AGILENT VACUUM VALVES

Agilent Technologies

AGILENT VACUUM VALVE SOLUTIONS

Agilent offers a range of vacuum valves that are engineered for reliability, performance, and value. These valves also optimize conductance, operate in a wide variety of applications, and employ a minimum of moving parts. This reduces wear and particle generation which contributes to their performance and reliability. Agilent valves are manufactured using the highest quality vacuum materials and provide a choice of actuation, and a variety of mounting flanges.

Agilent High Performance Valves

We are pleased to add to our offering valve products manufactured to the highest international standards. The Series 26 Aluminum Block Valves, Series 12 Aluminum Gate Valves, and Series 54 UHV All-Metal Valves are the proven workhorses in their respective application segments. These are easily ordered with any of Agilent's vacuum pumps or other components.

Agilent High Performance Valves

Series 26 Aluminum Block Valves
Multi-purpose, high cycle life valves; position indication.

Series 12 Aluminum Gate Valves
Robust, compact, high conductance means of isolating a high vacuum pump.

Series 54 UHV All-Metal Valves
Extreme High Vacuum (XHV) compatible with dynamic all-metal sealing system.

Agilent Vacuum Valves

Stainless Steel Tube Valves
Provide maximum conductance, low outgassing, and easy installation.

Electromagnetic Block Valves
Rapid spring closure, service-free; eliminate the need for compressed air.

Variable Leak Valve
Unique device provides extremely precise control of gas flow to vacuum system.

VACUUM VALVES

Common Applications

- **Rough Vacuum**
  - Freeze drying
  - Food processing
  - Metal ore refining
  - Steam plant condensers
  - Vacuum distillation
- **Medium Vacuum**
  - Decorative coatings
  - Functional coatings
  - Chemical processes
  - Electron microscopes
  - Microscopy sample processing
- **High/Ultrahigh Vacuum**
  - Physics research
    - Optics
    - High energy
  - Semiconductor manufacturing
  - Electron tube manufacturing
  - Surface analysis (Auger Spectroscopy)
  - Molecular beam epitaxy
  - Outer space simulation

Vacuum Range	Valve Type		Housing Material	Size Range	Feed-through	Flange Options	Actuation	Page
Primary/Medium to High Vacuum								
Atm - 10^{-6} Torr	Block, Right Angle		Aluminum	0.75 in. to 1.0 in.	Shaft	ISO-KF	Electromagnetic	22-23
Atm - 10^{-9} Torr	Block, Right Angle	*Series 26*	Aluminum	0.75 in. to 1.5 in.	Bellows	ISO-KF	Manual/Air	4-9
Atm - 10^{-9} Torr	Block, In-Line	*Series 26*	Aluminum	0.75 in. to 1.0 in.	Bellows	ISO-KF	Manual/Air	4-9
Atm - 10^{-9} Torr	Tube, Right Angle		Stainless Steel	0.63 in. to 1.5 in.	Bellows	CF, ISO-KF	Manual/Air	18-21
Atm - 10^{-9} Torr	Tube, In-Line		Stainless Steel	0.63 in. to 1.5 in.	Bellows	CF, ISO-KF	Manual/Air	18-21
Atm - 10^{-9} Torr	Gate	*Series 12*	Aluminum	2.5 in. to 10 in.	Shaft	ISO, ASA	Manual/Air	10-14
Ultra High Vacuum								
Atm - 10^{-11} Torr	UHV, All-Metal Angle	*Series 54*	Stainless Steel	0.75 in. to 1.5 in.	Bellows	CF	Manual	15-17
Special Purpose								
Atm - 10^{-11} Torr	Variable Leak		Stainless Steel		Bellows	CF	Manual	24

Agilent Aluminum Block Valves - Series 26

Thank you for choosing Agilent Valves. These valves are designed with the highest international vacuum standards and manufactured with uncompromising quality. We are confident that Agilent Valves will meet your most demanding vacuum control needs.

The valves are available in manually-operated and pneumatically-operated versions. The pneumatic valve is also available with a position indicator.

The position indicator delivers an electrical output signal when the valve cycles, and is user-set in either the normally-open or normally-closed position.

Technical Specifications

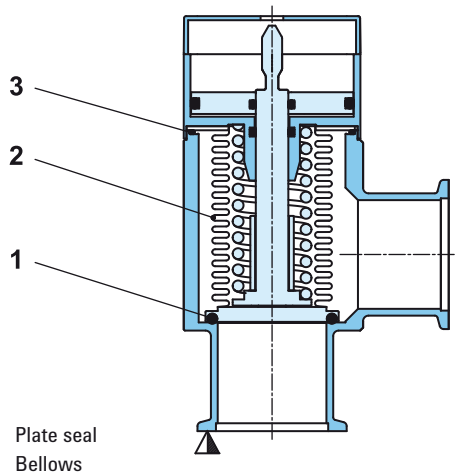
Cycles until first service	
with manual actuator	10 000
with closing spring	3 million
Maximum temperature	
Valve body	≤ 150 °C
Manual and pneumatic actuator	≤ 120 °C
Solenoid valve, position indicator	≤ 80 °C
Material	
Valve body aluminum	EN AW-6060 (3.3206)
Plate	AISI 316L (1.4404, 1.4435)
Bellows	AISI 316L (1.4404, 1.4435), AISI 316 Ti (1.4571)
Seal: bonnet, plate	FKM (Viton)
Mounting orientation	any
Solenoid valve	24 V DC, 115 VAC, 220 VAC; 2.5 W
Position indicator: contact rating	
Voltage	5 – 50 V AC / DC
Current	5 – 100 mA
Valve position indication	visual (mechanical)
Leak rate: valve body, valve seat	$< 1 \cdot 10^{-9}$ mbar $l s^{-1}$
Pressure range, series 26 (bellows)	$1 \cdot 10^{-8}$ mbar to 5 bar (abs)
Differential pressure on the plate	
In opening direction	≤ 2.0 bar
In closing direction	≤ 5.0 bar
Differential pressure at opening	≤ 1 bar

Features

- Body material: aluminum
- Angle and inline version
- Bellows
- Resistant against differential pressure
- Long lifetime

Aluminum Block Valves Functional Principle

NW 16–40 with pneumatic actuator NC



1 Plate seal
2 Bellows
3 Bonnet seal
▼ Valve seat side

Angle valves

NW (nominal I. D.) mm (in.)	Conductance (molecular flow) ls^{-1}	Valve with manual actuator: Turns per stroke n	Valve with manual actuator: Weight Aluminum body kg (lbs)	Valve with pneumatic actuator, single acting with closing spring (NC): Compressed air min.–max. overpressure bar (psi)	Volume of pneumatic actuator l	Volume of pneumatic actuator ft^3	Closing time s	Weight Aluminum body kg (lbs)
16 (⅝)	5	3.6	0.20 (0.44)	4–8 (58–116)	0.004	0.0001	0.10	0.28 (0.62)
25 (1)	14	3.8	0.27 (0.60)	4–8 (58–116)	0.011	0.0004	0.20	0.41 (0.90)
40 (1 ½)	45	4.5	0.60 (1.32)	4–8 (58–116)	0.035	0.0012	0.55	0.97 (2.14)

