

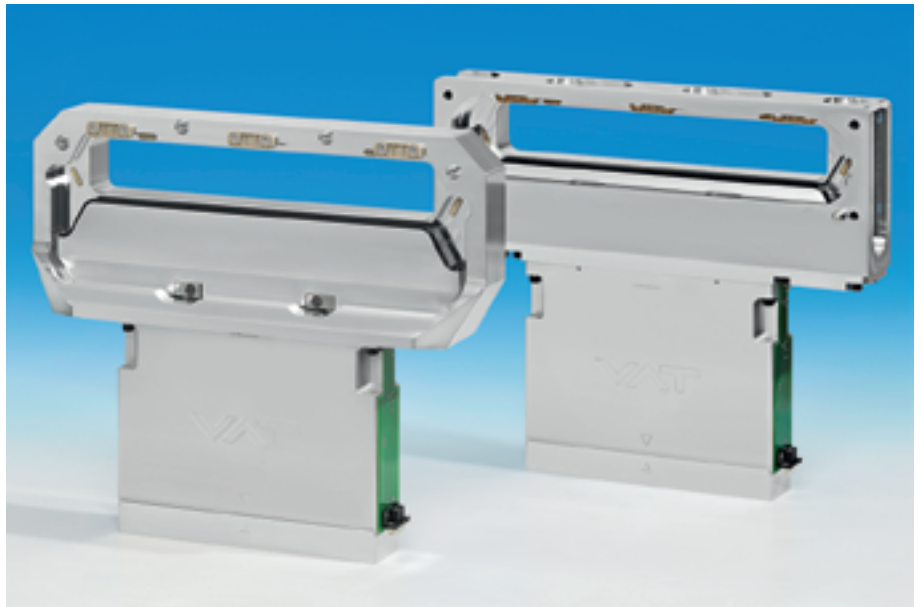
For SEMI applications handling
200, 300 and 450 mm wafers

For load lock / process module isolation

Virtually particle and vibration-free

>5 million cycles between maintenance

Very easy maintenance
thanks to self-adjusting plate



Body material

aluminum or stainless steel

Valve Series 022

double acting
pneumatic actuator
with position indicator

SEMI E21-94

SEMI E21-94

SEMI E21.1-1296

DN (D1 x D)		Ordering numbers			
mm	inch	type B opening: rear side > seat side with bonnet flange		type A opening: rear side = seat side with bonnet flange	
		aluminum	stainless steel	aluminum	stainless steel
32 x 222	1.26 x 8.74	02209-BA24	02209-BE24	02209-AA24	02209-AE24
46 x 236	1.81 x 9.29	02210-BA24	02210-BE24	02210-AA24	02210-AE24
50 x 336	1.97 x 13.23	02212-BA24	02212-BE24	02212-AA24	02212-AE24
56 x 496	2.20 x 19.53	02213-BA24	02213-BE24	02213-AA24	02213-AE24

with solenoid for impulse actuation: 022 **44** (specify control voltage)

Other opening sizes: see «Options»

Insert Series 032

double acting
pneumatic actuator
with position indicator

SEMI E21-94

SEMI E21-94

SEMI E21.1-1296

DN (D1 x D)		Ordering numbers	
mm	inch	type C	
		aluminum	stainless steel
32 x 222	1.26 x 8.74	03209-CA24	03209-CE24
46 x 236	1.81 x 9.29	03210-CA24	03210-CE24
50 x 336	1.97 x 13.23	03212-CA24	03212-CE24
56 x 496	2.20 x 19.53	03213-CA24	03213-CE24

with solenoid for impulse actuation: 032 **44** (specify control voltage)

Other opening sizes and insert types: see «Options»

