

# Chicago Valves & Controls



**SERIES 89/FS89**  
**FLANGED FULL PORT**  
**BALL VALVE CLASS 150/300**

316 STAINLESS STEEL - ASTM A351

CARBON STEEL - ASTM A216 WCB

ALLOY 20 - ASTM A351 CN7M

LIVE LOADED STEM

ANTI-STATIC DEVICE

LOCKABLE HANDLE

DIRECT MOUNTED PAD (1/2"-4")

ELEVATED PAD ALLOWED TO ADJUST

GLAND PACKING FLANGE WHILE VALVE

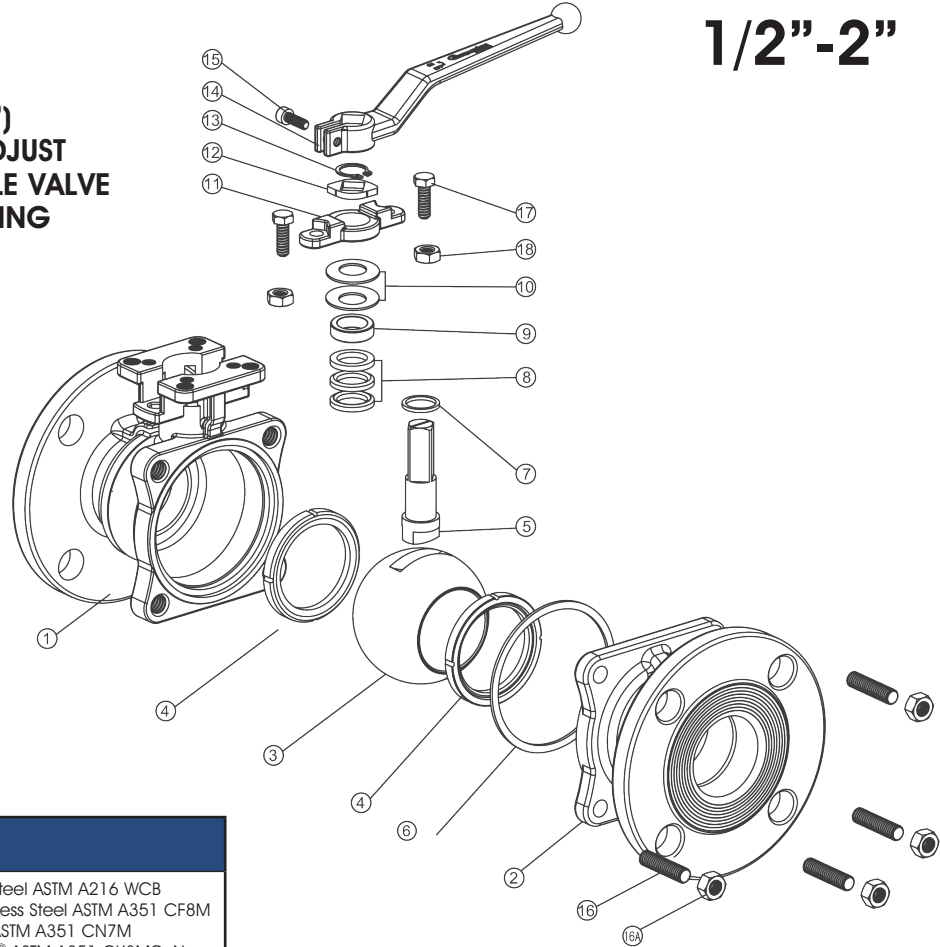
IS IN SERVICE WITHOUT REMOVING

ACTUATOR OR HANDLE

API 608 (1/2"-4")

