NORO Gesellschaft für Rohrsysteme mbH
Kruppstraße 1 | 49453 Rehden | Germany

Fon +49 5446 20636-0 | info@noro-rohre.de
www.noro-rohre.de

Operating manual

Two-way valve, pneumatic, with rotary actuator

Translated from original operating manual
Two-way valve – Document No. 004-01-EN version 01/2022

NORO Gesellschaft für Rohrsysteme mbH
Kruppstr. 1
49453 Rehden

Phone: 05446 / 20636 - 0
E-mail: info@noro-rohre.de

Declaration of incorporation

within the meaning of the EC Machinery Directive 2006/42/EC, Appendix II, B for partly completed machinery

We hereby declare that the conception and design of the

Device:	**Two-way valves, pneumatic, with/without seal**
Article:	10…0660 up to 35…0660, 10…0650 up to 35…0650 10…16610 up to 40…16610, 10…16510 up to 40…16510 10…16620 up to 40…16620, 10…16520 up to 40…16520 and 15…968 up to 40…968
Function:	**Distribution of bulk materials in "free fall"**
Year of manufacture:	as from 2022

in the version brought by us onto the market is intended for installation in a machine, or for assembly together with other machines. It conforms to the regulations of the EC Machinery Directive 2006/42/EC, appendix II, B for partly completed machinery.

Advice:
The bringing into service is not allowed until it is asserted that the entirety of machine and partly completed machine together with the surrounding area conforms to the regulations of this machinery directive.

The special technical documents according to annex VII, part B, of the machinery directive 2006/42/EC, for partly completed machinery, will be transmitted by mail, in response to a reasonable request by individual states authorities.

Rehden, 16.06.2022

p.p.

Documentation officer

Axel Havekost
Managing director

Gabriele Venske
Technical staff
Address: see manufacturers address

Table of contents

Page

2 Important notes

Adherence to the operating manual is a prerequisite for trouble-free operation and for the acceptance of warranty claims.

Therefore, read the operating manual first before putting the two-way valve into operation. The operating manual contains important notes regarding service. Therefore, keep it with your documents.

Pay attention to the notes in the individual chapters of the operating manual.

3 Safety instructions

3.1 Qualification and training of personnel

The operating, maintenance and inspection personnel must have the appropriate qualifications for the respective type of work.
The operating company must ensure that the contents of the operating manual are fully understood by the personnel.
If necessary, the requisite knowledge is to be imparted by training. This can be done by the manufacturer/supplier on behalf of the operating company if desired.

The area of responsibility, competence and supervision of the personnel must be precisely defined by the operating company. Young persons may only be employed under the supervision of an expert.

3.2 Hazards associated with disregard of the safety instructions

Disregarding the safety instructions can lead to the endangerment of personnel, the environment and the machine.

Disregarding the safety instructions can lead to the loss of all claims for compensation for damages.

Disregard can result in the following hazards, for example:

- failure of important functions of the two-way valve or the system
- failure of prescribed methods of service or maintenance
- endangerment of persons due to electrical, mechanical, chemical and biochemical influences
- endangerment of the environment due to the leakage of hazardous substances.

3.3 Safety-conscious working

The following knowledge is a prerequisite for safety-conscious working:

- ✓ knowledge of the safety instructions listed in the manual
- ✓ knowledge of the existing national accident prevention regulations
- ✓ knowledge of the local and the operating company's own internal work, factory and safety regulations.

3.4 Safety instructions for the operating company and for the operating personnel

- A contact protection protects against moving parts only as long as it is in its intended location.
- Never remove protection devices as long as the components are moving or even just switched on.
- Wash your hands thoroughly before eating and drinking due to the risk of infection.
- Consult a doctor immediately in the case of injuries, accidents or skin irritations.
- The plant operator is responsible for carrying out a risk assessment, that possibly will lead to further protective measures.

3.5 Safety instructions for maintenance, inspection and assembly work

All maintenance, inspection and assembly work is to be carried out by authorised and qualified technical personnel only.

Note: Work may only be carried out on the two-way valve when it is at a standstill.

Stopping the two-way valve:

- ✓ Interrupt the supply of product to the two-way valve.
- ✓ Switch off the compressed air supply to the pneumatic unit.
- ✓ Switch off the main switch.
- ✓ Secure the main switch against being switched on again.

