AUTOMATION AND DIGITALIZATION

# NAF DUBALL DL POCKET BALL VALVES

TECHNICAL BULLETIN

ANDRITZ

ENGINEERED SUCCESS

# Primary characteristics

The NAF Duball DL Pocket Valve is the pulp and paper industry's choice for a reliable and robust valve solution that allows for safe removal of sand or debris in separator and junk trap applications during normal process operation. Building on years of experience in providing flow control solutions in harsh environments, the Duball DL Pocket Valve is specifically designed to ensure continuous process uptime and throughput by allowing process pressure to be maintained while unwanted process particles are eliminated.

**The NAF Duball Pocket Valve is engineered to excel:**

- Longer service life via ball constructed in Solid Alloy 6 **material for unmatched performance in challenging applications**
- Improved process uptime **from a reliable valve design which discharges solids while maintaining full process pressure and minimizes loss of process medium**
- Improved wear resistance with sealed and locked seats which prevent extensive wear on the ball **caused by medium build-up behind the seats**
- Minimized leakage owing to metal seats **with a rigid welded overlay of Alloy 6**
- Two flush port connections to effectively flush both the body and the ball cavity **during the discharge sequence**
- **Long, maintenance free and safe operation provided by a** spring loaded stem seal packing
- Robust, blowout-proof stem supported by a wear resistant anti-friction washer in Alloy 6 **provides a high torque transmission**
- **An** easy-to-service arrangement, **due to the off-center joint face of the valve body, which allows for easy replacement of the ball and seals, without the need for removing the stem and actuator**

CE-marked **according to Pressure Equipment Directive (PED 2014/68/EU) module H, category III.**