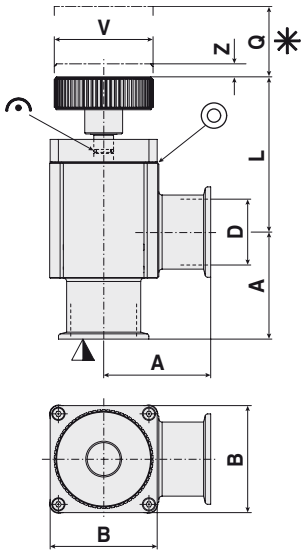
Inline valves

NW (nominal I. D.) mm (in.)	Conductance (molecular flow) ls^{-1}	Valve with manual actuator: Turns per stroke n	Valve with manual actuator: Weight Aluminum body kg (lbs)	Valve with pneumatic actuator, single acting with closing spring (NC): Compressed air min.–max. overpressure bar (psi)	Volume of pneumatic actuator l	Volume of pneumatic actuator ft^3	Closing time s	Weight Aluminum body kg (lbs)
16 (⅝)	5	3.6	0.28 (0.62)	4–8 (58–116)	0.004	0.0001	0.10	0.50 (1.10)
25 (1)	14	3.8	0.42 (0.93)	4–8 (58–116)	0.011	0.0004	0.20	0.60 (1.32)
40 (1 ½)	45	4.5	1.00 (2.20)	4–8 (58–116)	0.035	0.0012	0.55	1.40 (3.09)

Dimensions

Angle valve with manual actuator

NW 16–40 (⅝"–1 ½") ISO-KF



Models	NW 16	NW 25	NW 40
	(⅝)	(1)	(1 ½)
A	40	50	65
	(1.57)	(1.97)	(2.56)
B	40	48	65
	(1.57)	(1.89)	(2.56)
D	16	25	40
	(0.63)	(0.98)	(1.57)
L	64.90	60.90	94.30
	(2.56)	(2.40)	(3.71)
Q	46	44	73.50
	(1.81)	(1.73)	(2.89)
V	40	40	60
	(1.57)	(1.57)	(2.36)
Z*	3.60	4.70	7.90
	(0.14)	(0.19)	(0.31)

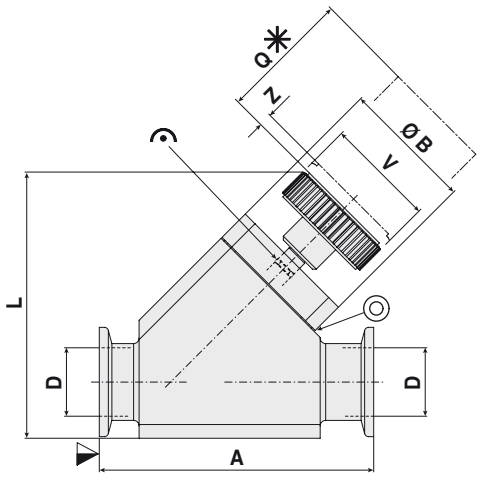
* *Gate stroke is longer due to transmission*

▼ Valve seat side
✳ Required for dismantling
Mechanical position indication
◎ Leak detection hole

Dimensions: millimeters (inches)

Inline valve with manual actuator

NW 16–40 (⅝"–1 ½") ISO-KF



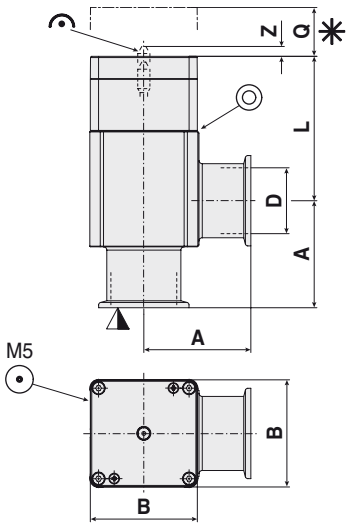
Models	NW 16	NW 25	NW 40
	(⅝)	(1)	(1 ½)
A	80	100	130
	(3.15)	(3.94)	(5.12)
B	40	48	65
	(1.57)	(1.89)	(2.56)
D	16	25	40
	(0.63)	(0.98)	(1.57)
L	90.60	97	143.50
	(3.57)	(3.82)	(5.65)
Q	46	44	73.50
	(1.81)	(1.73)	(2.89)
V	40	40	60
	(1.57)	(1.57)	(2.36)
Z	3.60	4.70	7.90
	(0.14)	(0.19)	(0.31)

Dimensions: millimeters (inches)

Dimensions

Angle valve with pneumatic actuator, single acting with closing spring

NW 16–40 (⅝"–1 ½") ISO-KF



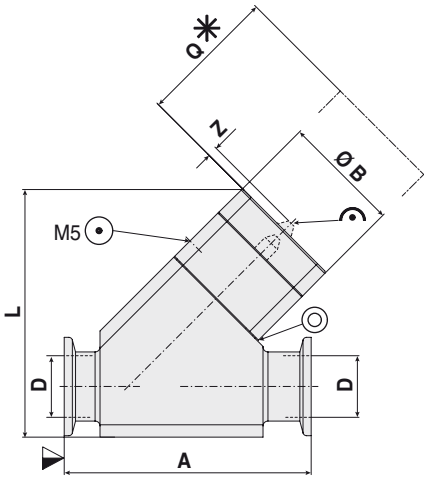
Models	NW 16	NW 25	NW 40
	(⅝)	(1)	(1 ½)
A	40	50	65
	(1.57)	(1.97)	(2.56)
B	40	48	65
	(1.57)	(1.89)	(2.56)
D	16	25	40
	(0.63)	(0.98)	(1.57)
L (with closing spring)	65.20	60.60	87.70
	(2.57)	(2.39)	(3.45)
Q	46	44	73.50
	(1.81)	(1.73)	(2.89)
Z	2	4	9.50
	(0.08)	(0.16)	(0.37)

Dimensions: millimeters (inches)

- Valve seat side
- Required for dismantling
- Compressed air connection
- Mechanical position indication
- Leak detection hole

Inline valve with pneumatic actuator, single acting with closing spring

NW 16–40 (⅝"–1 ½") ISO-KF

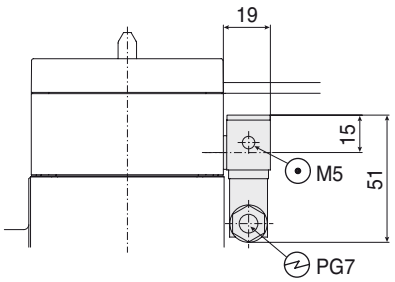


Models	NW 16	NW 25	NW 40
	(⅝)	(1)	(1 ½)
A	80	100	130
	(3.15)	(3.94)	(5.12)
B	40	48	65
	(1.57)	(1.89)	(2.56)
D	16	25	40
	(0.63)	(0.98)	(1.57)
L (with closing spring)	91.50	100.30	140.90
	(3.60)	(3.95)	(5.55)
Q	46	44	73.50
	(1.81)	(1.73)	(2.89)
Z	2	4	9.50
	(0.08)	(0.16)	(0.37)

Dimensions: millimeters (inches)

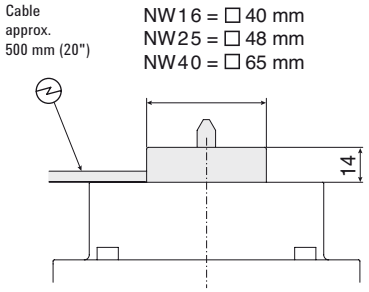
Solenoid valve

Solenoid valve
NW 16–40 (⅝"–1 ½")



Position indicator

Position indicator
NW 16–40 (⅝"–1 ½")