Note: Clean the interior of the two-way valve before working on it. Check the functions after the work is concluded.

3.5.1 General safety instructions for assembly, inspection and maintenance work

- Do not switch the two-way valve on again immediately if it has stopped for inexplicable reasons. Someone could have stopped the plant for a manual intervention and forgotten to secure it against being restarted. Unexpected restarting can lead to injuries to persons.
- When carrying out maintenance work in the interior of the two-way valve, all connection openings should be covered such that they are safe to step on. This avoids injuries to persons and also prevents foreign bodies falling into the pipeline.
- No protection devices may be modified, removed or their function impaired.
- Original spare parts and accessories authorised by the manufacturer ensure safety. The use of other parts can lead to injuries to persons and damage to property.
- Converting or modifying the two-way valve is permitted only after consulting the manufacturer. Correspondence regarding this must be exclusively in writing.
- The electrical controller of the two-way valve is provided by the operating company.

4 Transport

Examine the delivery immediately upon receipt for any transport damages. The manufacturer or the transport company is to be informed immediately of any such damage. You may not be able to put a damaged two-way valve into operation. The two-way valve is delivered lying and loose or in a packing carton, depending upon number of items.

In-house transport to the storage place or to the final installation place can take place using a fork-lift truck or a pallet truck.

5 Storage

In the case of long-term storage, please check whether the housing shows any signs of damage and that all moving parts fulfil their functions. Please observe the storage conditions specified in the following table in the case of long-term storage.

Storage conditions:

Climatic zone	Packaging *)	Storage place	Storage period
Moderate (Europe, USA, Canada, China and Russia with the exception of tropical regions)	Packed in container with desiccant and humidity indicator, sealed in foil.	Roofed over, protected against rain and snow, free of vibrations	Max. 3 years with regular examination of packaging and humidity indicator (relative humidity < 50%)
	Open	Roofed over and closed at constant temperature and air humidity (5 °C to 60 °C, < 50% relative humidity). No sudden fluctuations in temperature, no aggressive vapours and no vibrations.	2 years and longer with regular inspection. Check for cleanliness and mechanical damage when inspecting Check the integrity of the anti-corrosion coating.
Tropical (Asia, Africa, Central and South America, Australia and New Zealand, with the exception of the moderate regions)	Packed in container with desiccant and humidity indicator, sealed in foil	Roofed over, protected against rain, free of vibrations.	Max. 3 years with regular examination of packaging and humidity indicator (relative humidity < 50 %)
	Open	Roofed over and closed at constant temperature and air humidity (5 °C to 60 °C, < 50% relative humidity). No sudden fluctuations in temperature, no aggressive vapours and no vibrations. Protection against insect damage.	2 years and longer with regular inspection. Check for cleanliness and mechanical damage when inspecting. Check the integrity of the anti-corrosion coating.

*) The packing must be performed by an experienced company using packaging material expressly approved for the application.

6 Intended use

The two-way valve is intended for the diversion of bulk materials in granular or powder form with a residual humidity of 15 %. These consist of non-conductive dusts in a conveying pipe with a Kst value up to 160 bar m/sec.

The standard two-way valves in round and rectangular versions are not suitable for pneumatic conveying or for the conveying of seeds. There must be neither vacuum nor positive pressure in the conveying pipe.

Two-way valves are only to be used in closed rooms.
The component is considered to be safe if all connections in the system are made correctly.
The flap position may only be changed when the flow of product is interrupted. They are to be used only in the installation position illustrated on page 10.

7 Structure of the two-way valves

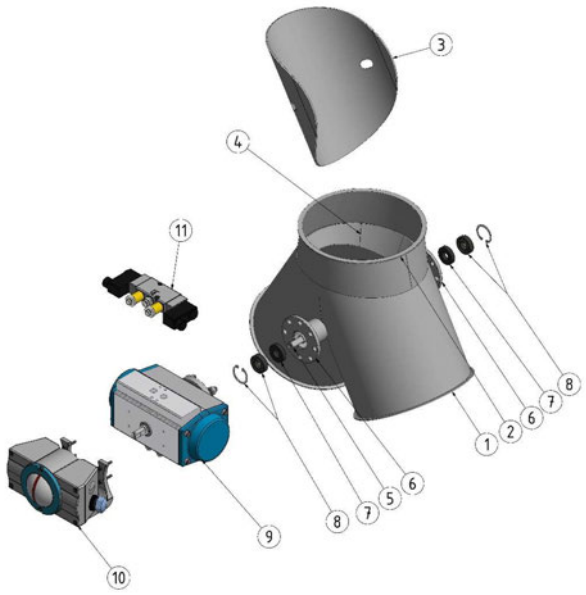
The two-way valves can be manufactured in different versions.