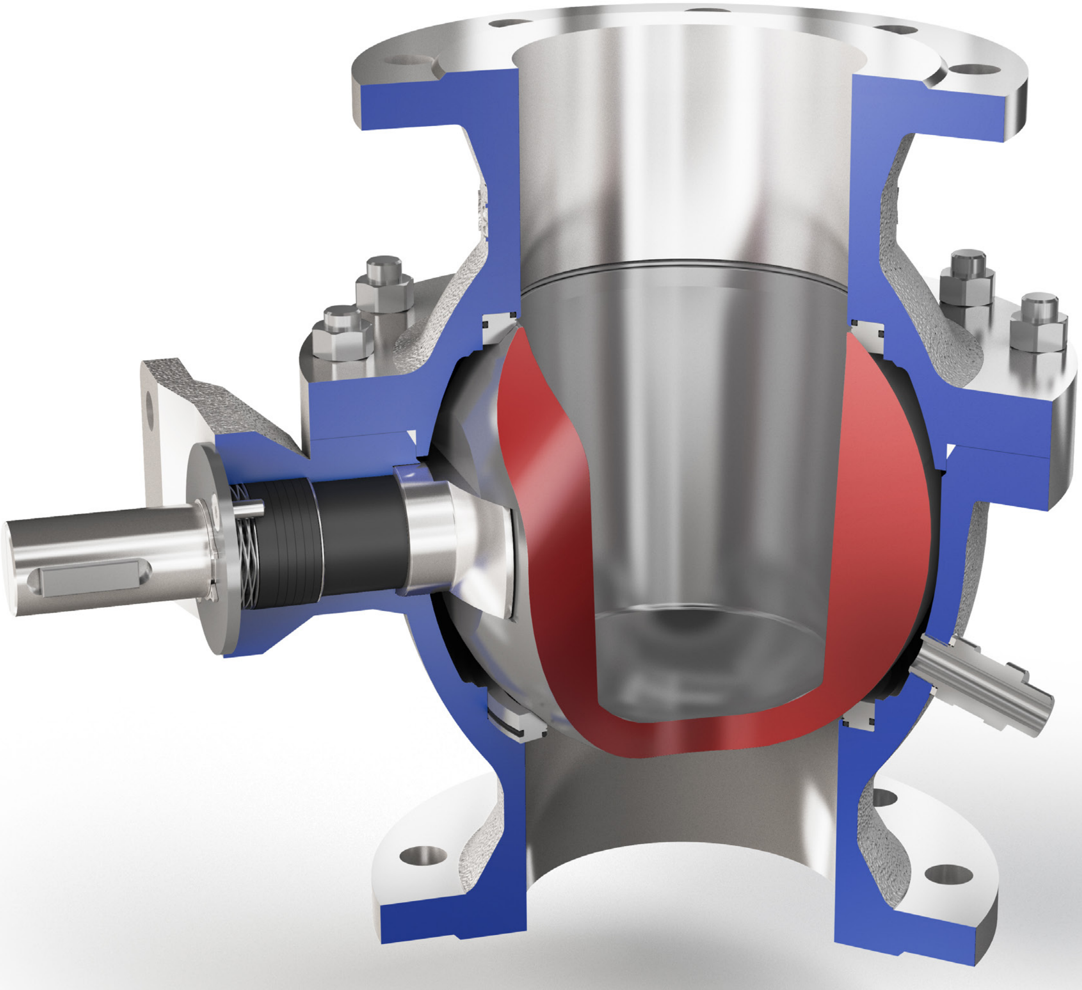
## TABLE 1: TECHNICAL SPECIFICATIONS FOR STANDARD DESIGN

| | |
|---|---|
| **Material** | Stainless steel |
| **Size range** | DN 80-200, 3″-8″ |
| **Pressure ratings** | PN 10-40, ANSI Class 150-300 |
| **Face-to-face lengths** | PN 10-16: EN558-1 series 12 (SSG 1042)<br>PN 25-40: EN558-1 series 4 (SSG 1043)<br>ANSI 150: ANSI B 16.10 Class 150 long<br>ANSI 300: ANSI B 16.10 Class 300 short |
| **Valve design** | ANSI B16.34 or EN 12 516 |
| **Installation method** | Flanges to EN or ANSI B 16.5 |
| **Temperature range** | -30 - 250 °C, see graph on page 7 |
| **Test procedure** | Body: 1.5 x maximum working pressure<br>Seat: 1.1 x maximum allowed differential pressure<br>Testing medium is water with inhibitor |
| **Tightness class** | ISO 5208 Rate D |

# Applications

Typical applications for the NAF Duball DL Pocket valve include sand removal under a separator or other junk trap applications. The NAF Duball DL Pocket Valve is installed on a vertical pipe allowing debris to sediment into the ball cavity.

The valve is typically automated using a pneumatic actuator with a stroke set to 140 degrees. Alternatively, a severe service electric actuator can be used for larger valves and higher differential pressures.



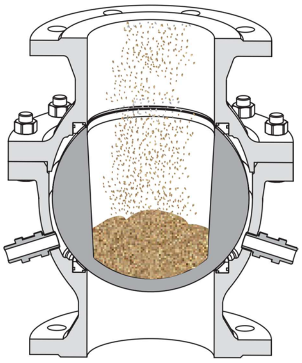
**NAF Duball DL Pocket Valve**

# Valve sizing and flushing

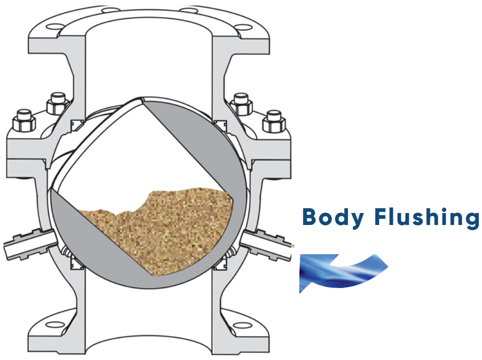
In order to minimize wear and maximize lifetime, it is very important that the valve is correctly sized and flushed during the discharge sequence. Valve sizing, flushing requirements and a complete sequence description can be found in user instruction NFENTB4163.