One closing contact each for the open and closed valve positions

Ordering Information

Description: Aluminum Right Angle Block Valves Series 26	Part Number
Valve, Block, Aluminum, Right Angle, Hand-operated, NW16	X3202-60031
Valve, Block, Aluminum, Right Angle, Hand-operated, NW25	X3202-60032
Valve, Block, Aluminum, Right Angle, Hand-operated, NW40	X3202-60033
Valve, Block, Aluminum, Right Angle, Air-operated, NW16, without Solenoid	X3202-60034
Valve, Block, Aluminum, Right Angle, Air-operated, NW25, without Solenoid	X3202-60035
Valve, Block, Aluminum, Right Angle,, Air-operated, NW40, without Solenoid	X3202-60036
Valve, Block, Aluminum, Right Angle, Air-operated, NW16, 115VAC	X3202-60037
Valve, Block, Aluminum, Right Angle, Air-operated, NW25, 115VAC	X3202-60038
Valve, Block, Aluminum, Right Angle, Air-operated, NW40, 115VAC	X3202-60039
Valve, Block, Aluminum, Right Angle, Air-operated, NW16, 220VAC	X3202-60040
Valve, Block, Aluminum, Right Angle, Air-operated, NW25, 220VAC	X3202-60041
Valve, Block, Aluminum, Right Angle, Air-operated, NW40, 220VAC	X3202-60042
Valve, Block, Aluminum, Right Angle, Air-operated, NW16, 24VDC	X3202-60043
Valve, Block, Aluminum, Right Angle, Air-operated, NW25, 24VDC	X3202-60044
Valve, Block, Aluminum, Right Angle, Air-operated, NW40, 24VDC	X3202-60045
Valve, Block, Aluminum, Right Angle, Air-operated, Position Indicator, NW16, without Solenoid	X3202-60051
Valve, Block, Aluminum, Right Angle, Air-operated, Position Indicator, NW25, without Solenoid	X3202-60052
Valve, Block, Aluminum, Right Angle, Air-operated, Position Indicator, NW40, without Solenoid	X3202-60053
Valve, Block, Aluminum, Right Angle, Air-operated, Position Indicator, NW16, 115VAC	X3202-60054
Valve, Block, Aluminum, Right Angle, Air-operated, Position Indicator, NW25, 115VAC	X3202-60055
Valve, Block, Aluminum, Right Angle, Air-operated, Position Indicator, NW40, 115VAC	X3202-60056
Valve, Block, Aluminum, Right Angle, Air-operated, Position Indicator, NW16, 220VAC	X3202-60057
Valve, Block, Aluminum, Right Angle, Air-operated, Position Indicator, NW25, 220VAC	X3202-60058
Valve, Block, Aluminum, Right Angle, Air-operated, Position Indicator, NW40, 220VAC	X3202-60059
Valve, Block, Aluminum, Right Angle, Air-operated, Position Indicator, NW16, 24VDC	X3202-60060
Valve, Block, Aluminum, Right Angle, Air-operated, Position Indicator, NW25, 24VDC	X3202-60061
Valve, Block, Aluminum, Right Angle, Air-operated, Position Indicator, NW40, 24VDC	X3202-60062

Ordering Information

Description: Aluminum Inline Block Valves Series 26	Part Number
Valve, Block, Aluminum, In-line, Hand-operated, NW16	X3202-60063
Valve, Block, Aluminum, In-line, Hand-operated, NW25	X3202-60064
Valve, Block, Aluminum, In-line, Hand-operated, NW40	X3202-60065
Valve, Block, Aluminum, In-line, Air-operated, NW16, without Solenoid	X3202-60066
Valve, Block, Aluminum, In-line, Air-operated, NW25, without Solenoid	X3202-60067
Valve, Block, Aluminum, In-line, Air-operated, NW40, without Solenoid	X3202-60068
Valve, Block, Aluminum, In-line, Air-operated, NW16, 115VAC	X3202-60069
Valve, Block, Aluminum, In-line, Air-operated, NW25, 115VAC	X3202-60070
Valve, Block, Aluminum, In-line, Air-operated, NW40, 115VAC	X3202-60071
Valve, Block, Aluminum, In-line, Air-operated, NW16, 220VAC	X3202-60072
Valve, Block, Aluminum, In-line, Air-operated, NW25, 220VAC	X3202-60073
Valve, Block, Aluminum, In-line, Air-operated, NW40, 220VAC	X3202-60074
Valve, Block, Aluminum, In-line, Air-operated, NW16, 24VDC	X3202-60075
Valve, Block, Aluminum, In-line, Air-operated, NW25, 24VDC	X3202-60076
Valve, Block, Aluminum, In-line, Air-operated, NW40, 24VDC	X3202-60077
Valve, Block, Aluminum, In-line, Air-operated, Position Indicator, NW16, without Solenoid	X3202-60078
Valve, Block, Aluminum, In-line, Air-operated, Position Indicator, NW25, without Solenoid	X3202-60079
Valve, Block, Aluminum, In-line, Air-operated, Position Indicator, NW40, without Solenoid	X3202-60080
Valve, Block, Aluminum, In-line, Air-operated, Position Indicator, NW16, 115VAC	X3202-60081
Valve, Block, Aluminum, In-line, Air-operated, Position Indicator, NW25, 115VAC	X3202-60082
Valve, Block, Aluminum, In-line, Air-operated, Position Indicator, NW40, 115VAC	X3202-60083
Valve, Block, Aluminum, In-line, Air-operated, Position Indicator, NW16, 220VAC	X3202-60084
Valve, Block, Aluminum, In-line, Air-operated, Position Indicator, NW25, 220VAC	X3202-60085
Valve, Block, Aluminum, In-line, Air-operated, Position Indicator, NW40, 220VAC	X3202-60086
Valve, Block, Aluminum, In-line, Air-operated, Position Indicator, NW16, 24VDC	X3202-60087
Valve, Block, Aluminum, In-line, Air-operated, Position Indicator, NW25, 24VDC	X3202-60088
Valve, Block, Aluminum, In-line, Air-operated, Position Indicator, NW40, 24VDC	X3202-60089

Spare Parts	Part Number
Seal Kit, Aluminum Block Valve Series 26, NW16	X3202-60103
Seal Kit, Aluminum Block Valve Series 26, NW25	X3202-60104
Seal Kit, Aluminum Block Valve Series 26, NW40	X3202-60105
O-Ring Removal Tool, Aluminum Block Valve Series 26	X3202-60106

Agilent Aluminum Gate Valves - Series 12

Thank you for choosing Agilent Valves. These valves are designed with the highest international vacuum standards and manufactured with uncompromising quality. We are confident that Agilent Valves will meet your most demanding vacuum control needs.

The valves are available in manual, push-rod operation and double acting pneumatic operation. The pneumatic valves are available with solenoid (pilot) valves at 115 VAC, 220 VAC and 24 VDC, and a position indicator. See operator's manual for more information.