Housing versions:

Two-way valve with interior collar, without flap seal,
Two-way valve with flap sealing,
in versions:
symmetrical, with outlet angles 45° and 60°
asymmetrical, with outlet angles 45° and 60°

7.1 Description of the assemblies

Two-way valve with interrior collar, without flap seal



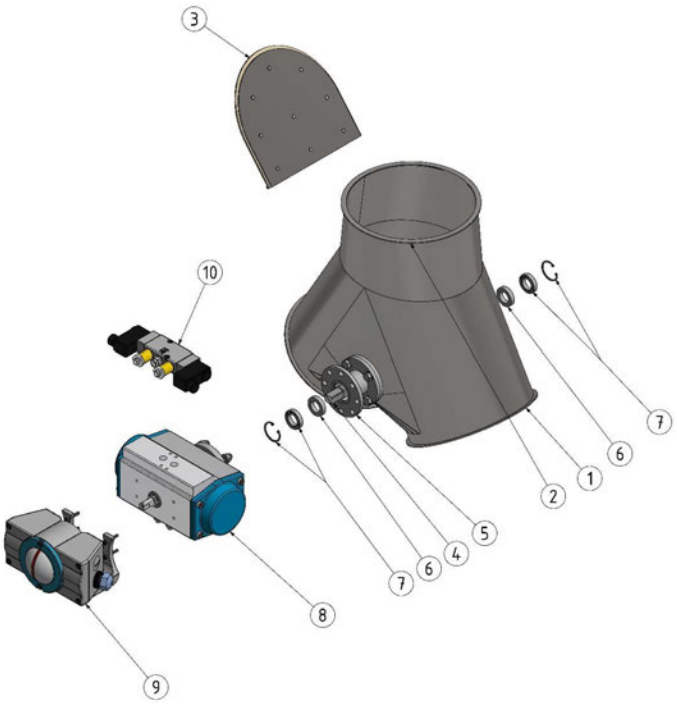
Diversion station

1 Outlet (product outlet)
2 Inlet (product entrance)
3 Flap
4 Collar

Drive station

5 Drive shaft
6 Flange bushing
7 Radial shaft sealing ring
8 Roller bearing with lock ring
9 Pneumatic rotary drive
10 Proxi-box incl. 2 limit switches
11 5/2-way solenoid valve

Two-way valve with flap seal



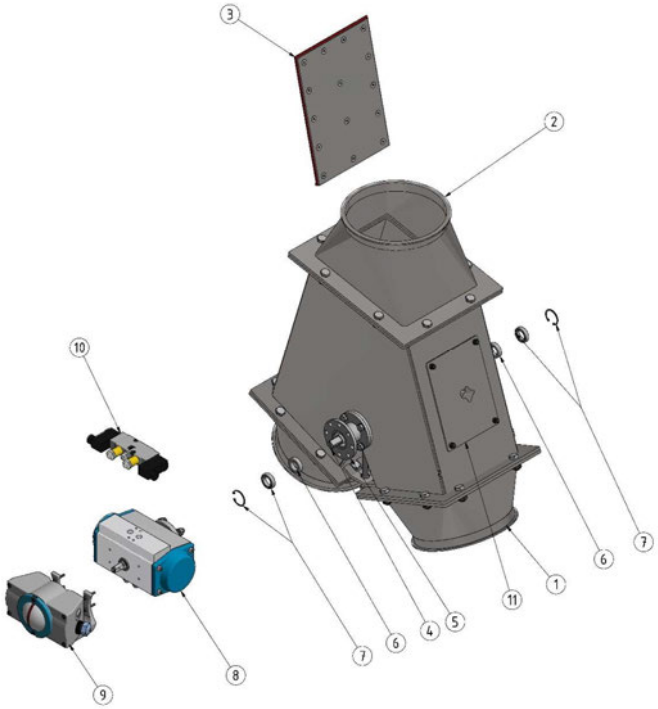
Diversion station

1 Outlet (product outlet)
2 Inlet (product entrance)
3 Flap with seal

Drive station

4 Drive shaft
5 Flange bushing
6 Radial shaft sealig ring
7 Roller bearing with lock ring
8 Pneumatic rotary drive
9 Proxi-box incl. 2 limit switches
10 5/2-way solenoid valve

