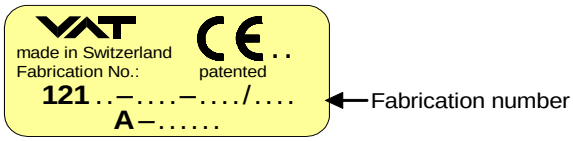
Vacuum Gate Valve
with manual actuator

This manual is valid for the valve ordering number(s):
12136-.A03
12138-.A03
12140-.A03

The fabrication number is indicated on each product as per the label below (or similar):



← Fabrication number

Explanation of symbols:


Read declaration carefully before you start any other action!


Attention!


Product is in conformity with EC guidelines, if applicable!


Disconnect electrical power and compressed air lines. Do not touch parts under voltage!


Keep body parts and objects away from the valve opening!


Hot surfaces; do not touch!


Loaded springs and/or air cushions are potential hazards!


Wear gloves!


Read these **«Installation, Operating & Maintenance Instructions»** and the enclosed **«General Safety Instructions»** carefully before you start any other action!

Imprint:

Manufacturer VAT Vakuumventile AG, CH-9469 Haag, Switzerland

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Series 12.1, DN 63 - 100 (I.D. 2½" - 4")

Contents:

1 Use of product

Use product for clean and dry indoor vacuum applications under the conditions indicated in chapter «Technical data» only! Other applications are only allowed with the written permission of VAT.

1.1 Technical data

Pressure range	1 x 10^{-7} mbar to 1.6 bar (abs)
Differential pressure on the valve gate	≤ 1.6 bar in either direction
Differential pressure at opening	≤ 30 mbar
Admissible temperature: Valve	≤ 150°C
Manual actuator	≤ 80°C

Further data according to product data sheet 253244

2 Installation

2.1 Unpacking

Make sure, that the delivered components are according the order.
Visually check the quality of the components.
If something of the delivery is not as expected please immediately contact VAT.

Notice:
Please do not throw away the original packaging. Packaging my useful in a case of service to return the components to VAT.

2.2 Installation into the system

The valve seat side is indicated by the symbol "∇" on the connection flange.

2.3 Tightening torque for flange screws

The screws of the flanges have to be tightened uniformly in crosswise order. The tightening torques indicated in the following table have to be observed.

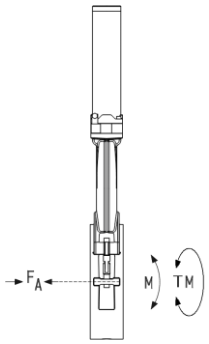
DN		Tightening torque «Nm»			lbf · ft		
mm	inch	ISO	JIS	ASA-LP	ISO	JIS	ASA-LP
63	2½	6 - 8	6-8		4.5 - 6		
80	3	6 - 8	6-8		4.5 - 6		
100	4	6 - 8	10 - 12	10 - 12	4.5 - 6	7.5 - 9	7.5 - 9

Higher tightening torques may deform the valve body. This can lead to improper function of the valve or to a leaky valve gate.

2.4 Admissible forces

Forces from evacuating the system, from the weight of other components, and from baking can lead to deformation of the valve body and to malfunction of the valve. The stress has to be relieved by suitable means, e.g. bellows sections. The following forces are admissible:

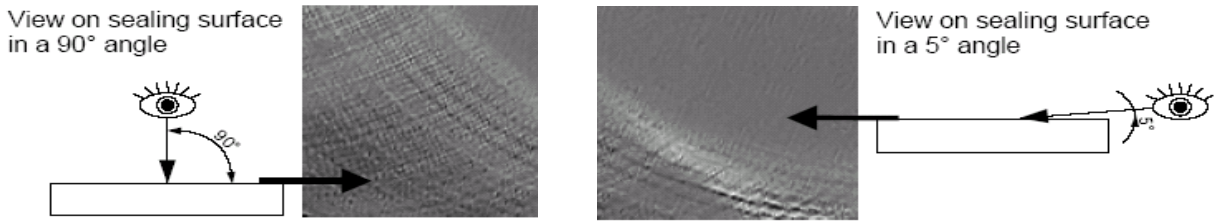
DN (nom. I.D.)		Axial tensile or compressive force «FA»		Bending moment «M»		Maximum admissible torsional moment of body «TM»	
mm	inch	N	lbf	Nm	lbf · ft	Nm	lbf · ft
63	2½	980	220	39	29	3'000	2'210
80	3	1025	230	43	32	n/a	n/a
100	4	1080	242	49	36	10'000	7'370
If a combination of forces («FA», «M» and «TM») occurs, the values mentioned above are invalid. Please contact VAT for more information. ATTENTION: The stated maximum torsional moment «TM» is only valid for the valve equipped with the standard flange to flange dimension (see catalogue 2008 Dimension A)							



2.3 Milled flange sealing surfaces

The sealing surfaces are now being manufactured with the new PCD (Poly Crystaline Diamond) milling method that does not require any remachining.

Altough the PCD milling leaves fine tracks on the surface, the sealing quality is much better.



3 Operation

3.1 Operation under increased temperature

The maximum temperatures indicated in the technical data are only valid as long as the valve is in one of the end positions. Cycling the valve at these temperatures may reduce the cycle life of the mechanism. See «1.1 Technical data

4 Trouble shooting

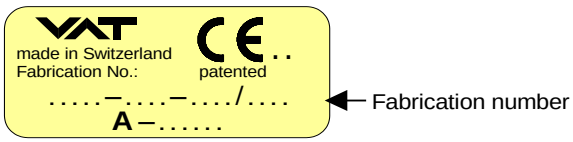
Failure	Check	Action
Leak at gate	Valve seat or gate seal contaminated ?	Clean valve seat and gate seal or replace gate seal if necessary
Leak at body	Flanges leak tight ?	Fasten screws or replace bonnet seal if necessary

If you need any further information, please contact one of our service centers. You can find the addresses on our website: http://www.vat.ch

5 Maintenance & repairs

Under clean operating conditions, the valve does not require any maintenance during the specified cycle life. Contamination from the process may influence the function and requires more frequent maintenance.

Before carrying out any maintenance or repairs, please contact VAT. It has to be individually decided whether the maintenance/repair can be performed by the customer or has to be carried out by VAT. The fabrication number on the valve



has always to be specified.

All supplies (e. g. compressed air, electrical power) must be disconnected for removal/installation of the valve from/into the system and for maintenance work.

Even with disconnected supply, loaded springs and/or air cushions in cylinders can be potential hazards.

Keep fingers and objects away from the valve opening!

Products returned to VAT must be free of harmful substances such as e.g. toxical, caustic or microbiological ones. If products are radioactively contaminated, fill in the VAT form «Contamination and Radiation Report» and send it with the product. The form is available at VAT. The maximum values indicated in the form must not be exceeded.

5.1 Cleaning or replacement of gate seal and, or bonnet seal

The figures in brackets refer to the drawing on page 12

The lower part of the body (flange part) need not be removed from the system for cleaning/replacing the gate seal and/or bonnet seal!

1. Vent vacuum chambers on either side of the valve
2. Open the valve by moving the handle
3. Remove bonnet screws (3)
4. Withdraw actuator (1) with mechanism carefully from the valve lower part of body (2) and place it on a clean surface
5. Clean (A) or replace (B) gate seal:

(A) 1. Leave gate seal in groove and clean it by using a lint-free cloth and alcohol
2. Slightly lubricate seal with VAT vacuum grease (see spare parts)

(B) 1.Pull gate seal out of groove by means of a scribing tool
Attention: Be careful not do damage the bottom of the groove!
2. Clean seal groove by using a lint-free cloth and alcohol
3. Put new gate seal on seal groove and press it into groove uniformly

Removal of gate seal

7. Clean (A) or replace (B) bonnet seal (5):

(A) 1. Leave bonnet seal in groove and clean it by using a lint-free cloth and alcohol
2. Slightly lubricate seal with VAT vacuum grease [see «Spare parts»]

