

VACUUM ANGLE / INLINE VALVE, SERIES 24.4 / 24.5

For pumping and venting of vacuum systems with large gas flows.



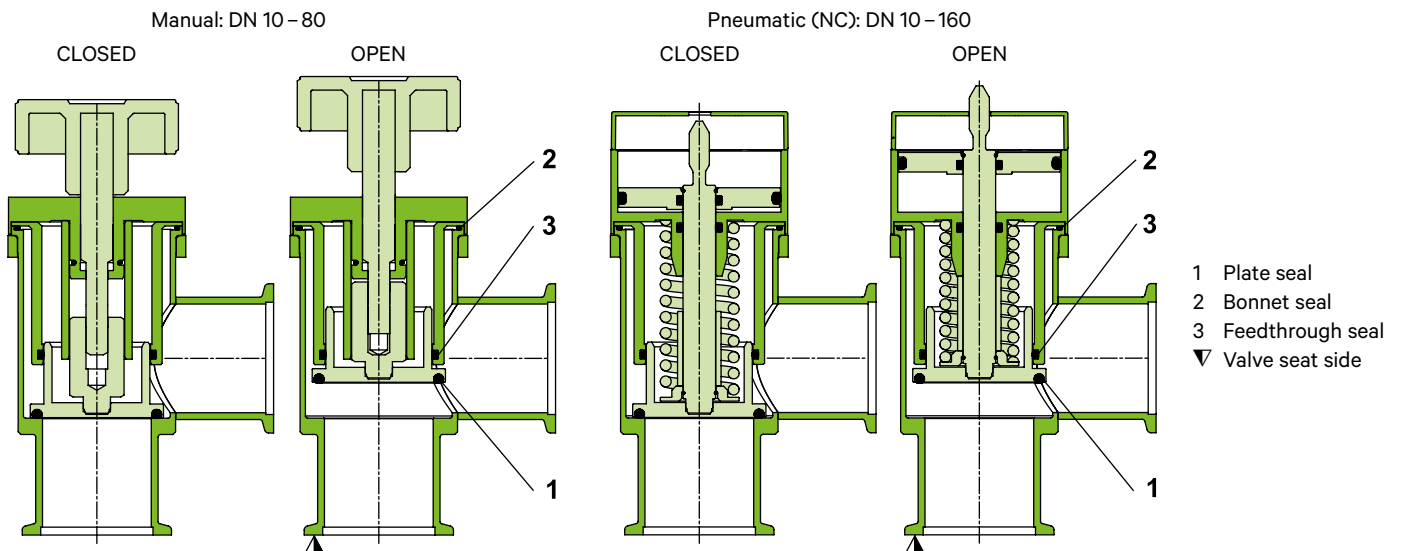
Resistant against high differential pressure