Sealing materials

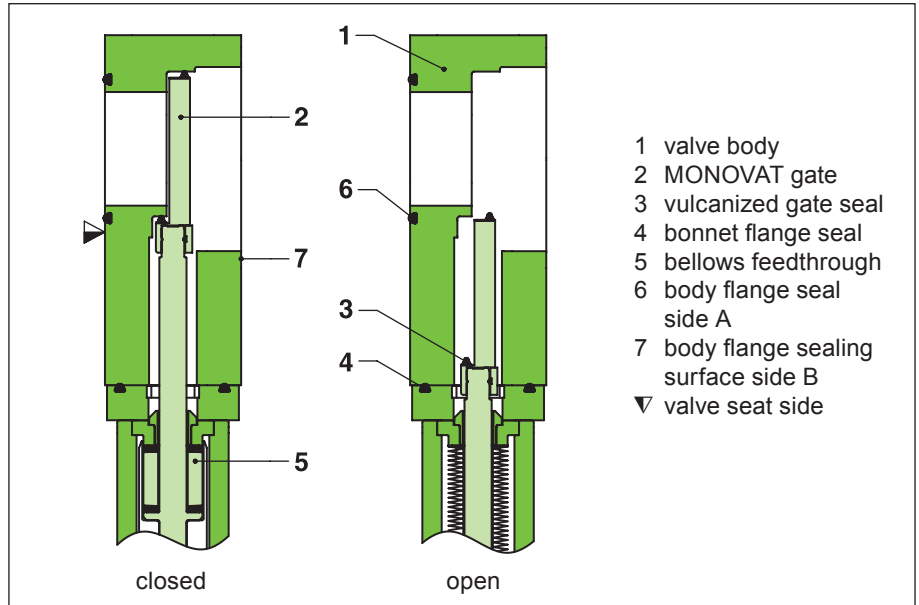
Gate: FKM (VITON, vulcanized)

Bonnet flange: FKM (VITON, O-ring)

Body flange (seat side):
FKM (VITON, O-ring)

Feedthrough

Bellows feedthrough (welded bellows)
inside, protected



- 1 valve body
- 2 MONOVAT gate
- 3 vulcanized gate seal
- 4 bonnet flange seal
- 5 bellows feedthrough
- 6 body flange seal side A
- 7 body flange sealing surface side B
- ▽ valve seat side

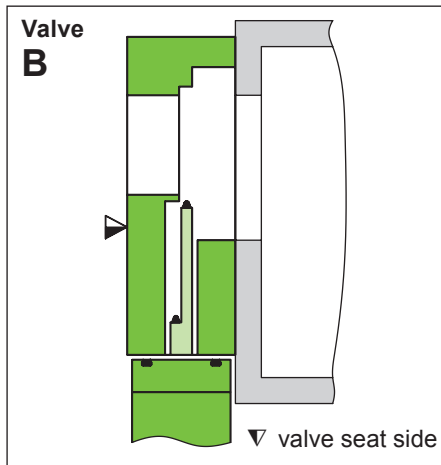
Features

Compact design

Modular system, same actuator for different valve sizes

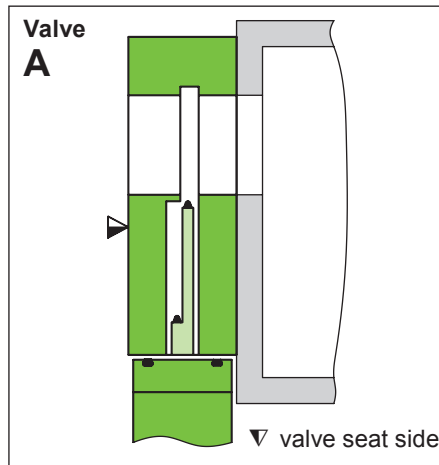
Maintenance-free actuator, self-adjusting gate without detached mounting parts

Types



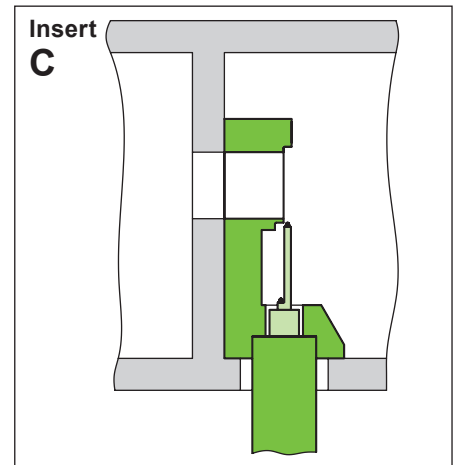
Opening on rear side larger than on seat side