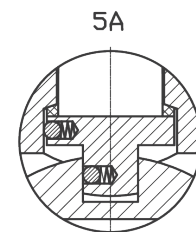
**Series 89**

**1/2"-2"**



#### PARTS & MATERIAL

| PART NO. | PART NAME                                | QTY.                           | MATERIAL                                                                                                                  |
|----------|------------------------------------------|--------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| 1        | Body                                     | 1                              | Carbon Steel ASTM A216 WCB<br>316 Stainless Steel ASTM A351 CF8M<br>Alloy 20 ASTM A351 CN7M<br>SMO 254® ASTM A351 CK3MCuN |
| 2        | End Piece                                | 1                              | Carbon Steel ASTM A216 WCB<br>316 Stainless Steel ASTM A351 CF8M<br>Alloy 20 ASTM A351 CN7M<br>SMO 254® ASTM A351 CK3MCuN |
| 3        | Ball                                     | 1                              | 316 Stainless Steel<br>Alloy 20<br>SMO 254®                                                                               |
| 4        | Seat                                     | 2                              | TFM®, XM, PEEK                                                                                                            |
| 5        | Stem                                     | 1                              | 316 Stainless Steel, Alloy 20,<br>17-4PH<br>SMO 254®                                                                      |
| 5A       | Anti-Static Device<br>Spring Loaded Ball | 2                              | 300 Series Stainless Steel<br>Hard Drawn Stainless Steel                                                                  |
| 6        | Body Seal                                | 1                              | PTFE, Graphite                                                                                                            |
| 7        | Thrust Washer                            | 1                              | TFM®, PEEK                                                                                                                |
| 8        | Stem Packing                             | 3                              | TFM®, XM, Graphite                                                                                                        |
| 9        | Gland                                    | 1                              | 300 Series Stainless Steel                                                                                                |
| 10       | Belleville Washer                        | 2                              | 300 Series Stainless Steel                                                                                                |
| 11       | Gland Flange                             | 1                              | 304 Stainless Steel ASTM A351 CF8                                                                                         |
| 12       | Travel Stop                              | 1                              | 300 Series Stainless Steel                                                                                                |
| 13       | Snap Ring                                | 1                              | 300 Series Stainless Steel                                                                                                |
| 14       | Handle                                   | 1                              | 300 Series Stainless Steel                                                                                                |
| 15       | Handle Bolt                              | 1                              | 300 Series Stainless Steel                                                                                                |
| 16       | Body Stud                                | See N in<br>Dimension<br>Table | B7 ASTM A193 GR B8MA                                                                                                      |
| 16A      | Body Nut                                 |                                | 2H ASTM A194 GR 8A                                                                                                        |
| 17       | Gland Flange Bolt                        | 2                              | B7 ASTM A193 GR B8MA                                                                                                      |
| 18       | Gland Bolt Nut                           | 2                              | 2H ASTM A194 GR 8A                                                                                                        |

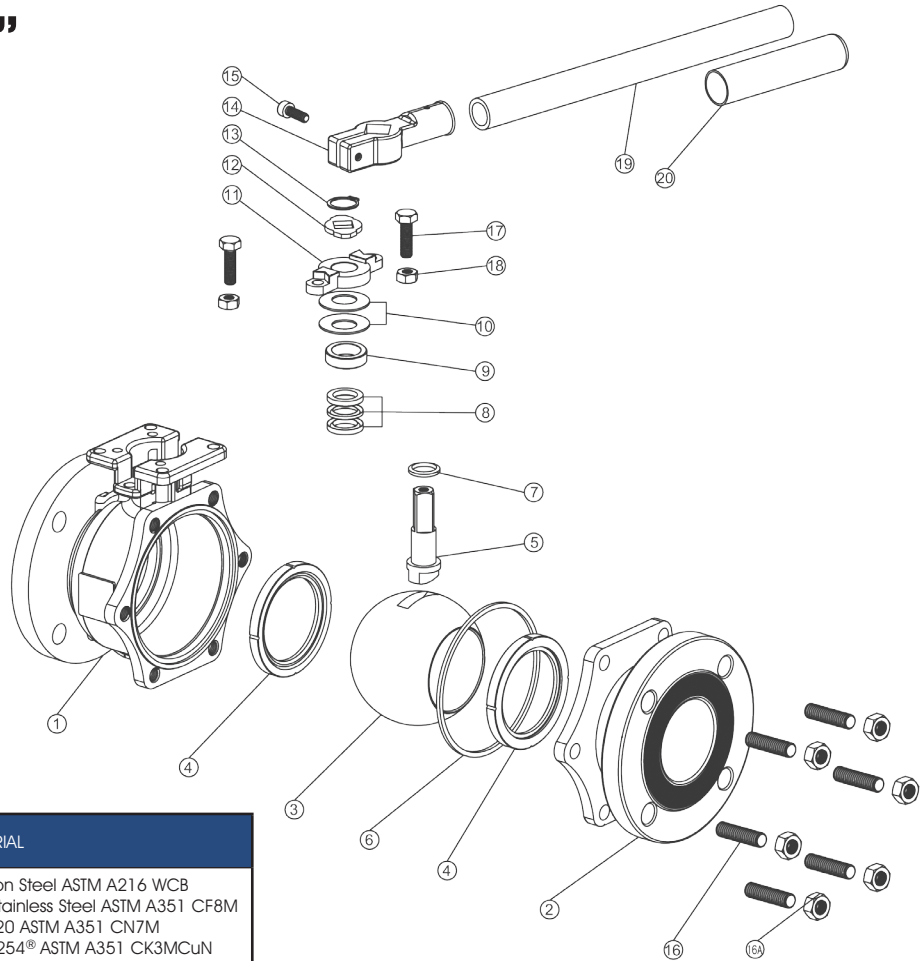


Anti-static device

#### APPLICABLE STANDARDS

|                           |                                         |
|---------------------------|-----------------------------------------|
| BASIC DESIGN              | ASME B16.34                             |
| FACE TO FACE<br>DIMENSION | ASME B16.10                             |
| FLANGE DIMENSIONS         | ASME B16.5                              |
| TEST                      | API 598                                 |
| MOUNTED PADS DIEM         | ISO 5211                                |
| FIRE SAFE                 | API 607 6TH EDITION (FIRE SAFE ONLY)    |
| NACE                      | MR-0175 (WITH 316 STAINLESS STEEL STEM) |

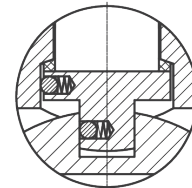
## 21/2"-4"