The cut-away images show the discharge sequence together with valve flushing.

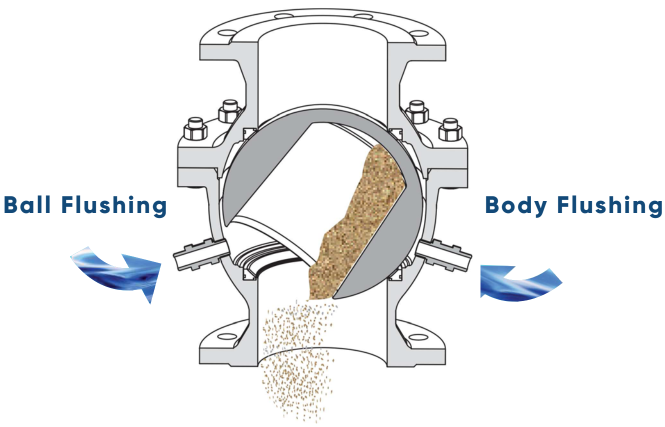
## FILLING MODE



## BALL UNDER ROTATION – PROCESS PRESSURE IS MAINTAINED




## FINAL DISCHARGE POSITION – BALL CAVITY IS FLUSHED



# Seats

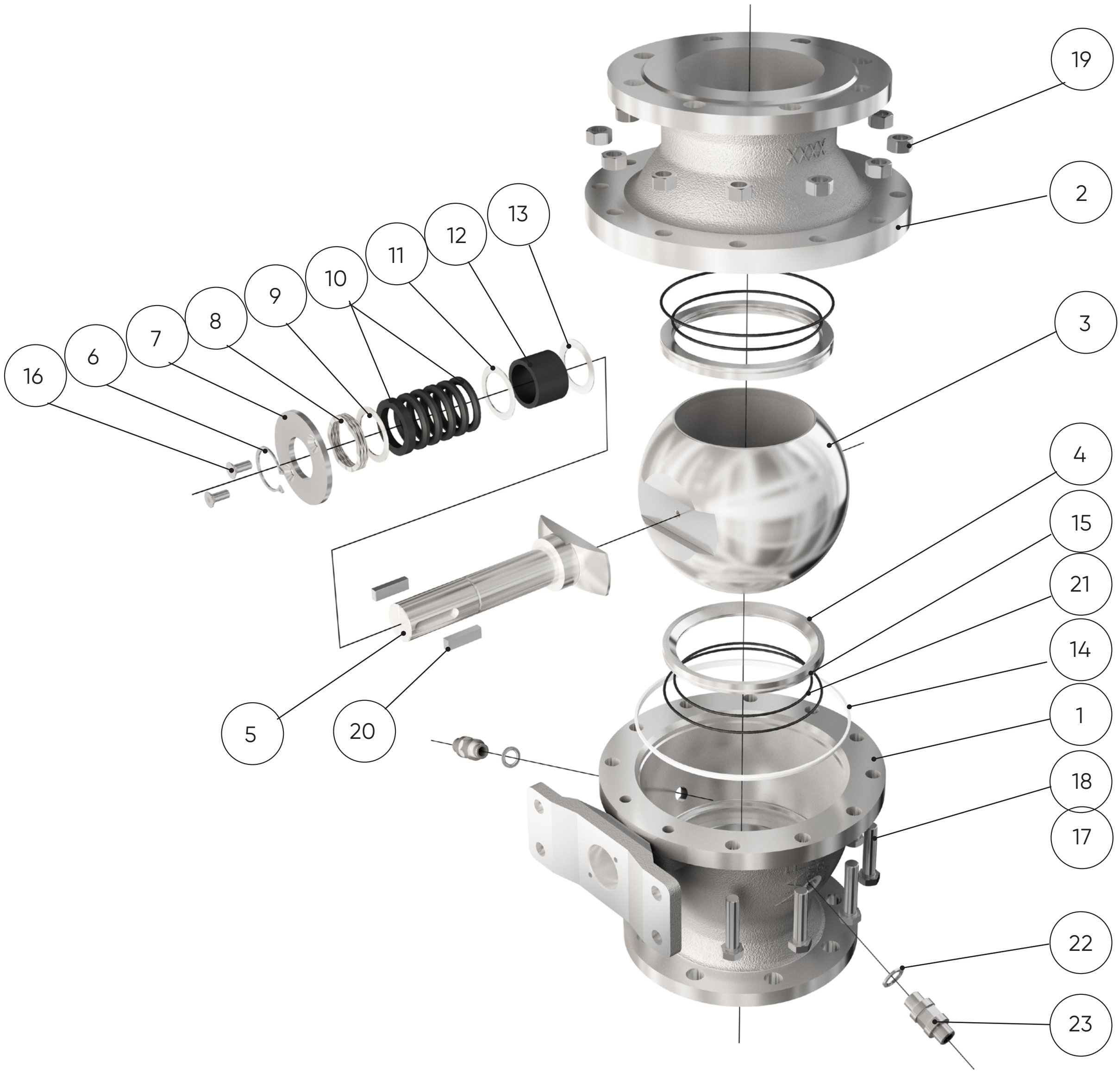



**TABLE 1: MATERIALS**

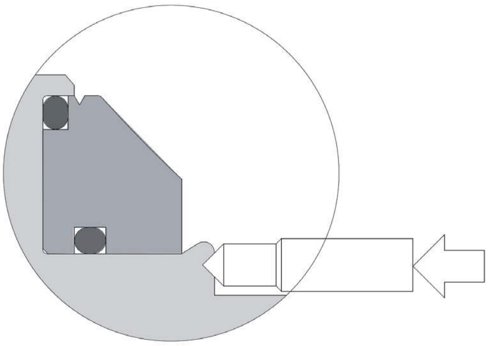
| Item | Qty | Part | Material |
|---|---|---|---|
| 1 | 1 | Body, main | CF8M / 1.4408 |
| 2 | 1 | Body, cover | CF8M/1.4408 |
| 3 | 1 | Pocket Ball | Solid Alloy 6 |
| 4 | 2 | Seat ring | SS / Alloy 6 |
| 5 | 1 | Stem | EN 1.4460 (Type AISI 329) |
| 6 | 1 | Circlip | A2 |
| 7 | 1 | Cover | AISI 316L/EN 1.4404 |
| 8 | 1 | Spring | 17-7PH |
| 9 | 1 | Washer | AISI 316L/EN 1.4404 |
| 10 | 1 | Stem packing | R-PTFE carbon-reinforced |
| 11 | 1 | Washer | AISI 316 /EN 1.4404 |
| 12 | 1 | Bushing | R-PTFE carbon-reinforced |

| Item | Qty | Part | Material |
|---|---|---|---|
| 13 | 1 | Anti-friction washer | Alloy 6 |
| 14 | 1 | Body seal | PTFE |
| 15 | 2 | Seat seal | H-ELAST |
| 16 | [1] | Screw | A4 |
| 17 | 2 | Stud | A4/ASTM A193 gr. B8M |
| 18 | [1] | Bolt | A4/ASTM A193 gr. B8M |
| 19 | [1] | Nut | A4/ASTM A194 gr. 8M |
| 20 | 2 | Key | A4 |
| 21 | 2 | Outside seat seal | H-ELAST |
| 22 | 2 | Seal ring | AISI 316/EPDM |
| 23 | 2 | Water flushing fittings | AISI 316 |

[1] Quantity depending on size of the valve.
Material and design of the parts vary depending on the version of the valve. Version is determined by NAF No. on the identification plate of the valve.

# Seat rings

The seats are sealed and locked in place. This prevents medium build-up behind the seat and creating an increased torque over time.