Technical Specifications

Leak rate: valve body, valve seat		$< 1 \cdot 10^{-9}$ mbar ls^{-1}
Pressure range		
ISO 63–160		$1 \cdot 10^{-7}$ mbar to 1.6 bar (abs)
ISO 250		$1 \cdot 10^{-7}$ mbar to 1.2 bar (abs)
Differential pressure on the gate		
ISO 63–160		≤ 1.6 bar
ISO 250		≤ 1.2 bar
Differential pressure at opening		≤ 30 mbar
Cycles until first service		
ISO 63–160		200 000
ISO 250		100 000
Temperature*		
Valve body		≤ 120 °C
Manual and pneumatic actuator		≤ 80 °C
Solenoid valve		≤ 50 °C
Position indicator		≤ 80 °C
Heating and cooling rate		≤ 30 °C h^{-1}
Material		
Valve body	ISO 63–160	EN AW-5083 (3.3547), -6061 (3.3211)
	ISO 250	EN AC-42100 (3.2371)
Mechanism	ISO 63–160	AISI 304 (1.4301)
	ISO 250	EN AW-6082 (3.2315)
Seal: bonnet, gate		FKM (Viton)
Feedthrough		shaft feedthrough
Mounting orientation		any
Solenoid valve		24 V DC, 115 V, 220 V, 5.4 W
Position indicator: contact rating		
Voltage		≤ 250 V AC ≤ 50 V DC
Current		≤ 2 A ≤ 1.2 A
Valve position indication		visual (mechanical)

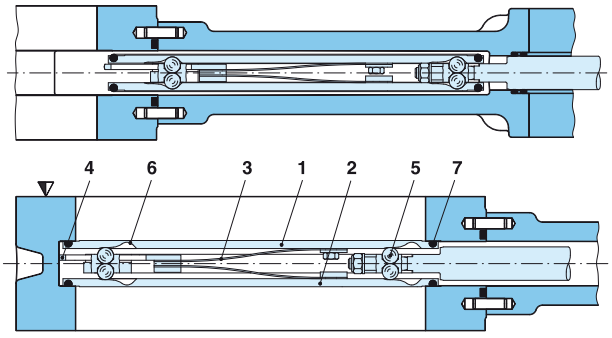
* *Maximum values: depending on operating conditions and sealing materials*

Features

- Body material: aluminum
- Low cost gate valve
- Split body for easy cleaning
- VATLOCK configuration

Aluminum Gate Valves Functional Principle

Body style ISO 63-250
Gate mechanism ISO 160-250

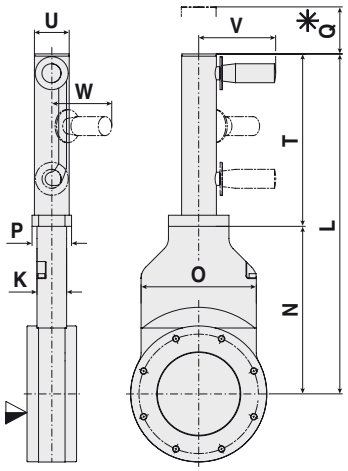


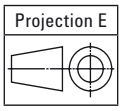
1	Gate	5	Ball pairs
2	Counter-plate	6	Ball detents
3	Leaf springs	7	Gate seal
4	Spring stop	▼	Valve seat side

DN (nominal I. D.) mm (in.)	Standard flanges	Conductance (molecular flow) (depending on A-dimension and flange type) ls^{-1}	Valve with manual actuator	Valve with pneumatic actuator				
			Weight kg (lbs)	Compressed air min.–max. overpressure bar (psi)	Volume of pneumatic actuator l	Volume of pneumatic actuator ft^3	Closing or opening time s	Weight kg (lbs)
63 (2 ½)	See page 14	550	3.00 (7.00)	4–7 (58–102)	0.16	0.006	1.5	3.00 (7.00)
100 (4)		2000	4.50 (10.00)	4–7 (58–102)	0.22	0.008	2	4.50 (10.00)
160 (6)		6000	9.00 (20.00)	4–7 (58–102)	0.50	0.018	2	9.00 (20.00)
250 (10)		22000	N/A (N/A)	4–7 (58–102)	1.50	0.053	5	25.00 (55.00)

Main Dimensions

Valve with manual actuator: push rod
DN 63–100 (2½"–4")

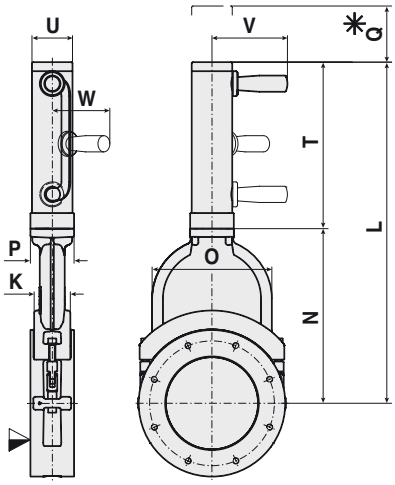




Models	DN 63	DN 100	DN 160
	(2 ½)	(4)	(6)
K	36	36	58
	(1.42)	(1.42)	(2.28)
L	329.50	413	547
	(12.97)	(16.26)	(21.54)
N	155.50	203.50	280
	(6.12)	(8.01)	(11.02)
O	100	140	192
	(3.94)	(5.51)	(7.56)
P	48	48	70
	(1.89)	(1.89)	(2.76)
Q	25	25	60
	(0.98)	(0.98)	(2.36)
T	174	209.50	267
	(6.85)	(8.25)	(10.51)
U	43	43	65
	(1.69)	(1.69)	(2.56)
V	94	94	122
	(3.70)	(3.70)	(4.80)
W	75	75	95
	(2.95)	(2.95)	(3.74)

Flange dimensions: see page 14

Valve with manual actuator: push rod
DN 160 (6")

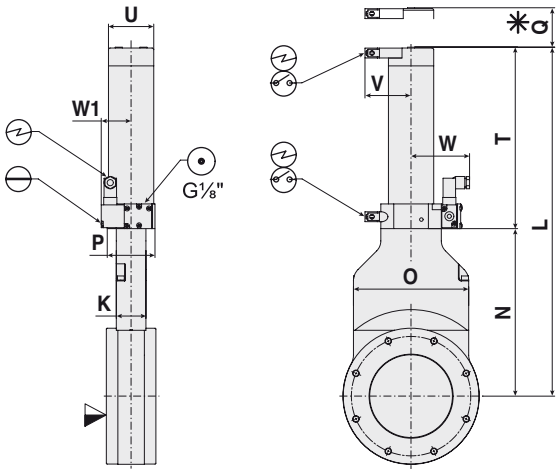


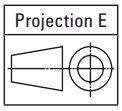
▼ Valve seat side
✳ Required for dismantling

Dimensions: millimeters (inches)

Main Dimensions

Valve with pneumatic actuator: double acting
ISO 63–100 (2½"–4")

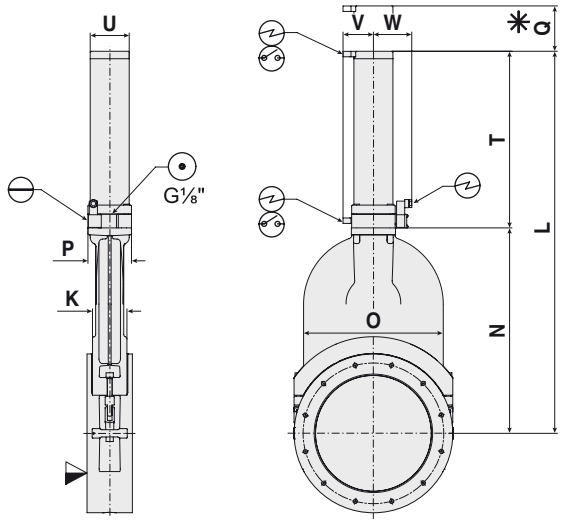




Models	ISO 63	ISO 100	ISO 160	ISO 250
	(2 ½)	(4)	(6)	(10)
K	36	36	58	76
	(1.42)	(1.42)	(2.28)	(2.99)
L	341.50	425	547	843
	(13.45)	(16.69)	(21.54)	(33.19)
N	155.50	203.50	280	453
	(6.12)	(8.01)	(11.02)	(17.83)
O	100	140	192	308
	(3.94)	(5.51)	(7.56)	(12.13)
P	58	58	70	96
	(2.28)	(2.28)	(2.76)	(3.78)
Q	25	25	60	100
	(0.98)	(0.98)	(2.36)	(3.94)
T	186	221.50	267	390
	(7.32)	(8.72)	(10.51)	(15.35)
U	55	55	65	86
	(2.17)	(2.17)	(2.56)	(3.39)
V	56	56	57	67
	(2.20)	(2.20)	(2.24)	(2.64)
W	72	72	71.50	84.50
	(2.83)	(2.83)	(2.82)	(3.33)
W1	36.50	36.50	–	–
	(1.44)	(1.44)	–	–

