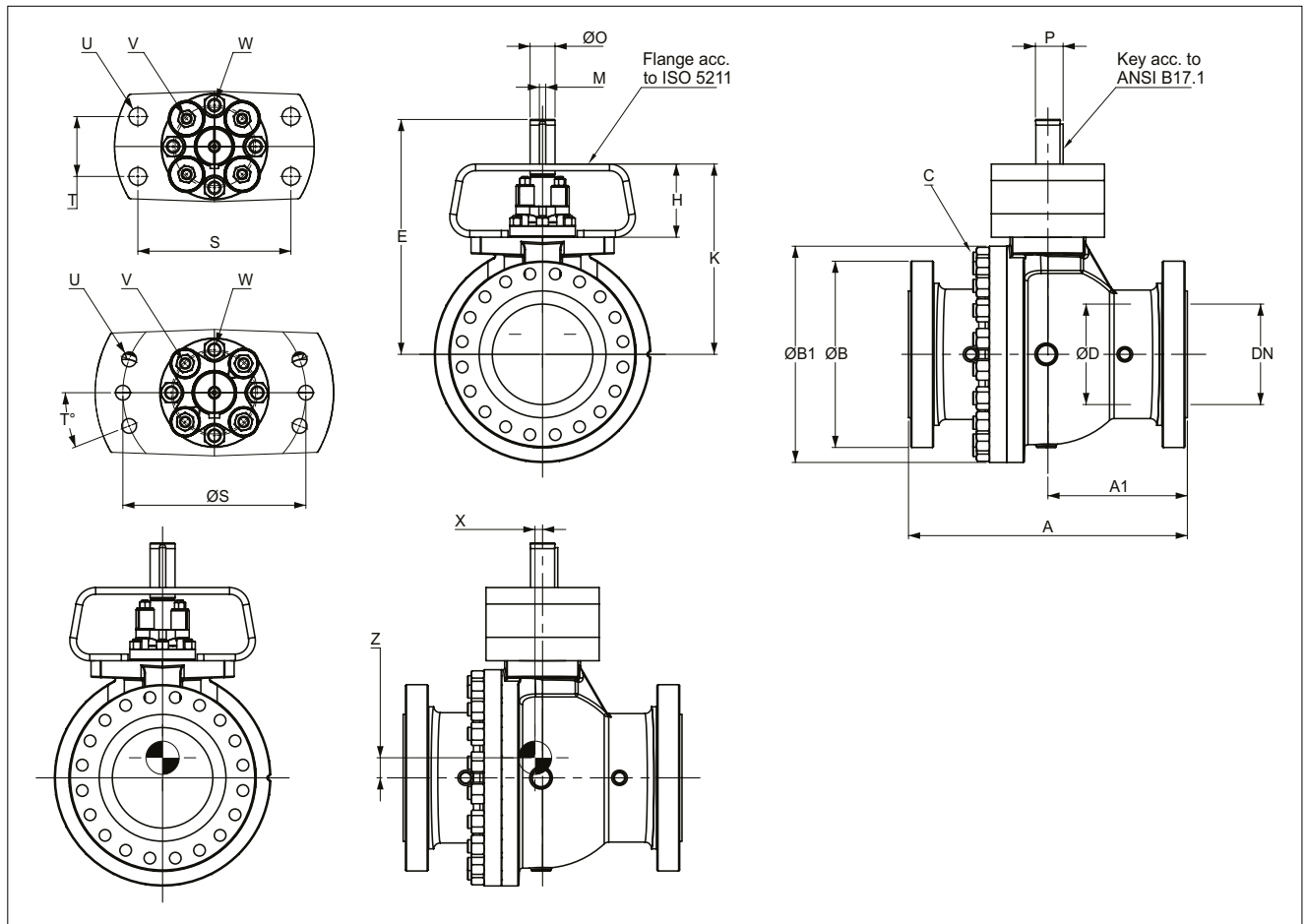
Ball seat: Stainless steel + hard facing  
 Seat seal: Graphite, FKM O-ring  
 Spring: Inconel 625  
 Temp. range: -30 °C... +200 °C  
 Note: For temperature higher than +200 °C, please contact product center.  
 Fire safe API 607 design.

### G High temperature solids proof seat



Ball seat: Stainless steel + hard facing  
 Seat seal: Graphite  
 Spring: Inconel 625  
 Temp. range: -50 °C... +425 °C  
 Note: For temperature higher than +425 °C, please contact product center.  
 Fire safe API 607 design.

