

V86 Series Ball Valves VC86 Series CNG/NGV Valves

Pressure Rating up to 689 bar (10,000psig)



Features

- High pressure up to 10,000 psi (689 bar).
- Blowout proof design with internally loaded stem.
- Handle indicates the flow direction.
- Positive stop with a robust stop pin.
- High flow rate with maximum orifice.
- Various end ports including DK-Lok tube port.
- Various flow control with side and bottom inlet port on 3-way diverter valves.

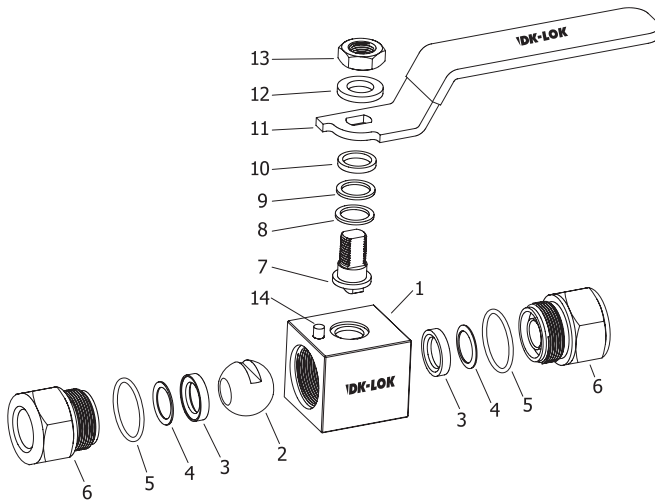


Table 1. **Materials of Construction**

| Component | Materials Grade/ASTM Specification |
|-----------|------------------------------------|
| 1 | Body |
| 2 | Ball |
| 3 | Seat (2) |
| 4 | Disc Spring (2) |
| 5 | End Seal (2) |
| 6 | End Connector (2) |
| 7 | Stem |
| 8 | Bearing |
| 9 | Packing |
| 10 | Gland |
| 11 | Lever Handle |
| | Optional Oval Handle |
| 12 | Washer |
| 13 | Stem Nut |
| 14 | Stop Pin |

- Wetted parts and lubricants listed in **blue**.
- Fluorinated-based lubricant

CNC/NGV Certifications

VC86 Series with PEEK seat and HNBR O-rings are available with CNG/NGV certifications.

The sealing material of seat and O-rings are selected for compatible with CNG.

VC86 Series with the live loaded compensation disc spring reacts on ball movement in both low and high pressure systems in CNG and NGV applications.

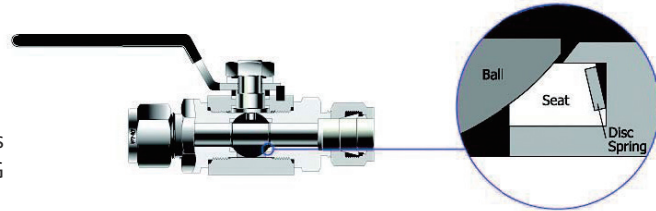


Table 2. **Pressure - Temperature Rating for CNG Service**

| Valve Series | Certificates | ECER110 | ANSI / AGA NGV 3.1-1995 CGV NGV 12.3-M95 | ANSI / IAS NGV 4.6-1999 CSA 12.56-M99 | ISO 15500 |
|-------------------------------------|------------------|-------------------------------|---|--|-------------------------------|
| VC86 Series 2-way ball valves | Certificate No. | 110R-000181 | 2010-REPORT-002 (00) | 2010-REPORT-003 (00) | 2010-REPORT-001- (00) |
| | Classification | Class 0 | manual valve | manual valve (Class B) | manual valve |
| | Temperature | -40 to 120 °C (-40 to 250 °F) | -40 to 121 °C (-40 to 250 °F) | -40 to 65 °C (-40 to 150 °F) | -40 to 121 °C (-40 to 250 °F) |
| | Working Pressure | 274 bar @ 120 °C | 273 bar @ 121 °C | 293 bar @ 65 °C | 273 bar @ 121 °C |

Operation

- 2-way positive shut off and 3-way directional control of fluids in process, power and instrument application.
- Valves are designed to control fluids in full open or full closed position.