Long lifetime

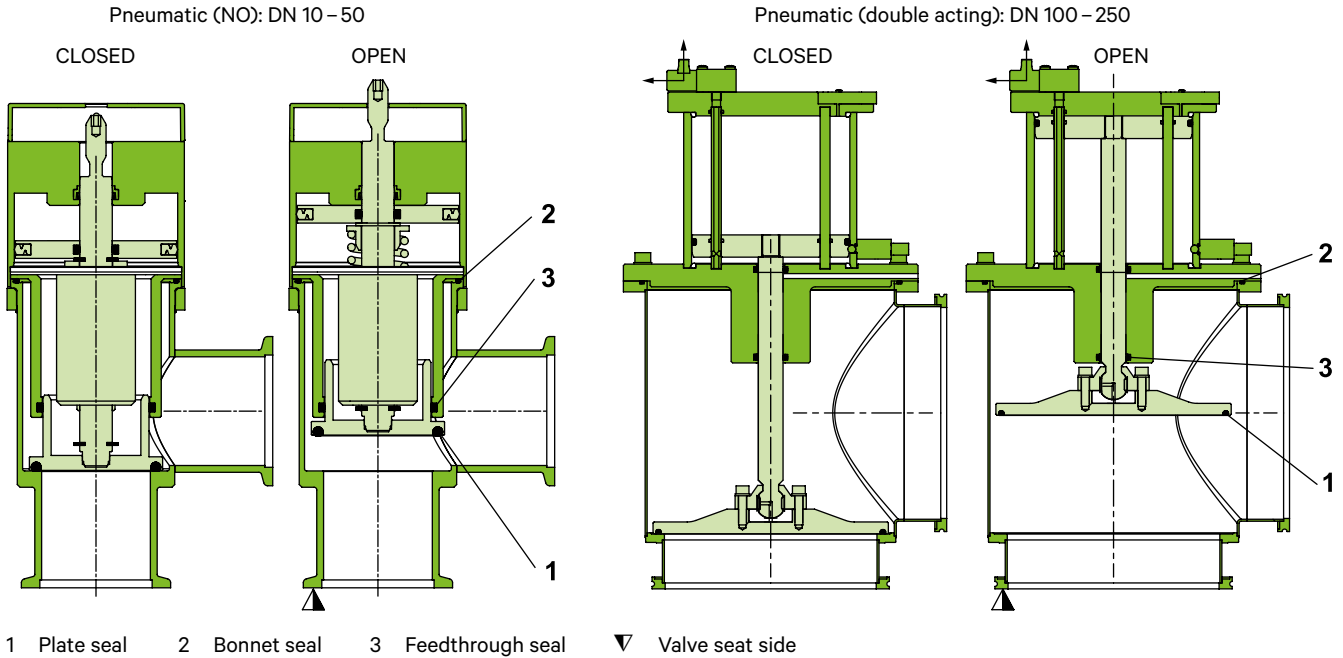
MAIN FEATURES

Sizes	DN 10 – 250 mm (3/8" – 10")
Actuators	manual: with removable handwheel pneumatic: single acting with closing spring (NC) or opening spring (NO), or double acting
Body material	aluminum or stainless steel
Feedthrough	shaft feedthrough
Standard flanges	ISO-KF, ISO-K

FUNCTIONAL PRINCIPLE



FUNCTIONAL PRINCIPLE



TECHNICAL DATA (ANGLE AND INLINE VALVES)

Leak rate	Valve body, valve seat		$< 1 \cdot 10^{-9}$ mbar ls ⁻¹
Pressure range		DN 10 – 50	$1 \cdot 10^{-7}$ mbar to 5 bar (abs)
		DN 63 – 80	$1 \cdot 10^{-7}$ mbar to 4 bar (abs)
		DN 100 – 160	$1 \cdot 10^{-7}$ mbar to 2 bar (abs)
		DN 200 – 250	$1 \cdot 10^{-7}$ mbar to 1.6 bar (abs)
Differential pressure on the plate	In opening direction	DN 10 – 50	≤ 2.0 bar
		DN 63 – 250	≤ 1.2 bar
	In closing direction	DN 10 – 50	≤ 5.0 bar
		DN 63 – 80	≤ 4.0 bar
		DN 100 – 160	≤ 2.0 bar
		DN 200 – 250	≤ 1.6 bar
Differential pressure at opening			≤ 1 bar
Cycles until first service ¹⁾	Valve with manual actuator	DN 10 – 80	10 000
	Valve with pneumatic actuator	DN 10 – 80	3 million (NC, NO)
		DN 100 – 160	1 million (NC, NO)
		DN 100 – 160	2 million (double acting)
		DN 200 – 250	1 million ²⁾ (double acting)
Temperature ³⁾	Valve body		≤ 150 °C
	Manual & pneumatic actuator		≤ 120 °C
	Solenoid valve & position indicator	DN 10 – 80	≤ 80 °C
		DN 100 – 250	≤ 50 °C
Material	Aluminum valve body	DN 16 – 63	EN AW-6060 (3.3206), EN AW-6061 (3.3211), EN AW-6063 (3.3206), EN AW-6082 (3.2315)
		DN 80 – 160	EN AC-42000
	Stainless steel valve body Plate	DN 10 – 250	AISI 316L (1.4404)
		DN 10 – 160	AISI 316L (1.4404, 1.4435)
		DN 200 – 250	AISI 304 (1.4301)

¹⁾ Tested at room temperature under clean and static conditions..

²⁾ Reduced lifetime with venting applications.

³⁾ Maximum values: depending on operating conditions and sealing materials.

TECHNICAL DATA (ANGLE AND INLINE VALVES)

Seal	Bonnet, plate	FKM (Viton®)
Feedthrough		shaft feedthrough
Mounting position		any
Solenoid valve		DN 10 – 80 24 V DC, 2.5 W (others on request) DN 100 – 250 24 V DC, 1.0 W (others on request)
Position indicator: contact rating	Voltage	DN 10 – 160 5 – 50 V AC / DC
		DN 200 – 250 ≤ 50 V AC / DC
	Current	DN 10 – 160 5 – 100 mA
		DN 200 – 250 ≤ 1.2 A
Valve position indication		visual (mechanical)