## Dimensions and weights



| Size |     | Dimensions in mm |           |            |            |             |     |      |      |      |     |        |     |         |     |      | T   | U   | V   | W   | C     | Weight<br>kg | X  | Z |
|------|-----|------------------|-----------|------------|------------|-------------|-----|------|------|------|-----|--------|-----|---------|-----|------|-----|-----|-----|-----|-------|--------------|----|---|
| NPS  | DN  | ØD               | A<br>(RF) | A<br>(RTJ) | A1<br>(RF) | A1<br>(RTJ) | ØB  | ØB1  | E    | K    | H   | M      | ØO  | P       | S   |      |     |     |     |     |       |              |    |   |
| 6    | 150 | 151              | 559       | 562        | 279.5      | 281         | 355 | 390  | 475  | 395  | 180 | 12.7   | 45  | 50.4    | 230 | 90   | M24 | M16 | M16 | M33 | 229.7 | 23           | 26 |   |
| 8    | 200 | 202              | 660       | 663        | 330        | 331.5       | 420 | 472  | 536  | 446  | 180 | 12.7   | 55  | 60.6    | 230 | 90   | M30 | M16 | M20 | M33 | 362.6 | 21           | 29 |   |
| 10   | 250 | 252              | 787       | 790        | 393.5      | 395         | 510 | 570  | 597  | 485  | 180 | 15.875 | 65  | 71.875  | 230 | 90   | M30 | M16 | M20 | M39 | 603.6 | 26           | 23 |   |
| 12   | 300 | 303              | 838       | 841        | 419        | 420.5       | 560 | 650  | 706  | 572  | 220 | 19.05  | 75  | 83.15   | 330 | 21.3 | M30 | M20 | M24 | M39 | 821.9 | 25           | 34 |   |
| 14   | 350 | 334              | 889       | 892        | 444.5      | 446         | 605 | 716  | 752  | 606  | 220 | 22.225 | 85  | 94.625  | 330 | 21.3 | M30 | M20 | M24 | M42 | 1123  | 36           | 28 |   |
| 16   | 400 | 385              | 991       | 994        | 495.5      | 497         | 685 | 804  | 843  | 687  | 250 | 22.225 | 95  | 104.825 | 400 | 23.6 | M36 | M20 | M30 | M48 | 1599  | 42           | 37 |   |
| 18   | 450 | 436              | 1092      | 1095       | 546        | 547.5       | 745 | 888  | 1031 | 826  | 330 | 31.75  | 120 | 133.75  | 500 | 24.8 | M42 | M24 | M33 | M52 | 2221  | 50           | 54 |   |
| 20   | 500 | 487              | 1194      | 1200       | 597        | 600         | 815 | 995  | 1069 | 864  | 330 | 31.75  | 120 | 133.75  | 500 | 24.8 | M42 | M24 | M33 | M52 | 2870  | 53           | 44 |   |
| 24   | 600 | 589              | 1397      | 1407       | 698.5      | 703.5       | 940 | 1172 | 1281 | 1031 | 380 | 38.1   | 150 | 166.6   | 550 | 24.7 | M48 | M30 | M33 | M64 | 4548  | 57           | 59 |   |

