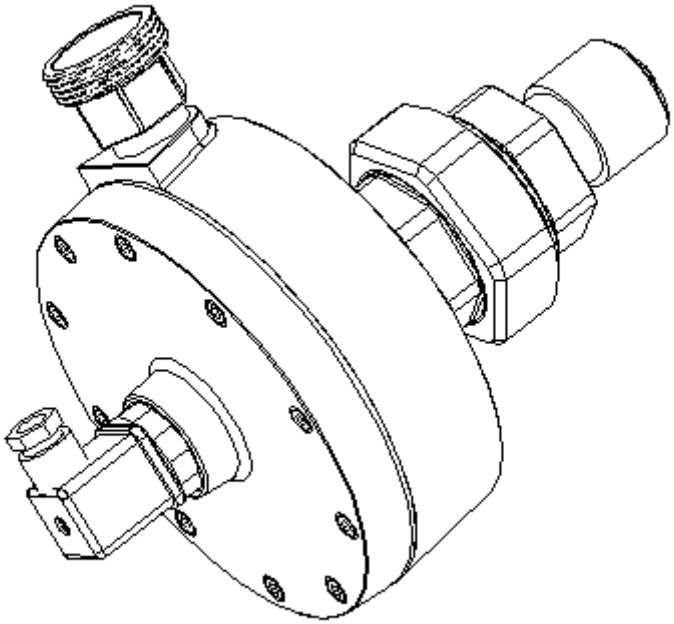
ALBRECHT - Pulsors

Pneumatic Loosening and Fluidisation of Bulk Solids and Filter Dust

Assembly Instructions



ALBRECHT Ingenieurbüro GmbH

Flow Promotion Technology
for Bulk Solids and Filter Dust

Mangenberger Str. 33 • D - 42655 Solingen
Phone: +49 - (0)212 – 16393
Fax: +49 - (0)212 - 201644
Email: albrecht@pulsoren.com
Website: www.pulsoren.com

0. General Notes

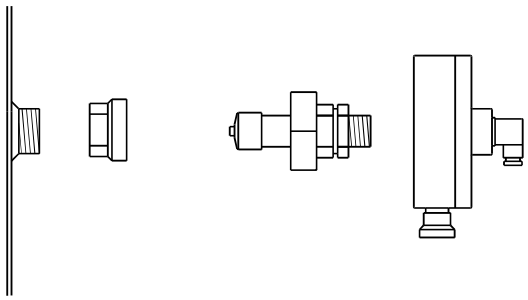
The Pulsors are to be used in keeping with the technical recommendations and documentation of ALBRECHT Ingenieurbüro. Only technically competent personnel may carry out the assembly of the equipment, especially the installation of the compressed air connections and the electrical connections, as well as the commissioning, under compliance with the relevant standards and specifications.

The instructions in this manual must be followed, especially when using the equipment in explosive atmosphere. No liability is accepted for improper use of the equipment and consequential damage.

3. Assembly Instructions

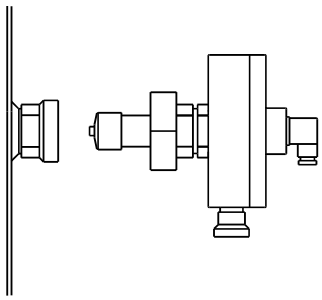
3.1 Installing the impulse nozzle and the Pulsor

At the intended assembly location, the supplied weld-on nipple is welded to the silo wall. The silo wall is then drilled concentrically to the weld-on pipe nipple with sufficient width (see technical data), so that the impulse nozzle can be pushed in and turned inside the pipe nipple easily, without getting stuck.

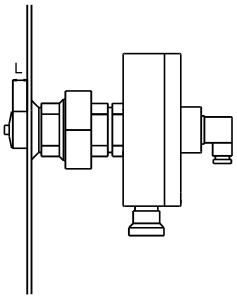


The threaded part of the union is then screwed onto the weld-on pipe nipple **as firmly as possible (!)** using a thread sealant.

