



**INSTALLATION, OPERATION AND MAINTENANCE MANUAL  
WALL MOUNTED AND CHANNEL MOUNTED PENSTOCKS**

**VICENTE CANALES INDUSTRIAL GROUP**

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### IMPORTANT NOTICE



CAREFULLY READ AND FOLLOW THE INSTRUCTIONS IN THIS MANUAL BEFORE INSTALLING OR SERVICING THE DEVICE. THE MANUFACTURER WILL NOT BE LIABLE FOR ANY DAMAGE THAT MAY RESULT, EVEN FOR NEGLIGENCE ARISING FROM NOT READING THE MANUAL

This appliance has been designed so that it does not cause any risk during the use for which it has been designed, provided that:

Both the installation and management and maintenance are carried out in accordance with the instructions in this manual.

The conditions of the premises and the supply voltage meet those specified.

Any use other than this will be considered misuse, as will the addition of any modifications not expressly approved by the manufacturer. Only the user will be fully responsible for injuries or damages caused by misuse, which will automatically result in any warranty being void.

Remember that the penstocks may have live electrical components and, therefore, all service or maintenance operations shall be performed by qualified and experienced personnel, who are aware of the necessary precautions. Disable power before accessing the internal parts.

READ AND SAVE THESE INSTRUCTIONS

*We want to save you time and money!*

*We assure you that fully reading this manual will guarantee  
proper installation and safe use of the product.*

The penstock described in this manual complies with the 2006 / 42 / EC Directive:



## 1. INTRODUCTION

VICAN-Técnicas del Agua thanks you for purchasing a Sliding Wall Mounted Penstock or a Sliding Channel Mounted Penstock

All products manufactured by Vican are easy to install, use and maintain.

Should you have any questions about the operation after reading this manual, please contact VICAN-Técnicas del Agua Technical department.

CONTACT	
	<p>VICAN - TECNICAS DEL AGUA</p> <p>+34 974 401 548</p> <p>+34 974 401 448</p> <p>info@vicentecanales.com</p> <p>www.vicentecanales.com</p>

## 2. WARRANTY


VICENTE CANALES, S.A. hereby certifies that the WARRANTY for the WALL MOUNTED or CHANNEL MOUNTED PENSTOCKS shall be valid for a period of 24 months from the date of invoice and covers any manufacturing defects.

Installation, operation and maintenance thereof shall be performed by qualified personnel. The warranty shall be void in case of wrong connection, installation or misuse of the equipment.

The use of non-genuine spare parts and changes to the device will also void the warranty.

Compensation for direct or indirect damage caused by misuse of the device is excluded from the warranty

### 3. SAFETY

INSTRUCTIONS FOR THE SAFE USE OF THE PENSTOCK	
	<p>MISUSE AND IMPROPER MAINTENANCE OF THIS DEVICE CAN CAUSE INJURY TO USERS.</p> <p>IN ORDER TO AVOID THESE RISKS, YOU ARE STRONGLY ADVISED TO FOLLOW THE INSTRUCTIONS BELOW.</p> <p>TAKE AS MANY ACCIDENT PREVENTION MEASURES AS POSSIBLE TO ENSURE PERSONAL AND EQUIPMENT SAFETY.</p>

The instructions in this manual must be followed for proper installation, commissioning, maintenance and use of the penstocks in order to ensure that all the components they consist of work properly and have a longer life.

These instructions are mandatory and must be known in full before installation. The performance of each penstock shall be limited to that listed in the respective technical bid.

Inspection, installation, connection, commissioning and control of the penstocks shall be carried out only by qualified personnel.

It is prohibited to disassemble, bypass or disable any of the safety features that the penstocks are equipped with during operation.

The penstocks can only start working when all of their components are in perfect technical condition and installation has been completed in full.

Any damage to any of the components that make up the penstocks resulting from breach of the instructions for installation, commissioning and maintenance shall be excluded from the warranty provided by Vicente Canales.

Any defective parts or components must be replaced with original spare parts from Vicente Canales.

Any modifications made to the device or any component thereof without the express consent of Vicente Canales shall be excluded from the warranty.

Any fault or damage shall only be repaired by qualified personnel.

Any work affecting mobile components or those withstanding hydrostatic or hydrodynamic pressure shall be performed once the device has been isolated, and shall only be carried out by qualified personnel.

In the event that any adjustments or checks have to be made while the device is under pressure, these operations must be performed by qualified personnel who are familiar with the safety recommendations for each case.