Flange dimensions: see page 14

Valve with pneumatic actuator: double acting
ISO 160 (6")–250 (10")



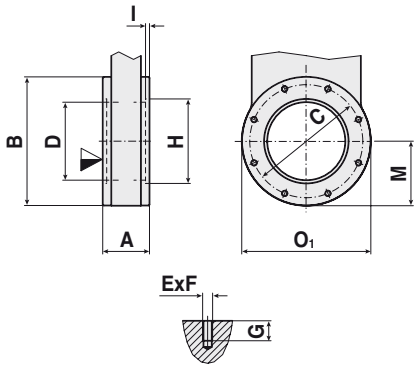
▼ Valve seat side
✳ Required for dismantling
⊙ Compressed air connection
⏦ Electrical connection
⏦ Position indicator
⊖ Emergency operation

Dimensions: millimeters (inches)

Flange Dimensions

ISO-F

ISO 63–250 (2½"–10")



Models	ISO 63	ISO 100	ISO 160	ISO 250
	(2 ½)	(4)	(6)	(10)
A	60	60	70	100
	(2.36)	(2.36)	(2.76)	(3.94)
B	130	165	235	350
	(5.12)	(6.50)	(9.25)	(13.78)
C	110	145	200	310
	(4.33)	(5.71)	(7.87)	(12.20)
D	65	100	150	261
	(2.56)	(3.94)	(5.91)	(10.27)
E x F	4 x M8	8 x M8	8 x M10	12 x M10
G	12	12	16	16
	(0.47)	(0.47)	(0.63)	(0.63)
H	70	102	153	–
	(2.76)	(4.02)	(6.02)	–
I	3	3	5	–
	(0.12)	(0.12)	(0.20)	–
M	65.50	83	117.50	175
	(2.58)	(3.27)	(4.63)	(6.89)
O1	131	166	237	352
	(5.16)	(6.54)	(9.33)	(13.86)

Ordering Information

Description Aluminum Gate Valves - Series 12	Part Number
Valve, Gate, Aluminum, 63 ISO, Air-operated, Position Indicator, 115VAC	X3202-60000
Valve, Gate, Aluminum, 63 ISO, Air-operated, Position Indicator, 220VAC	X3202-60001
Valve, Gate, Aluminum, 63 ISO, Air-operated, Position Indicator, 24VDC	X3202-60002
Valve, Gate, Aluminum, 63 ISO, Air-operated, Position Indicator, without Solenoid	X3202-60003
Valve, Gate, Aluminum, 63 ISO, Hand-operated	X3202-60004
Valve, Gate, Aluminum, 100 ISO, Air-operated, Position Indicator, 115VAC	X3202-60010
Valve, Gate, Aluminum, 100 ISO, Air-operated, 220VAC, Position Indicator	X3202-60011
Valve, Gate, Aluminum, 100 ISO, Air-operated, 24VDC, Position Indicator	X3202-60012
Valve, Gate, Aluminum, 100 ISO, Air-operated, Position Indicator, without Solenoid	X3202-60013
Valve, Gate, Aluminum, 100 ISO, Hand-operated	X3202-60014
Valve, Gate, Aluminum, 160 ISO, Air-operated, Position Indicator, 115VAC	X3202-60020
Valve, Gate, Aluminum, 160 ISO, Air-operated, Position Indicator, 220VAC	X3202-60021
Valve, Gate, Aluminum, 160 ISO, Air-operated, Position Indicator, 24VDC	X3202-60022
Valve, Gate, Aluminum, 160 ISO, Air-operated, Position Indicator, without Solenoid	X3202-60025
Valve, Gate, Aluminum, 160 ISO, Hand-operated	X3202-60026
Valve, Gate, Aluminum, 250 ISO, Air-operated, Position Indicator, 115VAC	X3202-60027
Valve, Gate, Aluminum, 250 ISO, Air-operated, Position Indicator, 220VAC	X3202-60028
Valve, Gate, Aluminum, 250 ISO, Air-operated, Position Indicator, 24VDC	X3202-60029
Valve, Gate, Aluminum, 250 ISO, Air-operated, Position Indicator, without Solenoid	X3202-60030

Spare Parts	Part Number
Seal Kit, Aluminum Gate Valve Series 12, ISO 63	X3202-60099
Seal Kit, Aluminum Gate Valve Series 12, ISO 100	X3202-60100
Seal Kit, Aluminum Gate Valve Series 12, ISO 160	X3202-60101
Seal Kit, Aluminum Gate Valve Series 12, ISO 250	X3202-60102

Agilent UHV All Metal Valves - Series 54

Thank you for choosing Agilent's High Performance Valves. These valves are designed with the highest international vacuum standards and manufactured with uncompromising quality. We are confident that you will find these valves meet your most demanding vacuum control needs.

The valves are manually operated with a standard Hex wrench, so no Torque Wrench is required. Thanks to the "hard-on-hard" metal seals, these valves can operated thousands of times before requiring maintenance.

Technical Specifications

Leak rate: valve body, valve seat	$< 1 \cdot 10^{-10}$ mbar ls^{-1}
Pressure range	XHV to 2 bar (abs)
Differential pressure on the gate	≤ 2 bar
Differential pressure at opening	≤ 1 bar*
Lifetime	≥ 1000 cycles
Bake-out temperature**	≤ 300 °C open and closed
Heating and cooling rate	≤ 60 °C h^{-1}
Material	
valve body, mechanism, bellows	AISI 316L (1.4404, 1.4435)
Seal: bonnet, plate	metal
Feedthrough	bellows
Mounting orientation	any
Valve position indication	visual (mechanical)
Conductance (molecular flow)	NW 16: 5 ls^{-1} / NW 40: 50 ls^{-1}
Closing force	closes at a mechanical stop
Weight: NW 16 / 40 kg (lbs)	0.4 (0.9) / 1.9 (4.2)

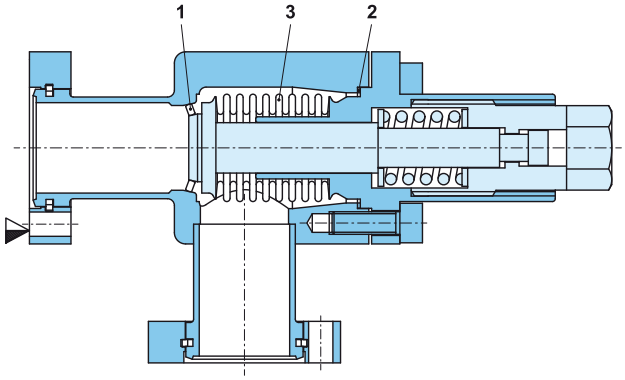
* *> 1 bar with reduced number of cycles*