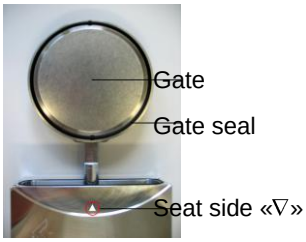
(B) 1. Pull bonnet seal out of groove by means of a scribing tool
Attention: Be careful not to damage the bottom of the groove!
2. Clean seal groove by using a lint-free cloth and alcohol
3. Put new bonnet seal on seal groove and press it into groove on one short side
4. Distribute seal uniformly over long sides to opposite short side and press it fully into the groove

Removal of bonnet seal

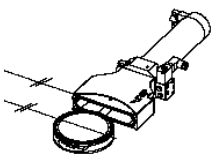
8. Clean sealing surface of upper part of body (6) by using a lint-free cloth and alcohol
9. Clean sealing surface of valve seat on lower part of body (2) by using a lint-free cloth and alcohol

Make sure to have gate (8) on seat side «∇»:
Symbol «∇» on upper part of body (6)

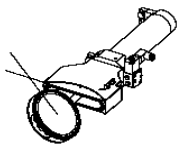
Note: Mechanism with actuator shaft (8) is stiffly rotatable by 360°!



10. Align mechanism with opening of upper part of body (2)

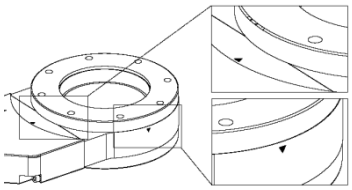


Correct



Wrong

12 Set upper part of body (6)/ actuator assembly carefully on lower part of body (2)
Attention: The triangles «∇» of both body parts must face each other!



13 Insert bonnet screws (3) and fasten them with torque 6 Nm / 4.5 lbf.ft
14 Perform function and leak test
15 Valve is ready for operation

5.2 Cleaning or replacement of locking balls

The figures in brackets refer to the drawing on page 12

The lower part of the body (flange part) need not be removed from the system for cleaning/replacing the locking balls! When the locking balls are cleaned/replaced, we recommend to clean the gate seal and bonnet seal as well (see relevant chapter).

1. Vent vacuum chambers on either side of the valve
2. Open the valve by moving the handle
3. Place the valve on a clean surface
4. Remove bonnet screws (3)
5. Withdraw actuator (1) with mechanism carefully from the valve lower part of body (2) and place it on a clean surface
6. Remove nuts (7) from gate (8)
7. Lift off counter plate (10) carefully and put it on a clean place
8. Remove all visible locking balls (9) from shaft (11)
9. Clean (A) or replace (B) locking balls (3):

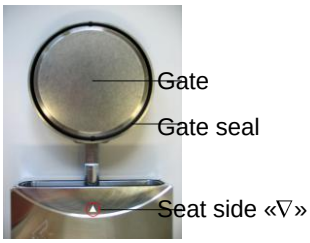
(A)
1. Clean ball tracks in gate (8) and counter plate (10) by using a lint-free cloth, and check their condition with regard to wear
2. Clean balls and ball sockets in shaft (11) by using a lint-free cloth and alcohol
3. Lubricate balls with VAT vacuum grease [see «Spare parts»]
4. Insert balls into ball tracks in gate (8)

(B)
1. Clean ball tracks in gate (8) and counter plate (10) by using a lint-free cloth and alcohol , and check their condition with regard to wear
2. Clean ball sockets in shaft (11) by using a lint-free cloth and alcohol
3. Insert new, lubricated balls [see «Spare parts»] into ball tracks in gate (8)

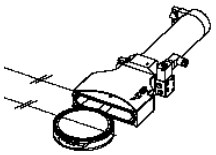
10. Put gate (8) in place, insert washers and nuts (7) and fasten nuts with a torque of 5 Nm /3.75 lbf.ft
Attention: slightly lubricate the threaded bolts
11. Clean and check bonnet sealing surfaces and seal (5)

Make sure to have gate (8) on seat side «∇»:
Symbol «∇» on upper part of body (6)

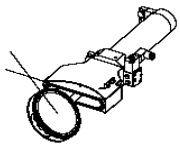
Note: Mechanism with actuator shaft (8) is stiffly rotatable by 360°!