### 3.1. SAFE INSTALLATION OR REMOVAL.

If the penstock is unloaded and placed into position by a crane, this must be placed in compliance with regulations regarding stability and rollovers. Any lifting and supporting accessories must be properly sized. The load must be handled so that the penstock is safely balanced when it is suspended. The working area should be free of obstacles and must have been previously marked and secured in order to prevent any workers from entering it while the works are in progress.

The penstock must be securely fastened to prevent it from falling each time it is placed against the wall in order to perform measurements or leveling.

When using electric hand tools, the safety recommendations and personal protective equipment specified by the manufacturer in the instructions manual must be respected at all times.

Follow the manufacturer's instructions as described in the safety data sheet when two-component polyurethane adhesive is used to seal the penstock to the wall.

The working area must be sufficient and appropriate for the work to be performed and there must be no hazards or, where appropriate, safety measures must be implemented with regard to same level falls, falls from height, slipping, tripping or electrocution.

The coordination of business activities for installation or removal of the penstock shall be taken into account in those cases when it is required by law.

### 3.2. SAFE MAINTENANCE.

Maintenance work must be performed with no water in the pipes and must always be carried out by skilled workers. When it must be performed otherwise, the specialized staff will be knowledgeable of the safety recommendations to follow in each specific case.

When a crane is used for maintenance tasks, it must be placed in compliance with regulations regarding stability and rollovers. Any lifting and supporting accessories must be properly sized. The load must be handled so that the penstock is safely balanced when it is suspended. The working area should be free of obstacles and must have been previously marked and secured in order to prevent any workers from entering it while the works are in progress.

The penstock must be securely fastened to prevent it from falling each time it is handled for maintenance purposes.

The working area must be sufficient and appropriate for the work to be performed and there must be no hazards or, where appropriate, safety measures must be implemented with regard to same level falls, falls from height, slipping, tripping or electrocution.

When using electric hand tools, the safety recommendations and personal protective equipment specified by the manufacturer in the instructions manual must be respected at all times.

Follow the manufacturer's instructions as described in the safety data sheet when two-component polyurethane adhesive is used to seal the penstock to the wall.

When replacing gaskets or other components makes it necessary to work at the location of the gate and this is not attached to the actuator, it will be removed in order to prevent it from dropping out of control down the slide rails.

The coordination of business activities shall be taken into account in those cases when it is required by law.

## 4. OVERVIEW

### 4.1 DESCRIPTION

Penstocks are devices used for insulation or to seal the passage of a fluid. They consist of three parts:

- Gate: The part of a penstock which slides, thus allowing or blocking the passage of fluid.
- Frame-Slide rail: Its function is twofold: it is used by the gate in order to let water through or to block its passage and it is also where it rests so that the whole set is sealed.
- Actuator: A mechanism for handling the gate. They are of various types.

Based on their use, the penstocks may be:

- Channel mounted penstocks: They have been designed to block the passage of fluid as long as the height of the gate is not exceeded.
- Wall mounted penstocks: These penstocks are sealed on all four sides, so the height of the gate can be exceeded.

### 4.2 OPERATION CONDITIONS

Wall mounted penstocks: They have been designed for installation over holes in walls. The holes may be round, square or rectangular.

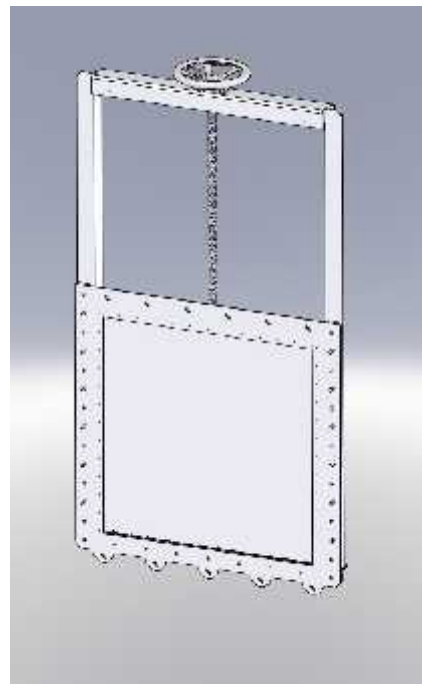
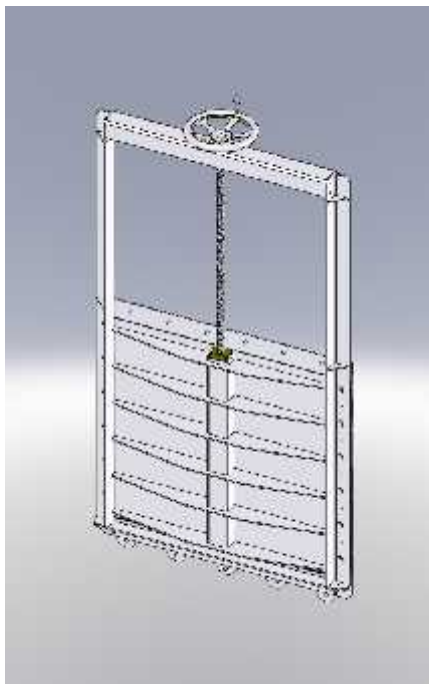
They are installed attached to the wall by means of chemical or expansion anchors and their design is consistent with the operation conditions to be met at each facility.



