

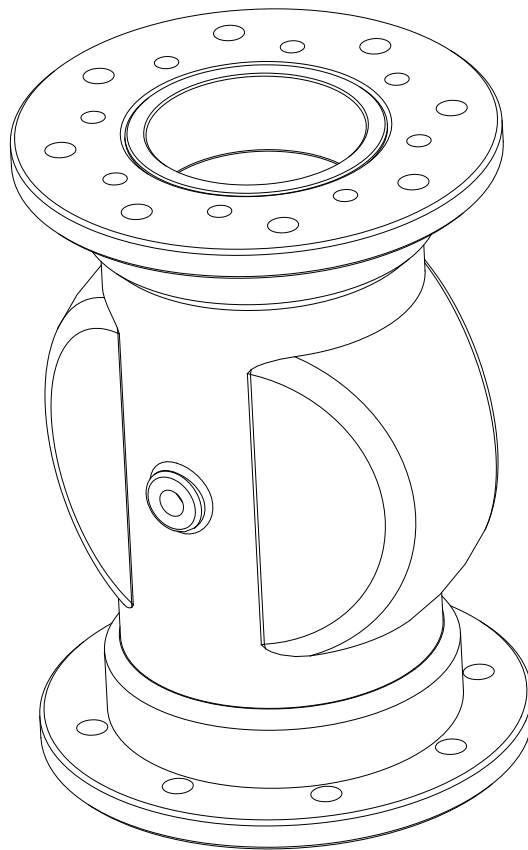


# VM

## PINCH VALVES

# 2

# ASSEMBLY AND MAIN INSTRUCTIONS FOR USE AND MAINTENANCE



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ORIGINAL INSTRUCTIONS IN ENGLISH

**TOREX S.p.A.**  
Via Canaletto, 139/A  
I-41030 S. Prospero s/S  
(MO) - Italy

☎ + 39 / 059 / 8080811  
fax + 39 / 059 / 908204  
e-mail [torex@torex.it](mailto:torex@torex.it)  
internet [www.torex.it](http://www.torex.it)





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## 1.1 Scope of the Manual

This Manual has been prepared by the Manufacturer to provide the operating technical information for installation, operation and maintenance of the valve concerned.

The Manual, which is an integral part of the valve concerned, must be preserved throughout the life of the valve in a known easily accessible place, available for consultation whenever required.

If the Manual is lost, damaged or becomes illegible, contact the Manufacturer for a copy specifying the serial number of the valve.

If the valve concerned changes ownership, the Manual has to be handed over to the new owner as part of the valve supply.

The Manual is meant for specialist technical personnel appointed and authorized by the Manufacturer, owner and installer to act on the valve concerned for which specific technical skills in the sector concerned are necessary (electrical, mechanical, etc.).

The illustrations may differ from the actual structure of the valve concerned but do not interfere with the explanation of the operations.

In case of doubt, contact the Manufacturer for explanations.

The Manufacturer reserves the right to make changes to the Manual without the obligation to provide prior notification, except in case of modifications concerning the safety level.

The technical information included in this Instruction Manual is the property of the Manufacturer and therefore has to be considered as confidential.

It is forbidden to use the Manual for purposes other than those strictly linked to the operation and maintenance of the valve concerned.

This information is provided by the Manufacturer in the original language (English) and can be translated into other languages to satisfy legislative and/or commercial requirements.

## 1.2 Symbols

To highlight certain parts of the text, for purposes of safety, or to indicate important information, certain symbols are used, the meaning of which is described below.

It is important to comply with and scrupulously follow the information highlighted by the symbols.



### Danger - Warning

It indicates situations of serious danger which, if ignored, can seriously put to a risk the health and safety of persons.



### Caution





Indicates that appropriate behaviour must be adopted to avoid posing risk for the health and safety of persons and avoid causing economic damage.



### Important

Indicates particularly important technical information which must not be ignored.

### List of safety and information symbols

Symbol representation	Symbol description
	<b>Danger sign:</b> indicates danger of electric shock caused by the presence of powered components inside the junction box or control panel.
	<b>Obligation:</b> read this Manual before carrying out any action on the valve concerned.
	<b>Forbidden:</b> indicates that it is forbidden to lubricate or adjust moving parts.
	<b>Forbidden:</b> indicates it is forbidden to introduce hands into the valve.

### 1.3 Glossary and terminology

**Operator:** person appropriately trained and authorized by the Production Manager for setting up the valve concerned and carrying out routine maintenance.

**Installer:** organization with specialized technicians and appropriate equipment for carrying out risk-free installation and extraordinary maintenance.

**Specialist technician:** person responsible for and authorized by the Manufacturer, owner or installer to act on the valve; must have specific technical skills depending on the sector concerned (electrical, mechanical etc.). The specialist technician, in addition to being familiar with the working of the valve concerned, must be familiar with the working of the plant or equipment on which the valve concerned is installed.

**Routine maintenance:** includes all the actions necessary to keep the valve in good working conditions, to ensure greater operating durability and to keep the safety requisites constant.

**Extraordinary maintenance:** all the actions meant to keep the valve in perfect working order.

**Setting in safety conditions:** all the precautions the authorized personnel must adopt before acting on the valve concerned.

The precautions are listed below.

- Ensure that the valve concerned is disconnected from all the mains and appropriate devices are used to prevent these from being reconnected accidentally.
- Ensure that all the moving parts of the valve have come to a complete stop.
- Ensure the temperature of the valve concerned is such that it does not burn.
- Provide appropriate lighting in the area around the operations.
- Wait for the material to be handled inside the valve concerned to settle down completely.

## 1.4 Manufacturer's data and identification of the valve



### Important

**Do not change the data on the identification plate.**

**Keep the ID plates clean, intact and legible as regards the data they contain.**

**If the ID plate is damaged or is no longer legible (even just one informative element on it) contact the Manufacturer for a new ID plate and replace it.**



- 1) Manufacturer's name and address
- 2) Serial No.
- 3) Machine model
- 4) Max. operation pressure
- 5) Max. closing pressure
- 6) Differential pressure meter

The ID plates shown identify the equipment concerned and its main components. The plates show the reference necessary for operating safety.

## 1.5 Request for assistance

For all technical assistance, contact the Manufacturer's service network.

For all requests, provide the valve identification data, the type of problem encountered and all other information which could be useful for identifying the problem.

## 1.6 Warranty

The conditions for validity and applicability of the warranty are specified in the sales contract.



## 1.7 Exclusion of responsibility

The valve is delivered according to the specifications indicated by the Buyer in the order and the conditions valid at the time of purchase.

The Manufacturer shall not accept responsibility for safety of persons or objects and operation failure of the valve if the loading/unloading operations from trucks, transport, positioning at the site, use, repairs, maintenance etc. have not been carried out in compliance with the warnings described in this Manual, and in accordance with the national legislation in force.

Likewise, the Manufacturer shall not accept any responsibility if the valve concerned is used:

- improperly;
- by unauthorized persons and/or persons not sufficiently trained for installation, operation and maintenance;
- with modifications made to the original configuration without the Manufacturer's permission;
- with spare parts that are not original or are not specific for the model;
- without maintenance;
- non-pursuant to the regulatory standards and national or local legislation on the matter of occupational safety;
- non-pursuant to the recommendations in this Manual or on the warning and danger plates applied on the valve.

## 2.1 General safety prescriptions

Read the Instruction Manual carefully and strictly follow the instructions it includes, especially those regarding safety.

Most accidents at the workplace are caused by negligence, failure to follow the most elementary safety regulations and incorrect or improper use of tools and equipment.