Metal seat standard – Seats are sealed and locked in place

## OPERATING TORQUE

Table 2 is provided for the correct sizing of an actuator. Please note the following;

- The actuator must be able to turn 140°
- Maximum allowed differential pressure according to the graphs on page 7 must be taken into consideration
- Operating torque is only valid when valve is sufficiently flushed during the discharge sequence. Please refer to the user instruction NFENIM4163

### TABLE 2: OPERATING TORQUE, NM

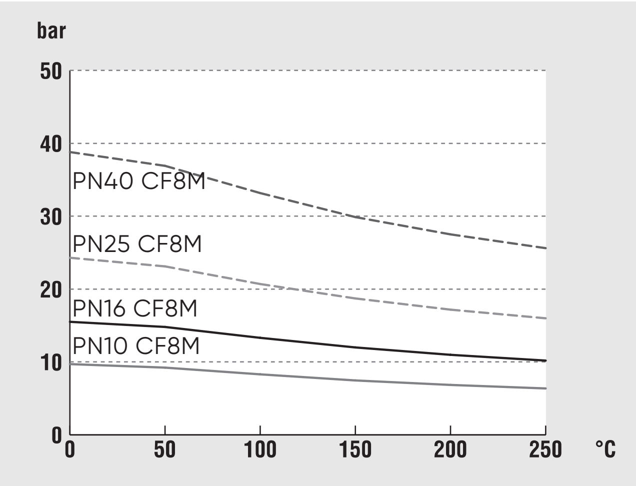
| DN | Size | Differential pressure in bar | | | | |
|---|---|---|---|---|---|---|
| | | 5 | 10 | 16 | 20 | 25 |
| 80 | 3″ | 130 | 218 | 323 | 393 | 480 |
| 100 | 4″ | 230 | 398 | 599 | 733 | 900 |
| 150 | 6″ | 700 | 1225 | 1855 | 2275 | 2800 |
| 200 | 8″ | 1860 | 3145 | 4687 | 5715 | |

# Working pressure and temperature

## MAX. WORKING PRESSURE

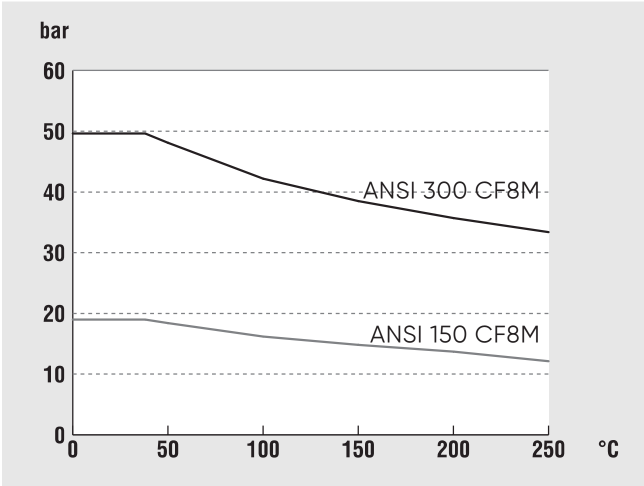
### PN RATED VALVES

Stainless steel body (CF8M)




### ANSI RATED VALVES

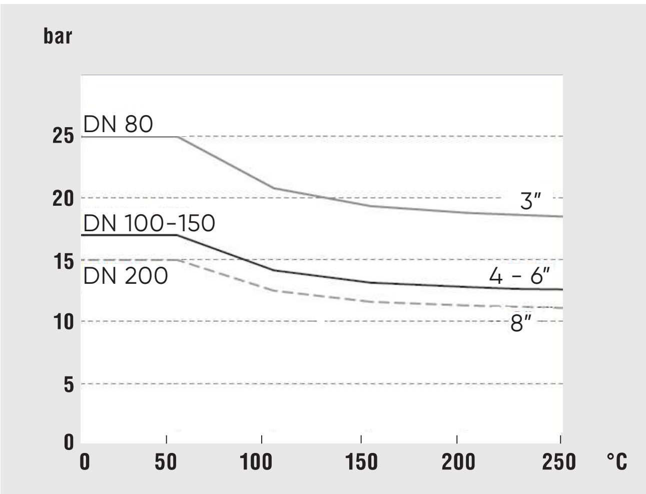
Stainless steel body (CF8M)