### PARTS & MATERIAL

| PART NO. | PART NAME                                | QTY.                           | MATERIAL                                                                                                                  |
|----------|------------------------------------------|--------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| 1        | Body                                     | 1                              | Carbon Steel ASTM A216 WCB<br>316 Stainless Steel ASTM A351 CF8M<br>Alloy 20 ASTM A351 CN7M<br>SMO 254® ASTM A351 CK3MCuN |
| 2        | End Piece                                | 1                              | Carbon Steel ASTM A216 WCB<br>316 Stainless Steel ASTM A351 CF8M<br>Alloy 20 ASTM A351 CN7M<br>SMO 254® ASTM A351 CK3MCuN |
| 3        | Ball                                     | 1                              | 316 Stainless Steel<br>Alloy 20<br>SMO 254®                                                                               |
| 4        | Seat                                     | 2                              | TFM®, XM, PEEK                                                                                                            |
| 5        | Stem                                     | 1                              | 316 Stainless Steel, Alloy 20,<br>17-4PH<br>SMO 254®                                                                      |
| 5A       | Anti-Static Device<br>Spring Loaded Ball | 2                              | 300 Series Stainless Steel<br>Hard Drawn Stainless Steel                                                                  |
| 6        | Body Seal                                | 1                              | PTFE, Graphite                                                                                                            |
| 7        | Thrust Washer                            | 1                              | TFM®, PEEK                                                                                                                |
| 8        | Stem Packing                             | 3                              | TFM®, XM, Graphite                                                                                                        |
| 9        | Gland                                    | 1                              | 300 Series Stainless Steel                                                                                                |
| 10       | Belleville Washer                        | 2                              | 300 Series Stainless Steel                                                                                                |
| 11       | Gland Flange                             | 1                              | 304 Stainless Steel ASTM A351 CF8                                                                                         |
| 12       | Travel Stop                              | 1                              | 300 Series Stainless Steel                                                                                                |
| 13       | Snap Ring                                | 1                              | 300 Series Stainless Steel                                                                                                |
| 14       | Handle                                   | 1                              | 300 Series Stainless Steel                                                                                                |
| 15       | Handle Bolt                              | 1                              | 300 Series Stainless Steel                                                                                                |
| 16       | Body Stud                                | See N in<br>Dimension<br>Table | B7 ASTM A193 GR B8MA                                                                                                      |
| 16A      | Nut                                      |                                | B7 ASTM A193 GR B8MA                                                                                                      |
| 17       | Gland Flange Bolt                        | 2                              | B7 ASTM A193 GR B8MA                                                                                                      |
| 18       | Gland Bolt Nut                           | 2                              | 2H ASTM A194 GR 8A                                                                                                        |
| 19       | Handle                                   | 1                              | 300 Series Stainless Steel                                                                                                |
| 20       | Handle Sleeve                            | 1                              | PVC                                                                                                                       |

5A



Anti-static device

### APPLICABLE STANDARDS

|                           |                                         |
|---------------------------|-----------------------------------------|
| BASIC DESIGN              | ASME B16.34                             |
| FACE TO FACE<br>DIMENSION | ASME B16.10                             |
| FLANGE DIMENSIONS         | ASME B16.5                              |
| TEST                      | API 598                                 |
| MOUNTED PADS DIEM         | ISO 5211                                |
| FIRE SAFE                 | API 607 6TH EDITION (FIRE SAFE ONLY)    |
| NACE                      | MR-0175 (WITH 316 STAINLESS STEEL STEM) |

## PARTS & MATERIAL

| PART NO. | PART NAME            | QTY.                           | MATERIAL                                                         |
|----------|----------------------|--------------------------------|------------------------------------------------------------------|
| 1        | Body                 | 1                              | Carbon Steel ASTM A216 WCB<br>316 Stainless Steel ASTM A351 CF8M |
| 2        | End Piece            | 1                              | Carbon Steel ASTM A216 WCB<br>316 Stainless Steel ASTM A351 CF8M |
| 3        | Ball                 | 1                              | 316 Stainless Steel                                              |
| 4        | Stem                 | 1                              | 316 Stainless Steel                                              |
| 5        | Seat                 | 2                              | RTFE                                                             |
| 6        | Body Seal            | 1                              | 316 SS / Graphite Sprial Wound                                   |
| 7        | Thrust Washer        | 1                              | RTFE                                                             |
| 8        | Thrust Washer        | 1                              | 50% PTFE/50% 316 Stainless Steel                                 |
| 9        | Stem Bearing         | 1                              | RTFE                                                             |
| 10       | Stem Packing (1)     | 3-4                            | Graphite                                                         |
| 11       | Stem Packing (2)     |                                | Graphite                                                         |
| 12       | Wrench Block*        | 1                              | Carbon Steel                                                     |
| 13       | Handle, Pipe*        | 1                              | Ductile Iron                                                     |
| 14       | Handle, Bolt*        | 2                              | C.S                                                              |
| 15       | Sleeve               | 1                              | Steel<br>304 Stainless Steel                                     |
| 16       | Gland Flange         | 1                              | Carbon Steel ASTM A216 WCB 316<br>Stainless Steel ASTM A351 CF8M |
| 17       | Gland Bolt           | 2                              | Steel<br>300 Series Stainless Steel                              |
| 18       | Travel Stop          | 1                              | Zinc Plated Steel<br>300 Series Stainless Steel                  |
| 19       | Snap Ring            | 1                              | Nickel Plated Carbon Steel                                       |
| 20       | Ball Support Seat    | 1                              | RTFE                                                             |
| 21       | Ball Support Pin     | 1                              | 316 Stainless Steel                                              |
| 22       | Ball Support Packing | 1                              | Graphite                                                         |
| 23       | Ball Support Nut     | 1                              | 300 Series Stainless Steel                                       |
| 24       | Set Nut              | 1                              | 300 Series Stainless Steel                                       |
| 25       | Tuning Screw         | 1                              | 300 Series Stainless Steel                                       |
| 26       | Body Nut             | See N in<br>Dimension<br>Table | 2HM<br>8MA<br>ASTM A194 Gr 8A<br>ASTM A194 Gr 2HM                |
| 27       | Body Stud            | See N in<br>Dimension<br>Table | B7M<br>B8A<br>ASTM A193 Gr B8MA<br>ASTM A193 Gr B7M              |
| 28       | Anti-Static          | 2                              | 316 Stainless Steel                                              |
| 29       | Stop Housing         | 1                              | Carbon Steel ASTM A216 WCB<br>304 Stainless Steel ASTM A351 CF8M |
| 30       | Screw                | 4                              | Steel<br>304 Stainless Steel                                     |