Accidents can be prevented and avoided by taking due care, using suitable equipment and adopting adequate preventive measures.

Apply and comply with the standards in force regarding workplace hygiene and safety.

The personnel trained for and authorized for the operations has to have the psychological/physical requisites, experience in the sector concerned and the necessary technical skills for carrying out the operations assigned to them.

All workers involved in any kind of operation must be prepared, trained and informed as regards the risks and the behaviour to be adopted.

Pay attention to the meaning of the notices applied on the valve, keep these legible and respect the information indicated.

Use instruments, equipment and tools that have been approved and are intrinsically safe, and cannot alter the safety level of the operations or damage the valve during installation, use and maintenance.

Modifications to the valve components should not be made for any reason whatsoever, without the Manufacturer's permission.

## 2.2 Safety prescriptions for transport and handling

Carry out all the handling and transport operations in accordance with the procedures and instructions shown on the packaging and in the Manual supplied.

All the operations must be performed by qualified authorized personnel.

Those authorized to carry out the handling operations must have the capabilities and experience required to adopt all the necessary measures to guarantee one's safety and the safety of persons directly involved in the operations.

The chosen features of the lifting and handling means (crane, bridge crane, forklift truck etc.) must take into account the weight to be handled, the dimensions and the gripping points.

### 2.3 Safety prescriptions for installation

Before starting with installation, a “Safety Plan” must be implemented to safeguard the personnel directly involved and those who carry out operations in the surrounding area.

All the laws must be strictly applied, especially those concerning workplace safety.

Before proceeding with installation operations, mark off the work area to prevent access by unauthorized persons.

The electrical connections must be made in compliance with the standards and laws in force.

The person in charge of making the electrical connections has to ensure that the required standards and laws are respected before testing.

### 2.4 Safety prescriptions for use and operation

Do not tamper with the valve concerned by using any kind of device to obtain performances different from those designed.

All unauthorized changes can affect the health of people and the integrity of the valve.

The operators have to exclusively wear protective clothing and have to be equipped with appropriate individual protection devices for carrying out the operations and as required by the safety and work accident prevention standards.

Before use, ensure that all the safety devices are installed and that they are working properly.

During operations, prevent access to the work area by unauthorized persons.

Remove all obstacles or sources of danger from the work area.

It is strictly forbidden placing any improper load on the valve.

## 2.5 Safety prescriptions for maintenance and replacement of components



### **Danger - Warning**

**Before carrying out any operation on the valve concerned, ensure it is switched off and disconnected from all mains and use suitable devices to prevent the possibility of the power sources being activated accidentally.**

Maintain the valve concerned in the conditions of utmost efficiency compliant with the maintenance plan provided by the Manufacturer.

Good maintenance apart from preserving the functional features and essential safety features over time, will also allow extending the working life of the valve concerned and achieving the best possible performance.

Strictly follow the procedures indicated in the Manual, especially those concerning safety.

Ensure that all the safety devices are active and working properly.

Mark off the work area in such a manner as to prevent the access of unauthorized persons.

Replace the worn and damaged components exclusively with original spare parts, whose safety, reliability and interchangeability have been undoubtedly established.

Apart from invalidation of the warranty, the Manufacturer declines all responsibility for damage to objects and harm to persons deriving from the use of non-original spare parts or due to modifications made during repairs without express written authorization.

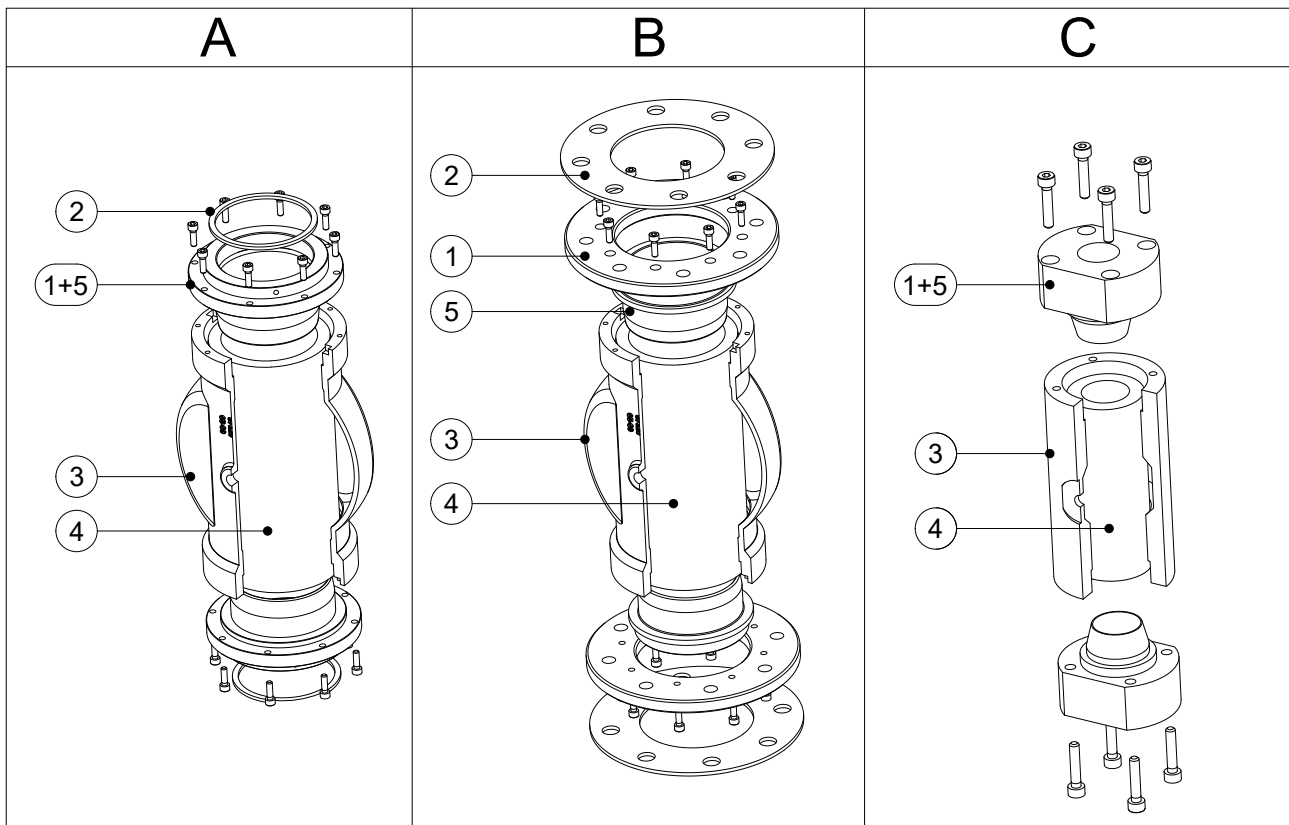
Do not dump polluting material (oil, grease, paint, plastic etc.) in the environment, but carry out waste separation disposal depending on the chemical composition of the various products in compliance with the legislation in force.

On completion of maintenance or replacement operations, before resuming production, check that no foreign bodies (rags, tools etc.) have been left inside the valve concerned.

