

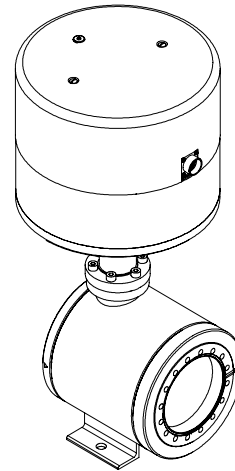
## Fast closing valve with pneumatic actuator

This manual is valid for the valve ordering number(s):

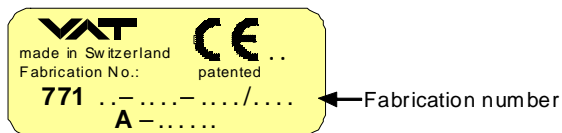
77136- . E44- . . . .

77140- . E44- . . . .

77144- . E44- . . . .



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



### Explanation of symbols:



Read declaration carefully before you start any other action!



Keep body parts and objects away from the valve opening!



Attention!



Hot surfaces; do not touch!



Product is in conformity with EC guidelines, if applicable!



Loaded springs and/or air cushions are potential hazards!



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



Wear gloves!



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



**Installation, Operating & Maintenance Instructions**  
**Series 77.1, DN 63-160 CF-F (I.D. 2½"- 6")**

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**Imprint:**

**Manufacturer** VAT Vakuumventile AG, CH-9469 Haag, Switzerland

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## 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

Leak rate		
- Body		$< 1 \cdot 10^{-10} \text{ mbar ls}^{-1}$
- Seat		$< 30 \text{ mbar ls}^{-1}$
Pressure range		$1 \cdot 10^{-10} \text{ mbar to 1.2 bar}$
Differential pressure on the gate	in closing direction	$\leq 2.0 \text{ bar}$
	in opening direction	$\leq 1.2 \text{ bar (DN63, DN100) / 0.5 bar (DN160)}$
Max. diff. pressure at opening	in closing direction	$\leq 0.6 \text{ bar (DN63) / } \leq 0.18 \text{ bar (DN100) / } \leq 0.05 \text{ bar (DN160)}$
	in opening direction	$\leq 1.0 \text{ bar}$
Molecular flow conductance		200 (DN63) / 700 (DN100) / 1700 (DN160)
Cycles until first service		2000 under clean operating conditions
Bake-out temperature		
- Valve	Standard	$\leq 300^{\circ}\text{C}$
- Actuator		$\leq 50^{\circ}\text{C}$
- Solenoid		$\leq 50^{\circ}\text{C}$
- Position Indicator		$\leq 50^{\circ}\text{C}$
Temperature difference seat/gate		$\leq 40^{\circ}\text{C}$
Heating and cooling rate		$\leq 80^{\circ}\text{Ch}^{-1}$
Material		
- Body		1.4404, 1.4435, AISI 316L
- Mechanism		1.4435, AISI 316L / 3.7035, Titanium
- Bellows		1.4404, AISI 316L
Seal		
- Bonnet		metal
- Gate		metal
- Actuator		NBR, PTFE/Nitril
Mounting position		any; counter seat side should look in direction of the air inrush
Position indicator: contact rating		$\leq 50 \text{ V AC / DC; } \leq 1.2 \text{ A}$



#### Radiation resistance

- Actuator	Standard	10 <sup>4</sup> Gy (10 <sup>6</sup> rad)
	Radiation resistant 10 <sup>5</sup> Gy	10 <sup>5</sup> Gy (10 <sup>7</sup> rad)
- Position indicator	Standard	10 <sup>4</sup> Gy (10 <sup>6</sup> rad)
	Radiation resistant 10 <sup>6</sup> Gy	10 <sup>6</sup> Gy (10 <sup>8</sup> rad)
Compressed air connection		R 1/8" (1/8" NPT for USA)
Compressed air pressure (overpressure)		5 – 8 bar / 70 – 110 psig
Solenoid (opening)		
- Supply voltage		24V DC
- Power required		2.5 W
Closing time (DN63/100/160/200)		< 13 / 15 / 23 ms (response time of sensor is not included)
Opening time		7 s
Weight (DN63/100/160)		28 / 32 / 36 kg // 62 / 70 / 80 lbs

## 2 Installation

### 2.1 Unpacking



Caution! dirt sensitive product. Touching the product or parts thereof with bare hands increases the desorption rate.

Always wear clean lint-free gloves and use clean tools when working in this area.

### 2.2 Installation into the system

The valve must not support other components and has to be protected from forces of the system (e.g. by bellows sections).




## 2.3 Connections

### 2.3.1 Compressed air connection



- Connect compressed air only if
- the valve has been installed into the vacuum system
  - moving parts cannot be touched

Connect compressed air to  (internal thread R 1/8", 1/8" NPT for USA, see dimensional drawing)

Compressed air pressure (min. - max. overpressure): 5 - 8 bar / 70 - 110 psi

Use only clean, dry or slightly lubricated air!