ANGLE VALVES

			with manual actuator					with pneumatic actuator, single acting with closing spring (NC)								
DN (nominal I.D.)		Conductance (molecular flow)	Turns per stroke	Weight				Compressed air min. – max. overpressure	Volume of pneumatic actuator	Closing time	Weight					
mm	inch			kg	lbs	kg	lbs				bar	psi	l	ft ³	kg	lbs
10	3/8	3	3.6	–	–	0.26	0.57	4 – 8	58 – 116	0.004	0.0001	0.10	–	–	0.34	0.75
16	5/8	5	3.6	0.20	0.44	0.26	0.57	4 – 8	58 – 116	0.004	0.0001	0.10	0.28	0.62	0.34	0.75
25	1	14	3.8	0.27	0.60	0.34	0.75	4 – 8	58 – 116	0.011	0.0004	0.20	0.41	0.90	0.51	1.12
40	1½	45	4.5	0.60	1.32	0.75	1.65	4 – 8	58 – 116	0.035	0.0012	0.55	0.97	2.14	1.13	2.49
50	2	80	4.8	0.94	2.07	1.10	2.43	4 – 8	58 – 116	0.047	0.0017	0.65	1.45	3.20	1.61	3.55
63	2½	160	6.6	2.90	6.39	1.70	3.75	4 – 8	58 – 116	0.112	0.0040	0.70	2.90	6.39	1.70	3.75
80	3	200	6.6	3.10	6.83	–	–	4 – 8	58 – 116	0.112	0.0040	0.70	3.10	6.83	–	–
100	4	440	–	–	–	–	–	4.5 – 7	65 – 102	0.330	0.0117	1	10	22	–	–
160	6	1000	–	–	–	–	–	4.5 – 7	65 – 102	1.050	0.0371	2	14	31	–	–

			with pneumatic actuator, single acting with opening spring (NO)													
mm	inch	Conductance	Turns per stroke	kg	lbs	kg	lbs	bar	psi	l	ft ³	s	kg	lbs	kg	lbs
10	3/8	3	3.6	–	–	0.26	0.57	4 – 8	58 – 116	0.004	0.0001	0.10	–	–	0.40	0.88
16	5/8	5	3.6	0.20	0.44	0.26	0.57	4 – 8	58 – 116	0.004	0.0001	0.10	0.40	0.88	0.40	0.88
25	1	14	3.8	0.27	0.60	0.34	0.75	4 – 8	58 – 116	0.011	0.0004	0.15	0.60	1.32	0.80	1.76
40	1½	45	4.5	0.60	1.32	0.75	1.65	4 – 8	58 – 116	0.035	0.0012	0.20	1.36	3	1.6	3.52
50	2	80	4.8	0.94	2.07	1.10	2.43	4 – 8	58 – 116	0.047	0.0017	0.25	2.10	4.63	2.10	4.63

			with pneumatic actuator, double acting													
mm	inch	Conductance	Turns per stroke	kg	lbs	kg	lbs	bar	psi	l	ft ³	s	kg	lbs	kg	lbs
100	4	440	–	–	–	–	–	4.5 – 7	65 – 102	0.330	0.0117	1	7.38	16.27	8.80	19.40
160	6	1000	–	–	–	–	–	4.5 – 7	65 – 102	0.380	0.0134	2	12.54	27.65	12.20	26.80
200	8	2000	–	–	–	–	–	5 – 7	73 – 102	3.100	0.1095	2	–	–	32.25	71.09
250	10	3100	–	–	–	–	–	5 – 7	73 – 102	3.100	0.1095	2	–	–	46.95	103.51

INLINE VALVES

			with manual actuator					with pneumatic actuator, single acting with closing spring (NC)								
DN (nominal I.D.)		Conductance (molecular flow)	Turns per stroke	Weight				Compressed air min. – max. overpressure		Volume of pneumatic actuator		Closing time	Weight			
mm	inch			kg	lbs	kg	lbs	bar	psi	l	ft ³		kg	lbs	kg	lbs
16	5/8	5	3.6	0.28	0.62	0.26	0.57	4 – 8	58 – 116	0.004	0.0001	0.10	0.50	1.10	0.50	1.10
25	1	14	3.8	0.42	0.93	1.04	2.29	4 – 8	58 – 116	0.011	0.0004	0.20	0.60	1.32	0.60	1.32
40	1½	45	4.5	1	2.20	2.45	5.40	4 – 8	58 – 116	0.035	0.0012	0.55	1.40	3.09	1.20	2.65
50	2	80	4.8	1.61	3.55	4.71	10.38	4 – 8	58 – 116	0.047	0.0017	0.65	2.60	5.73	2.60	5.73
80	3	200	6.6	3	6.61	–	–	4 – 8	58 – 116	0.112	0.0040	0.70	3.75	8.27	–	–

			with pneumatic actuator, single acting with opening spring (NO)												
mm	inch	Conductance (molecular flow)	kg	lbs	kg	lbs	bar	psi	l	ft ³	s	kg	lbs	kg	lbs
16	5/8	5	–	–	–	–	4 – 8	58 – 116	0.004	0.0001	0.10	0.45	0.99	0.47	1.04
25	1	14	–	–	–	–	4 – 8	58 – 116	0.011	0.0004	0.15	0.70	1.54	0.60	1.32
40	1½	45	–	–	–	–	4 – 8	58 – 116	0.035	0.0012	0.20	1.54	3.40	1.40	3.09
50	2	80	–	–	–	–	4 – 8	58 – 116	0.047	0.0017	0.25	2.90	6.39	2.79	6.15