With bonnet flange
Gate service through bonnet flange



Same size of opening on seat side and rear side

With bonnet flange
Gate service through bonnet flange

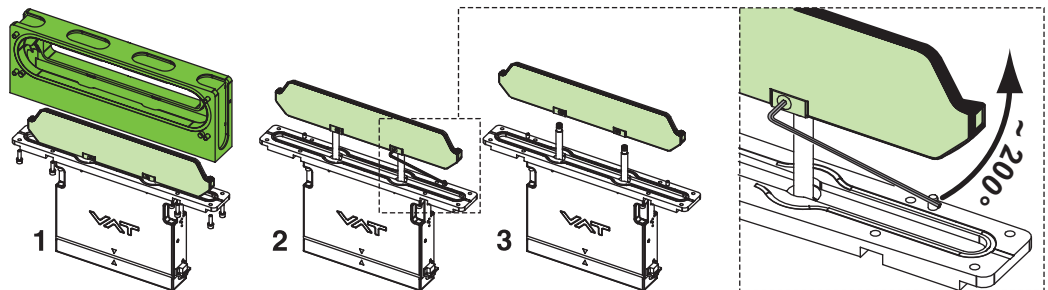


MONOVAT seat mounted inside of chamber

Insert installation from the top
Gate service through chamber

Easy gate exchange

- 1 Dismount actuator/gate
- 2, 3 Remove gate screws:
To do this, apply an Allen wrench and turn it about 200°



Technical data

Leak rate ¹⁾ at body and at seat in mbar ls⁻¹

sealing surface	FKM seal		FFKM seal		metal seal
	body	seat	body	seat	body
metal blank (milled / ball polished)	$< 1 \cdot 10^{-9}$	$< 1 \cdot 10^{-9}$	$< 1 \cdot 10^{-8}$	$< 1 \cdot 10^{-7}$	$< 5 \cdot 10^{-10}$ (stainless steel only)
aluminum: hard anodized	$< 1 \cdot 10^{-5}$	$< 1 \cdot 10^{-4}$	$< 1 \cdot 10^{-5}$	$< 1 \cdot 10^{-4}$	
aluminum: nickel-plated	$< 1 \cdot 10^{-9}$	$< 1 \cdot 10^{-9}$	$< 1 \cdot 10^{-8}$	$< 1 \cdot 10^{-7}$	
Measuring conditions: Body: 30s, He conc. $\geq 20\%$ Seat: 15s, He conc. $\geq 30\%$			Automatic leak rate supervision dp = 1 bar		

Pressure range

- Metal blank or nickel-plated $1 \cdot 10^{-9}$ mbar to 1.2 bar (abs)
- Aluminum, hard anodized $1 \cdot 10^{-6}$ mbar to 1.2 bar (abs)
- Metal seal $5 \cdot 10^{-10}$ mbar to 1.2 bar (abs)

Differential pressure on the gate

1.2 bar in either direction

Differential pressure at opening

≤ 30 mbar in either direction

Cycles until first service

≥ 5 million

Temperature ²⁾

operating temperature of valve	configurations			
	valve		actuator	
	body	gate	position indicator	cycle counter
$\leq 80^\circ\text{C}$	aluminum	aluminum	standard	standard
$\leq 150^\circ\text{C}$	aluminum	aluminum	bakeable	without
$\leq 200^\circ\text{C}$	stainless steel	stainless steel	without	without

Pneumatic box (solenoid, non-return valve, pressure controller): $< 60^\circ\text{C}$

Material

- Valve body and gate: aluminum EN AW-6082 (3.2315)
- Valve body and gate: stainless steel AISI 316L (1.4404, 1.4435)
- Differential pressure tabs, stoppers PEEK (Polyetheretherketon)
- Bellows end pieces, rod AISI 316L (1.4404, 1.4435)
- Bellows AISI 633 (AM 350)
- Clamping piece AISI 301 (1.4310)

¹⁾ At room temperature (25°C) and under clean environmental conditions.

²⁾ Maximum values: depending on operating conditions and sealing materials

³⁾ In order to maximize the life time of the gate, the operating pressure should be kept as low as possible, however high enough to ensure the required leak rate in the closed valve position. Depending on the length of the sealing line (size of gate), tolerances of the sealing lip, accuracy of the measurement and required leak rate, the operating pressure settings may be slightly beyond the specified pressure range.