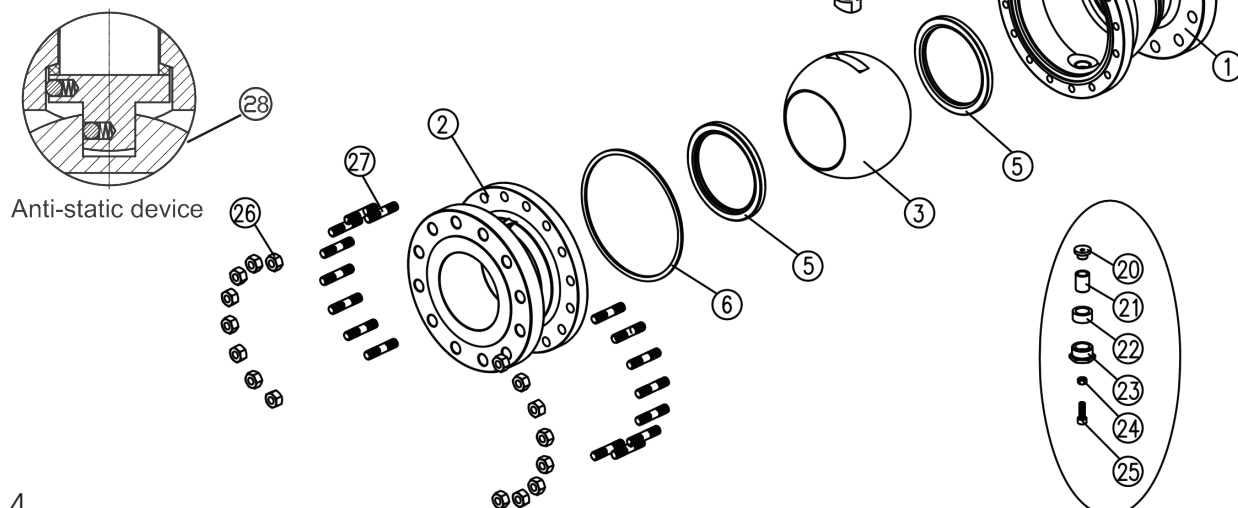
\* Ball Support for:  
Class 150 10"-12"  
Class 300 6"-12"