** *Maximum values: depending on operating conditions and sealing materials*

Features

- Body material: stainless steel
- FLEX VATRING configuration: see below
- Sealing surfaces are only elastically deformed
- Convenient operation with a standard hexagon wrench – no torque wrench required
- High conductance
- FLEX VATRING exchangeable twice

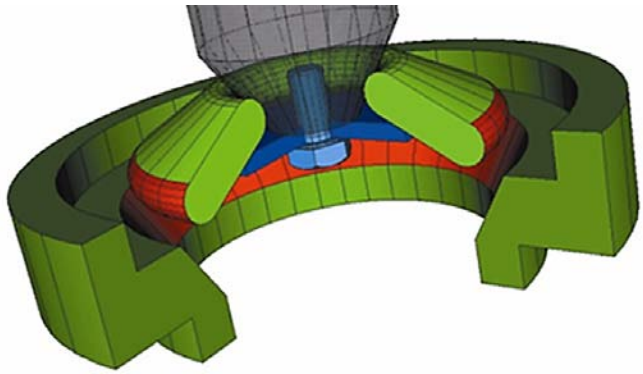
UHV All Metal Valves Functional Principle



1 FLEX VATRING
2 Bonnet seal
3 Bellows
▼ Valve seat side

FLEX VATRING

This dynamic, all-metal sealing system is characterized by consistent sealing and closing forces. It enables achieving high sealing forces with comparably low axial forces.
The seal mating surfaces are in stainless steel, and deformed elastically only.
The FLEX VATRING system is suitable for extreme UHV. It may be baked to 300 °C in open and closed position and reaches a lifetime of > 1 000 cycles if operated under clean conditions.



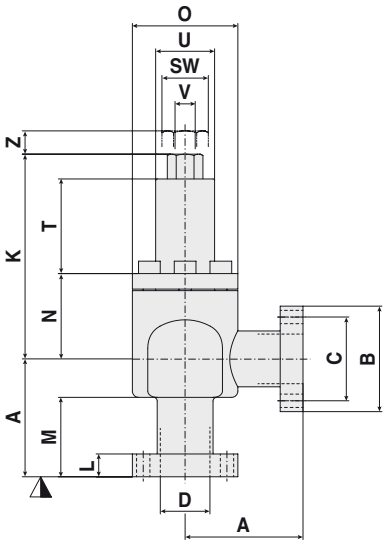
Ordering Information

Description UHV All Metal Valves	Part Number
Valve, ¾ Metal/Mini CFF	X3202-60097
Valve, All-Metal, 1 ½", RT-Angle	X3202-60098

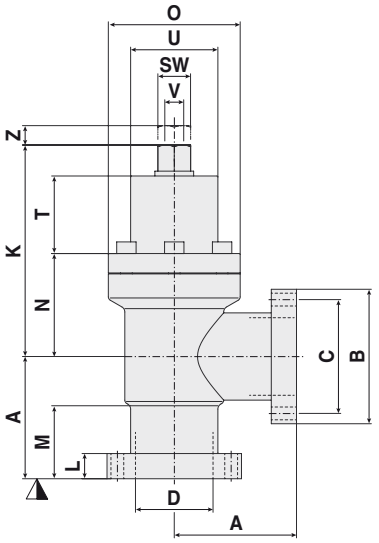
Spare Parts	Part Number
Seal Kit, 1st Replacement, UHV Series 54, ¾"	X3202-60107
Seal Kit, 2nd Replacement, UHV Series 54, ¾"	X3202-60109
Seal Kit, 1st Replacement, UHV Series 54, 1½"	X3202-60108
Seal Kit, 2nd Replacement, UHV Series 54, 1½"	X3202-60110

Dimensions

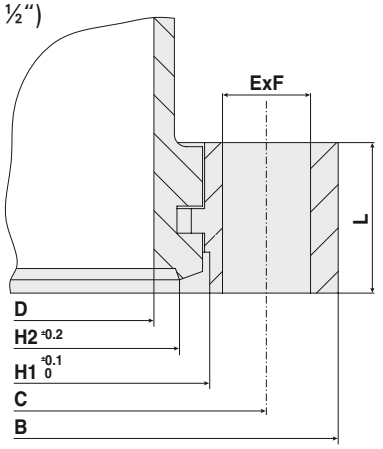
Valve NW 16 (⅝")



Valve NW 40 (1 ½")



Flange NW 16–63 (⅝"–2 ½")



Models	DN 16	DN 40
	(⅝)	(1 ½)
A	38	63
	(1.50)	(2.48)
B	34	69.35
	(1.34)	(2.73)
C	27	58.70
	(1.06)	(2.31)
D	16	40
	(0.63)	(1.57)
E x F	6 x 4.30	6 x 6.60
	6 x 0.17	6 x 0.26
H1	21.40	48.30
	(0.84)	(1.90)
H2	18.50	42
	(0.73)	(1.65)
K	66	109.10
	(2.60)	(4.30)
L	7.35	13
	(0.29)	(0.51)
M	25.60	37.60
	(1.01)	(1.48)
N	27.50	53.10
	(1.08)	(2.09)
O	34	68
	(1.34)	(2.68)
SW	10	17
	(0.39)	(0.67)
T	30.50	40
	(1.20)	(1.57)
U	19	45
	(0.75)	(1.77)
V	6.35	9.53
	(0.25)	(0.38)
Z	8.50	20
	(0.33)	(0.79)

▽ Valve seat side

Dimensions: millimeters (inches)

Agilent Stainless Steel Valves

Agilent's family of vacuum stainless steel tube and in-line valves are designed to connect our rough vacuum and high vacuum pumps to your system. Delivering maximum conductance and sized for easy, convenient installation, these valves are ideally suited for systems requiring high reliability with low outgassing.

Excellent low outgassing characteristics are derived from the valve's fusion welded 304 stainless steel body, welded AM-350 stainless steel nesting bellows and small cross section elastomers and do not contain any blind internal cavities.

In combination with our popular hardware products, the new stainless steel valves offer a complete, bundled solution for your vacuum system, making it possible for convenient one-stop shopping for everything required to connect Agilent vacuum pumps to your system.

A selection of port mounts...

Standard port mounts include:

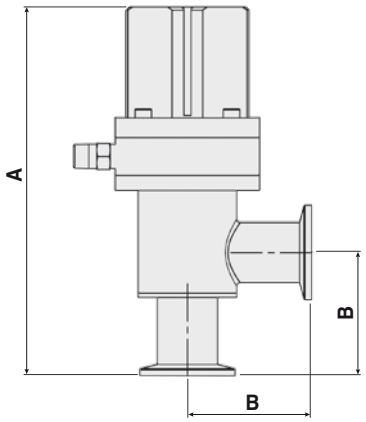
- **Conflat metal seal flanges**, recommended for ultra-high vacuum service
- **KF and ISO flanges** for quick elastomer seal flanges, ideal for high vacuum applications that require frequent assembly and disassembly. See range of sizes in specifications table
- **Solenoids and position indicators** are optional and are sold separately.