The air lines have to be flushed or even cleaned before they are connected to the valve.

Only clean compressed air may be used for operating the valve.

Commercially available water separators and filters have to be installed.

To avoid malfunctions of the solenoid, we recommend to seal the thread of the compressed air inlet with liquid plastic (e.g. Loctite) and not by means of Teflon ribbon or similar fibrous material.

### 2.3.2 Electrical connection



**Note:** The controller has to be disconnected from the mains before it is connected to or disconnected from the valve.

Before the controller is connected to the mains make sure that

- the voltage set inside the controller matches the mains voltage (see label near mains socket)
- the opening of the valve is completely free and the plate can move without obstruction



Do not touch any electrically charged parts!

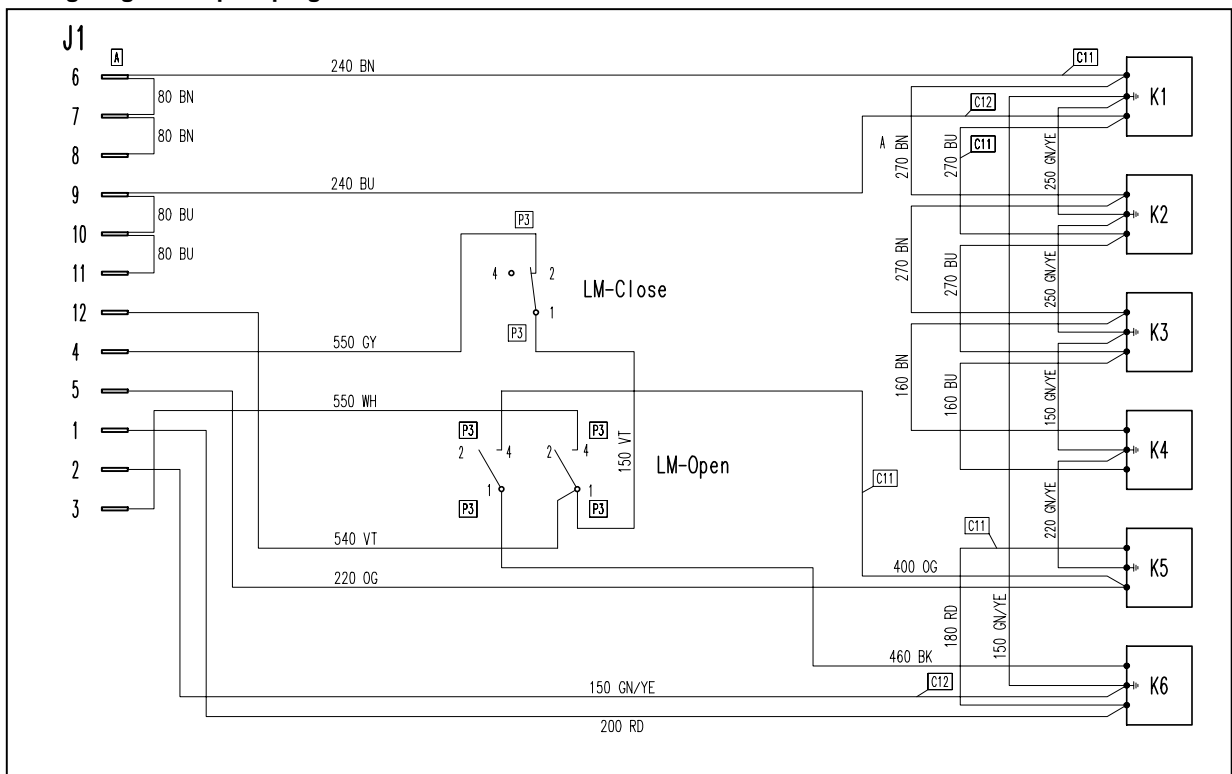


Connect electrical power only if

- valve has been installed into the vacuum system
- moving parts cannot be touched

Electrical connection between fast closing valve and controller is performed with a 12 pole plug and a single connection cable according to the following drawing.

#### Wiring diagram 12 pole plug





## 3 Operation

### 3.1 Normal operation



Warning: Keep fingers and objects away from the valve opening and from slot of the distance piece between valve body and actuator!

The fast closing shutter series 77.1 may only be operated by the controller VF-2 (series 77). Start-up and operation of the complete system is described in a separate manual.

The valve is closed and opened by compressed air. The cylinder is permanently maintained under compressed air pressure.

Closing is initiated by solenoids, which trigger the pressure air reservoir. After triggering the compressed air pressure acts immediately on the cylinder. This results in an extremely short closing time. The final stage of closing is pneumatically dampened.