| Size |     | Dimensions in inch |           |            |            |             |       |       |       |       |       |      |      |      |       |      | T   | U   | V   | W   | C     | Weight,<br>lbs | X    | Z |
|------|-----|--------------------|-----------|------------|------------|-------------|-------|-------|-------|-------|-------|------|------|------|-------|------|-----|-----|-----|-----|-------|----------------|------|---|
| NPS  | DN  | ØD                 | A<br>(RF) | A<br>(RTJ) | A1<br>(RF) | A1<br>(RTJ) | ØB    | ØB1   | E     | K     | H     | M    | ØO   | P    | S     |      |     |     |     |     |       |                |      |   |
| 6    | 150 | 5.94               | 22.01     | 22.13      | 11.00      | 11.06       | 13.98 | 15.35 | 18.70 | 15.55 | 7.09  | 0.50 | 1.77 | 1.98 | 9.06  | 3.54 | M24 | M16 | M16 | M33 | 505   | 0.91           | 1.02 |   |
| 8    | 200 | 7.95               | 25.98     | 26.10      | 12.99      | 13.05       | 16.54 | 18.58 | 21.10 | 17.56 | 7.09  | 0.50 | 2.17 | 2.39 | 9.06  | 3.54 | M30 | M16 | M20 | M33 | 798   | 0.83           | 1.14 |   |
| 10   | 250 | 9.92               | 30.98     | 31.10      | 15.49      | 15.55       | 20.08 | 22.44 | 23.50 | 19.09 | 7.09  | 0.63 | 2.56 | 2.83 | 9.06  | 3.54 | M30 | M16 | M20 | M39 | 1328  | 1.02           | 0.91 |   |
| 12   | 300 | 11.93              | 32.99     | 33.11      | 16.50      | 16.56       | 22.05 | 25.59 | 27.80 | 22.52 | 8.66  | 0.75 | 2.95 | 3.27 | 12.99 | 21.3 | M30 | M20 | M24 | M39 | 1808  | 0.98           | 1.34 |   |
| 14   | 350 | 13.15              | 35.00     | 35.12      | 17.50      | 17.56       | 23.82 | 28.19 | 29.61 | 23.86 | 8.66  | 0.88 | 3.35 | 3.73 | 12.99 | 21.3 | M30 | M20 | M24 | M42 | 2471  | 1.43           | 1.09 |   |
| 16   | 400 | 15.16              | 39.02     | 39.13      | 19.51      | 19.57       | 26.97 | 31.65 | 33.19 | 27.05 | 9.84  | 0.88 | 3.74 | 4.13 | 15.75 | 23.6 | M36 | M20 | M30 | M48 | 3518  | 1.65           | 1.44 |   |
| 18   | 450 | 17.17              | 42.99     | 43.11      | 21.50      | 21.56       | 29.33 | 34.96 | 40.59 | 32.52 | 12.99 | 1.25 | 4.72 | 5.27 | 19.69 | 24.8 | M42 | M24 | M33 | M52 | 4886  | 1.96           | 2.14 |   |
| 20   | 500 | 19.17              | 47.01     | 47.24      | 23.50      | 23.62       | 32.09 | 39.17 | 42.09 | 34.02 | 12.99 | 1.25 | 4.72 | 5.27 | 19.69 | 24.8 | M42 | M24 | M33 | M52 | 6314  | 2.10           | 1.74 |   |
| 24   | 600 | 23.19              | 55.00     | 55.39      | 27.50      | 27.70       | 37.01 | 46.14 | 50.43 | 40.59 | 14.96 | 1.50 | 5.91 | 6.56 | 21.65 | 24.7 | M48 | M30 | M33 | M64 | 10005 | 2.24           | 2.32 |   |

## Modular ball valves, series XH, trunnion valves

| Trunnion mounted, Neles™ ball valve, series XH ASME class 600, EN PN 100 |    |    |    |    |    |    |    |    |     |     |     |     |
|--------------------------------------------------------------------------|----|----|----|----|----|----|----|----|-----|-----|-----|-----|
| 1.                                                                       | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. |
| XH                                                                       | 06 | F  | W  | TA | J2 | PJ | S  | A  | B   | F   | A   |     |

| 1. sign | VALVE SERIES & STYLE & FACE-TO-FACE                                                                      |
|---------|----------------------------------------------------------------------------------------------------------|
|         | Flanged                                                                                                  |
| XH      | Full bore, trunnion bearings, f-to-f ASME B 16.10, table 3, long pattern, ASME Class 600, EN PN 63 - 100 |

| 2. sign | ASME VALVES, NPS Pressure class availability, Class 600 |
|---------|---------------------------------------------------------|
| 06      | 6"                                                      |
| 08      | 8"                                                      |
| 10      | 10"                                                     |
| 12      | 12"                                                     |
| 14      | 14"                                                     |
| 16      | 16"                                                     |
| 18      | 18"                                                     |
| 20      | 20"                                                     |
| 24      | 24"                                                     |

| EN VALVES, DN Pressure class availability, EN PN 63 - 100 |     |
|-----------------------------------------------------------|-----|
| 150                                                       | 150 |
| 200                                                       | 200 |
| 250                                                       | 250 |
| 300                                                       | 300 |
| 350                                                       | 350 |
| 400                                                       | 400 |
| 450                                                       | 450 |
| 500                                                       | 500 |
| 600                                                       | 600 |

| 3. sign | PRESSURE CLASS |
|---------|----------------|
| F       | ASME class 600 |
| N       | PN 63          |
| P       | PN 100         |