The Pulsor with the impulse nozzle screwed into it* is inserted in the weld-on nipple in such a way that the air inlet union of the Pulsor points to the right ("3-o'clock position"). If the spatial conditions do not permit this position, have the air inlet union point up or down. The "9-o'clock position" must be avoided at all cost, since the Pulsor can then get detached from the pulse nozzle. Thereafter, the union nut of the assembly union is tightened firmly.



* The pulse nozzle is first screwed into the Pulsor housing and tightened by hand, and then tightened further with a screw wrench about 1/8 - 1/4ths of a revolution. A suitable pipe or similar lever can be inserted in the air inlet opening for locking.

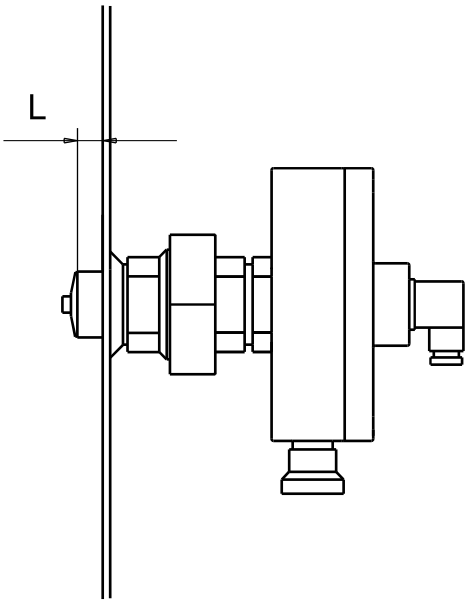


No sealant, Teflon tape or hemp may be used when screwing in the nozzle pipe into the Pulsor housing.

The length of the weld-on nipple must thus be matched to the length of the nozzle pipe. The nozzle cap must at least:

L = 10 mm (Pulsor type 100),
L = 15 mm (Pulsor type 150),
L = 20 mm (Pulsor type 300)

project by the above values into the silo.



3.2 Installation of the Pulsors on heated and insulated vessels

Pulsor housing and the control valve must be located outside the insulation. The union nut of the assembly union must be accessible, so that the pulse nozzle can be easily taken down for inspection and maintenance purposes.

3.3 Installation of the compressed air supply pipes

Dried compressed air at approx. 6 bar is required for operating the Pulsors. The air supply pipes must be of sufficient size, so that during operation of the pulsors, the pre-pressure does not drop below 4 bar. The following guide value applies: The main air feeding pipes should be made at least in nominal width DN 40 (1 ½"), the branches to the individual Pulsors in nominal width DN 25 (1"). The feeding pipes must not contain any filters, controllers or other cross-section reductions that are unfavourable for the flow. In case the available compressor system is not powerful enough, or only air pipes of small nominal width are available, the use of an air tank as a buffer volume in the vicinity of the silo is necessary.

Before fitting the connecting hoses, the compressed air supply pipe must be blown out to remove any foreign bodies like dirt, metal chips or sealant residues from the pipes.

3.4 Assembly of solenoid valve and connecting hose

After blowing out the supply pipes, the control valve with the pre-fitted union is connected to the Pulsor and the connecting hose between the valve and the piping is installed.

It should be possible to connect the control valve to the Pulsor without torsion or warping of the connecting hose. The weight of the valve and the hose as well as the restoring force of the hose bend must exert a right-rotating torque on the Pulsor, since otherwise, there is a danger that the Pulsor will get detached from the impulse nozzle.

3.5 Installation of the control air pipes in the case of pneumatically operated control valves

The control valves of the Pulsors and the pilot solenoid valves (see Chapter 1.3 , pg. 2) are supplied with push-in fittings for plastic pipes (PU or PA pipe, diameter 6 or 8 mm).

The pneumatically actuated rapid control valves are kept closed with compressed air. If there is a drop in pressure in the control air pipe, the Pulsors are activated.