Technical Specifications

Pressure range	Atmosphere to 1 x 10^{-8} mbar (7.5 x 10^{-9} Torr)					
Leak rate	<1 x 10^{-9} std cc/sec He					
Service life (bellows)	1.5 million cycles (minimum)					
Mounting position	any					
Baking temperature	Valve open 200 °C (392 °F)	Valve closed 150 °C (302 °F)	Position indicator (A/O optional) 70 °C (158 °F)		Solenoid (A/O optional) 60 °C (140 °F)	
Conductance	¾ in. Angle 6 l/sec	¾ in. In-line 5 l/sec	1 in. Angle 15 l/sec	1 in. In-line 13 l/sec	1½ in. Angle in. 48 l/sec	1½ in. In-line 44 l/sec
Materials	Valve body 304L SS	Bellows AM-350	Bellow flange 304 SS	Seal plate 304 SS	Bonnet gasket Viton (V747)	O-rings Viton (V747)
Pneumatic						
Air connection	⅛ in. NPT					
Air pressure	60 psig (minimum)		80 psig (maximum)			
Open/Close time	¾ in. Valve <0.5 seconds		1 in. Valve <0.5 seconds		1½ in. Valve <0.8 seconds	
Solenoid (optional)	Supply Voltages: 110/120 V; 50/60 Hz; 220/240 V, 50/60 Hz; 24 VDC					
Volume of air	¾ in. Valve		1 in. Valve		1½ in. Valve	
Cylinder	0.049 L		0.049 L		0.1 L	
Valve position	No mechanical indicator (see optional position indicator)					
Position indicator (optional)	Voltage 5-240V DC/AC	Current 100 mA (maximum)	Power 10 W (maximum)		Visual Indicator Green LED	
Switching logic	SPST normally open					

Dimensions

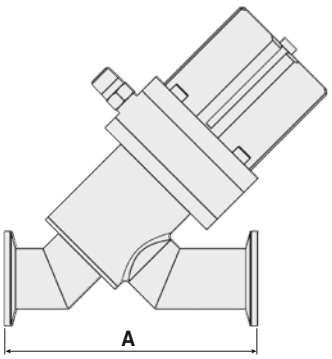
Angle valves pneumatic



Size	A	B
NW 16	157.58	50.8
	(6.22)	(8.2)
NW 25	155.7	52.07
	(6.13)	(2.05)
NW 40	176.36	65
	(6.94)	(2.56)
CF 1.33	162.02	55.25
	(6.38)	(2.18)
CF 2.12	156.29	52.63
	(6.15)	(2.07)
CF 2.75	177.87	66.51
	(7.00)	(2.62)
¾ in.	157.58	50.8
	(6.25)	(2.00)
1 in.	151.9	48.27
	(5.98)	(1.9)
1½ in.	172.56	61.2
	(6.79)	(2.41)

Dimensions: millimeters (inches)

In-line valves pneumatic

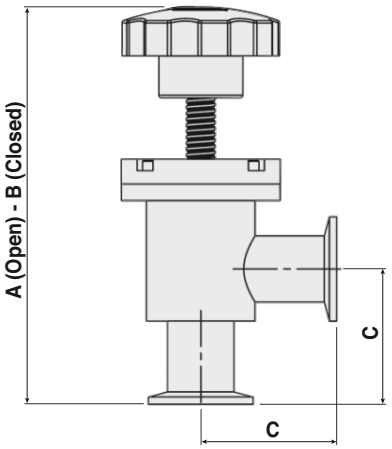


Size	A
NW16	101.6
	(4.0)
NW25	106.7
	(4.2)
NW40	130.05
	(5.12)
CF 1.33	119.41
	(4.70)
CF 2.12	107.79
	(4.24)
CF 2.75	133.07
	(5.24)
¾ in.	94
	(3.7)
1 in.	99.1
	(3.9)
1½ in.	122.4
	(4.82)

Dimensions: millimeters (inches)

Dimensions

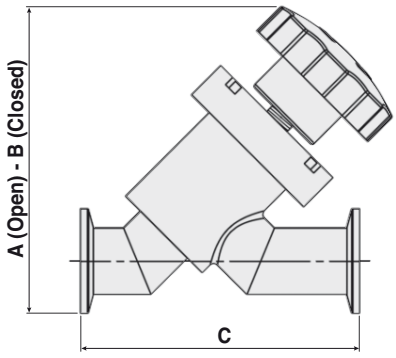
Angle valves hand-operated



Size	A	B	C
NW 16	158.08	137.75	54.6
	(6.22)	(5.42)	(2.15)
NW 25	152.4	132.07	52.07
	(6.0)	(5.2)	(2.05)
NW 40	188.07	163.71	65
	(7.41)	(6.45)	(2.56)
CF 1.33	158.72	138.27	55.12
	(6.25)	(5.44)	(2.17)
CF 2.12	152.96	132.59	52.63
	(6.02)	(5.22)	(2.07)
CF 2.75	189.58	165.22	66.51
	(7.46)	(6.5)	(2.62)
¾ in.	154.28	133.75	50.8
	(6.07)	(5.27)	(2.00)
1 in.	148.6	128.07	48.27
	(5.85)	(5.04)	(1.90)
1½ in.	182.27	159.91	61.2
	(7.18)	(6.3)	(2.41)

Dimensions: millimeters (inches)

In-line valves hand-operated



Size	A	B	C
NW 16	119.89	99.56	101.6
	(4.72)	(3.92)	(4.0)
NW 25	117.66	97.33	106.7
	(4.63)	(3.83)	(4.2)
NW 40	138.28	122.76	130.5
	(5.44)	(4.83)	(5.12)
CF 1.33	119.87	99.54	119.4
	(4.72)	(3.92)	(4.7)
CF 2.12	117.64	97.31	107.8
	(4.63)	(3.83)	(4.24)
CF 2.75	147.28	122.76	133.07
	(5.8)	(4.83)	(5.24)
¾ in.	119.89	99.56	94
	(4.72)	(3.92)	(3.7)
1 in.	117.66	97.33	99.08
	(4.63)	(3.83)	(3.9)
1½ in.	147.28	122.76	122.45
	(5.8)	(4.83)	(4.82)

Dimensions: millimeters (inches)

Ordering Information

Ordering Instructions:

- Use only the Product Number list in the Product Number column.
- Numbers in the Option Number column are for reference only; use Short Description for ordering options.

Example Order: for a right angle, 1 ⅓" pneumatic valve with position indicator for the valve, and a spare position indicator:
Item 1:
X3200A: Agilent Stainless Steel Tube Valve, Right Angle
Option: Pneumatically Operated, 1 ⅓" ConFlat (021)
Option: Position indicator with LED light (060)
Item 2:
X3200-63000: Position indicator (as a separate spare part)

Note: Items are delivered as separate items in the same box, for assembly upon arrival.
For assistance with assembly, please see the video on **Agilent Chem Vacuum YouTube Channel**.