- Valves that have not been actuated for a period of time may have a higher initial actuation torque.
- Valves must be in open position during system test not to damage the valve seat.
- Sour Gas Service NACE MR0175 available.

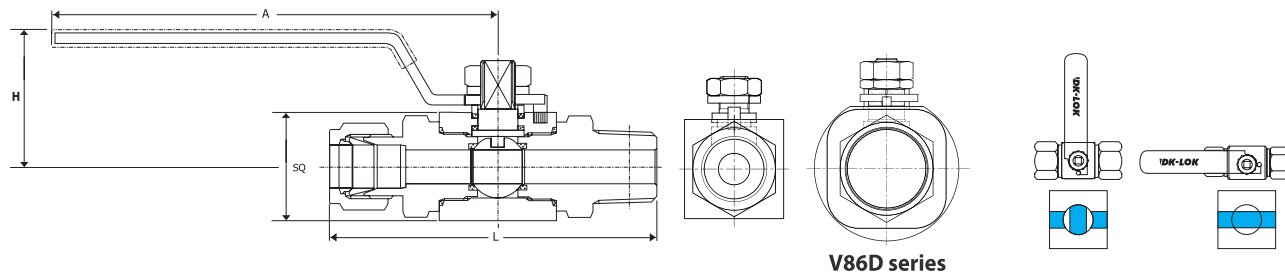
Factory Test

Every valve is tested with nitrogen gas @1,000 psig (68 bar) for leakage at the seat to a maximum allowable leak rate of 0.1 SCCM. The stem packing is tested with nitrogen gas @1,000 psig for no detectable leakage.

Cleaning and Packaging

Every valve is cleaned and packaged in accordance with DK-Lok cleaning standard DC-01. Special cleaning and packaging in accordance with DK-Lok DC-11 ensures compliance with product cleaning of ASTM G93 Level C is available for valves with PCTFE seat.

2-Way On-off Valves



Ordering Information and Dimensions

| Basic Ordering Number | End Connections Inlet & Outlet | Orifice mm (in.) | Cv | Dimensions mm (in.) | | | |
|-----------------------|--------------------------------|--------------------|--------------|---------------------|-------------|---------------|-------------|
| | | | | A | H | L | SQ |
| V86A- VC86A- | D-4T | 1/4 in. DK-Lok | 4.8 (0.19) | 108.3 (4.26) | 38.4 (1.52) | 97.12 (3.82) | 32.0 (1.26) |
| | D-6T | 3/8 in. DK-Lok | 7.1 (0.28) | | | 104.5 (4.11) | |
| | D-8T | 1/2 in. DK-Lok | 10.0 (0.39) | | | 109.6 (4.31) | |
| | F-4N | 1/4 in. Female NPT | | | | 74.0 (2.91) | |
| | F-6N | 3/8 in. Female NPT | 77.0 (3.03) | | | | |
| | F-8N | 1/2 in. Female NPT | 85.0 (3.35) | | | | |
| | M-4N | 1/4 in. Male NPT | 7.1 (0.28) | | | 95.4 (3.76) | |
| | M-6N | 3/8 in. Male NPT | 7.2 | | | 95.4 (3.76) | |
| M-8N | 1/2 in. Male NPT | 10.0 (0.39) | 100.2 (3.94) | | | | |
| V86B- VC86B- | F-8N | 1/2 in. Female NPT | 12.7 (0.50) | 149.0 (5.86) | 50.8 (2.00) | 89.0 (3.50) | 40.0 (1.57) |
| | F-12N | 3/4 in. Female NPT | | | | 90.0 (3.54) | |
| | D-12M | 12mm DK-Lok | 112.6 (4.43) | | | | |
| | D-16M | 16mm DK-Lok | 115.0 (4.53) | | | | |
| | D-8T | 1/2 in. DK-Lok | 114.6 (4.51) | | | | |
| | D-10T | 5/8 in. DK-Lok | 114.4 (4.50) | | | | |
| D-12T | 3/4 in. DK-Lok | 12.7 (0.50) | 114.8 (4.52) | | | | |
| V86C- VC86C- | F-12N | 3/4 in. Female NPT | 19.0 (0.75) | 149.0 (5.86) | 56.0 (2.20) | 96.0 (3.78) | 50.0 (1.97) |
| | F-16N | 1 in. Female NPT | | | | 111.0 (4.37) | |
| | D-12T | 3/4 in. DK-Lok | 125.0 (4.92) | | | | |
| | D-16T | 1 in. DK-Lok | 134.0 (5.27) | | | | |
| | M-12N | 3/4 in. Male NPT | 15.7 (0.62) | | | 119.0 (4.68) | |
| M-16N | 1 in. Male NPT | 19.0 (0.75) | 129.0 (5.07) | | | | |
| VC86D- | F-16N | 1 in. Female NPT | 25.0 (0.98) | 193.7 (7.62) | 84.1 (3.31) | 112.90 (4.44) | 70 (2.76) |