## Series 89

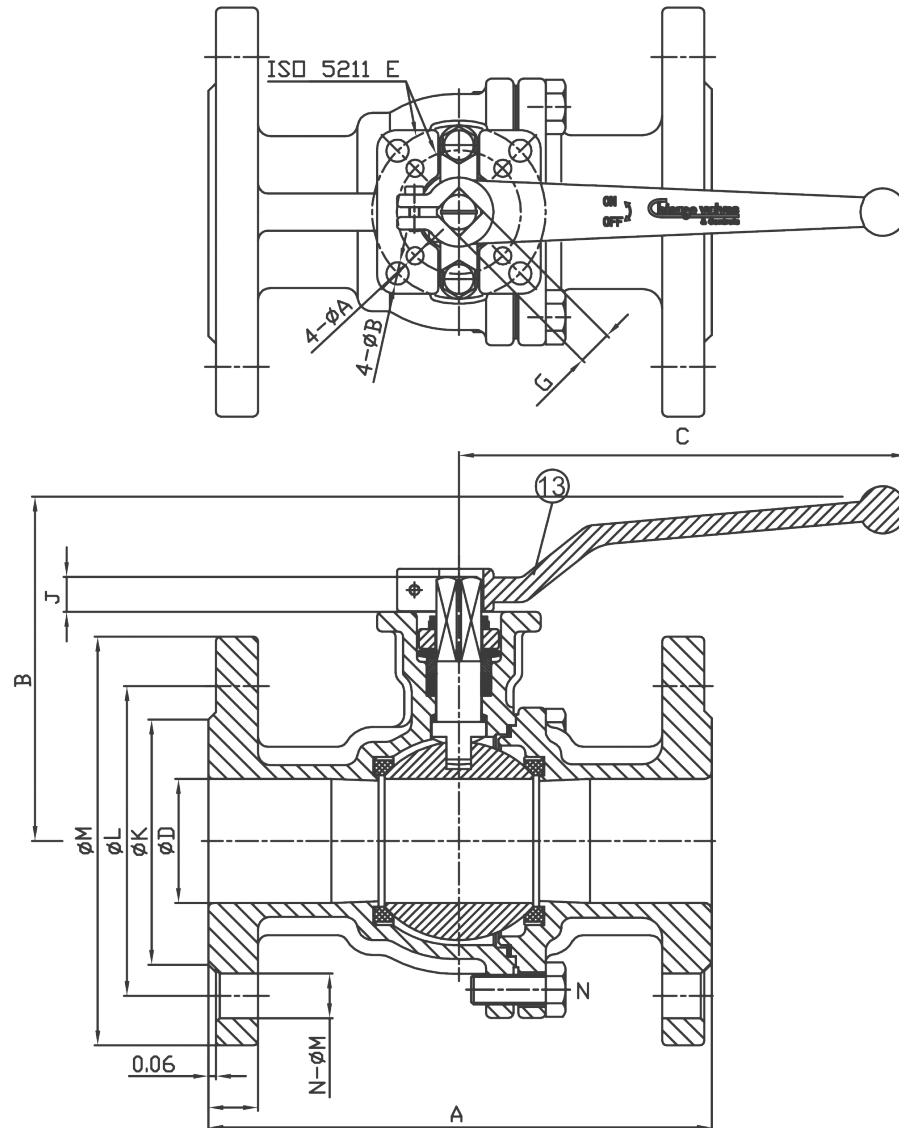
# 6"-12"

### APPLICABLE STANDARDS

|                           |                                          |
|---------------------------|------------------------------------------|
| BASIC DESIGN              | ASME B16.34                              |
| FACE TO FACE<br>DIMENSION | ASME B16.10                              |
| FLANGE DIMENSIONS         | ASME B16.5                               |
| TEST                      | API 598                                  |
| MOUNTED PADS DIEM         | ISO 5211                                 |
| FIRE SAFE                 | API 607 4TH EDITION (FIRE SAFE ONLY)     |
| NACE                      | MIR-0175 (WITH 316 STAINLESS STEEL STEM) |



# Series 89

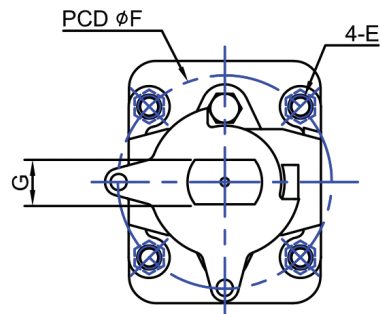
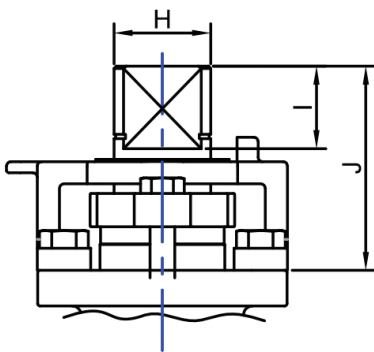
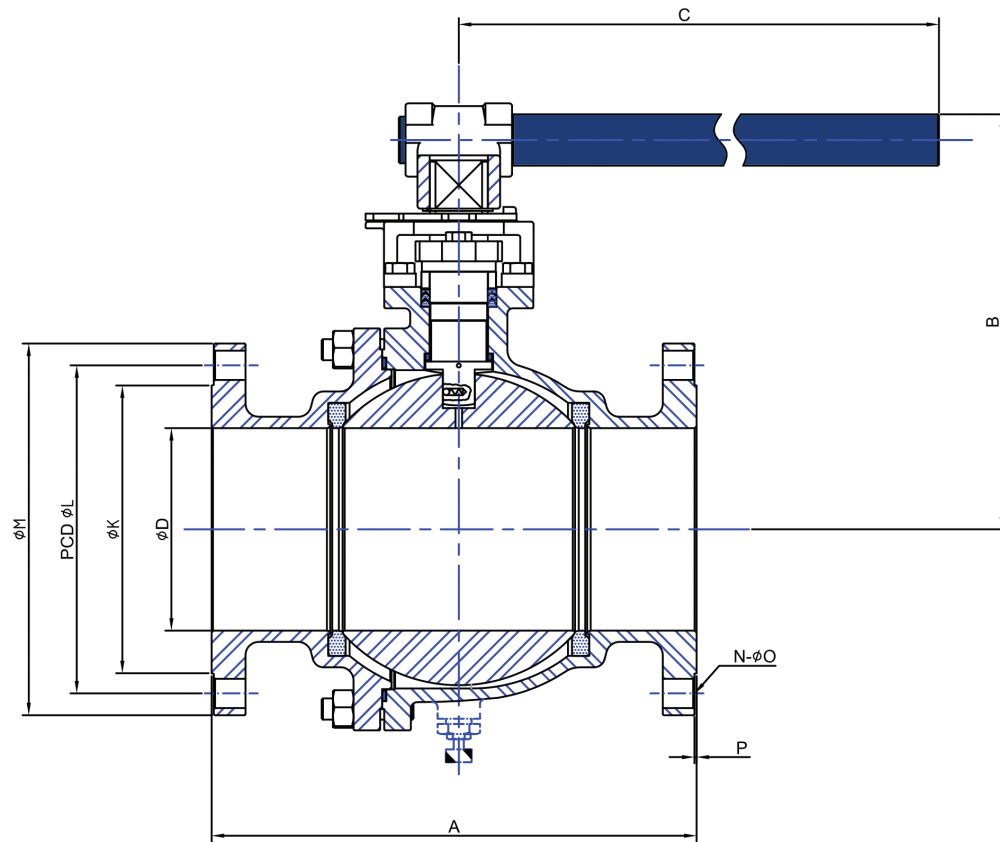