Seal: gate, bonnet FKM (VITON)

Air connection internal threads $\frac{1}{8}$ " (ISO / NPT)

Recommended operating pressure ³⁾ 2 - 6 bar / 30 - 90 psi

Position indicator: contact rating

- Voltage ≤ 50 VAC / DC
- Current ≤ 0.1 A, > 5 mA
- Connection 9 pin subminiature D

Mounting position any

DN (D1 x D) D1 slit height D slit length		molecular flow conductance	compressed air pressure min. - max. overpressure ³⁾		volume of air cylinder		closing or opening time		weight			
mm	inch		bar	psi	l	ft3	with standard pneumatics (400SLPM)	with high speed actuation kit	aluminum body (type A)	stainless steel body (type A)	kg	lbs
32 x 222	1.26 x 8.74	1590	3 - 6	45 - 90	0.09	0.003	≤ 1	≤ 0.5	8	18	16	35
46 x 236	1.81 x 9.29	3340	2 - 4	30 - 60	0.12	0.004	≤ 1	≤ 0.5	10	22	20	44
50 x 336	1.97 x 13.23	5000	2 - 4	30 - 60	0.12	0.004	≤ 1	≤ 0.5	12	26	25	55

Options

Valve body:

- Opening sizes:
 - 25 x 160 / 210 / 265 / 420 mm (designation 01 / 02 / 03 / 04)
 - 51 x 160 / 210 / 265 / 420 mm (designation 05 / 06 / 07 / 08)
 - Other opening sizes on request, max. 56 x 700 mm
- Body flange:
 - Sealing surface or groove with O-ring
 - Sealing materials (O-ring): FKM, FFKM
 - Metal seal (for stainless steel)
 - Other sealing materials on request
 - Bolt pattern outside or inside of the sealing line
 - Alignment pins, alignment holes
- Surface treatment:
 - Aluminum: hard anodized or nickel-plated
 - Aluminum / stainless steel: ball-polished
- UHV version:
 - Sealing surfaces for metal flange seal
 - Metal seal on bonnet flange
 - Bellows assembly welded to bonnet flange
- Temperature management:
 - Valve body prepared for: liquid cooling (stainless steel) / nitrogen purge / heating cartridges
 - Heating cartridges with or without thermocouple
 - PTC heating cartridges
 - Temperature sensors with/without overtemp. protection
- High speed closing for the connection valve body/bonnet flange (dismounting/mounting of actuator/gate unit)
- Port KF16 for bypass, venting or gauges
- Valve body prepared for customer-specific sensor systems (pressure, temperature, wafer detection)

Actuator, pneumatics:

- Pneumatic locking in closed and open position
- High speed venting valve for fast closing and opening times
- Pressure control for the closed valve position
- Bakeable to 150°C
- Manual mechanical locking
- Solenoid for impulse actuation
12 / 24 VDC, 115 / 230 V 50/60Hz

Feedthrough:

- Bellows feedthrough with optimized particle protection
- Bellows feedthrough with detachable convolutions and optimized particle protection

Accessories

- VATSEAL metal seal for flanges
- Claw (M8) for valves with clamp edges: Ord. No. 32009-QAPR

Insert:

- Types L, M, N:
(Special requirements concerning stiffness and manufacturing tolerances of the chamber design must be considered. VAT recommends using the one-piece C-type.)
 - L: Seat mounted to chamber wall, with bonnet flange, gate service through bonnet flange
 - M: Seat mounted to chamber wall, without bonnet flange, gate service through chamber
 - N: Seat mounted through chamber wall, without bonnet flange, gate service through chamber
- Opening sizes:
 - 25 x 160 / 210 / 265 / 420 mm (designation 01 / 02 / 03 / 04)
 - 51 x 160 / 210 / 265 / 420 mm (designation 05 / 06 / 07 / 08)
 - Other opening sizes on request, max. 56 x 700 mm
- Sealing materials (O-ring):
 - FKM, FFKM
 - Other sealing materials on request
- Surface treatment: see paragraph «Valve body»
- Temperature management: see paragraph «Valve body»