Modular two-way valve



Diversion station

1 Outlet (product outlet)
2 Inlet (product entrance)
3 Flap with seal

Drive station

4 Drive shaft
5 Flange bushing
6 Radial shaft sealig ring
7 Roller bearing with lock ring
8 Pneumatic rotary drive
9 Proxi-box incl. 2 limit switches
10 5/2-way solenoid valve

(11 Inspection opening)

7.2 Assembly functions

Two-way valves with interior collar, without seal:
The arched flap is arranged inside the housing and closes around the collar, so that the product flows reliably into the desired outlet.

Two-way valves with flap seal:
The straight flap is arranged inside the housing and closes form-locking to the housing
The seal provides for the dustproof sealing of the cavity between the housing and the flap.

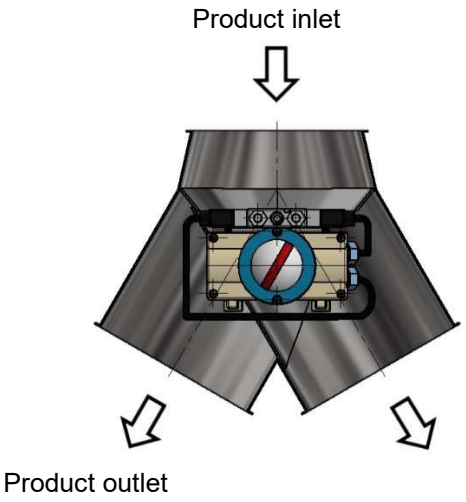
The drive is attached to the housing. It swivels the flap via the shaft to the desired outlet. The direction of rotation is controlled via the valve.

The drive shaft of the flap has a roller bearing and is sealed with a shaft seal. As a result, no dust can escape from the pipe and dust deposits in the area of the shaft bearing are prevented.

The flap position is detected via the two limit switches in the switch-box.

7.3 Method of operation of the two-way valve:

The bulk material is fed into the two-way valve in free fall vertically or at an angle. It is then diverted into the desired outlet via the flap.



8 Operating and maintenance manual

8.1 Installation and assembly

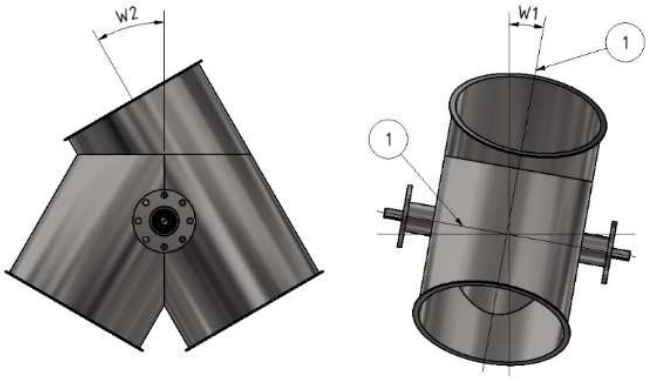
The two-way valves may only be installed in closed rooms. An outdoor installation is only possible if the two-way valve is provided with a weatherproof protective coating.
All electrical attached parts must be adapted according to the requirements in the factory for operating temperatures below -10 °C or above 50 °C.

The following points are to be observed when installing:

- Two-way valves are to be installed only in the intended installation position.
- Ensure adequate suspension or support (4023968: approx. 53 kg).
- The continuative piping must be installed and suspended **without stress**.