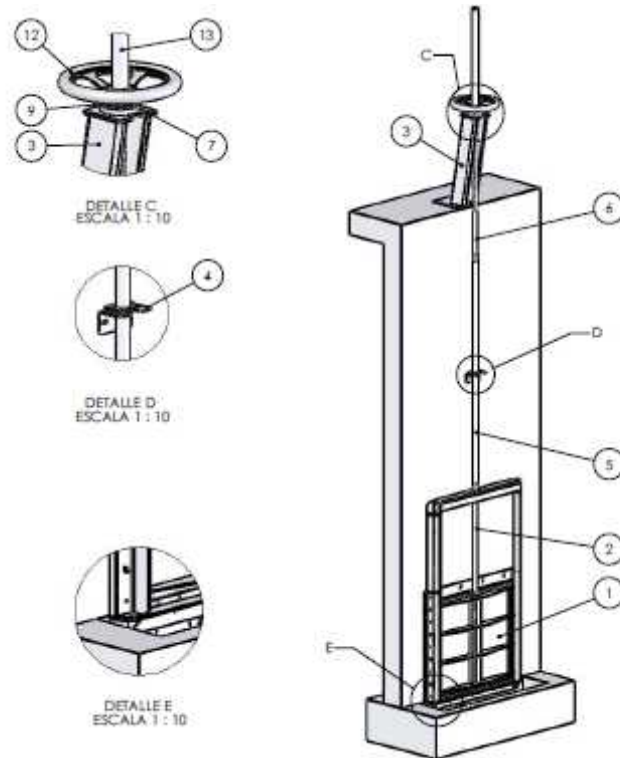
## 5. TECHNICAL SPECIFICATIONS

### 5.1 STANDARD DESIGN DETAILS

- Mechanically welded construction
- Size: From DN200 to DN1200 for standard models. Please ask about other sizes.
- Section: Round / Square
- Deafult pressure: Up to 5 mwc (please ask about other pressures or special applications)
- Installation: Wall mounted
- Sealing: One-way or two-way
- Sealing type: Upstream or downstream



## 5.2 COMPONENTS OF THE PENSTOCK



LISTA DE ELEMENTOS POR CONJUNTO	
Conjunto Estructura Compuerta Mural Deslizante CMUR:	1
Conjunto Husillo Ascendente Inferior	2
Conjunto Torreta Inclinada	3
Sonjunto Soporte Prolongacion Husillo Eje de x mm	4
Prolongacion de Husillo para eje de x mm (Hembra/Hembra)	5
Husillo Ascendente Superior	6
Base Rodamientos ISO5210 F10 para H.A Serie 3	7
Tuerca para H.A Serie 3	8
Tapeta Rodamientos para H:A Serie 3	9
Volante de cuatro radios en Acero Estampado de diametro 400mm (para Serie 3)	12
Conjunto Protector Husillo Ascendente Volante 400	13

### 5.3 MATERIALS USED TO MANUFACTURE THE STANDARD MODELS

PENSTOCK PART	MATERIAL
Gate	AISI-304L stainless steel
Frame	AISI-304L stainless steel
Rising spindle	AISI-304L stainless steel
Spindle extension brackets	AISI-304L stainless steel
Nut	Bronze
Seals	EPDM grade natural rubber, in accordance with ISO 48 Standard (60 Shore)
Slide rails	Polyethylene
Screws	A-2 grade (AISI-304L)
Operating shaft	AISI-304L stainless steel
Welded joints	Approved Procedure in accordance with UNE-EN 15609 Standard or ASME Code, Section IX
<b>STANDARD COATING</b>	
Shot blasting using fiberglass spheres in accordance with SA 2 ½ roughness	