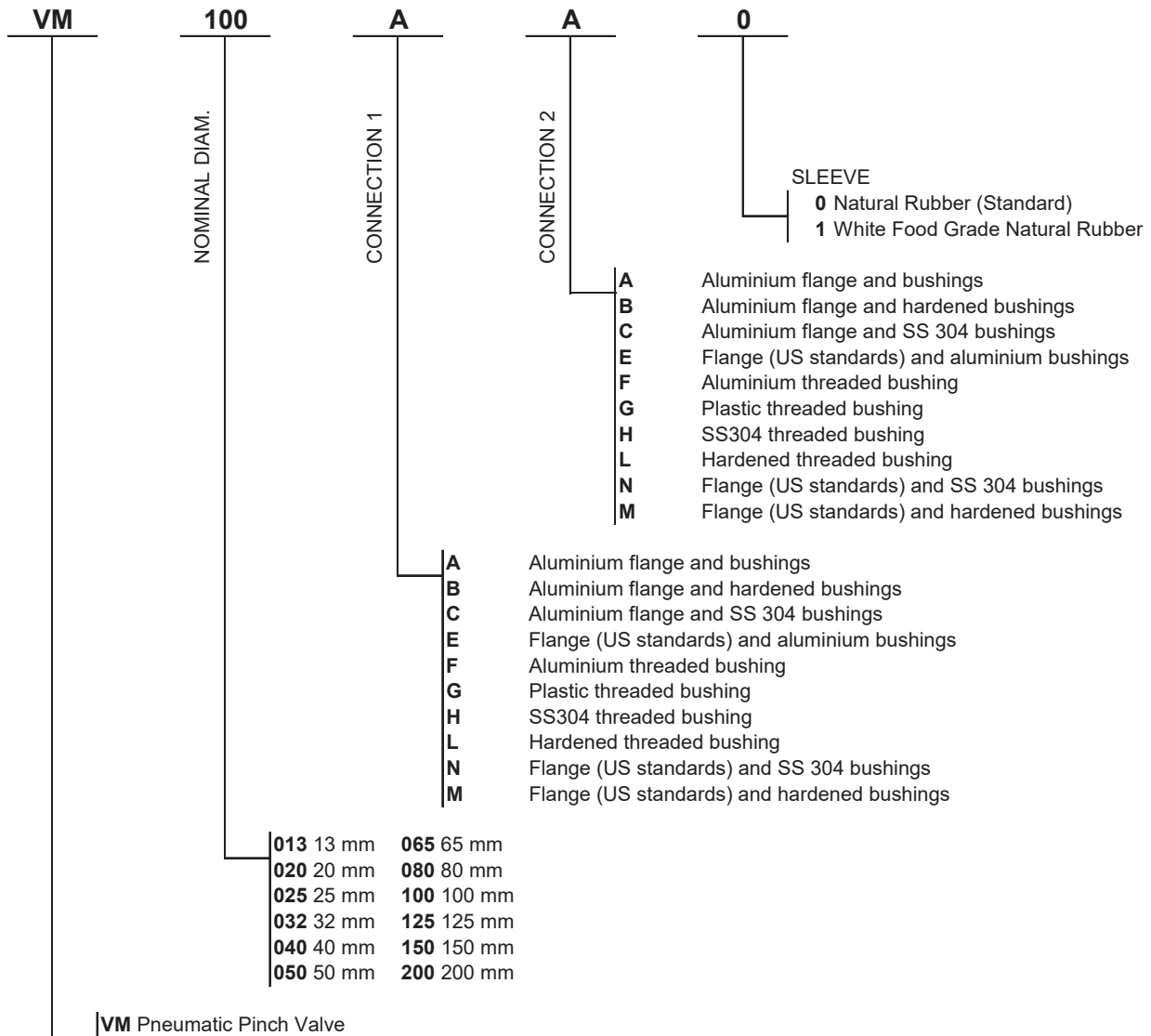
### 3.1 General description of the valve

The VM valve opens or closes the passage of material through rubber sleeve that closes due to the action of the control pressure. The connection to the process occurs through the two flanges.

### 3.2 Main components



Sizes and material														
Item	Component	13	20	25	32	40	50	65	80	100	125	150	200	
1	Flange	Polyamide					Aluminium							
2	Seal						NBR (black) / SBR (white)							
3	Casing	Aluminium												
4	Sleeve	NR (Standard) / NR (Food Grade)												
5	Bushing	Polyamide					Aluminium / SS 304 / 316 / Hardened							
		C					A,B					A		
		Configuration												

**3.2 Modular key code**


**3.2.2 Accessories: Control Unit VMX**

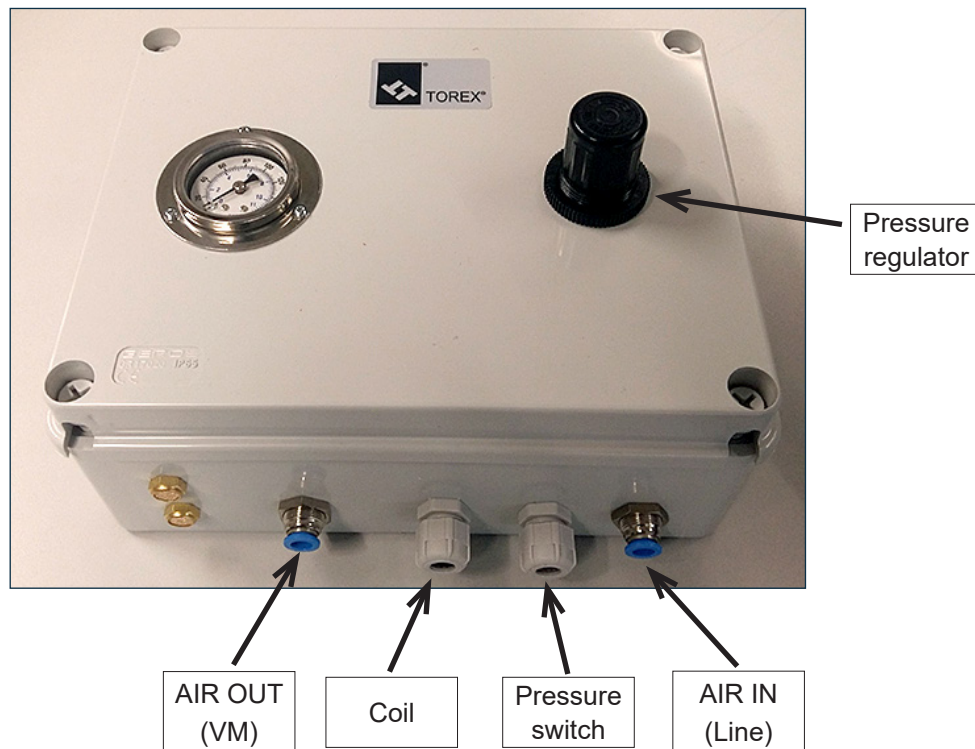
The control unit VMX allows:

- drive the opening / closing of the VM valve
- adjust the control pressure
- detect the presence of the control pressure on the valve

Technical data and codes					
Control unit					
Code	Description	Operation temperature	Case	Power	Pressure switch
<b>VMX01N</b>	Control Unit (without solenoid valve)	-10°C +40°C	Polymer IP55		N.O+N.C Max.230 VAC 0.5 A (Inductive) Max.24 VDC 4A (Resistive)
<b>T-6740010020</b>	24 VAC solenoid valve	-10°C +40°C	IP65	5.5 VA	Rod diameter: 9 mm Format: DIN 43650 (22mm) Connector included
<b>6740010060</b>	115 VAC solenoid valve			5.5 VA	
<b>T-6740010080</b>	230 VAC solenoid valve			5.5 VA	
<b>T-6740010030</b>	24 VDC solenoid valve			6 W	