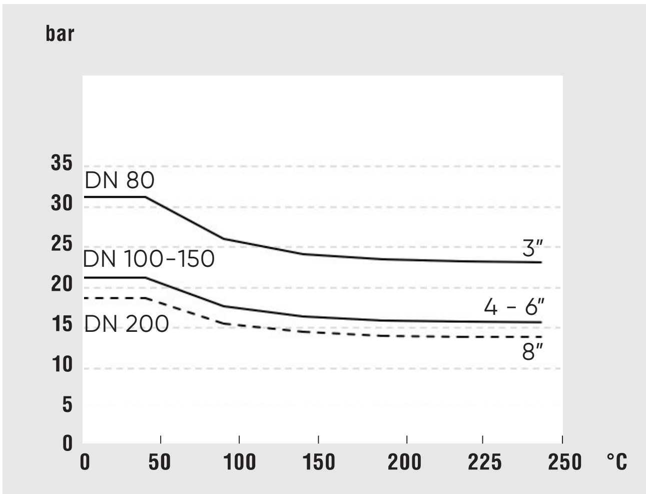

## DIFFERENTIAL PRESSURE AND TEMPERATURE

The maximum allowed differential pressure (dp) is based on high torque requirements which are commonly witnessed in applications where the Duball DL Pocket Valve is used. The maximum allowed differential pressure is determined by the size of the valve, the temperature and the stem material.
The maximum allowed differential pressure can be further reduced if the maximum allowed working pressure (based on valve body material and pressure class) is lower than the maximum allowed differential pressure.

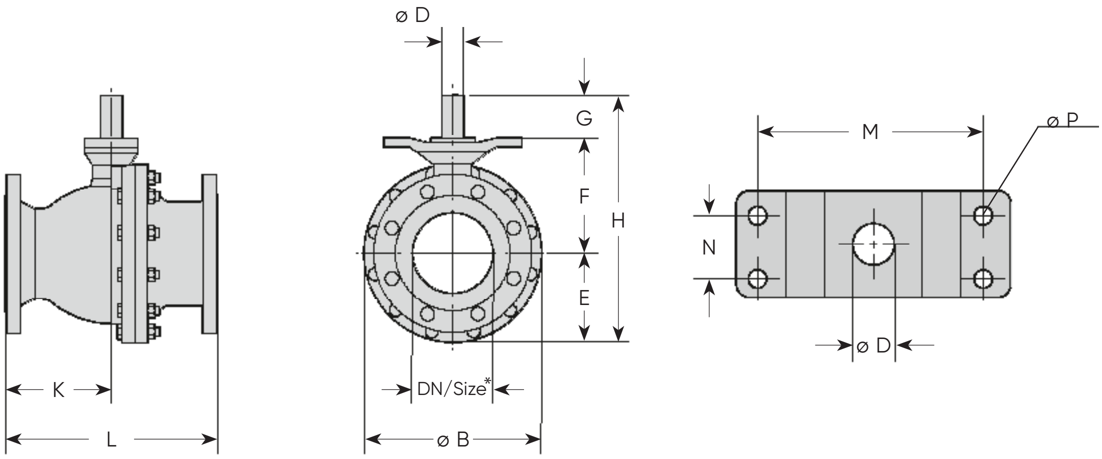
### MAX. DP STANDARD STEM (1.4460)