## 5.5 SPECIAL MANUFACTURING MATERIALS

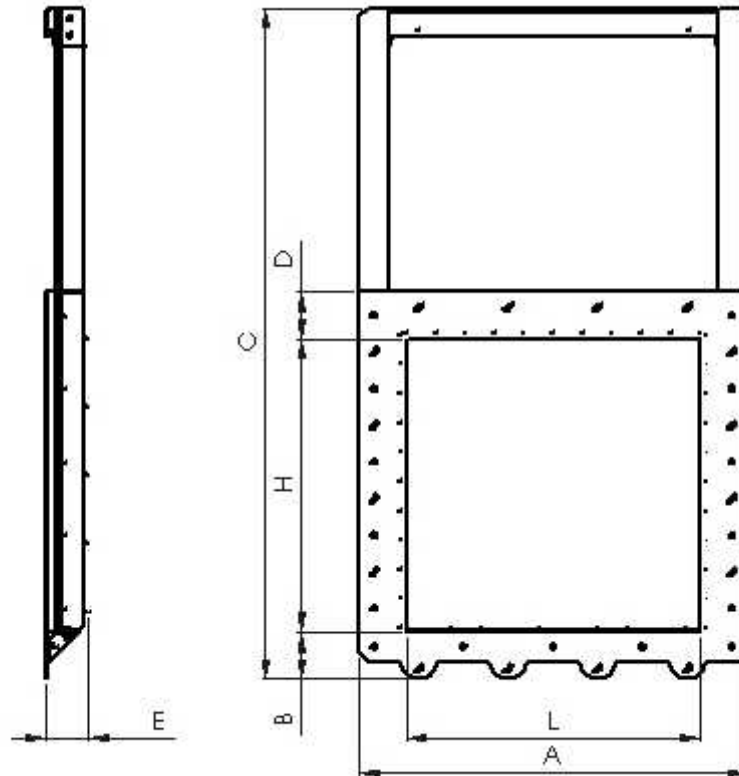
PENSTOCK PART	MATERIAL
Gate	S-235-JR ó S-275-JR carbon steel AISI-316L stainless steel AISI-904L stainless steel Duplex Super Duplex .....
Frame	S-235-JR ó S-275-JR carbon steel AISI-316L stainless steel AISI-904L stainless steel Duplex Super Duplex .....
Rising spindle	S-235-JR ó S-275-JR carbon steel AISI-316L stainless steel AISI-904L stainless steel Duplex Super Duplex .....
Spindle extension brackets	S-235-JR ó S-275-JR carbon steel AISI-316L stainless steel AISI-904L stainless steel Duplex Super Duplex .....
Nut	AISI-304L stainless steel AISI-316L stainless steel Aluminium
Seals	Nitrile
Slide rails	AISI-304L stainless steel AISI-316L stainless steel
Screws	A-4 grade (AISI-316L)
Operating shaft	S-235-JR ó S-275-JR carbon steel AISI-316L stainless steel AISI-904L stainless steel Duplex Super Duplex .....
Maximum pressure	20 mwc
Welded joints	Approved Procedure in accordance with UNE EN 15609 Standard or ASME Code, Section IX
<b>SPECIAL COATINGS</b>	
Epoxy-polyester powder coating Pickling - Passivation Special paint for marine use	