**Important**

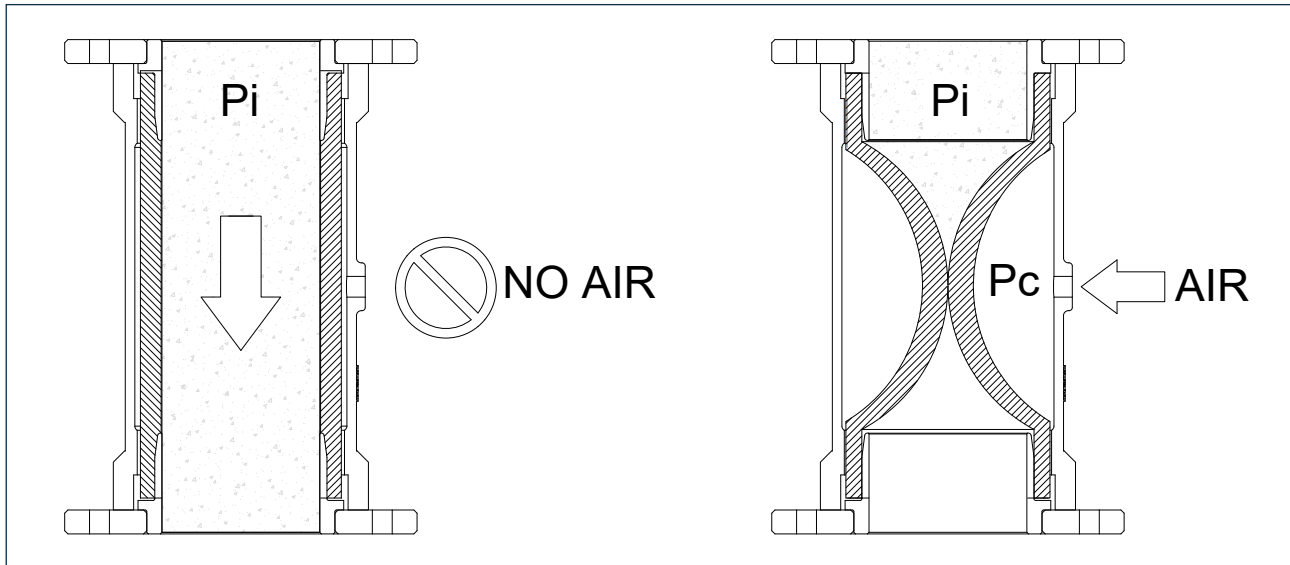
**On ordering the control unit, it is necessary to also require the solenoid valve, by specifying the code on the basis of the supply voltage.**



### 3.3 Operating principle

Under normal operation conditions there is no compressed air inside the valve body; allowing, thus, the flowing of the material inside the valve.

In the case of "stimulated" operation, compressed air is present inside the valve body and exerts pressure on the sleeve, allowing the closing of the valve and, as a consequence, prevents the flowing of the material.



### 3.4 Permitted use

The VM Pinch Valve has been designed to intercept the flow of powder or granular material in pneumatic conveying systems and, in particular, in pneumatic systems applied to material loading from tanker.

### 3.5 Improper use not permitted

The standard VM Pinch Valves have NOT been designed to operate in hazardous conditions or with hazardous materials. If these conditions are met, it is compulsory to inform the manufacturer.

The materials considered being hazardous are the following:

- explosives,
- toxic,
- flammable,
- harmful and / or similar.

The applications considered being hazardous are the following:

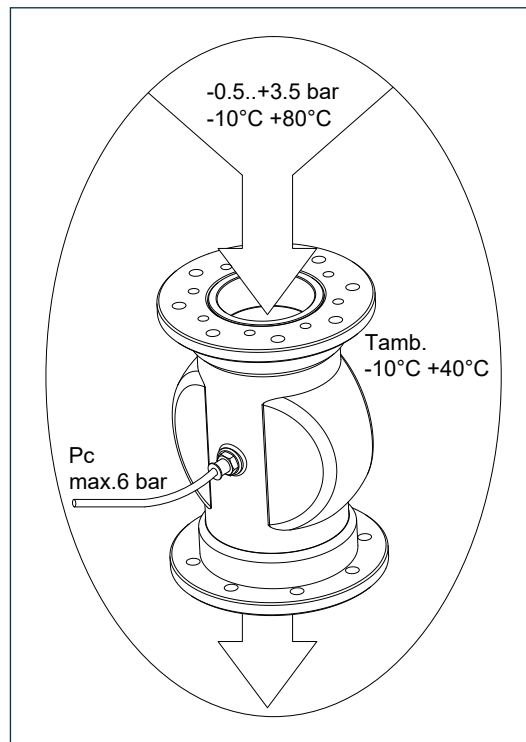
- unloading from the silo or cells containing the materials previously indicated



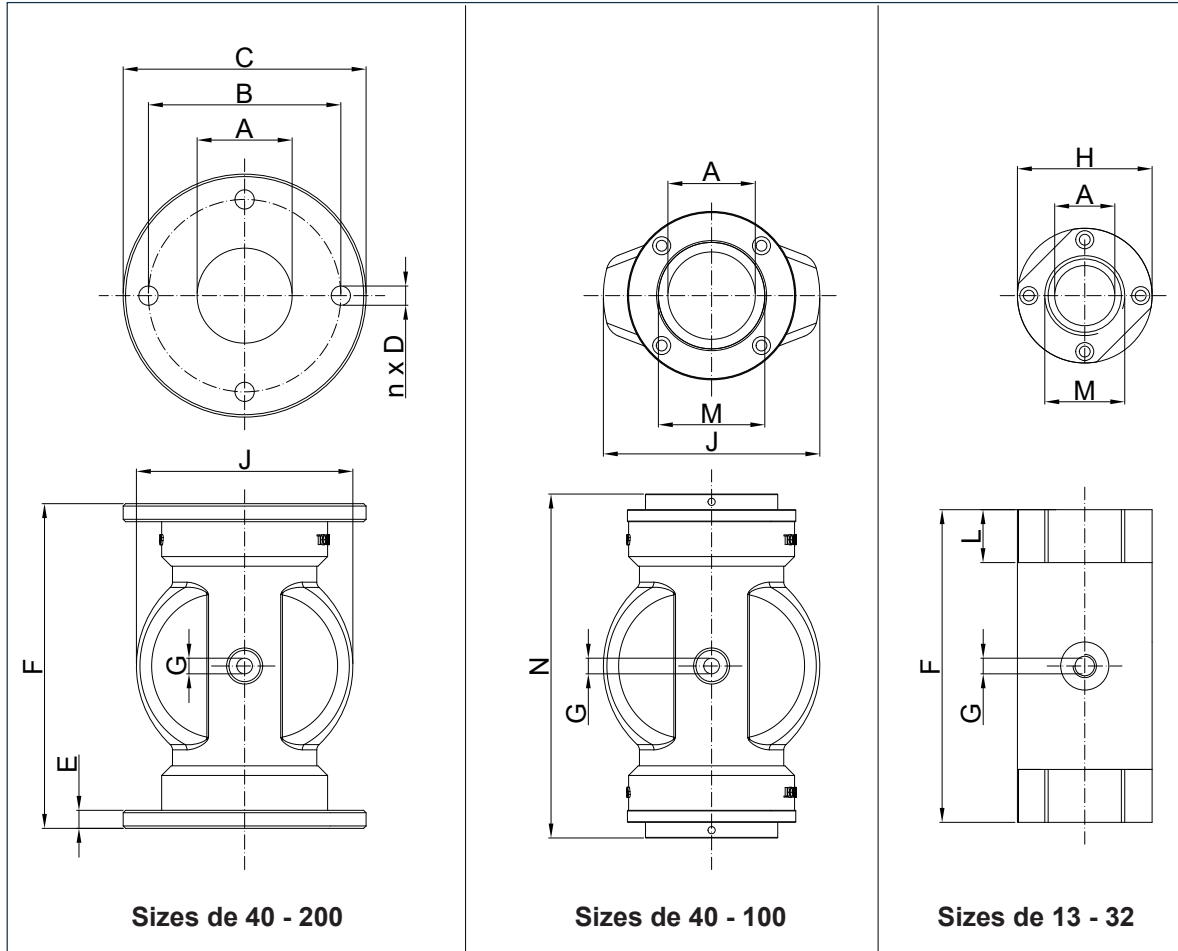
### 3.6 Noise level

NOT APPLICABLE.