Table 3. 2-Way Valve Actuation Torque
Standard Valves

CNG valve ordering number :

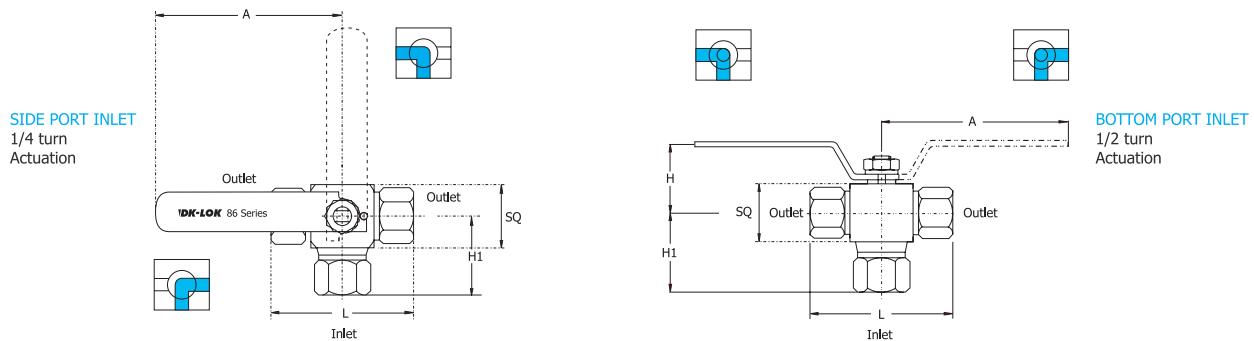
The basic ordering number listed in black are not for CNG/NGV applicable valves.

| Valve Series | System Pressures, bar (psig) | | |
|--------------|------------------------------|---------------|-------------|
| | 0 (0) | 334 (5000) | 413 (6000) |
| | Torque Unit: Nm | | |
| V86A | 3.92 (2.89) | - | 6.37 (4.69) |
| V86B | 7.35 (5.42) | 10.30 (7.59) | - |
| V86C | 12.26 (9.04) | 19.61 (14.46) | - |

CNG/NGV Valves

| Valve Series | System Pressures, bar (psig) | |
|--------------|------------------------------|------------|
| | 0 (0) | 344 (5000) |
| | Torque Unit: Nm | |
| VC86B | 5.19 | 10.59 |
| VC86C | 2.15 | 5.88 |
| VC86D | 7.35 | 9.80 |

3-Way Diverter Valves



V86 3-way ball valve is designed to switch media through the inlet port and direct it to out of two outlet ports.