| SIZE   | CV<br>(GPM) | WEIGHT (LBS) |       |
|--------|-------------|--------------|-------|
|        |             | 150LB        | 300LB |
| 1/2"   | 26          | 4.30         | 5.54  |
| 3/4"   | 50          | 4.74         | 7.61  |
| 1"     | 94          | 6.94         | 10.36 |
| 1 1/2" | 260         | 12.74        | 19.16 |
| 2"     | 480         | 19.22        | 22.02 |
| 2 1/2" | 750         | 30.31        | 38.80 |
| 3"     | 1300        | 39.84        | 52.27 |
| 4"     | 2300        | 63.32        | 90.37 |

## DIMENSIONS (INCHES)

| SIZE   | A     |       | B     |       | C     | D    | E    | E    | F         | G    | ISO<br>5211 | J    | K    | L     |       | M     |       | N-□M  |       |
|--------|-------|-------|-------|-------|-------|------|------|------|-----------|------|-------------|------|------|-------|-------|-------|-------|-------|-------|
|        | 150LB | 300LB | 150LB | 300LB |       |      |      |      |           |      |             |      |      | 150LB | 300LB | 150LB | 300LB | 150LB | 300LB |
| 1/2"   | 4.25  | 5.50  | 3.55  | 3.55  | 4.84  | 0.59 | 0.24 | 0.24 | 1.42-1.65 | 0.35 | F03-F04     | 0.35 | 1.38 | 2.38  | 2.62  | 3.50  | 3.74  | 4-□   | 4-□   |
| 3/4"   | 4.62  | 6.0   | 3.94  | 3.94  | 4.84  | 0.79 | 0.24 | 0.24 | 1.42-1.65 | 0.35 | F03-F04     | 0.35 | 1.69 | 2.76  | 3.25  | 3.86  | 4.61  | 4-□   | 4-□   |
| 1"     | 5.0   | 6.50  | 4.22  | 4.22  | 6.02  | 0.98 | 0.24 | 0.28 | 1.65-1.97 | 0.43 | F04-F05     | 0.43 | 2.01 | 3.13  | 3.50  | 4.25  | 4.88  | 4-□   | 4-□   |
| 1 1/2" | 6.50  | 7.50  | 5.51  | 5.51  | 7.20  | 1.57 | 0.28 | 0.35 | 1.97-2.76 | 0.55 | F05-F07     | 0.55 | 2.87 | 3.88  | 4.51  | 5.0   | 6.14  | 4-□   | 4-□   |
| 2"     | 7.0   | 8.50  | 5.75  | 5.75  | 7.20  | 1.97 | 0.28 | 0.35 | 1.97-2.76 | 0.55 | F05-F07     | 0.35 | 3.62 | 4.74  | 5.0   | 5.98  | 6.50  | 4-□   | 8-□   |
| 2 1/2" | 7.50  | 9.50  | 6.06  | 6.45  | 13.86 | 2.56 | 0.35 | 0.43 | 2.76-4.02 | 0.67 | F07-F10     | 0.67 | 4.13 | 5.49  | 5.87  | 7.01  | 7.48  | 6-□   | 8-□   |
| 3"     | 8.0   | 11.12 | 6.50  | 6.89  | 13.86 | 3.15 | 0.35 | 0.43 | 2.76-4.02 | 0.67 | F07-F10     | 0.67 | 5.0  | 6.0   | 6.61  | 7.48  | 8.27  | 6-□   | 8-□   |
| 4"     | 9.0   | 12.00 | 7.20  | 7.59  | 15.63 | 3.94 | 0.43 | 0.51 | 4.02-4.92 | 0.87 | F10-F12     | 0.87 | 6.18 | 7.50  | 7.87  | 9.02  | 10.0  | 8-□   | 8-□   |