### 3.7 Environmental operating limits



Control pressure Pc			
Sleeve	Size	Pc (bar)	Pc max (bar)
Standard	13-200	Pi + 2.5	6
White Food Grade	13-65	Pi + 2.5	6
	80-200	Pi + 2.0	5.5

**3.8 Overall dimensions and technical features**


Type	A	B	C	D	n	E	F	G	H	J	L	M
VM013	13						120	1/8"	42		18	1/2"
VM020	20						130		50		20	3/4"
VM025	25						130		56		22	1"
VM032	32						165		70		25	1+1/4"
VM040	40	110	150	M 16	4	12	178	1/4"		99		1+1/2"
VM050	50	125	165	M 16	4	15	190			114		2"
VM050 USA		121		5/8" UNF	4							
VM065	65	145	185	M 16	4	15	225			138		2+1/2"
VM080	80	160	200	M 16	4	15	270			180		3"
VM0100	100	180	220	M 16	8	15	310			214		4"
VM100 USA		190		5/8" UNF	8							
VM0125	125	210	250	M 16	8	15	350			250		
VM125 USA		216		3/4" UNF	8							
VM0150	150	240	285	M 16	8	18	396			285		
VM150 USA		241		3/4" UNF	8							
VM0200	200	295	340	M 16	8	25	460			374		

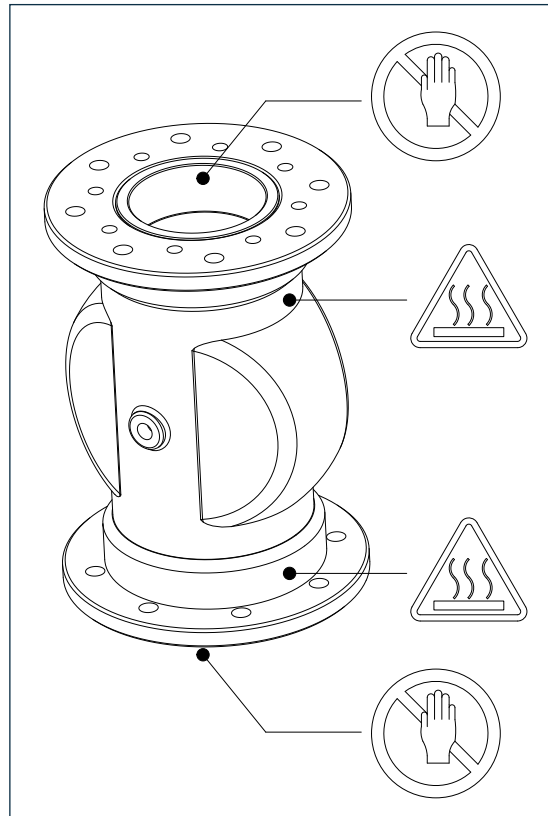
### 3.9 Safety and information signs



#### Danger - Warning

Follow the signs on the plates.

Ensure the plates are legible; otherwise clean them and replace the damaged ones, applying them in their original position.



### 4.1 Type of packaging

The VM Pinch valves are packed separately, in cardboard boxes.

Depending on the quantity ordered, the boxes can be secured on pallets covered with film or shrink-wrap.

The unpacking simply operations require the removal of the film (if present).

The pinch valves are not secured inside the boxes. The packages may differ depending on the size or configuration.



Item	LxWxH	kg
VM013	145x65x65	0.3
VM020		0.4
VM025		0.5
VM032	180x75x80	0.8
VM040	200x200x245	2.5
VM050		3.0
VM065		4.5
VM080	325x240x245	5.8
VM100		7.8
VM125	350x355x485	12.5
VM150		16.5
VM200		30.0
VMX01N	300x270x150	1.50

## 4.2 Reception of goods

On receiving the goods, ensure that the type and quantity correspond to the data present on the acknowledgement of order.

Possible damage has to be immediately communicated in writing in the space provided to this purpose in the waybill.

The carrier is obliged to accept the complaint and leave the Customer a copy of the waybill.

If the supply is “free destination” a copy of the waybill and of the complaint shall be sent to the Manufacturer or to the forwarder.

If the damages are not claimed immediately on receipt of the goods, your request for compensation may not be accepted.

**N.B.:** The data mentioned in the table below do not include the weight of any cumulative package (pallet or other).

## 4.3 Lifting and unloading methods



### **Danger - Warning**

**Carry out the lifting and handling operations according to the information indicated on the valve and in the Manufacturer's Operation Manual.**

**The person authorized for unloading operations has to make sure all the necessary measures are adopted to ensure his or her safety and the safety of other persons directly involved.**

**Use means and accessories (ropes, hooks, shackles etc.) suitable for the load to be lifted.**

**Pay attention in the lifting phase to balance the load to avoid uncontrolled movements which could cause work injuries to persons.**

**Do not place other weights on the packagings.**

**Do not drag or push the equipment as this will damage it.**

**Before lifting and handling the load, read the relevant information indicated in the “Information regarding safety” Chapter.**

## 5.1 Safety prescriptions for installation



### Danger - Warning

The replacement operations must be carried out by a specialist authorized technician with specific skills.

Provide appropriate safety measures and use suitable equipment to prevent risk of work accident to persons involved in the operations and to those nearby.

Before starting installation, define a safety plan compliant to the legislation in force regarding workplace safety. The specialist technician, authorized by the installer or owner, must assess whether the area has been prepared correctly and whether the necessary installation equipment is available.

## 5.2 Mechanical and pneumatic connections

### Pinch valve

The valve must be bolted on the two connecting flanges of the system; also, the pneumatic supply for the closure of the sleeve must be arranged.

### Control Unit

Make sure to arrange the compressed air supply from the line and the connection of the control line to the control unit.