Ordering Information and Dimensions

| Basic Ordering Number | End Connections | Orifice mm (in.) | Dimensions mm (in.) | | | | SQ |
|-----------------------|-----------------|--------------------|---------------------|-------------|-------------|--------------|-------------|
| | | | A | H | H1 | L | |
| V86A- | 3*- D-4T- | 1/4 in. DK-Lok | 108.3 (4.26) | 38.4 (1.52) | 50.9 (2.0) | 97.12 (3.82) | 32.0 (1.26) |
| | 3*- D-6T- | 3/8 in. DK-Lok | | | 53.0 (2.09) | 104.5 (4.11) | |
| | 3*- D-8T- | 1/2 in. DK-Lok | | | 55.8 (2.20) | 109.6 (4.31) | |
| | 3*- F-4N- | 1/4 in. Female NPT | | | 40.0 (1.57) | 74.0 (2.91) | |
| | 3*- F-6N- | 3/8 in. Female NPT | | | 41.5 (1.64) | 77.0 (3.03) | |
| V86B- | 3*- F-8N- | 1/2 in. Female NPT | 149.0 (5.86) | 50.8 (2.00) | 45.5 (1.79) | 85.0 (3.35) | 40.0 (1.57) |
| | 3*- F-8N- | 1/2 in. Female NPT | | | 55.0 (2.17) | 89.0 (3.50) | |
| | 3*- F-12N- | 3/4 in. Female NPT | | | 55.0 (2.17) | 90.0 (3.54) | |
| | 3*- D-10T- | 5/8 in. DK-Lok | | | 67.2 (2.66) | 114.4 (4.50) | |
| V86C- | 3*- D-12T- | 3/4 in. DK-Lok | 149.0 (5.86) | 56.0 (2.20) | 67.7 (2.66) | 115.0 (4.53) | 50.0 (1.97) |
| | 3*- D-12T- | 3/4 in. DK-Lok | | | 75.3 (2.96) | 125.0 (4.92) | |
| | 3*- D-16T- | 1 in. DK-Lok | | | 80.0 (3.15) | 134.0 (5.27) | |
| | 3*- F-12N- | 3/4 in. Female NPT | | | 59.5 (2.34) | 96.0 (3.78) | |
| | 3*- F-16N- | 1 in. Female NPT | | | 67.0 (2.64) | 111.0 (4.37) | |

All dimensions shown are for reference only and are subject to change.

Side and Bottom Port Valve Ordering Information

To order side port entry valve, replace * with S, to order bottom port entry valve, replace * with B.

Examples : V86A-3S-D-4T-S, V86A-3B-D-4T-S.

Table 4. 3-way Valve Actuation Torque

| Valve Series | System Pressures, bar (psig) | | |
|--------------|------------------------------|------------|------------|
| | 0 (0) | 206 (3000) | 275 (4000) |
| V86A | 3.92 | - | 4.90 |
| V86B | 7.35 | 7.85 | - |

Unit: Nm

Table 5. 2-way Valve Pressure and Temperature Rating

| Valve Series | Seat Material | Maximum Working Pressure at -54 ~ 21°C (-65 ~ 70°F) psig(bar) | Temperature Rating °C(°F) |
|--------------|---------------|---|---------------------------|
| V86A | PVDF | 6,000 (413) | -30 to 130 (-22 to 266) |
| | PCTFE | | -30 to 180 (-22 to 356) |
| | PEEK | 10,000 (689) | -54 to 260 (-65 to 500) |
| V86B V86C | PVDF | 5,000 (344) | -30 to 110 (-22 to 230) |
| | PCTFE | | -30 to 160 (-22 to 320) |
| | PEEK | 6,000 (413) | -40 to 210 (-40 to 410) |
| V86D | PCTFE | 6,000 (413) | -40 to 160 (-40 to 320) |

Table 6. 3-way Valve Pressure and Temperature Rating

| Valve Series | Seat | Maximum Working Pressure at -54~21°C (-65~70°F) psig (bar) | Temperature Rating °C(°F) |
|--------------------|-------|--|---------------------------|
| V86A-3* | PVDF | 4,000 (275) | -30 to 130 (-22 to 266) |
| | PCTFE | | -30 to 180 (-22 to 356) |
| | PEEK | 6,000 (413) | -40 to 230 (-40 to 446) |
| V86B-3* V86C-3* | PVDF | 3,000 (206) | -30 to 110 (-22 to 230) |
| | PCTFE | | -30 to 160 (-22 to 320) |
| | PEEK | 4,000 (275) | -40 to 210 (-40 to 410) |

