1. General

A start-unloading valve is generally used where more than one blower is connected to a common discharge header, each blower package being equipped with its own discharge check valve.

In absence of a start-unloading valve, the motor has to start the blower and to drive it up to its operating speed against the line pressure.

While starting, a squirrel cage induction motor typically draws 6 to 7 times its nominal current. To reduce this current peak, one can choose between several types of motor starters that start the motor at reduced voltage.

The most common type is the Y / Δ starter. While starting in the "Y" position, the starting torque of the motor is reduced to approximately 30 % of the full voltage starting torque.

By using a start-unloading valve, the blower can be started unloaded, allowing the motor to bring it to speed with reduced torque while in the "Y" position of the starter.

The starting torque for the fully unloaded blower amounts typically to approximately 5 – 10 % of the operating torque.

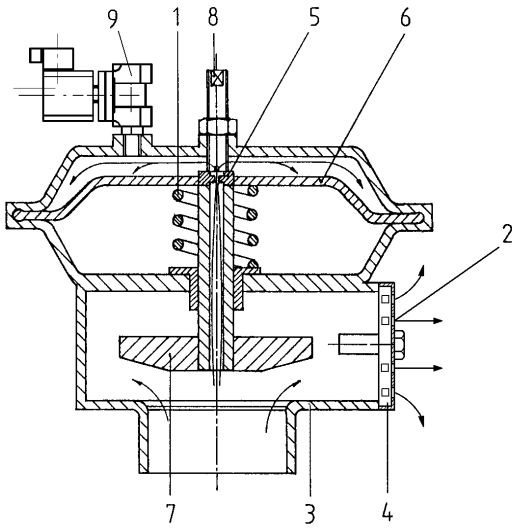
In its standard design (without solenoid valve), the AEROMAT start-unloading valve operates completely independent & without any electrical requirement.

2. Installation of the AEROMAT

The AEROMAT is to be installed between the check valve and the blower. On all Aerzen packages, the AEROMAT has been installed at the correct location. All of the AEROMAT valves come with Metric flange connections (DN-80, 150 or 200 depending on the model). Optional flange connections may be available – please contact Aerzen After-Sales / Service for details.

The valve may be installed in any orientation except flange side up.

Before start up, remove any shipping/packaging materials.



1. spring
2. vent opening
3. housing / valve seat
4. protective grill
5. hollow spindle with nozzle
6. diaphragm
7. valve piston
8. spindle
9. solenoid

3. Operation without solenoid valve (standard)

The unloading valve is a normally open device. Thus when the blower is started, the discharge air of the blower is diverted from the process piping (due to the closed check valve) through the unloading valve and out the vent opening (2). As the air flows through the valve a small amount of air travels up the spindle (5) to pressurize the top of the diaphragm (6). Ultimately the force resulting from the pressure on the diaphragm overcomes the spring force and the valve (7) closes, diverting the blower airflow back to the process piping. NORMAL CLOSING TIME 30-35 SECONDS.

4. Operation with solenoid valve (optional)

Operation of this system is the same as the “standard”, except that a solenoid valve (9) is installed, venting the top of the diaphragm, keeping the unloading valve open as long as the solenoid valve remains open. This allows the blower to run unloaded for a longer period at start-up as well as allowing the unloading cycle to be controlled by an electrical signal from the operator.

The standard solenoid valve (9) is normally closed, thus requiring electric current to energize the coil and open the solenoid valve, venting the top chamber of the valve allowing the AEROMAT valve to open. An optional normally open valve can also be purchased, however the reason for the normally closed version is in case of failure of the solenoid valve (valve fails closed) the AEROMAT would still function as a “standard” unit.

5. Maintenance

The AEROMAT unloading valve does not require any particular maintenance. It is important to make sure that the discharge opening is unobstructed with foreign material or paint.

Should the unloading device not close after correct adjustment, the nozzle (5) may need to be cleaned (refer to sectional drawing to disassemble unit) remove and blow out with compressed air.

6. Adjusting the closing time of the AEROMAT

The valves are shipped set up for maximum closing time. However if they need to be adjusted, in order to obtain the sufficient Δ P for the valve to operate properly (pressure drop across the valve should be between 2 psi and 1/3 of the normal operating pressure). After this initial adjustment the valve will operate automatically without any further manipulation. Follow this procedure for adjustment:

a) **Attention!** Paying attention to the starting frequency of the drive motor. Also, due to safety reasons adjustments must only be done when the motor is switched off!
b) Remove the discharge plenum for units within sound enclosures.
c) The closing process can be detected by the noise of the air escaping from the unloading device or by monitoring the discharge pressure gauge.
d) If necessary an adjustment can be made to the closing time. This can be done set by loosening the lock-nut holding the spindle (8) and moving the spindle:
   - spindle (8) clockwise — closing time is decreased
   - spindle (8) counter-clockwise — closing time is increased
e) After the adjustment, tighten the lock-nut.
f) After resetting the unloading device, all loosened and disassembled parts are to be re-attached and secured properly.

7. Performance

Base Size	Size	P/N	Application Flow Range	
			m^3/min	cfm
DN-50	1/2	*	≤ 4.5	≤ 160
DN-80	2	150220	≤ 10.5	≤ 370
DN-100	2	150220	≤ 10.5	≤ 370
	3	159077	≤ 21	≤ 740
DN-125	2	150220	≤ 10.5	≤ 370
	3	159077	≤ 25	≤ 883
DN-150	4	150222	≤ 45	≤ 1589
DN-200	4	154166	≤ 45	≤ 1589
	5	151763	≤ 60	≤ 2119
DN-250	6	166088	≤ 110	≤ 3884
DN-300	6	166088	≤ 110	≤ 3884
	8	157902	≤ 141	≤ 4979
	(2) 6	166088	≤ 220	≤ 7768
DN-400	6	166088	≤ 110	≤ 3884
	8	157902	≤ 141	≤ 4979
	(2) 6	166088	≤ 220	≤ 7768
	(2) 8	157902	≤ 282	≤ 9957

NOTE: DN-50 valve is a solenoid valve ONLY (p/n is dependent on coil voltage)
NOTE: See Appendix-A for dimensional drawing of Aeromat valve