### Compressed air features

The compressed air used for the valve and control unit must be:

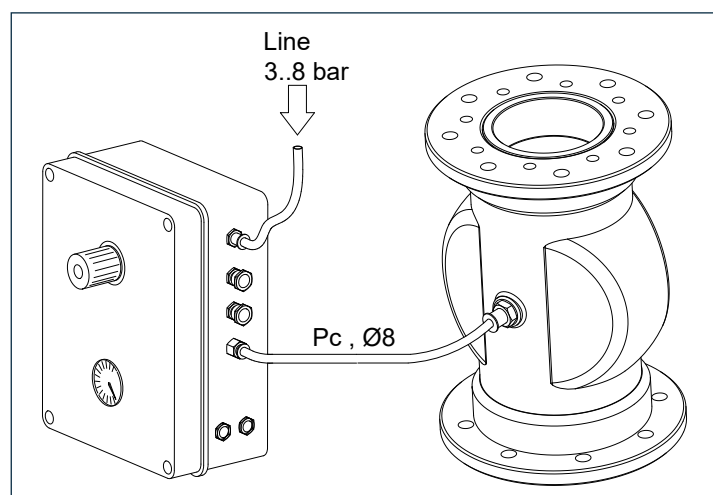
**CLEAN:** free from residues that might damage the sleeve or the solenoid valve fitted on the pneumatic actuator

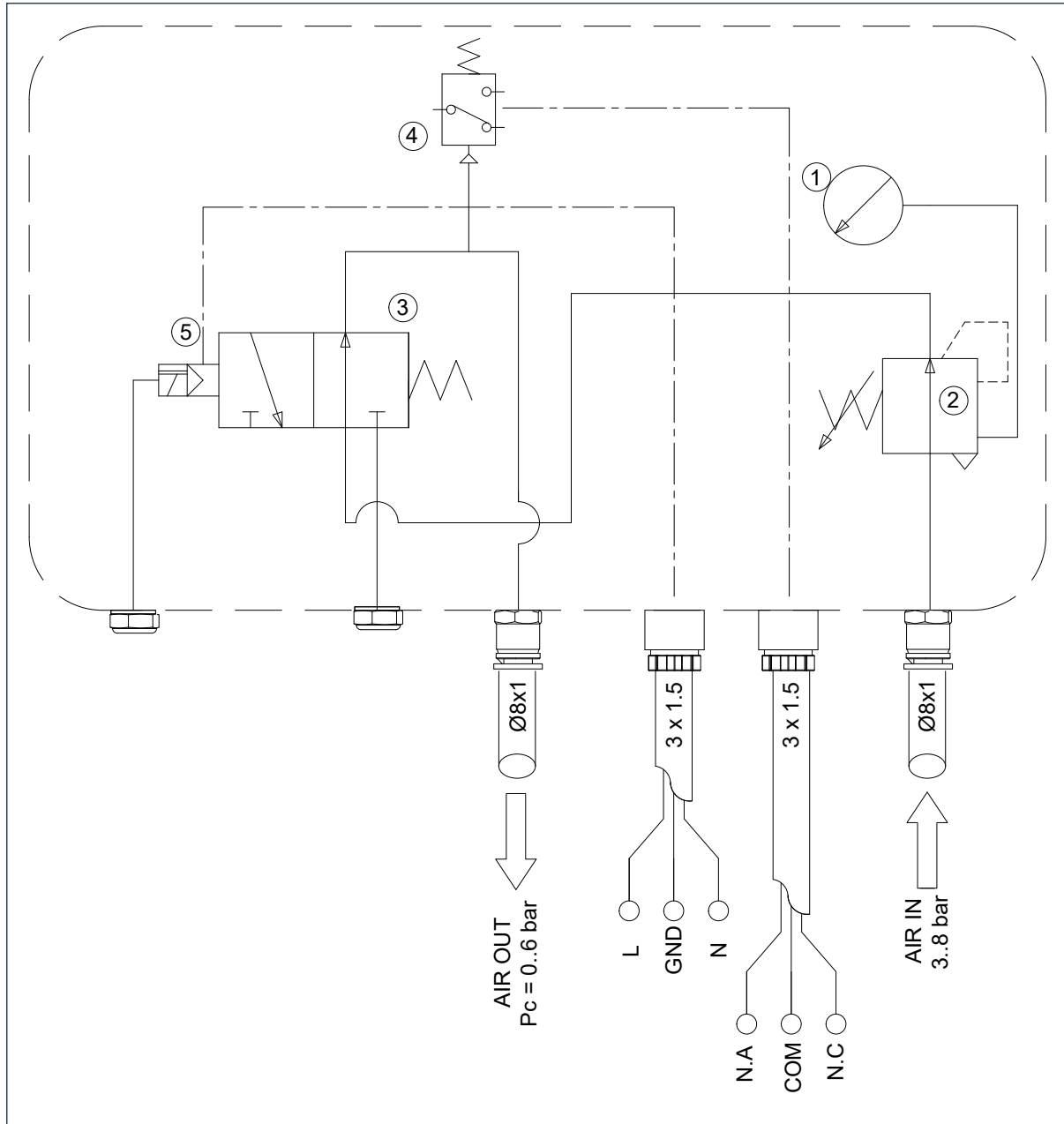
**DE-MOIST:** the user should provide for a condensation separator.

**OIL-FREE:** The presence of oily substances contained in the air might cause the early and irreversible clogging of the components.

Use only filters that maintain the air always clean and oil free.

The valve must be fed by a special independent branch that can be disconnected; pressure reducer valves are installed at the connection points of the mains supply to keep the pressure level constant in the valve and control unit.



**5.3 Electrical connection of the control unit VMX**


Item	Description
1	Pressure gauge
2	Pressure regulator
3	Monostable solenoid valve 3/2 1/8" N.A
4	Pressure switch 1/8" 2.5 bar
5	Solenoid valve

## 6.1 Production start-up



### Important

#### Set the equipment in safety condition before start-up.

Before the final start-up of the valve, ensure the installation has been completely and properly carried out and that connections to external mains were made according to the following indications:

- Read fully the INSTALLATION, USE AND MAINTENANCE manual.
- Check the fastening of the flanges.
- Ensure the power, mechanical and pneumatic supply connexions have been carried out properly and the junction box is properly closed.
- Make sure the pressure of the control valve (Pc) is correct.
- Ensure all warning plates are intact.
- Check if foreign substances or water have entered the valve. If so, empty it and clean it thoroughly.

## 6.2 Long shutdowns of the valve

Clean the inside of the valve and protect it before storing it for long periods.

Avoid as much as possible salty and moist environments.

Place the valve on wooden pallet.

Protect from heat and light the internal area of the sleeve.

## 6.3 Reuse after long shut-down



### Important

#### If the device is to be used in different conditions and with materials other than the previous application, ensure the "Permitted use" indications are complied with.

Close and open the valve to make sure operation the sleeve works properly and has suffered no damages.

Enable the control unit VMX to verify proper operation of the internal devices.

Make sure the pneumatic connections are intact and the tubes are well inserted into the fittings.

Make sure the electrical connections are intact and the cables are tightened in the cable glands.



**Danger - Warning**

**Before carrying out any maintenance activity, activate all the safety devices to ensure the safety of the persons involved in the operations and those nearby. Set the equipment concerned in safety condition.**

**Wear suitable personal protection equipment; in this regard, consult the person in charge of production activities safety.**

**Prior to any operation, disconnect device from the power and pneumatic supply.**

**7.1 Cleaning the valve****Important**

**When removing the dust that may be present in the valve, take care not to disperse the dust in the environment.**

For a safe operation, the user must use cleaning products suitable to the purpose, on the basis of the plant type; avoid toxic or flammable products.

In case the device is used with food products, it is mandatory to use not toxic detergents, suitable to the type of application.

The cleaning frequency depends on the type of product being handled and on the plant type.

In case of toxic or dangerous products, the cleaning residues must be collected in closed tanks and disposed of in accordance with the instructions of the product safety chart.

Do not use water jets.

Properly clean the valve every time it has to be used for food products.

With foodstuffs, the VM valves must be completely emptied and cleaned every time they are shut-down and in case the material conveyed is changed.

## 8.1 Safety recommendations for replacement



### **Danger - Warning**

The replacement operations must be carried out by a specialist authorized technician with specific skills in the sector concerned (mechanical, electrical etc).

Before carrying out any operation, provide suitable safety measures and use the appropriate equipment to prevent risk of work injuries to persons involved in the operations and those nearby.