12. Align mechanism with opening of upper part of body (2)

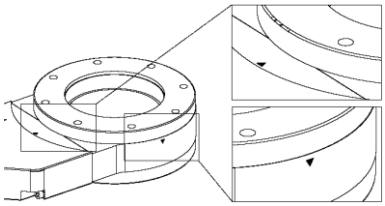


correct



wrong

13. Move mechanism into upper part of body (6) by moving handle to open position
14. Set upper part of body (6)/ actuator assembly carefully on lower part of body (2)
    Attention: The triangles «∇» of both body parts must face each other!



15. Insert bonnet screws (3) and fasten them with torque 6 Nm / 4.5 lbf.ft
16. Perform function and leak test
17. Valve is ready for operation

5.3 Cleaning or replacing of shaft feedthrough seals

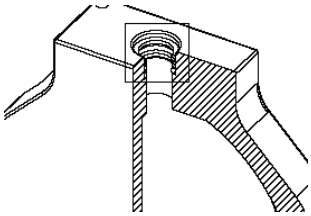
The figures in brackets refer to the drawing on page 12

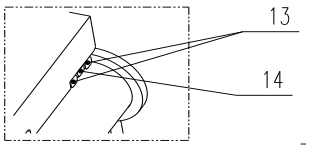
The lower part of the body (flange part) need not be removed from the system for cleaning/replacing the shaft feedthrough seals! When the shaft feedthrough seals are cleaned/replaced, we recommend to clean the gate seal and bonnet seal as well (see relevant chapter).

1. Vent vacuum chambers on either side of the valve
2. Open the valve by moving the handle
3. Place the valve on a clean surface
4. Remove bonnet screws (3)
5. Withdraw actuator (1) with mechanism carefully from valve block and place it on a clan surface.
6. Move mechanism slowly out of upper part of body (6) by hand
7. Remove nuts (7) from gate (8)
8. Lift gate (8) carefully and put it on a clean surface
9. Remove all visible balls (9) from shaft (11)
10. Lift actuator (1) and put it on a clean surface
11. Separate actuator (1) from upper part of body (6)

12. Separate actuator (1) from valve block

13. Remove both seal (14) and spacer (13) carefully from upper part of body (6) ***Attention:*** Do not damage the sealing surface!

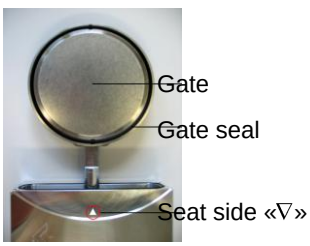




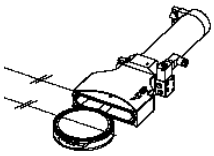
14. Clean feedthrough hole in upper part of body (6) and spacer (14) by using a lint-free cloth and alcohol
15. Remove seals (13)
16. Clean seals by using a lint-free cloth and alcohol or replace the seals if necessary
17. Extensively lubricate first seal (13) with VAT vacuum grease [see 7 Spare parts] and insert it into the feedthrough hole of the upper part of body (6)
18. Insert spacer (14)
19. Extensively lubricate second seal (13) with VAT vacuum grease [see 7 Spare parts] and insert it into the feedthrough hole of upper part of body (6)
20. Extensively lubricate space between both seals with VAT vacuum grease [see 7 Spare parts]
21. Clean actuator shaft (11)
22. Reconnect actuator (1) and upper part of body (6)
23. Insert screws (12) and fasten them with a torque of 6 Nm / 4.5 lbf . ft
24. Clean ball tracks in gate (8), counter-plate (10) and shaft (11) by using a lint-free cloth and alcohol or replace the actuator (1) or the counter-plate (10) if wear is visible at the ball tracks
25. Clean balls (9) by using a lint-free cloth and alcohol or replace the balls if wear is visible
26. Lubricate balls (9) with VAT vacuum grease [see 7 Spare parts]
27. Insert balls (9) into ball track of counter-plate (10)
28. Put actuator (1) respective ball track of shaft (11) onto ball (9) of counter-plate (10)
29. Insert balls (9) into ball tracks of the shaft (11)
30. Put gate (8) in place, insert washers and nuts (7) and fasten nuts with a torque of 5 Nm / 3.75 lbf.ft
    Attention: slightly lubricate the threaded bolts
31. Clean and check bonnet sealing surfaces and seal (5)