Configuration	Product Number	Option Number	Actuation	Size	Flange	Short Description
Right Angle Stainless Steel Tube Valve	X3200A	001	Manual	¾"	ConFlat, 1 ⅓"	Manually operated, 1 ⅓" ConFlat
In-line Stainless Steel Tube Valve	X3201A	002	Manual	1"	ConFlat, 2 ⅛"	Manually operated, 2 ⅛" ConFlat
		003	Manual	1 ½"	ConFlat, 2 ¾"	Manually operated, 2 ¾" ConFlat
		004	Manual	¾"	Tube End, ¾"	Manually operated, ¾" Tube End
		005	Manual	1"	Tube End, 1"	Manually operated, 1" Tube End
		006	Manual	1 ½"	Tube End, 1 ½"	Manually operated, 1 ½" Tube End
		007	Manual	¾"	NW16	Manually operated, NW16
		008	Manual	1"	NW25	Manually operated, NW25
		009	Manual	1 ½"	NW40	Manually operated, NW40
		021	Pneumatic	¾"	ConFlat, 1 ⅓"	Pneumatically operated, 1 ⅓" ConFlat*
		022	Pneumatic	1"	ConFlat, 2 ⅛"	Pneumatically operated, 2 ⅛" ConFlat*
		023	Pneumatic	1 ½"	ConFlat, 2 ¾"	Pneumatically operated, 2 ¾" ConFlat*
		024	Pneumatic	¾"	Tube End, ¾"	Pneumatically operated, ¾" Tube End*
		025	Pneumatic	1"	Tube End, 1"	Pneumatically operated, 1" Tube End*
		026	Pneumatic	1 ½"	Tube End, 1 ½"	Pneumatically operated, 1 ½" Tube End*
		027	Pneumatic	¾"	NW16	Pneumatically operated, NW16*
		028	Pneumatic	1"	NW25	Pneumatically operated, NW25*
		029	Pneumatic	1 ½"	NW40	Pneumatically operated, NW40*

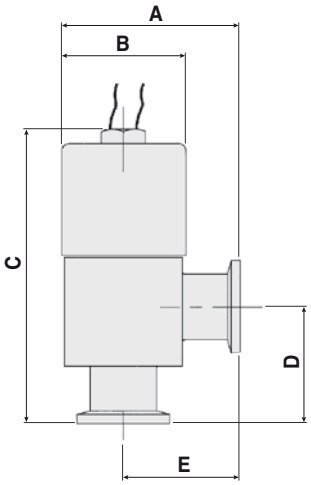
* *For pneumatically operated valves choose Solenoid and Position Indicator Options if desired - See Accessories Options table below.*

Accessory Options (shipped with valves for installation upon arrival)	**Add Option Number**
Solenoid, 24VDC	050
Solenoid, 110VAC	051
Solenoid, 220VAC	052
Position Indicator with LED	060

Service Parts (Ordered separately)	**Order Part Number**
Solenoid, 24VDC	X3200-63024
Solenoid, 110VAC	X3200-63110
Solenoid, 220VAC	X3200-63220
Position Indicator with LED	X3200-63000

Spare Parts	**Part Number**
Bellows Replacement Kit, NW16/25	X3200-67000
Bellows Replacement Kit, NW40	X3200-67001

Agilent Electromagnetic Block Valves



Models	A	B	C	D	E
NW16	64	58	113	40	40
	(2.50)	(2.28)	(4.43)	(1.58)	(1.58)
NW25	76	58	123	50	50
	(2.98)	(2.28)	(4.83)	(1.98)	(1.98)

Dimensions: millimeters (inches)

Features

- Reliable design
- Low cost
- Rapid spring-closed actuator
- KF Flange connections
- Single coil

Benefits

- Service-free operation
- Economical
- System protection on loss of power
- Ease of Installation
- Compact construction
- Rapid cycling

Technical Specifications

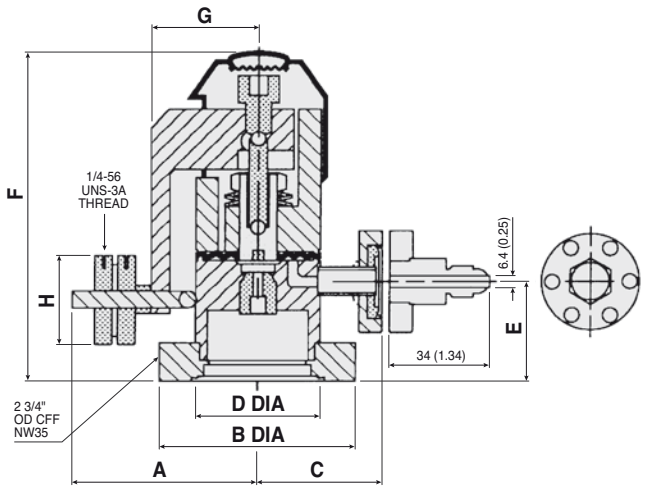
Vacuum range	Cleaned aluminum: atm to 10^{-6} Torr
Leak rate	<1 x 10^{-9} std cc/sec. (helium)
Operating temperature	15 °C min to 40 °C maximum
Bakeable to –	Non-operating (closed) 125 °C
Pulse voltage/Hold voltage	23 Watts
Service life	250,000 cycles
Conductance	NW16 – 2.2 l/s NW25 – 3.5 l/s
Speed to Open/Close	Open – 50 ms Close – 25 ms
Loss of power	Valve closes (in < 25 m/sec)

Ordering Information

Size	**Voltage Option**	**Part Number**	**Shipping Weight** kg (lbs)
Aluminum Body			
NW16	115 V; 50/60 Hz	L9940302	0.7 (1.5)
	220 V; 50/60 Hz	L9940304	0.7 (1.5)
	24 VDC	L9940306	0.7 (1.5)
	240 V; 50 Hz	L9940308	0.7 (1.5)
NW25	115 V; 50/60 Hz	L9942302	0.9 (2.0)
	220 V; 50/60 Hz	L9942304	0.9 (2.0)
	24 VDC	L9942306	0.9 (2.0)
	240 V; 50 Hz	L9942308	0.9 (2.0)

Description	**Part Number**	**Shipping Weight** kg (lbs)
Spare Parts		
Plunger Assembly – includes shaft, spring, and seal	L9987008	0.5 (1.0)
Operator, EMB, 115 V, 50/60 Hz	L9987002	0.5 (1.0)
Operator, EMB, 220 V, 50/60 Hz	L9987004	0.5 (1.0)
Operator, EMB, 240 V, 50 Hz	L9987009	1.0 (2.0)
Operator, EMB, 24 VDC	L9987006	0.5 (1.0)

Agilent Variable Leak Valve



	A	B	C	D	E	F	G	H
mm	67	70	44	44	33	114	39	32
Inches	2 21/34	2 3/4	1 3/4	1 3/4	1 5/16	4 1/2	1 17/32	1 1/4

The variable leak valve includes a movable piston with an optically flat sapphire that meets a captured metal gasket. This forms a seal completely free from friction, seizing, and shear. The sapphire's movement is controlled through a threaded shaft-and-lever mechanism which provides a mechanical advantage of 13,000 to 1.

Technical Specifications

Controlled leak rate	10^{-10} Torr-l/sec (minimum)
Vacuum range	Atmosphere to below 10^{-11} Torr (mbar)
Leak rate	No leak detectable on a helium mass spectrometer leak detector with sensitivity of 1 x 10^{-10} std cc/sec
Max flow conductance	6 l/m
Bakeable to –	450 °C

Ordering Information

Description	**Part Number**	**Shipping Weight** kg (lbs)
Sapphire-sealed variable leak valve and valve adjustment tools		
With 1 ⅓ in. (NW16) CFF gas inlet	9515106	1.8 (4.0)
Adapter kit, 1 ⅓ in. (NW16) CFF-to-flare-fitting adapter kit	9515117	0.5 (1.0)
Replacement gasket assembly	9535050	0.1 (0.3)
Replacement sapphire assembly	9530072	0.5 (1.0)
Sapphire removal tool	SR0061417400	0.2 (0.5)
Repair and tool kit includes fine screw assembly, handle, and collar adjusting knobs and spring driver assembly springs, sapphire assembly and gasket removal tool, brush, lubricant, 1⁄4 and 5⁄16 hex key wrenches and instruction manual	9620014	2.3 (5.0)