Activate all the safety devices envisaged and prevent access to controls which, if activated, could cause work injuries to the persons involved in the operations.

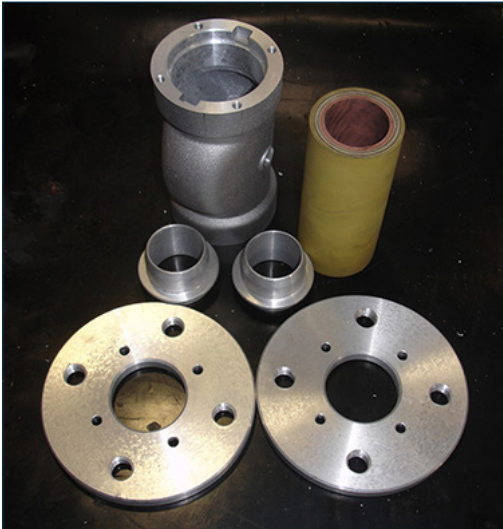


### **Caution**

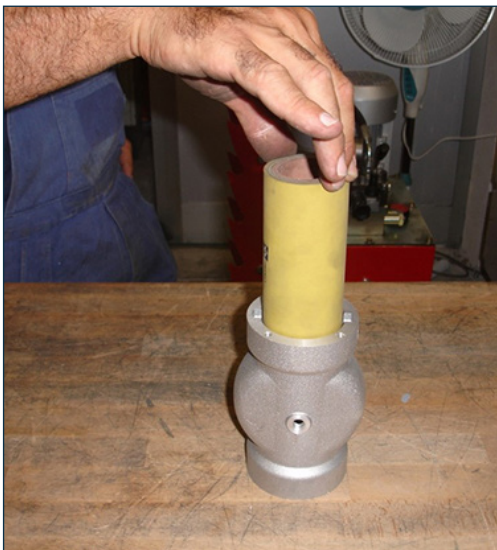
Operate other than according to the indications may cause operational problems and void the warranty that covers the machines provided.

## 8.2 Assembling/disassembling the pinch valves

### ASSEMBLING



1) Prepare the components: body - bushings - flanges - sleeve.



2) Fit the sleeve inside the valve body. In case it doesn't slip in easily, grease the inner side of the body with silicone grease.



3) Place a shim below the sleeve.



4) Make sure the sleeve protrudes from the upper edge of the body of a few millimetres (do not exceed 2 mm).



5) Lubricate the outer side of the bushing using only silicone grease.

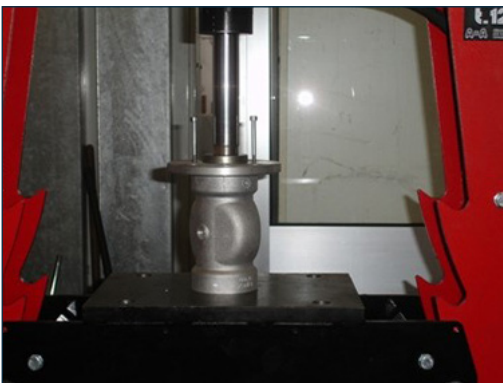


6) Insert the first bushing in the sleeve; make sure it slide sin uniformly.

## 8.0 REPLACEMENT OF PARTS



- 7) Insert the flange in the bushing seat. Use two long screws positioned 180 degrees from each other as centring pins, so that the holes of the flange match the holes of the body, prevent the flange from rotating.



- 8) Using a press (or the forks of a forklift) to abut the bushing-flange unit to the body. Tighten the flange to the body by means of the holes, and be reminded to replace the two long screws used as pins with suitable screws to fasten the flange.



- 9) Repeat the steps 5.6.7.8. for the opposite side of the valve.



- 10) Now the valve is completely assembled.



## DISASSEMBLY



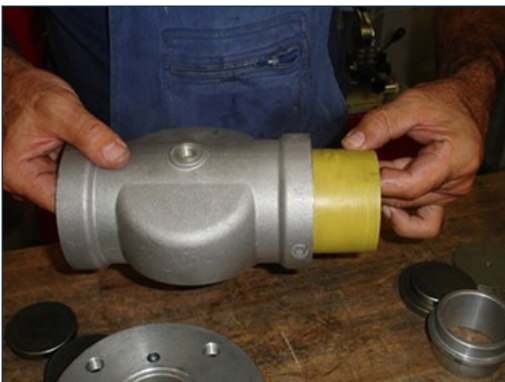
- 1) Use an Allen key to unscrew the screws of the inlet flange. Once free, you can extract it manually.



- 2) Use two tools one opposite to the other to lever and remove the valve inlet bushing.



- 3) Repeat the steps 1.2 also for the outlet flange.



- 4) Slip out the sleeve from the body.

### 8.3 Returning the valve

When returning the valve use the original packaging if it has been preserved, otherwise fix the it on a pallet and cover it with nylon shrink-wrap, to protect it as best as possible from impact during transport. In any event, make sure there is no residue material inside the valve.

### 8.4 Dismantling and disposal

Dismantling of the valve must be entrusted to personnel specialized in these activities and equipped with adequate skills.

Dismantle the components of the valve concerned; if necessary contact the Manufacturer for further information.

The components dismantled have to be separated on the basis of the nature of the materials of which they consist, in compliance with the laws on the matter of “differential collection and disposal of wastes”.

With reference to the WEEE Directives, electrical and electronic components, marked with a special symbol, have to be disposed off in authorized collection centres meant for the purpose.

Unauthorized disposal of “Waste Electrical and Electronic Equipment” (WEEE) is punishable with fines governed by the laws concerning the matter.

### 9.1 Trouble-shooting

Minor problems can be solved without consulting a specialist.

The following Table contains a list of the most common problems, the possible causes and possible remedies. For particularly difficult actions which are not mentioned in the Table, contact the Manufacturer's Customer Service Department.



#### **Danger - Warning**

**Before carrying out any operation "set the valve concerned in safety" (see "Glossary and terminology"), operate according to the indications on the "Operation and Maintenance Manual" and in accordance with and in compliance with the standards in force as regards health and safety.**

PROBLEM		SOLUTION	
1.0	The valve doesn't close	1.1	Make sure the plant line is fed pressure
		1.2	Check the operation of the solenoid valve on the control unit
		1.3	Make sure the hose has suffered no damages.
		1.4	Make sure the pneumatic connection between the control unit and the valve is free from obstruction or condensation and that the tube is not bent.
		1.5	Check to make sure the pressure on the control unit is greater than 3 bar.
2.0	The valve stays closed	2.1	Check the operation of the solenoid valve on the control unit, make sure the solenoid valve is not burnt
		2.2	Make sure the pneumatic connection between the control unit and the valve is free from obstruction or condensation and that the tube is not bent.
		2.3	Make sure the outlet silencers on the control unit are free
		2.4	Make sure the control unit is powered
		2.5	Check to make sure the pressure on the control unit is greater than 3 bar.
3.0	The valve does not close completely	3.1	Make sure the hose has suffered no damages.
		3.2	Check that the control pressure is suitable to the conveying pressure.
4.0	Air leakage from the valve	4.1	Make sure the hose has suffered no damages.
		4.2	Check the connections to the flanges and the compressed air hose.



## 9.2 Check-list in case of fault

If you have been unable to solve the problem on the valve even after having carried out the operations suggested in paragraph “Trouble-shooting” please contact the plant technician/installer/or the Manufacturer.

If technical assistance is required, in addition to the valve data, the plant technician/installer or Manufacturer will also need information concerning the plant in which the valve is installed, its installation and its working, for better identification of the problem that has occurred.