Gate:

- Sealing materials for vulcanized seals:
 - FKM, FFKM
 - Other sealing materials on request
- Gate with groove
- Sealing material for gate O-ring:
 - FKM, FFKM
 - Other sealing materials on request
- Surface treatment:
 - Aluminum: hard anodized or nickel-plated
 - Aluminum / stainless steel: bead-blasted or ball-polished
 - Stainless steel: electro polished
- Protective shields against heat radiation / coating / plasma and process gases
- Temperature management:
 - Liquid cooling (stainless steel)
 - Gate with heating conductor

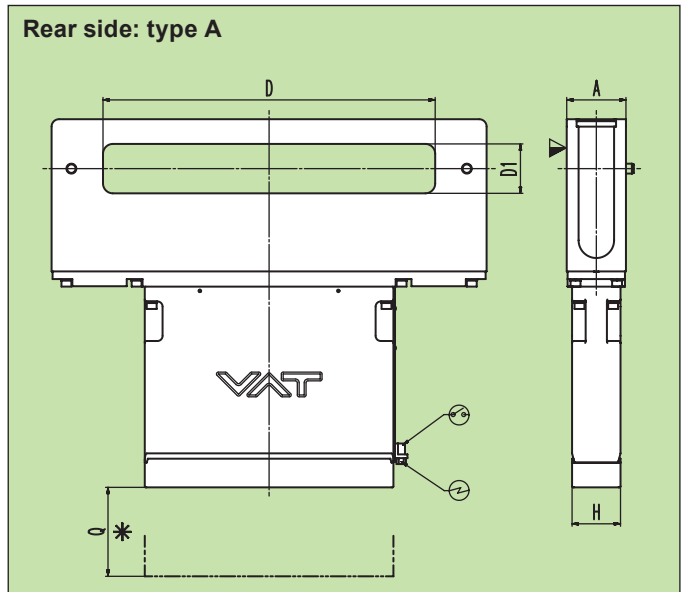
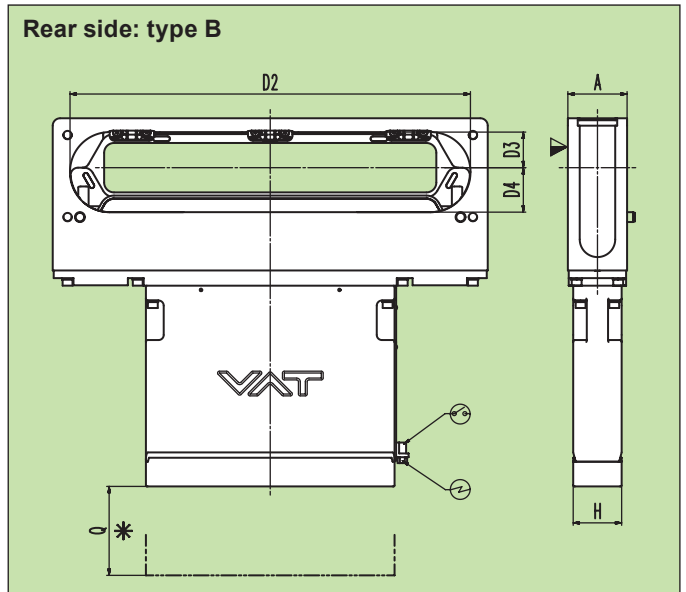
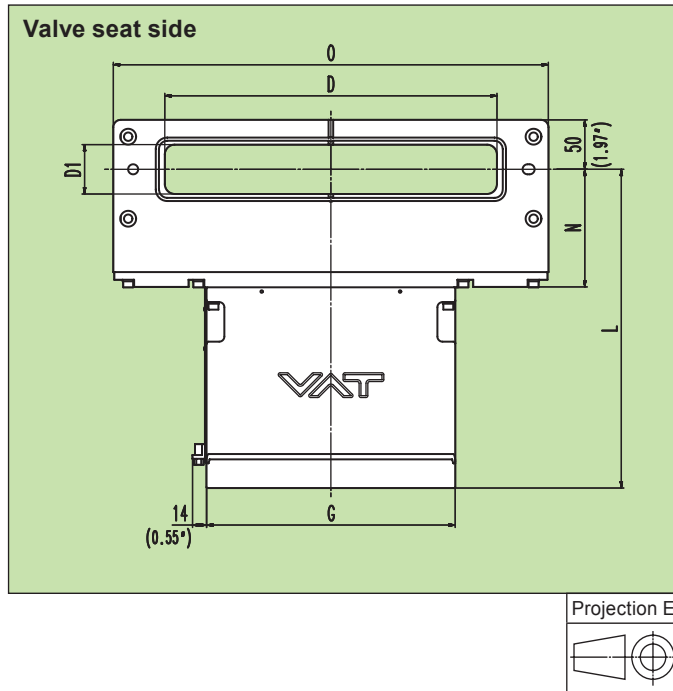
Position indicator:

- Bakeable to 150°C
- Double position indicators in both end positions
- Mechanical and electronic magnetic field sensors with LED
- Cycle counter

Service kit

- Seal kit, consisting of valve gate and bonnet flange seal. Ordering number on request.

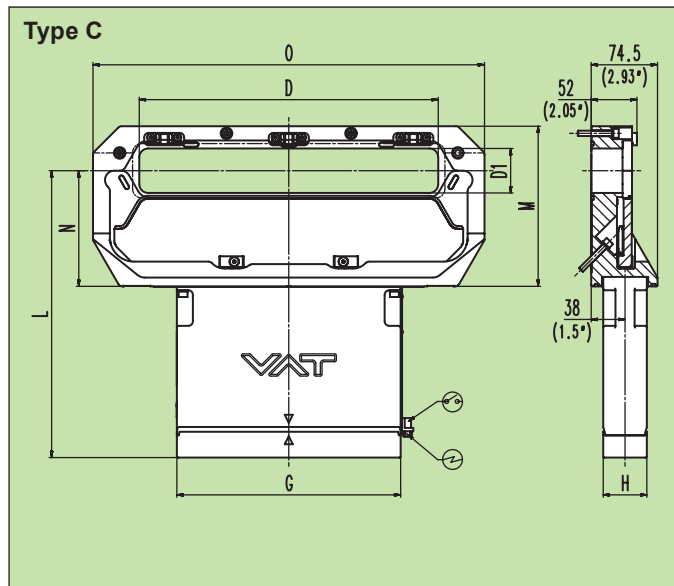
Dimensions: Valve Series 022



D1 x D	mm inch	32 x 222 1.26 x 8.74	46 x 236 1.81 x 9.29	50 x 336 1.97 x 13.23
A	mm inch	50 1.97	50 1.97	60 2.36
D	mm inch	222 8.74	236 9.29	336 13.23
D1	mm inch	32 1.26	46 1.81	50 1.97
D2	mm inch	275 10.83	305 12.01	405 15.94
D3	mm inch	29 1.14	36 1.42	36 1.42
D4	mm inch	35 1.38	44 1.73	45 1.77
G	mm inch	203.5 8.01	251.5 9.9	251.5 9.9
H	mm inch	43 1.69	49 1.93	49 1.93
L	mm inch	251.5 9.9	322.5 12.7	322.5 12.7
N	mm inch	112 4.41	119 4.69	119 4.69
O	mm inch	340 13.39	340 13.39	440 17.32
Q	mm inch	75 3.13	90 3.54	90 3.54

- ▽ valve seat side
- * required for dismantling
- ⊕ electrical connection
- ⊙ position indicator

Dimensions: Insert Series 032



- ⊖ electrical connection
- ⊙ position indicator

D1 x D	mm inch	32 x 222 1.26 x 8.74	46 x 236 1.81 x 9.29	50 x 336 1.97 x 13.23
D	mm inch	222 8.74	236 9.29	336 13.23
D1	mm inch	32 1.26	46 1.81	50 1.97
G	mm inch	203.5 8.01	251.5 9.9	251.5 9.9
H	mm inch	43 1.69	49 1.93	49 1.93
L	mm inch	251.5 9.9	322.5 12.7	322.5 12.7
M	mm inch	135 5.31	175 6.89	180 7.09
N	mm inch	100 3.94	130 5.12	130 5.12
O	mm inch	290 11.42	320 12.6	440 17.32