For other requirements, please consult the manufacturer



## 6. DIMENSIONS AND WEIGHT

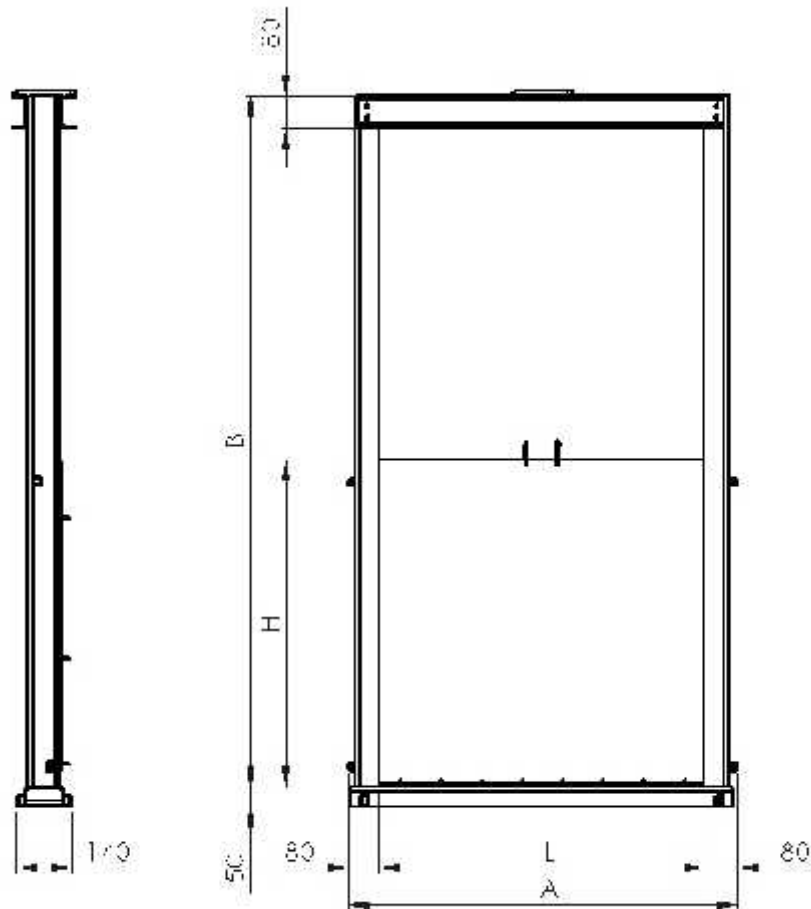
### 6.1 MODEL CMUR - SLIDING WALL MOUNTED PENSTOCK



DN	L	H	CA	A	B	C	Peso
200x200	200	200	5.000	400	75	555	14
300x300	300	300	5.000	500	75	755	21
400x400	400	400	5.000	620	90	975	42
500x500	500	500	5.000	720	90	1175	53
600x600	600	600	5.000	820	90	1375	65
700x700	700	700	5.000	980	130	1630	121
800x800	800	800	5.000	1080	130	1830	141
900x900	900	900	5.000	1180	130	2030	161
1000x1000	1.000	1.000	5.000	1320	160	2290	238
1100x1100	1100	1100	5.000	1420	160	2490	279
1200x1200	1.200	1.200	5.000	1520	160	2690	309

For other sizes, please consult the manufacturer

## 6.2 MODEL CCD – SLIDING CHANNEL MOUNTED PENSTOCK

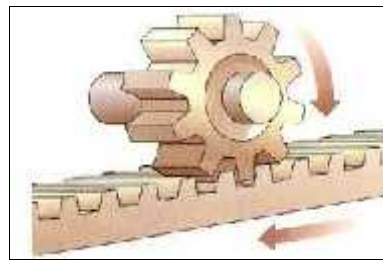
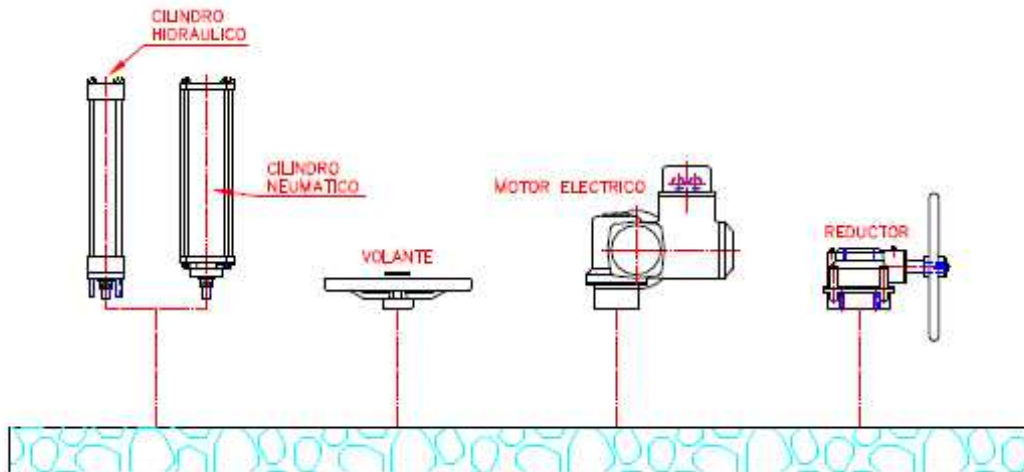


DN	L	H	CA
200x200	200	200	200
300x300	300	300	300
400x400	400	400	400
500x500	500	500	500
600x600	600	600	600
700x700	700	700	700
800x800	800	800	800
900x900	900	900	900
1000x1000	1.000	1.000	1.000
1100x1100	1100	1100	1.100
1200x1200	1.200	1.200	1.200

Level B: 900 mm. above the height of the channel (HC) available on site.