Obviously many of the checking operations which are requested have already been performed in the various steps during installation, testing and start-up of the valve concerned.



### **Danger - Warning**

**Before carrying out any operation “set the valve concerned in safety” (see “Glossary and terminology”), operate according to the indications on the “Operation and Maintenance Manual” and in accordance with and in compliance with the standards in force as regards health and safety.**

#### **1) Information necessary**

- a) Code and serial number.
- b) Photo that shows the application type as well as the plant.
- c) Description of the problem.
- d) Operation sequence (solenoid valves actuating sequences, signals management).
- e) Conveying pressure
- f) Is the duct cleaned prior to line switching?

#### **2) Checking the electrical part**

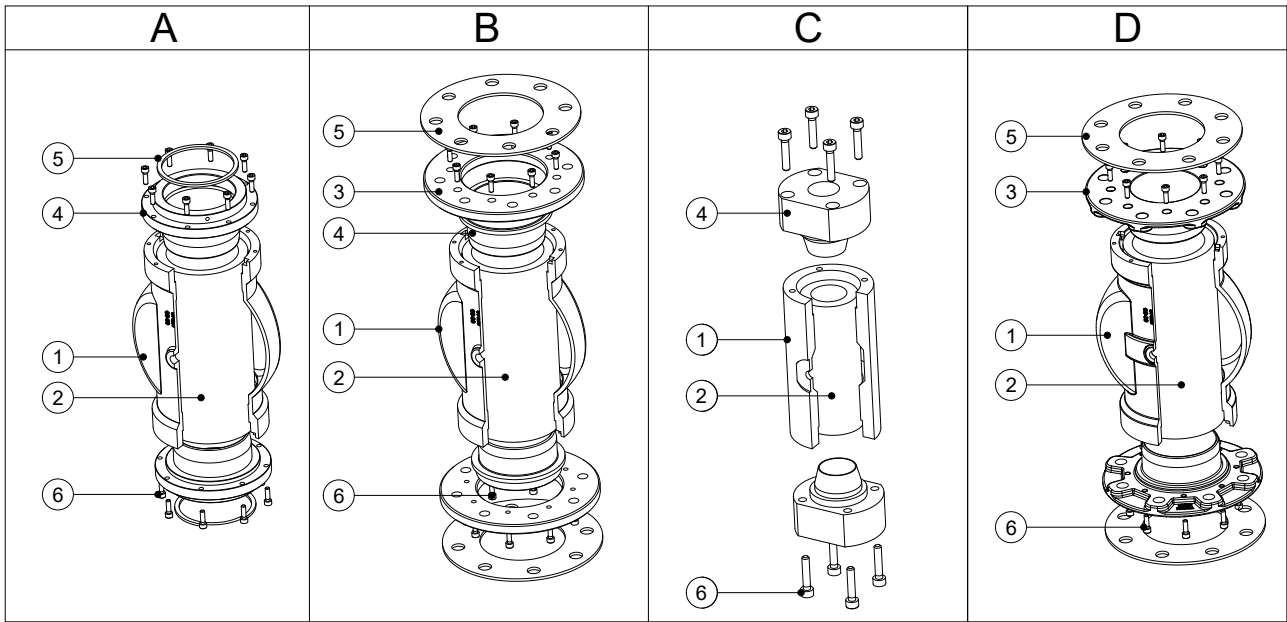
- a) Supply voltage on the solenoids.
- b) Voltage on the pressure switch contacts.

#### **3) Checking the pneumatic parts**

- a) Pressure fed to pneumatic components.
- b) Cases of sudden pressure changes, obstruction on the air ducts.
- c) Compressed air treatment.

#### **4) Checking the product**

- a) Type of product.
- b) Density and particle size, abrasiveness, hygroscopicity.



**10.0 SPARE PARTS**

CONFIGURATIONS A,B,C,D														
Item	Description	Codes												Qty.
		VM013	VM020	VM025	VM032	VM040	VM050	VM065	VM080	VM100	VM125	VM150	VM200	
1	EQUIPMENT SIZE	20972801A	20972851A	20972901A	20972951A	20973001B	20973051B	20973101B	20973151B	20973201B	20973251B	20973301B	20973351B	1
	Casing	20680301A	20680321A	20680341A	20680361A	20680031D	20680051D	20680071D	20680091C	20680111C	20680181C	20680191C	20680211C	1
2	White Sleeve Food Grade	20680302A	20680322A	20680342A	20680362A	20680032D	20680052D	20680072D	20680092C	20680112C	20680182C	20680192C	20680212C	1

**10.0 SPARE PARTS**

CONFIGURATION A							
Item	Description	Codes					Qty.
	EQUIPMENT SIZE	VM040	VM050	VM065	VM080	VM100	
4	Aluminium threaded bushing	20973551A	20973651A	20973751A	20973851A	20973951A	2
	SS 304 threaded bushing	20973552A	20973652A	20973752A	20973852A	20973952A	
	Hardened threaded bushing	20973554A	20973654A	20973754A	20973854A	20973954A	
5	Threaded bushing black seal			20680421A	20680411A	20680401A	2
6	Screw	N.8 M6x20 ISO 4762 Cl.8.8			N.16 M6x25 ISO 4762 Cl.8.8	N.16 M6x25 ISO 4762 Cl.8.8	

CONFIGURATION B										
Item	Description	Codes								Qty.
	EQUIPMENT SIZE	VM040	VM050	VM065	VM080	VM100	VM125	VM150	VM200	
3	Standard aluminium flange	20660021A	20660031A	20660041A	20660051B	20660061B	20660071A	20660081A	20660091A	2
	Aluminium flange USA		20660031U			20660061U	20660071U	20660081U		
4	Standard aluminium bushing	20973501A	20973601A	20973701A	Tab.D	Tab.D	20974001A	20974101A	20974201A	2
	SS 304 standard bushing	20973502A	20973602A	20973702A	20973802A	20973902A	20974002A	20974102A	20974202A	
	Hardened bushing	20973504A	20973604A	20973704A	20973804A	20973904A	20974004A	20974104A	20974204A	
5	Standard black seal	T-20680501A	T-20680511A	20680521B	20680531B	20680541B	20680551B	20680561B	20680571B	2
	Standard white seal	20680502A	20680512A	20680522B	20680532B	20680542B	20680552B	20680562B	20680572B	
	Black seal USA		20680511U			20680541B	20680551B	20680561B		
6	Screw	N.8 M6x20 ISO 4762 Cl.8.8			N.16 M6x25 ISO 4762 Cl.8.8	N.16 M6x25 ISO 4762 Cl.8.8	N.16 M8x25 ISO 4762 Cl.8.8		N.16 M8x40 ISO 4762 Cl.8.8	

CONFIGURATION C						
Item	Description	Codes				Qty.
	EQUIPMENT SIZE	VM013	VM020	VM025	VM032	
4	Polymer threaded bushing	20973401A	20973421A	20973441A	20973461A	2
6	Screw	M4x20 ISO 4762 Cl.8.8		M4x25 ISO 4762 Cl.8.8		8

CONFIGURATION D				
Item	Description	Codes		Qty.
	EQUIPMENT SIZE	VM013	VM020	
3	Standard aluminium flange and bushing	20660101A		20660151A
	Aluminium flange and bushing USA			20660151U
5	Standard black seal	20680531B		20680541B
	Standard white seal	20680532B		20680542B
	Black seal USA			20680541B
6	Screw	M6x20 ISO 4762 Cl.8.8		M6x25 ISO 4762 Cl.8.8