Make sure to have gate (8) on seat side «∇»:
Symbol «∇» on upper part of body (6)

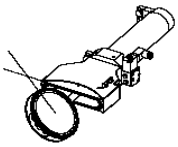
Note: Mechanism with actuator shaft (8) is stiffly rotatable by 360°!



32. Align mechanism with opening of upper part of body (2)

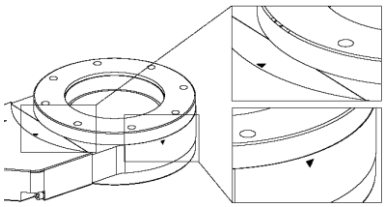


correct



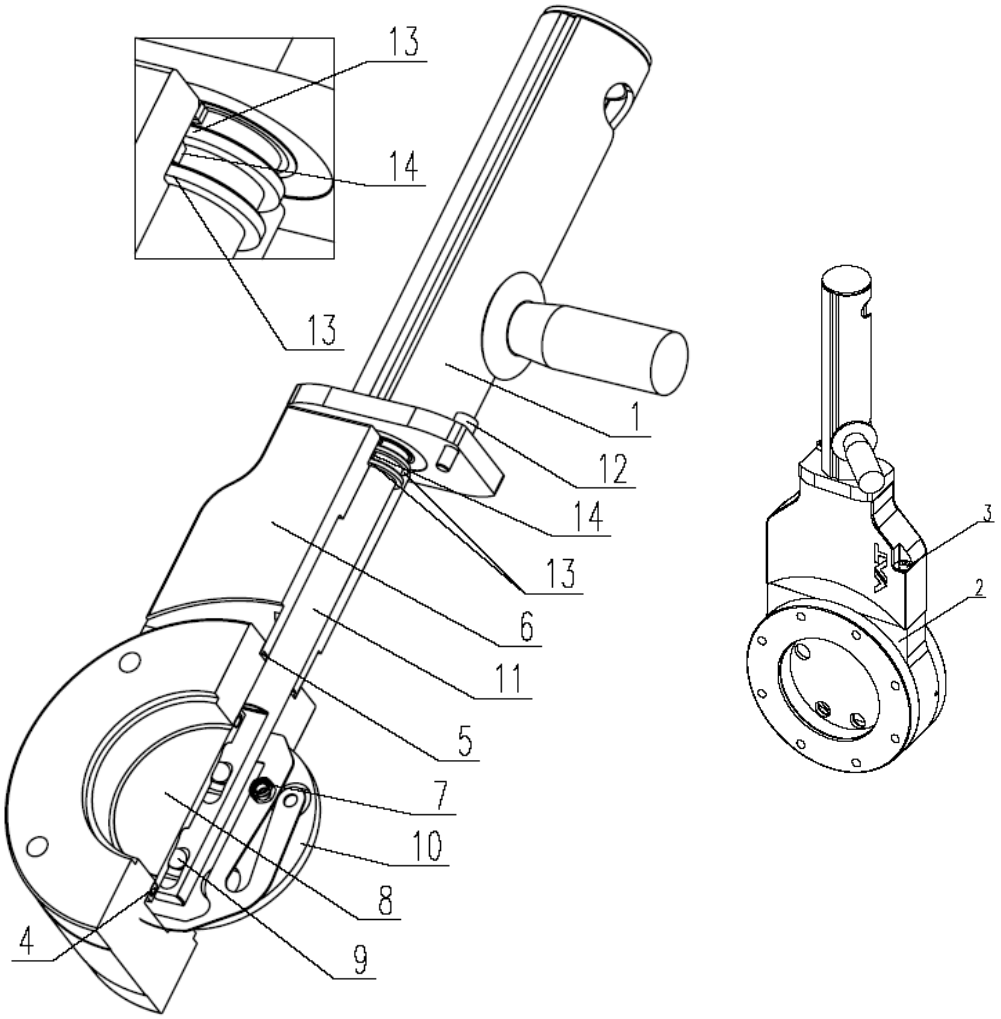
wrong

33. Move mechanism into upper part of body (6) by moving handle to position OPEN
34. Put actuator (1) carefully on the lower part of body (2). ***Attention:*** Observe seat sign "▽"!



35. Insert bonnet screws (3) and fasten them with a torque of 6 Nm / 4.5 lbf. ft
36. Perform function and leak test
37. Valve is ready for operation

6 Drawing



	Designation	Item	Designation	Item	Designation
1	manual actuator	7	lock nut	13	feedthrough seals
2	lower part of body	8	gate plate	14	spacer
3	bonnet screws	9	locking balls		
4	gate seal	10	counter plate		
5	bonnet seal	11	actuator shaft		
6	upper part of body	12	bonnet srews		

7 Spare parts

Please specify the **fabrication number of the valve** (see yellow label on valve) when ordering spare parts. This is to ensure that the appropriate spare parts are supplied.

Item	Designation	Ordering No.		
	DN	**63**	**80**	**100**
	Seal kit [1)]	256423	256215	242349
1	Gate seal	N-5100-231	N-5100-237	N-5100-243
2	Bonnet seal	N-5100-113	N-5100-113	N-5100-113
3	Spare parts kit «balls lubricated»	237916	237916	237916
4	Overhaul kit [2)]	256826	256804	260169
	VAT vacuum grease (10g)	N-6951-011	N-6951-011	N-6951-011

[1)] Seal kit includes: gate seal, bonnet seal, shaft feedthrough seals
[2)] Overhaul kit includes: gate plate, conter plate, leaf spring and lock nut

8 Warranty