OPTIONS, CUSTOMIZED SOLUTIONS

ACTUATOR

- Other solenoid valve voltage (standard 24VDC)
- Solenoid valve with manual emergency operation
- Bakeable position indicator: actuator bakeable to 120 °C or 200 °C
- Common connector for solenoid valve and position indicator (up to 48 V only)
- Customer specified actuators

VALVE

- CF flanges
- Other sealing materials
- Customer specified bodies

SPARE PARTS

We can offer a wide variety of spare parts. Please contact us for details and an offer.

Thank you for specifying the fabrication number of the valve indicated on the identification tag when asking for spare parts.

ACCESSORIES

- Flange connections for installation of the valve: see series 31 and 32
- Heater

ORDERING INFORMATION

FOR STANDARD VALVES

Valve with manual actuator
removable handwheel

	DN		Ordering numbers			
	mm	inch	Angle valve		Inline valve	
			aluminum	stainless steel	aluminum	stainless steel
ISO-KF	10	3/8	-	24420-KE01	-	-
	16	5/8	24424-KA01	24424-KE01	24524-KA01	24524-KE01
	25	1	24428-KA01	24428-KE01	24528-KA01	24528-KE01
	40	1 1/2	24432-KA01	24432-KE01	24532-KA01	24532-KE01
	50	2	24434-KA01	24434-KE01	24534-KA01	24534-KE01
ISO-K	63	2 1/2	24436-QA01	24436-QE01	-	-
	80	3	24438-QA01	-	24538-QA01	-

Valve with pneumatic actuator
single acting with closing spring (NC)
without solenoid valve
without position indicator

	DN		Ordering numbers			
	mm	inch	Angle valve		Inline valve	
			aluminum	stainless steel	aluminum	stainless steel
ISO-KF	10	3/8	-	24420-KE11	-	-
	16	5/8	24424-KA11	24424-KE11	24524-KA11	24524-KE11
	25	1	24428-KA11	24428-KE11	24528-KA11	24528-KE11
	40	1 1/2	24432-KA11	24432-KE11	24532-KA11	24532-KE11
	50	2	24434-KA11	24434-KE11	24534-KA11	24534-KE11
ISO-K	63	2 1/2	24436-QA11	24436-QE11	-	-
	80	3	24438-QA11	-	24538-QA11	-
	100	4	24440-QA11	-	-	-
	160	6	24444-QA11	-	-	-

without solenoid valve, with position indicator: 24 . . . - . . 21

with solenoid valve, without position indicator: 24 . . . - . . 31 (specify control voltage)

with solenoid valve, with position indicator: 24 . . . - . . 41 (specify control voltage)

Valve with pneumatic actuator
single acting with opening spring (NO)
without solenoid valve
without position indicator

	DN		Ordering numbers			
	mm	inch	Angle valve		Inline valve	
			aluminum	stainless steel	aluminum	stainless steel
ISO-KF	10	3/8	-	24420-KE12	-	-
	16	5/8	24424-KA12	24424-KE12	24524-KA12	24524-KE12
	25	1	24428-KA12	24428-KE12	24528-KA12	24528-KE12
	40	1 1/2	24432-KA12	24432-KE12	24532-KA12	24532-KE12
	50	2	24434-KA12	24434-KE12	24534-KA12	24534-KE12

without solenoid valve, with position indicator: 24 . . . - . . 22

with solenoid valve, without position indicator: 24 . . . - . . 32 (specify control voltage)

with solenoid valve, with position indicator: 24 . . . - . . 42 (specify control voltage)

Valve with pneumatic actuator
double acting
without solenoid valve
without position indicator

	DN		Ordering numbers	
	mm	inch	Angle valve	
			aluminum	stainless steel
ISO-K	100	4	24440-QA14	24440-QE14
	160	6	24444-QA14	24444-QE14
	200	8	-	24446-QE14
	250	10	-	24448-QE14

without solenoid valve, with position indicator: 244 . . -Q . 24

with solenoid valve, without position indicator: 244 . . -Q . 34 (specify control voltage)

with solenoid valve, with position indicator: 244 . . -Q . 44 (specify control voltage)