### MAX. DP HIGH TORQUE STEM (17-4PH)



# Dimensions and weight




* Indicates nominal valve size

### TABLE 3: COMMON DIMENSIONS – ALL PRESSURE CLASSES

| DN | Size | Dimensions, mm | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | B | D | E | F | G | H | M | N | P |
| 80 | 3″ | 214 | 25 | 107 | 137 | 50 | 284 | 115 | 30 | 11 |
| 100 | 4″ | 244 | 25 | 122 | 152 | 50 | 324 | 115 | 30 | 11 |
| 150 | 6″ | 336 | 40 | 168 | 218 | 80 | 466 | 214 | 60 | 18 |
| 200 | 8″ | 452 | 50 | 226 | 268 | 93 | 587 | 214 | 60 | 18 |

### TABLE 4 : PRESSURE CLASS RELATED DIMENSIONS AND WEIGHTS

| DN | Size | Dimensions, mm | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | PN10 | | | PN16 | | | PN25 | | | PN40 | | | ANSI 150 | | | ANSI 300 | | |
| | | K | L | Weight kg | K | L | Weight kg | K | L | Weight kg | K | L | Weight kg | K | L | Weight kg | K | L | Weight kg |
| 80 | 3″ | Identical to PN16 Choose PN16 | | | 121 | 241 | 27 | Identical to PN40 Choose PN40 | | | 142 | 283 | 32 | 102 | 203 | 28 | 142 | 283 | 34 |
| 100 | 4″ | | | | 153 | 305 | 39 | | | | 153 | 305 | 44 | 107 | 229 | 40 | 153 | 305 | 50 |
| 150 | 6″ | | | | 197 | 394 | 96 | | | | 202 | 403 | 110 | 197 | 394 | 101 | 202 | 403 | 117 |
| 200 | 8″ | 229 | 457 | 185 | 229 | 457 | 185 | 251 | 502 | 212 | 251 | 502 | 223 | 229 | 457 | 188 | 210 | 419 | 217 |

# Actuators and accessories

The NAF Duball DL Pocket Valve provides optimum performance when teamed with an Automax 180° pneumatic actuator set to a stroke of 140°. Actuator sizing is determined by the valve size and process data. Table 5 shows the correct Automax actuator size to be selected based on valve size, supply pressure to the actuator and the maximum dp.

For larger valves and higher differential pressures, a severe service electric actuator can be used. Please consult ANDRITZ NAF for further information.

The Pocket Valve is to be equipped with two on/off valves and solenoid valves that are mounted on the two flush connections on the valve body.