# Series 89



Mounting Dimensions

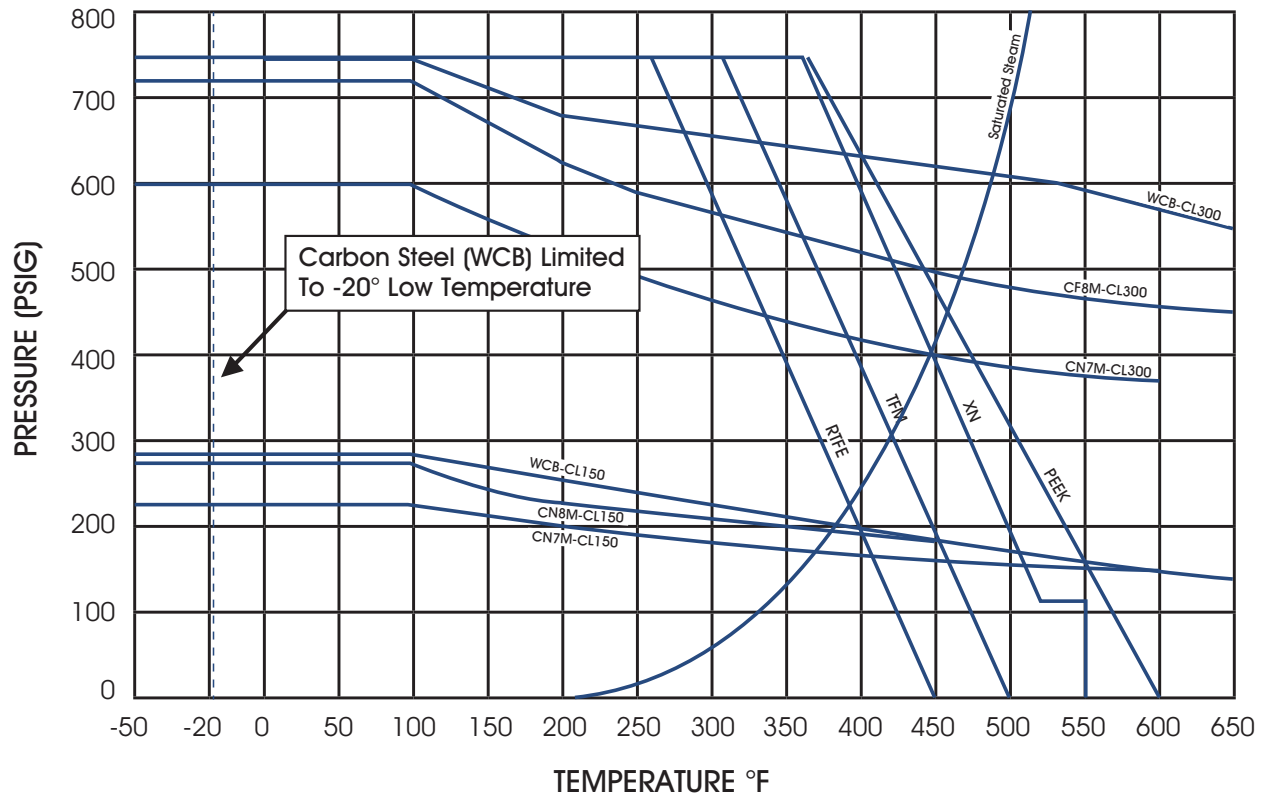
|      | 150      | 300      | 150          | 300          |
|------|----------|----------|--------------|--------------|
| SIZE | CV (GPM) | CV (GPM) | WEIGHT (LBS) | WEIGHT (LBS) |
| 6"   | 5000     | 5000     | 169.32       | 240.52       |
| 8"   | 9600     | 9600     | 292.33       | 380.30       |
| 10"  | 15000    | 15000    | 540.13       | 703.27       |
| 12"  | 21000    | 21000    | 656.98       | 859.80       |

## DIMENSIONS (INCHES)

| Class | 150  | 300   | 150   | 300   |       |       |               |      |      |      |      |      |      |       | 150   | 300   | 150   | 300   | 150 | 300 | 150  | 300  |
|-------|------|-------|-------|-------|-------|-------|---------------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-----|-----|------|------|
| Size  | A    | A     | B     | C     | C     | D     | E             | F    | G    | H    | H    | I    | J    | K     | L     | L     | M     | M     | N   | N   | O    | O    |
| 6"    | 15.5 | 15.8  | 11.22 | 11.22 | 25.59 | 5.98  | 1/2-13UNC/M12 | 4.92 | 1.02 | 1.71 | 1.71 | 1.65 | 3.58 | 8.50  | 9.51  | 10.63 | 10.98 | 12.52 | 8   | 16  | 0.87 | 0.87 |
| 8"    | 18   | 19.75 | 11.57 | 12.72 | 37.40 | 7.87  | 1/2-13UNC/M12 | 4.92 | 1.02 | 1.71 | 1.71 | 1.65 | 3.58 | 10.63 | 11.75 | 12.99 | 13.50 | 15.00 | 10  | 16  | 0.87 | 0.98 |
| 10"   | 21   | 22.38 | 14.65 | 14.49 | 14.49 | 9.84  | 5/8-11UNC/M16 | 5.51 | 1.38 | 1.97 | 2.17 | 2.13 | 3.86 | 12.76 | 14.25 | 15.26 | 15.98 | 17.48 | 16  | 20  | 0.98 | 1.14 |
| 12"   | 24   | 25.5  | 16.26 | 16.06 | 16.06 | 11.81 | 5/8-11UNC/M16 | 5.51 | 1.38 | 1.97 | 2.17 | 2.13 | 3.86 | 15.00 | 17.01 | 17.76 | 19.02 | 20.51 | 16  | 20  | 0.98 | 1.26 |



## PRESSURE-TEMPERATURE RATINGS SERIES 89



### Note:

The maximum pressure/temperature ratings of the valve assemblies are limited to lowest of the body or seat material fitted. The body ratings are based on ASME B16.34 rating for materials. The graphs are based on laboratory testing and our experience in field. The seat ratings depend on the material, design, application and function.