ORDERING INFORMATION

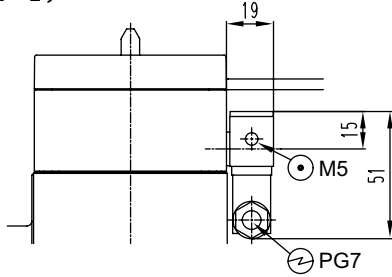
FOR VALVES WITH OPTIONS

Basic ordering number plus «-X»: -X to be specified

Example: 24432-KA42-X, X = position indicator bakeable to 200 °C

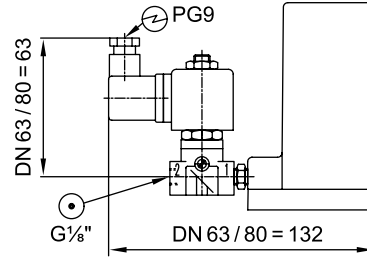
SOLENOID VALVES

Solenoid valve
DN 10 – 50 (3/8" – 2")



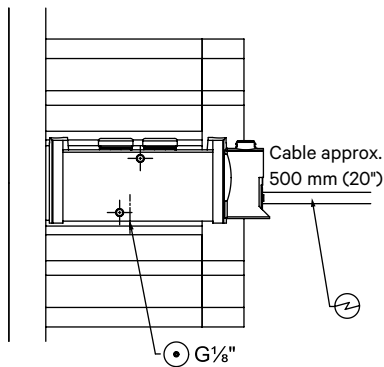
Ordering numbers: 24... -... **31/41**
24... -... **32/42**

Solenoid valve
DN 63 – 80 (2 1/2" – 3")



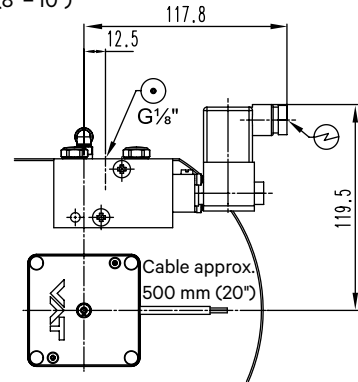
Ordering numbers: 24... -... **31/41**

Solenoid valve
DN 100 – 160 (4" – 6")



Ordering numbers: 24... -... **31/41**
24... -... **34/44**

Solenoid valve
DN 200 – 250 (8" – 10")

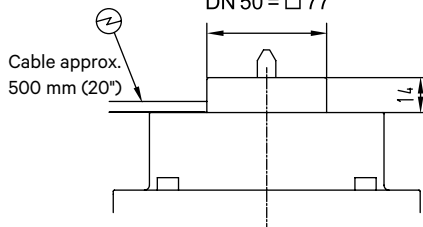


Ordering numbers: 24... -... **34/44**

POSITION INDICATOR

Position indicator
DN 10 – 250 (3/8" – 10")