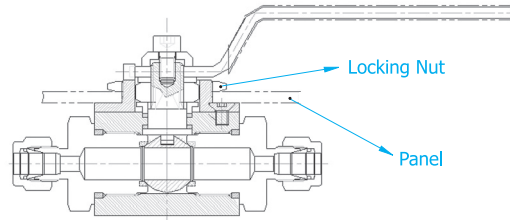
Note : Refer to table 2 for VC86 series's Pressure and Temperature Rating

Options

Locking Nut & Panel Mounting

Ordering designator : P1
 Addition locking nut below handle makes the valve panel mountable.
 Disassemble the handle prior to panel mounting.

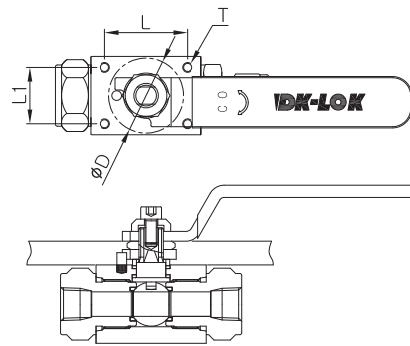
| Valve Series | Panel Hole Drill | Panel Thickness |
|--------------|------------------|------------------|
| V86A | 30.0 (1.18) | Max. 4.0 (0.157) |
| V86B | 38.0 (1.50) | |
| V86C | 38.0 (1.50) | |



Screw Hole for Panel Mounting

Ordering Designator : P2
 Additional four (4) screw holes on the top of valve makes the valve panel mountable.
 Disassemble the handle prior to panel mounting.

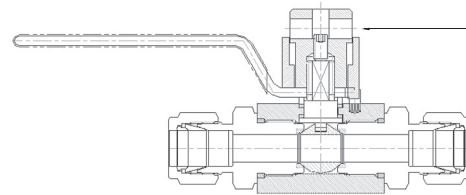
| Valve Series | L | L1 | T | D |
|--------------|-------------|-------------|---------|-------------|
| V86A | 34.0 (1.33) | 23.0 (0.91) | M4×0.7P | 30.0 (1.18) |
| V86B | 36.0 (1.42) | 29.0 (1.14) | M5×0.8P | 38.0 (1.50) |
| V86C | 40.0 (1.57) | 35.0 (1.37) | M6×1.0P | 38.0 (1.50) |



“Lift-Turn” Locking Device

Ordering Designator : LD
 Dk Tech patented “Lift-Turn” safety locking device allows you to lock the valve manually either in open or close position.
 The locking device consists of sturdy upper and lower locking detents made out of stainless steel.

Note : LD option applicable to 2-way valves.



Pad-Lock applicable
 7.2mm (0.28in) hole
 constructed on upper
 locking detent.

You may apply a pad-lock to
 secure the valve in the open
 or close position.

Ordering Information

Select the desired basic ordering number, and options from designators listed below.

| | | | | | |
|-------------|---|---|---------------------|---|---------------|
| V86A-D-4T | -PC | | -OH | -S | |
| V86B-F-12N | | | | -S | |
| VC86B-D-12M | | -LD | | -S | |
| | ↓ | ↓ | ↓ | ↓ | |
| | Seat | Panel Mounting | Locking Device | Handle | Body Material |
| | Nil : PEEK, standard for VC86 series Nil : PVDF, standard for V86 series PC : PCTFE PK : PEEK PV : PVDF | P1 : Locking nut & panel mounting P2 : Screw hole for panel mounting | LD : Locking Device | Nil : Standard Lever Handle OH : Oval Handle OH option is applicable to 2-way V86A Series valves. | S : SS316 |

Safe Valve Selection

The selection of a valve for any application or system design must be considered to ensure safe performance. Valve function, valve rating, material compatibility, proper installation, operation and maintenance remain the sole responsibility of the system designer and the user. DK-Lok accepts no liability for any improper selection, installation, operation or maintenance.

| | | | |
|--|---|--|---|
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