To open the valve, the cylinder is actuated by compressed air via a solenoid. The cylinder is filled with compressed air again, when the piston reaches the end position "open".

### 3.2 Operation under increased temperature

See «1.1 Technical data»

### 3.3 Behavior in case of compressed air pressure drop

valve open: no change  
during opening: valve closes but is not leak tight

valve closed: valve remains leaktight until air pressure is diminished by natural leakage of the pneumatic  
during opening: does not open completely until compressed air is available again)

We recommend to use an emergency air reservoir at the compressed air input.

### 3.4 Behavior in case of power failure

The behaviour at power failure can be set inside the controller, either for «no change» or «valve closes».



## 4 Trouble shooting

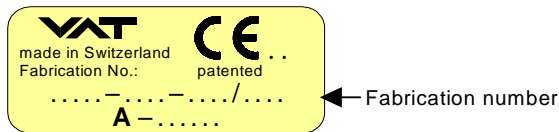
Failure	Check	Action
Valve does not close/open	Power available? Compressed air available? Coil of solenoid defect?	Check voltage! Check compressed air pressure! Check coil of solenoid!
Leak at the body	Flange seal leaktight? Bonnet seal leaktight? Screws at bonnet tightend?	Check flange seal! Check bonnet seal! Retighting of the bonnet screws!

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.



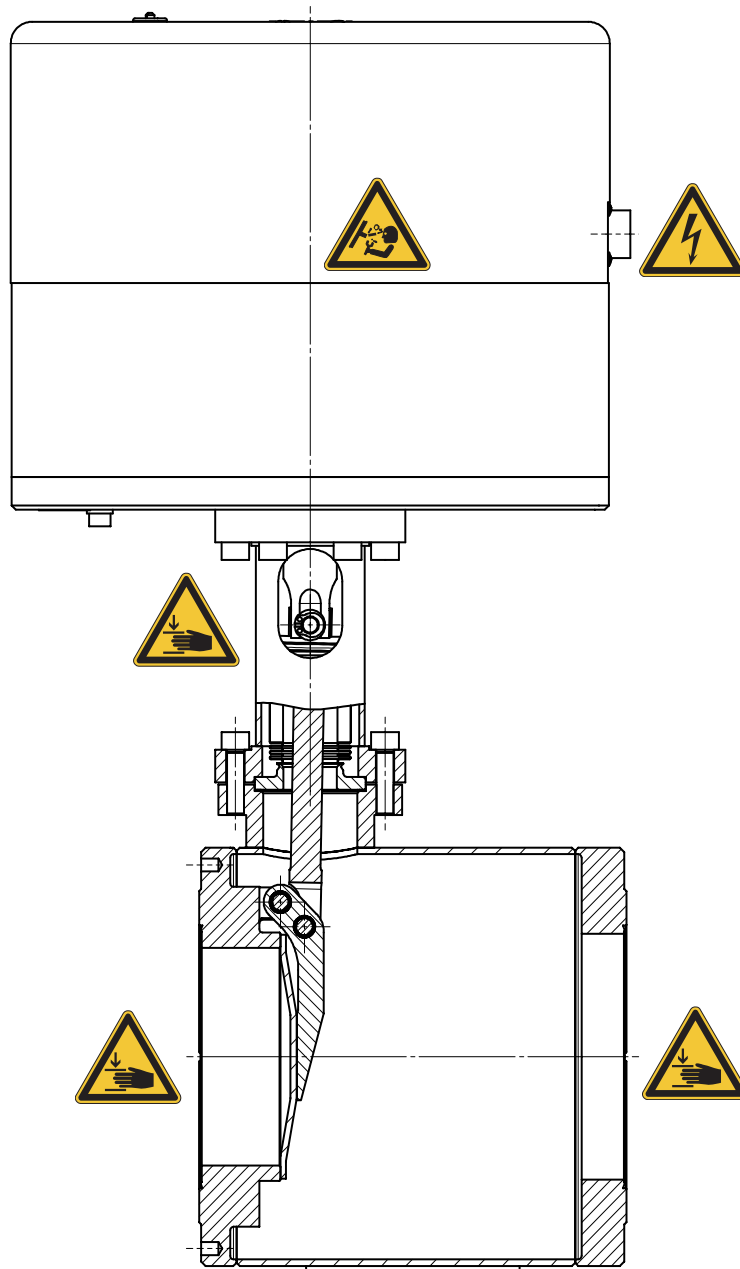
Even with disconnected supply, loaded springs and/or air cushions in cylinders can be potential hazards.



Keep fingers and objects away from the valve opening!

Products returned to VAT must be free of harmful substances such as e.g. toxic, 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.

## 6 Drawing





## 7 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.

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