DN 10 / 16 = □ 40
DN 25 / 63 / 80 / 100 / 160 = □ 48
DN 40 / 200 / 250 = □ 65
DN 50 = □ 77

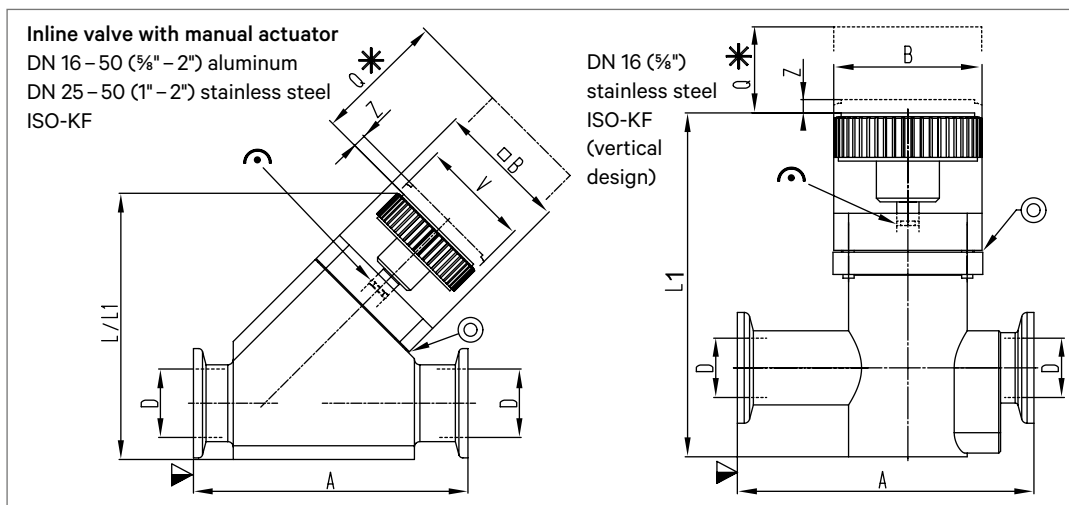
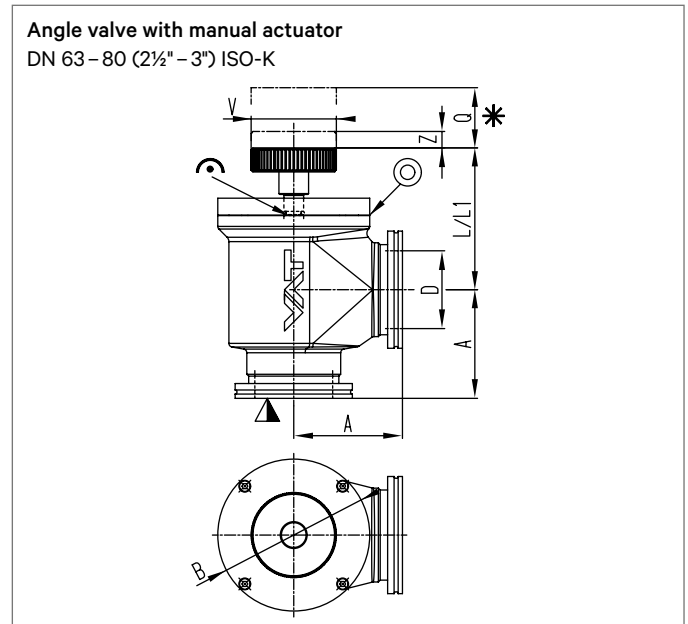
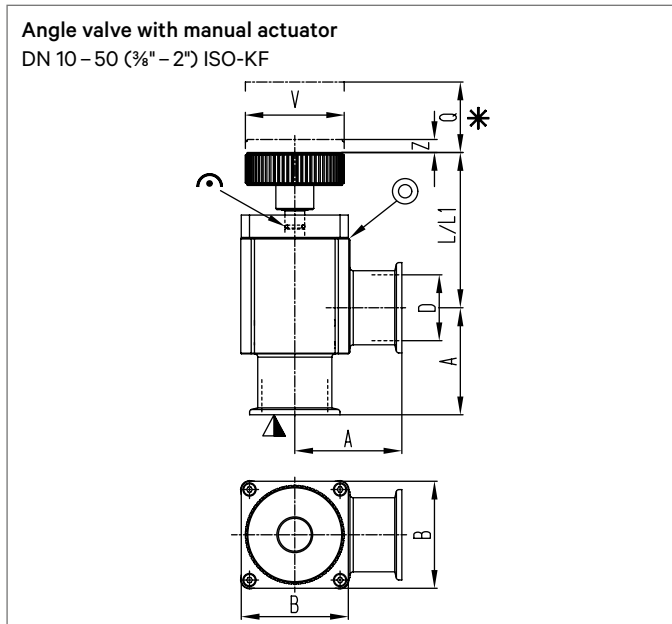


One closing contact each for the open and closed valve positions.

Ordering numbers: 24... -... **21/41**
24... -... **22/42**
24... -... **24/44**

- ⊕ Compressed air connection
- ⊖ Electrical connection

DIMENSIONS



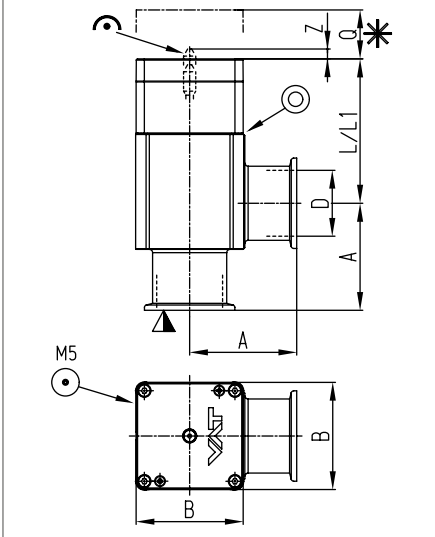
- ▽ Valve seat side
 - * Required for dismantling
 - ⊕ Mechanical position indication
 - ⊙ Leak detection hole
- L = aluminum
L1 = stainless steel