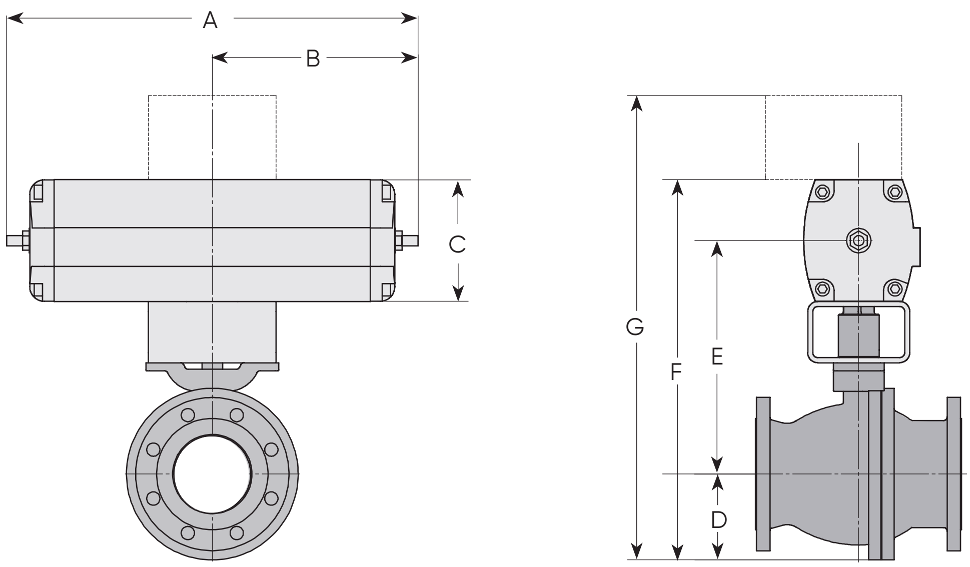



**TABLE 5 : NAF DUBALL DL POCKET VALVES WITH AUTOMAX 180° PNEUMATIC ACTUATORS (DOUBLE ACTING)**

| DN | Size | Max. dP1) bar at supply | | | Automax No. | Dimensions, mm | | | | | | | Weight kg2) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4 bar | 5 bar | 6 bar | | A | B | C | D | E | F | G3) | |
| 80 | 3″ | 15 | 19.5 | 24 | S150M | 640 | 320 | 174 | 107 | 304 | 391 | 648 | 54 |
| 100 | 4″ | 7 | 9.5 | 12 | S150M | 640 | 320 | 174 | 122 | 309 | 396 | 668 | 66 |
| 100 | 4″ | 12 | 15 | 18 | S175M | 726 | 363 | 209 | 122 | 326,5 | 431 | 703 | 79 |
| 150 | 6″ | - | 6 | 7.5 | S200M | 805 | 402,5 | 239 | 168 | 457,5 | 577 | 895 | 155 |
| 150 | 6″ | 11 | 14.5 | 18 | SN250M | 995 | 497,5 | 280 | 168 | 478 | 618 | 936 | 176 |
| 200 | 8″ | - | - | 6 | SN250M | 995 | 497,5 | 280 | 226 | 528 | 668 | 1044 | 289 |
| 200 | 8″ | 6 | 8 | 10 | SN300M | 1118 | 559 | 340 | 226 | 558 | 728 | 1104 | 327 |

1) Includes a safety factor of 1.25

2) Applies to average weight of a PN40 valve, mounting kit and Automax actuator

3) Including 150 mm for the height of an average switch box

# Product code

Example:

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 88 | 8 | 4 | K | F | - | 0006 | - | BAB | H | E | A | - | P |
| **Code** | 1 | 2 | 3 | 4 | 5 | | 6 | | 7 | 8 | 9 | 10 | | 11 |

1. Valve type
   88 NAF Duball DL

2. Material
   8 CF8M

3. Pressure rating

| | | |
|---|---|---|
| **2** | PN 10 | (DN 200)[1)] |
| **3** | PN 16 | (DN 80–200) |
| **4** | ANSI Class 150 | (Size 3″–8″) |
| **5** | PN 25 | (DN 200)[3)] |
| **6** | PN 40 | (DN 80-200) |
| **7** | ANSI Class 300 | (Size 3″-8″) |

4. Stem bearing
   K R-PTFE, carbon-reinforced

5. Body type
   F Flanged

6. Size

| PN ratings | DN | ANSI ratings | Size |
|---|---|---|---|
| **0080** | 80 | **0003** | 3″ |
| **0100** | 100 | **0004** | 4″ |
| **0150** | 150 | **0006** | 6″ |
| **0200** | 200 | **0008** | 8″ |

7. Seat, ball[2] and ball overlay

| | Seat | Ball sector | Overlay |
|---|---|---|---|
| BBA | Alloy 6 overlay/SS | Solid Alloy 6 | - |

8. Seat seal
   **H** **H-ELAST (same media resistance as EPDM), max t=250 °C**

9. Stem seal
   **E** **Spring loaded R-PTFE V-rings, carbon reinforced**

10. Stem material
    **A** **Duplex EN 1.4460 (~AISI 329)**
    C 17-4PH

11. Configuration
    P Pocket ball with locked and sealed seats.

Versions marked in bold text are the standard versions with shortest lead time.

[1] Sizes 80–150 have the same dimensions in PN 10 and PN 16. Choose PN 16 for these sizes.
Sizes 80–150 have the same dimensions in PN 25 and PN 40. Choose PN 40 for these sizes.

**CONTACT US!**

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