## Chicago Valves & Controls® Seat Materials

### M-TFM® PTFE

Dyneon TFME® PTFE is a second generation PTFE with improved chemical and heat resistant properties and stress recovery. Its temperature range is -100°F to 500°F (-73°C to 260°C) Color - white.

### R-Reinforced Polytetrafluoroethylene (RTFE).

PTFE's mechanical properties are enhanced by adding 15% filler material to provide improved strength, stability and wear resistance. Its temperature range is from -320°F to 450°F (-196°C to 232°C). Color-off-white.

**XN** - is a free-flowing compound based on TFME® containing electro-graphitized carbon. It features: increased thermal dimensional stability and surface hardness, improved deformation under load, reduced friction and wear, and good chemical stability. It has a high limiting oxygen index (LOI), low coefficient of friction, very good mechanical properties and exceptional temperature resistance. It is used as a seat material in chemical processing and automotive industries. It is ideal to with steam and thermal fluid applications up to 550°F (228°C) and as low as -40°F (-40°C). Color -black.

### P-PEEK (Unfilled) Polyetheretherketone

PEEK Polymer offers a unique combination of chemical, mechanical and thermal properties. Excellent for water and steam application at elevated temperatures up to 600°F (315°C). Color - beige.

### Other seat materials

Other seat materials are available according to the application, such as very high temperature or cryogenic conditions.

# HOW TO ORDER

| 1"          | FS89            | 6                      | 6                     | 6                   | R         | G                | G                               | 3                      | X              | OH      |
|-------------|-----------------|------------------------|-----------------------|---------------------|-----------|------------------|---------------------------------|------------------------|----------------|---------|
| Size        | Series          | Body & Ends            | Ball                  | Stem                | Seats     | Body Seal        | Stem Packing                    | Class                  | Service        | Options |
| <b>SIZE</b> | <b>SERIES</b>   | <b>BODY &amp; ENDS</b> |                       |                     |           | <b>BODY-SEAL</b> |                                 |                        | <b>SERVICE</b> |         |
| 1/2"        | 89-Full Port    | 6                      | 316 Stainless Steel   | T                   | PTFE      | X                | Oxygen Service (CVAC Standards) |                        |                |         |
| 3/4"        | *FS89-Fire Safe | 4                      | Carbon Steel          | G                   | Graphite  | SF               | Silicone FREE                   |                        |                |         |
| 1"          |                 | 2                      | Alloy 20              | <b>STEM PACKING</b> |           |                  |                                 |                        |                |         |
| 1 1/2"      |                 | <b>BALL</b>            |                       |                     |           | M                | TFM                             |                        |                |         |
| 2"          |                 | 6                      | 316 Stainless Steel   | X                   | XN**      |                  |                                 |                        |                |         |
| 2 1/2"      |                 | 2                      | Alloy 20              | G                   | Graphite  |                  |                                 |                        |                |         |
| 3"          |                 | <b>STEM</b>            |                       |                     |           | <b>OPTIONS</b>   |                                 |                        |                |         |
| 4"          |                 | 6                      | 316 Stainless Steel   | <b>CLASS</b>        |           |                  | OH                              | Oval Handle (Up to 2") |                |         |
| 6"          |                 | 2                      | Alloy 20              | 1                   | 15ORF     | VB               | Vented Ball                     |                        |                |         |
| 8"          |                 | 7                      | 17-4PH                | 3                   | 30ORF     | SH               | Spring Loaded Handle (Up to 2") |                        |                |         |
| 10"         |                 | <b>SEATS</b>           |                       |                     |           | 1F               | 15OFF                           |                        |                |         |
| 12"         |                 | M                      | TFM*                  | 3F                  | 30OFF     |                  |                                 |                        |                |         |
|             |                 | X                      | XN*                   | 1B                  | 150BW***  |                  |                                 |                        |                |         |
|             |                 | R                      | RTFE 15% Glass Filled | 3B                  | 300BW***  |                  |                                 |                        |                |         |
|             |                 | P                      | PEEK                  | 1BB                 | 150BW**** |                  |                                 |                        |                |         |
|             |                 |                        |                       | 3BB                 | 300BW**** |                  |                                 |                        |                |         |

\*Fire Safe Must Use Graphite Body Seals & Stem Packing, TFM®, XN, SEATS.

\*\*XN - Carbon Fill TFM®

\*\*\*One End

\*\*\*\*Both Ends

**Chicago Valves**  
& Controls



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