¹⁾ Gate stroke longer due to transmission

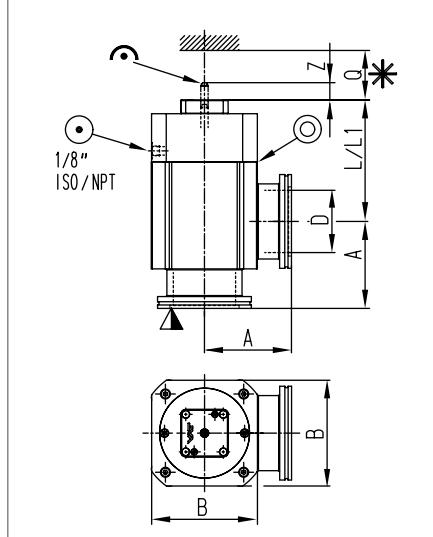
DN	Angle valves								Inline valves				
	mm inch	10 ¾"	16 1"	25 1"	40 1½"	50 2"	63 2½"	80 3"	16 ¾"	25 1"	40 1½"	50 2"	80 3"
A	mm inch	30 1.18	40 1.57	50 1.97	65 2.56	70 2.76	88 3.46	90 3.54	80 3.15	100 3.94	130 5.12	178 7.01	on request
B	mm inch	40 1.57	40 1.57	48 1.89	65 2.56	77 3.03	123 4.84	123 4.84	40 1.57	48 1.89	65 2.56	77 3.03	
D	mm inch	12 0.47	16 0.63	25 0.98	40 1.57	50 1.97	63 2.48	80 3.15	16 0.63	25 0.98	40 1.57	50 1.97	
L	mm inch	-	64.90 2.56	60.90 2.40	94.30 3.71	101.10 3.98	112 4.41	111.70 4.40	90.60 3.57	97 3.82	143.50 5.65	167.20 6.58	
L1	mm inch	67.40 2.65	67.40 2.65	64.30 2.53	97.30 3.83	104.10 4.10	111.70 4.40	-	92.80 3.65	105.80 4.17	152.50 6	175.10 6.89	
Q	mm inch	46 1.81	46 1.81	44 1.73	73.50 2.89	85.50 3.37	105 4.13	105 4.13	46 1.81	44 1.73	73.50 2.89	85.50 3.37	
V	mm inch	40 1.57	40 1.57	40 1.57	60 2.36	60 2.36	60 2.36	60 2.36	40 1.57	40 1.57	60 2.36	60 2.36	
Z ¹⁾	mm inch	3.60 0.14	3.60 0.14	4.70 0.19	7.90 0.31	9.30 0.37	13.30 0.52	13.30 0.52	3.60 0.14	4.70 0.19	7.90 0.31	9.30 0.37	

DIMENSIONS

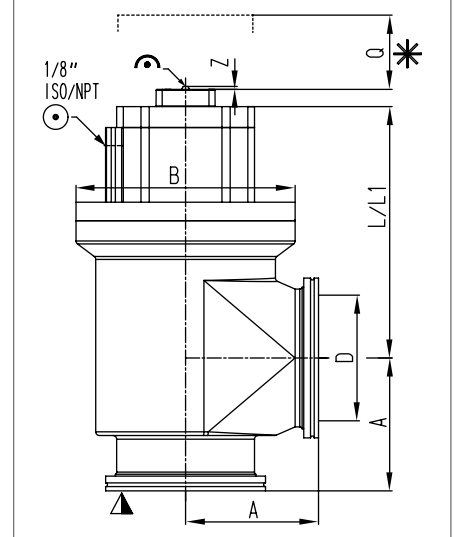
Angle valve with pneumatic actuator,
single acting with closing spring (NC)
or opening spring (NO)
DN 10 – 50 (3/8" – 2") ISO-KF



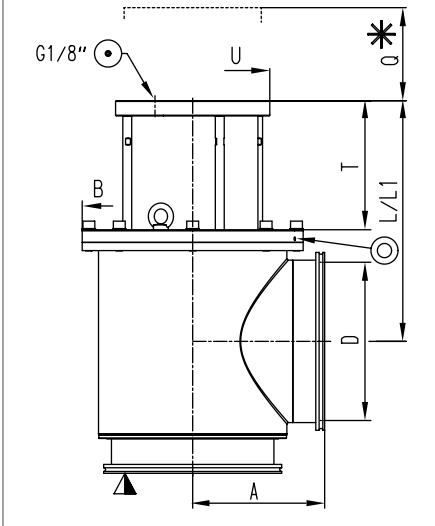
Angle valve with pneumatic actuator,
single acting with closing spring (NC)
DN 63 (2½") ISO-K



Angle valve with pneumatic actuator,
single acting with closing spring (NC)
double acting
DN 80 – 160 (3" – 6") ISO-K