For other requirements, please consult the manufacturer.

### 6.3 ACTUATORS AVAILABLE



Detail view of rack actuator

## 7. NAMEPLATE

This plate is displayed on each penstock supplied and shows registration and control details: Please refer to it should you require to order any spare parts.

 <p><b>VICIN</b> TÉCNICAS DEL AGUA</p> <p>Pol. Ind. Armeriara, 6B 22400 MONZON (Huesca) ESPAÑA (SPAIN)</p> <p>Tel : +34 974 40 13 48 Fax: + 34 974 40 14 48</p>	<b>COMPUERTA - PENSTOCK</b>	
	<b>MODELO - MODE</b>	
	<b>CMUR 600x600 HA VM</b>	
	<b>CONTROL DE CALIDAD - QUALITY CONTROL</b>	
	<b>Nº DE SERIE</b>	<b>FECHA</b>
	13/0110	08/04/2013



## 8. INSTALLATION AND REMOVAL INSTRUCTIONS

The installation of the penstock will be performed in a professional manner and in accordance with the manufacturer's instructions . It is the responsibility of the installer to handle, store and install the penstock in strict compliance with the manufacturer's instructions, drawings and recommendations.

### *Before installation:*

Before the installation of the penstocks it is necessary to check that the material supplied conforms to the order placed and matches the model and serial number assigned.

The damper assembly is provided in different parts:

- Gate fitting and attached to the frame together with a spindle.
- Extension spindle and wall brackets.
- Actuator and ground anchor.

Once the mechanical and dimensional checks have been carried out, cover again with the protections for transportation and storage it is supplied with, in order to keep the penstock free from dirt during installation.

To ensure correct installation, commissioning and maintenance of penstocks, an area free from obstacles must be available in case it is necessary to remove any components thereof, as well as to carry out repair and replacement tasks of any of the damaged components.

### 8.1. WALL MOUNTED PENSTOCKS, WALL SLIDING PENSTOCKS AND WEIR GATES.

It is essential that the penstocks be installed on a flat, sturdy surface and the level be checked. It must be made sure that the surface to which the penstock is to be attached is totally flat, that is, that the holes are in the same plane in order to avoid stress or twisting when they are screwed in, as this could result in the frame getting deformed, the penstock getting out of position or imbalanced, which could cause unwanted friction on the gate and other components as well as result in the shaft or other parts getting broken.

Once it has been secured by means of bolts, a sealing layer of two-component polyurethane adhesive putty is applied around the frame. The putty should be applied all around the outer side of the frame as a finish.

Once it has been placed into position, and the installation of the penstock has been verified, the spindle extension brackets are attached to the wall and the joints between the gate, the spindle and the actuator will be made.

Finally, the installation will be completed:

- In the case of penstocks with a handwheel, when the actuator bracket, the actuator and spindle cover, where appropriate, have been installed.
- In the case of penstocks with a square spindle, when the spindle extension brackets have been installed.

***Removal:***

The removal process will be in reverse order to that of installation.

With the gate at the bottom,

- remove the actuator from the spindle extension,
- take the spindle extension out of its brackets,
- loosen the connection between the spindle extension and the spindle and remove the spindle extension,
- unscrew the top of the frame and remove the gate,
- finally remove the frame from the wall and brackets.

**8.2. CHANNEL MOUNTED PENSTOCKS AND CHANNEL SLIDING PENSTOCKS.**

It is imperative that the penstocks be levelled over the hole intended for placement. The fastening is performed by means of a concrete filling.

Once it has been placed into position, and the installation of the penstock has been verified, the joints between the gate, the spindle and the actuator will be made.

Finally, the installation will be completed:

- In the case of penstocks with a handwheel, when the spindle cover has been placed.
- In the case of penstocks with a square spindle, when the parts have been joined together.

***Removal:***

The removal process will be in reverse order to that of installation.