In case of an external control air supply, the pressure of the control air must not be less than the pressure of the operating air. Care must be taken that this external pressure supply is not accidentally blocked, to avoid unintentional activation of the Pulsors.

3.8 Test Run

A test run of the Pulsors is carried out to check for proper installation of the Pulsors, the air feed pipes and the electrical controls.

The air feed pipes must be blown out before the first trial run.

6. Technical Data

The housings of the Pulsors are made of cast aluminium, the nozzle pipes of stainless steel. The nozzle heads projecting into the tank are made of hardened stainless steel.

	Pulsor type 300 with nozzle typ 50	Pulsor type 150 with nozzle type 40	Pulsor type 100 with nozzle type 20
Pulsor diameter	310 mm	160 mm	110 mm
Nozzle tube	1,5“	1“	1/2“
Weld-on nipple	R 2"	R 1,5"	R 3/4"
Wall bore hole	Ø 52,5 mm	Ø 40,5 mm	Ø 21,5 mm
Air connection hose	1“ x 1100 mm	1“ x 1100 mm	3/4“ x 900 mm
Weight, incl. nozzle, valve and hose	ca. 21 kg	ca. 7,5 kg	ca. 4 kg

8. Important Notes on the Use of the Devices "Pulsor with Impulse Nozzle" in Explosive Atmosphere ("ATEX Deployment")

ALBRECHT Pulsors and impulse nozzles are not devices with a potential ignition source in the meaning of the Directive 94/9/EC (ATEX Directive) and therefore do not carry an ATEX marking.
They can be safely operated in areas with explosive atmospheres by paying heed to the following points and restrictions.

- Der The use of ALBRECHT - Pulsors and impulse nozzles is limited to the area of flammable dust (Zone 20, 21 and 22) with a minimum ignition energy of > 3mJ at regulation-conformant tank inner temperatures. If used with dust with a low minimum ignition energy than 3 mJ, a special hazard evaluation is necessary.
- If the Pulsors are used with shut-off solenoid valve in ATEX version, the operating manual of the solenoid valves as well as the respective device category must be noted and followed, especially with regard to the maximum surface and ambient temperatures. In the combination solenoid valve / Pulsor + impulse nozzle, this can result in limitations of the possibilities of use of the overall system.
- The use of the Pulsors and impulse nozzles on explosion-resistant silos is only possible if the permissible maximum pressure of the Pulsor system (Pulsor housing, pulse nozzle, solenoid valve) of 10 bar is not exceeded, for process engineering reasons.
- Pulsors and impulse nozzles may only come in contact with such materials as do not change the properties of the materials used.
- If used in explosive atmospheres, the Pulsors and impulse nozzles must be earthed. The shunt resistance must have a value of $< 10^6$ Ω with respect to earth. The earthing of the devices can be achieved via the assembly union of the pulse nozzle and the earthing of the tank, or via a separate earth cable/ earthing strap. After installation of the devices, the prescribed shunt resistance should be verified by measurement.
- When installing suitable solenoid valves in conjunction with the Pulsors, the assembly Instructions of the solenoid valves must be followed.
- During the operation of the Pulsors and during maintenance work on the devices, explosive atmospheres can sometimes be generated, with an influence on the zone division. In particular, e.g. during the dismantling of devices, special precautionary measures are necessary, since dust can get discharged from the tank.
- The Pulsors and pulse nozzles do not generate any heat during operation. Their maximum surface temperature corresponds to the maximum surface temperature of the upstream shut-off valve or the resultant temperature from the temperature in the insides of the tank (process temperature), compressed air temperature, ambient temperature, tank wall temperature (heating temperature). The Pulsor system may only be used if the following temperature differences are maintained:

  1) maximum surface temperature of the Pulsor system:
     less than
     2/3rd of the ignition temperature of the swirled dust

  2) maximum surface temperature of the Pulsor system:
     less than
     the smoldering temperature of the deposited dust minus 75 Kelvin

- Pulsors, nozzles and valves must be freed of dust deposits at regular intervals of time.