Angle valve with pneumatic actuator,
double acting
DN 200 – 250 (8" – 10") ISO-K



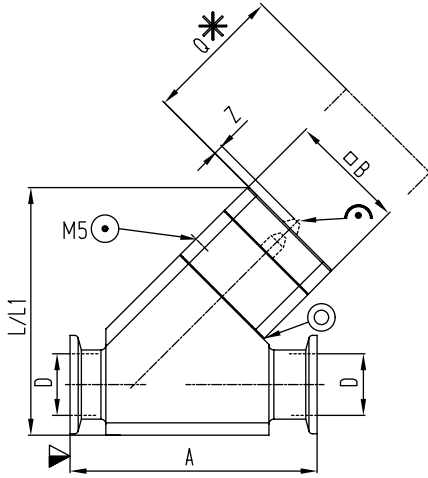
L = aluminum
L1 = stainless steel

	DN	mm	10	16	25	40	50	63	80	100	160	200	250
	inch	3/8	1/2	1	1 1/2	2	2 1/2	3	4	6	8	10	10
	A	mm	30	40	50	65	70	88	90	108	138	178	208
		inch	1.18	1.57	1.97	2.56	2.76	3.46	3.54	4.25	5.43	7.01	8.19
	B	mm	40	40	48	65	77	107.60	123	178	220	298	339
		inch	1.57	1.57	1.89	2.56	3.03	4.24	4.84	7.01	8.66	11.73	13.35
	D	mm	12	16	25	40	50	63	80	102	153	213	261
		inch	0.47	0.63	0.98	1.57	1.97	2.48	3.15	4.02	6.02	8.39	10.28
with closing spring	L	mm	-	65.20	60.60	87.70	96	123	109	218.30	221.50	-	-
		inch	-	2.57	2.39	3.45	3.78	4.84	4.29	8.59	8.72	-	-
with opening spring	L	mm	-	78.90	79.10	110.20	96	-	-	-	-	-	-
		inch	-	3.11	3.11	4.34	3.78	-	-	-	-	-	-
double acting	L	mm	-	-	-	-	-	-	-	218.10	218.50	-	-
		inch	-	-	-	-	-	-	-	8.59	8.60	-	-
	L1	mm	-	-	-	-	-	-	-	215.50	225	324.70	349.20
		inch	-	-	-	-	-	-	-	8.48	8.86	12.78	13.75
	Q	mm	46	46	44	73.50	85.50	105	115.60	170	200	258	305
		inch	1.81	1.81	1.73	2.89	3.37	4.13	4.55	6.69	7.87	10.16	12.01
	T	mm	-	-	-	-	-	-	-	77.50	84.50	174.10	204
		inch	-	-	-	-	-	-	-	3.03	3.30	6.80	7.97
	U	mm	-	-	-	-	-	-	-	136	136	208	208
		inch	-	-	-	-	-	-	-	5.35	5.35	8.19	8.19
	Z	mm	2	2	4	9.50	10.50	31.40	31.40	2.40	2.40	-	-
		inch	0.08	0.08	0.16	0.37	0.41	1.24	1.24	0.09	0.09	-	-

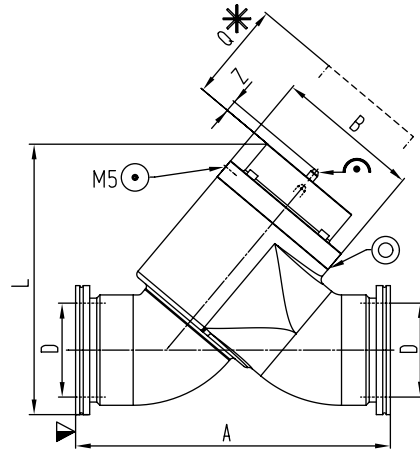
- ▼ Valve seat side
- * Required for dismantling
- ⊙ Compressed air connection
- ⊕ Mechanical position indication
- ⊙ Leak detection hole

DIMENSIONS

**Inline valve with pneumatic actuator,
single acting with closing spring (NC) or opening spring (NO)
DN 16 – 50 (½" – 2") ISO-KF**



**Inline valve with pneumatic actuator,
single acting with closing spring (NC)
DN 80 (3") ISO-K**



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

L = aluminum
L1 = stainless steel

	DN	16	25	40	50	80
	mm inch	mm inch	mm inch	mm inch	mm inch	mm inch
	mm inch	16 ¾	25 1	40 1½	50 2	80 3
	A	80 3.15	100 3.94	130 5.12	178 7.01	268 10.55
	B	40 1.57	48 1.89	65 2.56	77 3.03	123 4.84
	D	16 0.63	25 0.98	40 1.57	50 1.97	80 3.15
with closing spring	L	91.50 3.60	100.30 3.95	140.90 5.55	170.10 6.70	230.50 9.07
	L1	93 3.66	108.90 4.29	149.90 5.90	171.80 6.76	-
with opening spring	L	102.10 4.02	118 4.65	157.20 6.19	187.80 7.39	-
	L1	106.70 4.20	123.20 4.85	166 6.54	189.70 7.47	-
	Q	46 1.81	44 1.73	73.50 2.89	85.50 3.37	150 5.91
	Z	2 0.08	4 0.16	9.50 0.37	10.50 0.41	31.40 1.24