Each product sold by VAT Vakuumventile AG (VAT) is warranted to be free from the manufacturing defects that adversely affect the normal functioning thereof during the warranty period stated in VAT's «Terms of Sale» immediately following delivery thereof by VAT, provided that the same is properly operated under conditions of normal use and that regular, periodic maintenance and service is performed or replacements made, in accordance with the instructions provided by VAT. The foregoing warranty shall not apply to any product or component that has been repaired or altered by anyone other than an authorized VAT representative or that has been subject to improper installation or abuse, misuse, negligence or accident. VAT shall not be liable for any damage, loss, or expense, whether consequential, special, incidental, direct or otherwise, caused by, arising out of or connected with the manufacture, delivery (including any delay in or failure to deliver), packaging, storage or use of any product sold or delivered by VAT shall fail to conform to the foregoing warranty or to the description thereof contained herein, the purchaser thereof, as its exclusive remedy, shall upon prompt notice to VAT of any such defect or failure and upon the return of the product, part or component in question to VAT at its factory, with transportation charges prepaid, and upon VAT's inspection confirming the existence of any defect inconsistent with said warranty or any such failure, be entitled to have such defect or failure cured at VAT's factory and at no charge therefor, by replacement or repair of said product, as VAT may elect. VAT MAKES NO WARRANTY OR REPRESENTATION OF ANY KIND, EXPRESS OR IMPLIED, (INCLUDING NO WARRANTY OR MERCHANTABILITY), EXCEPT FOR THE FOREGOING WARRANTY AND THE WARRANTY THAT EACH PRODUCT SHALL CONFORM TO THE DESCRIPTION THEREOF CONTAINED HEREIN, and no warranty shall be implied by law.

Furthermore, the «Terms of sale» at the back of the price list are applicable.