With the gate at the bottom,

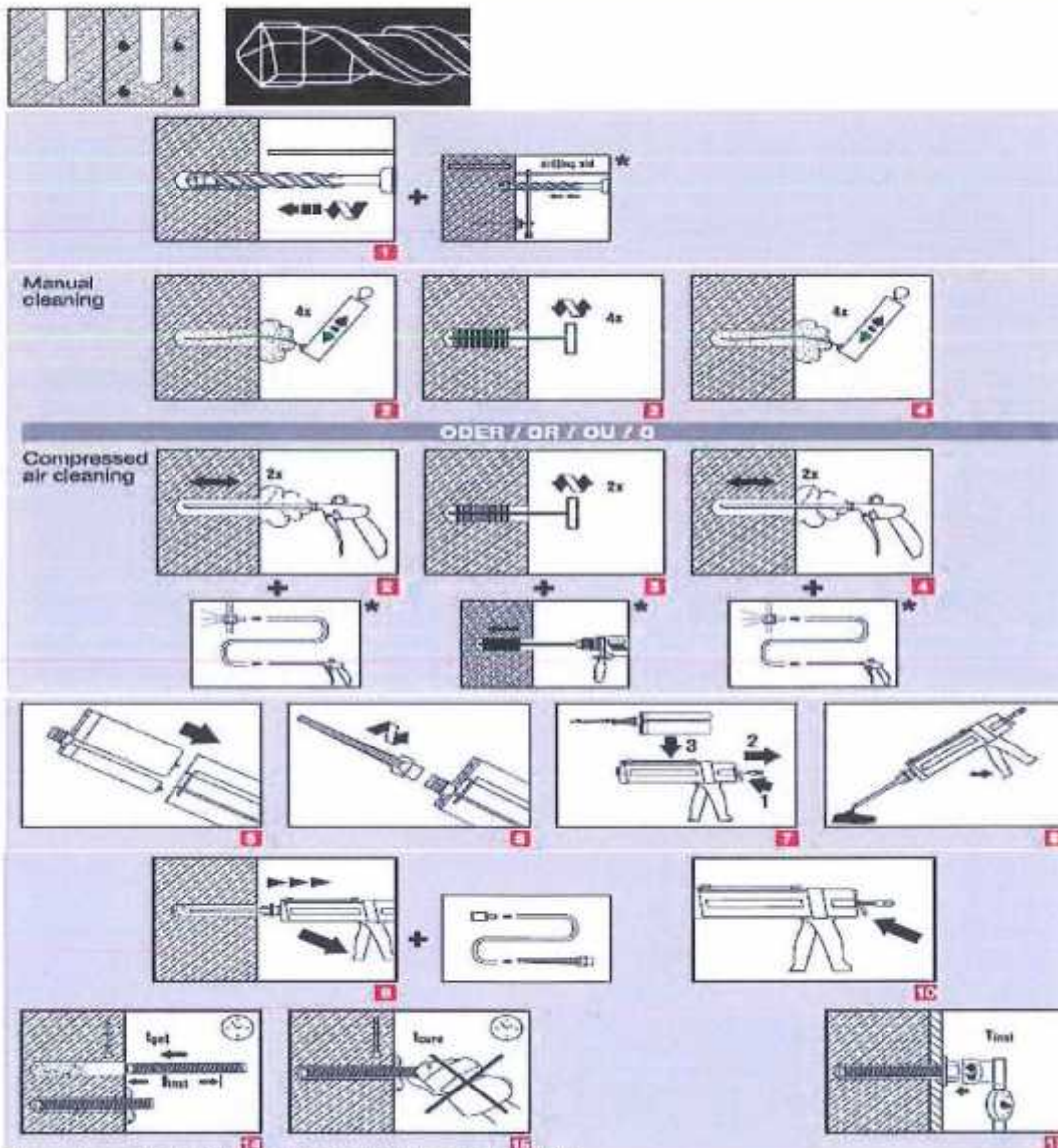
- remove the actuator from the spindle extension,
- take the spindle extension out of its brackets,
- loosen the connection between the spindle extension and the spindle and remove the spindle extension,
- unscrew the top of the frame and remove the gate,
- if the penstock frame must be removed, it will be necessary to break the concrete where it is embedded.