Installation position:

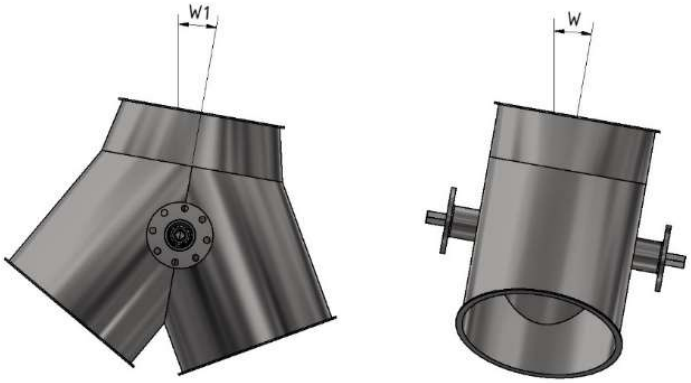
Asymmetrical two-way valve



1 = part axis

Ideal installation position: W2 = 30° for 60°-two-way valve, W2 = 22,5° for 45°-two-way valve; W1 = 0
Permissible installation position for W1 and W2: +/- 5°

Symmetrical two-way valve



Ideal installation position: W1 = W = 0
Permissible installation position for W1 and W: +/- 5°

All axes with inclination correspond to the part axes.

8.2 Commissioning

An appropriate controller must be present before commissioning.
The following instructions must be observed in the control:

All necessary control cables are to be connected in accordance with the wiring diagrams.
If necessary, readjust the limit position switches / limit switches during operation.
Ensure that sufficient operating pressure (min. 6 bar) is available.

Following the installation and the electrical connection, a test run is to be performed with a function check.

8.3 Inspection and maintenance

The length of the service life of the two-way valve can be influenced by the following maintenance intervals:

Time interval	What needs to be done?
Every 1000 hours of machine operation, but at least every three months	• Visually inspect the seals for damage • Check the limit switches, readjust if necessary
Depending on operating conditions, but after 1 year at the latest	• Check roller bearing and shaft seal • Check the flap
Varies (depending on external influences and on the characteristics oft he conveying product)	• Check interior of housing, clean if necessary • Check product-guiding parts for wear • Repair or renew surface and anti-corrosion coating • Exchange roller bearing and shaft seal

INSTRUCTION FOR ALL INSPECTION AND MAINTENANCE WORK:

Stop the supply of product to the two-way valve, switch off the two-way valve drive, secure against unintentional restarting.

9 Operational errors

If you should require the assistance of our customer service or our technical advice, we kindly ask you to supply the following data.

- Our order confirmation number
- Serial number
- Type and extent of the malfunction
- Time and attendant circumstances of the malfunction
- Suspected cause

9.1 Malfunctions of the two-way valve

Malfunction	Possible cause	Remedial action
Flap cannot be changed over	• Product adhering in the two-way valve • Bearings defective or shaft/flap seized up • Operating pressure interrupted or low • Rotary drive / valve defective • Product column in the two-way valve • Shaft broken off • Error in the controller	• Dismantle and clean the two-way valve • Replace all bearings, align the shaft/flap • Check the operating pressure • Replace the rotary drive / valve • Remove the product column • Replace two-way valve • Check the controller
Low flow rate or conveying interrupted	• Two-way valve or pipelines blocked • Shut-off devices in the system defective	• Locate and eliminate the blockage • Check the shut-off device
Leakage in the two-way valve	• Product jam in the two-way valve • Wrong installation position • Product deposits on the sealing surfaces • Flap seal defective • Flap worn • Collar worn*)	• Reduce the flow rate • Correct the installation position • Dismantle and clean the two-way valve • Replace the seal **) • Repair the flap, replace if necessary • Repair the collar, replace if necessary

*) round two-way valves with interior collar only
**) two-way valves with flap seal only.

10 Technical description of components

Pneumatic rotary drive*)

Make: bar

Part-no. for two-way valves with interior collar, without seal, **DN 80 - DN 250**:

GD-063/120°, with valve NM-522-H-24/DC, with final position indication for twin piston rotary actuators, series bar-switchcontrol, type SC-M2

Part-no. for two-way valves with interior collar, without seal, **DN 300 – DN 350**:

GD-083/120°, with valve NM-522-H-24/DC, with final position indication for twin piston rotary actuators, series bar-switchcontrol, type SC-M2

Part-no. for two-way valves with seal, **DN 100 – DN 175**:

GD-063/90°, with valve NM-522-H-24/DC, with final position indication for twin piston rotary actuators, series bar-switchcontrol, type SC-M2

Part-no. for two-way valves with seal, **DN 200 – DN 250**:

GD-083/90°, with valve NM-522-H-24/DC, with final position indication for twin piston rotary actuators, series bar-switchcontrol, type SC-M2

Part-no. for two-way valves with seal, **DN 300 – DN 400**:

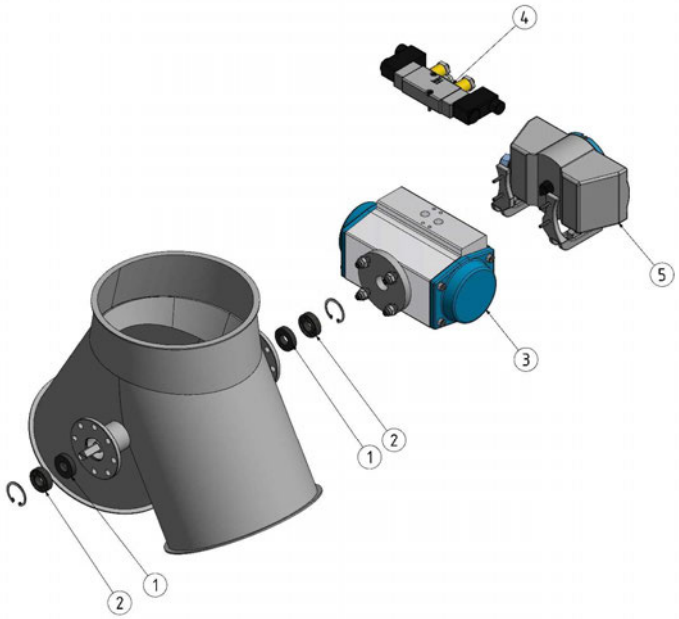
GD-092/90°, with valve NM-522-H-24/DC, with final position indication for twin piston rotary actuators, serie bar-switchcontrol, type SC-M2

***) In the case of deviating attached parts, please refer to the technical data in the acceptance protocol and in the respective manufacturer's technical data sheets.**

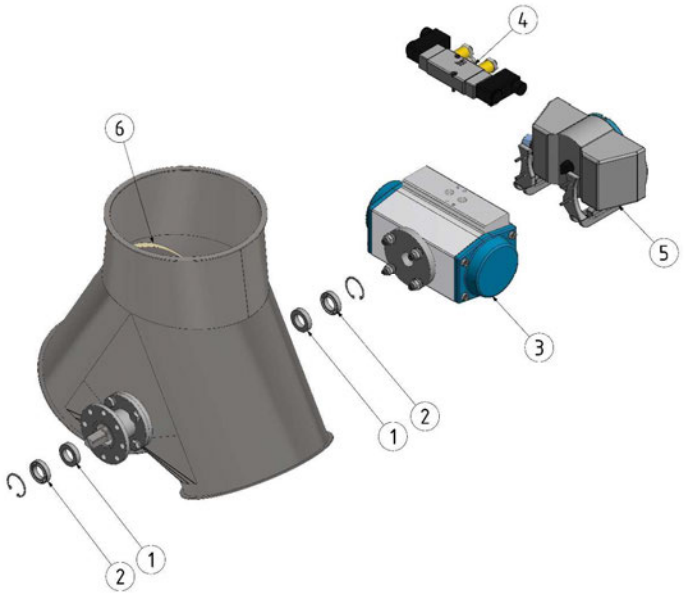
For terminal diagrams, please refer to the data-sheets in the appendix.

11 Spare parts list

Two-way valve with interior collar



Two-way valve with flap seal



Part-no.	Denomination	Quantity
1	Shaft seal	2
2	Roller bearing	2
3	Pneumatic rotary drive	1
4	5/2-way solenoid valve	1
5	Proxi-box with 2 limit switches	1
6	Flap seal	1

12 Disassembly and disposal

NORO's products may be disposed of, possibly by dividing them into different waste groups for recycling or combustion. We recommend that our product is disassembled as much as possible at the disposal and that you try to recycle it.

Please also observe the country-specific disposal regulations.

Additional information for two-way valves with inspection openings

The inspection openings on the two-way valve may only be used at standstill and when product feed is interrupted.

After completing the work, close the inspection openings properly again, restore the potential equilisation if necessary and check the functions.

Please also note chapter 3.5 „Safety instructions for maintenance, inspection and assembly work" in the operating manual.