| 4. sign     | END CONNECTION STYLE                                     |
|-------------|----------------------------------------------------------|
|             | ASME rated flanges:                                      |
| W           | Raised face, ASME B 16.5 (Ra 3.2-6.3), standard          |
| Z           | Ring joint, ASME B 16.5                                  |
| Y           | Special form or surface, to be specified, e.g. weld ends |
| EN flanges: |                                                          |
| C           | EN 1092-1 Type B1 (Ra 3.2 – 12.5).                       |

| 5. sign | CONSTRUCTION & APPLICATION                                        |
|---------|-------------------------------------------------------------------|
| TA      | Standard construction. Double seated. Live loaded packing.        |
| TE      | TE Single seated. Otherwise standard.                             |
| TQ      | Q-Trim construction. Otherwise standard.                          |
| EQ      | Single seated. Q-Trim construction                                |
| EM      | Single seated. QLM-Trim construction                              |
| 2G      | Q2G-trim for gas application, single seated, otherwise standard.  |
| 2H      | Q2GH-trim for gas application, single seated, otherwise standard. |

| 6. sign                | BODY MATERIALS, FORGINGS / CASTINGS |    |                        |
|------------------------|-------------------------------------|----|------------------------|
|                        | STANDARD materials                  |    |                        |
| J2                     | ASTM A216 gr WCB                    | S6 | ASTM A351 gr CF8M (SS) |
| NON-STANDARD materials |                                     |    |                        |
| J1                     | ASTM A216 gr WCC                    | S1 | ASTM A351 gr CF3M (SS) |
| J4                     | ASTM A217 gr WC6                    | S8 | ASTM A351 gr CF8C(SS)  |
| J8                     | ASTM A352 gr LCC                    |    |                        |

| 7. sign | BALL / COATING & STEM MATERIAL    |
|---------|-----------------------------------|
|         | XH, STANDARD materials            |
| PJ      | 316SS / Hard chrome & 17-4PH      |
| PX      | 316SS / Chrome carbide & 17-4PH   |
| PV      | 316SS / Tungsten carbide & 17-4PH |

| 8. sign | SEAT AND BACK SEAL TYPES / SPRING MATERIALS<br>SEAT CONSTRUCTIONS ARE SHOWN ON PAGE 9 |                   |             |              |
|---------|---------------------------------------------------------------------------------------|-------------------|-------------|--------------|
|         | Seat type                                                                             | Back seal type    | Spring      | Back-up ring |
| S       | Metal, general service                                                                | O-ring            | Inconel 625 | PTFE         |
| B       | Metal, solids proof                                                                   | Graphite + O-ring | Inconel 625 | PTFE         |
| G       | Metal, high temperature                                                               | Graphite          | Inconel 625 | ----         |

| 9. sign | SEAT MATERIAL |                        |
|---------|---------------|------------------------|
|         | Metal seats   |                        |
|         | Seat material | Coating                |
| A       | 316SS         | Cobalt based alloy     |
| B       | 316SS         | Chrome Carbide, CrC-LF |
| V       | 316SS         | Tungsten Carbide, TC2  |

| 10. sign | BEARING AND SEAL MATERIALS |          |              |         |                |
|----------|----------------------------|----------|--------------|---------|----------------|
|          | Trunnion bearing           | Packings | Body gaskets | O-rings | Thrust bearing |
| A        | RPTFE                      | V-rings  | PTFE         | FKM     | RPTFE          |
| B        | RPTFE                      | Graphite | Graphite     | FKM     | RPTFE          |
| C        | Metal                      | V-rings  | PTFE         | FKM     | Metal          |
| D        | Metal                      | Graphite | Graphite     | FKM     | Metal          |

| 11. sign | BOLTING MATERIALS                          |      |
|----------|--------------------------------------------|------|
|          | Bolting material with unified (XH) threads |      |
|          | Studs                                      | Nuts |
| D *      | B8M                                        | 8M   |
| F **     | L7M                                        | 7M   |

\*) Bolting materials for stainless steel body

\*\*) Bolting materials for carbon and low alloy steel body

| 12. sign | MODEL CODE      |
|----------|-----------------|
| A        | XH model code A |

| 13. sign | Option / Modifier      |
|----------|------------------------|
| D        | Drain plug on the body |
| B        | Bleeder valve          |



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