FITTING INSTRUCTIONS FOR TWO-COMPONENT INJECTION SYSTEM AND RODS



Setting instruction

Dry and water-saturated concrete, hammer drilling



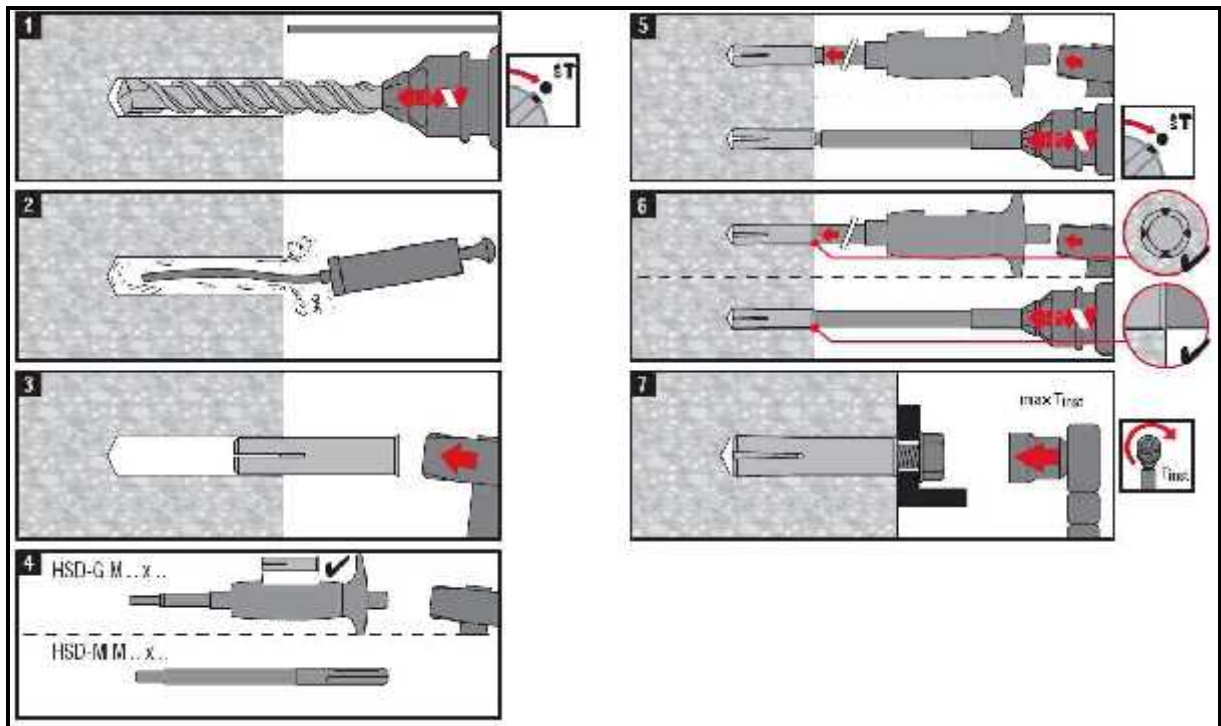
Brush bore hole with required steel brush HIT-RB

a) Note: Manual cleaning only for hef ≤ 250 mm and anchor size ≤ M16

For detailed information on installation see instruction for use given with the package of the

For detailed information on the installation, please see the instructions on the product package

FITTING INSTRUCTIONS USING AN IMPACT ANCHOR SOCKET



For detailed information on the installation, please see the instructions on the product package

## 9. MAINTENANCE INSTRUCTIONS

In addition to these general provisions, the instructions of the manufacturers of the components included in the penstock shall be taken into account.

The spare parts must be original from Vicente Canales in order to ensure quality and the conditions set forth in the sizing of equipment.

### 9.1. COMPONENTS OF THE PENSTOCKS

In order to prevent seal or slide rail deformation, it is very important to keep the sliding surfaces of the panel and stoppers clean, so its condition should be checked at least once a month and records must be kept of such checks. The use of non-original spare parts during the warranty period shall void the warranty.

### 9.2. BRACKETS

For those units installed outdoors, it is recommended to check the condition of the brackets at least every six months and records must be kept of such checks. The use of non-original spare parts during the warranty period shall void the warranty.

### 9.3 ELECTRIC ACTUATOR

The manufacturer recommends performing a test of the actuator operation every 6 months. It should be checked on a yearly basis that the screws joining the actuator/gear reducer and the gate are properly tightened.

The actuator is lubricated for life.

In the event of grease leaks, make sure new grease is added. Over-lubrication may result in grease leaks.

#### **9.4. GEAR REDUCER**

Once the gear reducer has been installed, checks every six months and the following recommendations have been suggested by the manufacturer:

- Perform a full operation: open and close.
- The gear reducers are lubricated for life. We recommend checking the level of grease during maintenance of the gear reducer.
- Check and tighten the screws that secure it to the penstock.
- Check the screws outside the gear reducer, holding the electric actuator or handwheel, are properly tightened.
- Check for signs of wear on the bush or bearings and replace if necessary.
- It is recommended to lubricate them on a yearly basis by inserting enough grease. The bearings must be properly lubricated.

#### **9.5 HYDRAULIC SYSTEM**

With proper maintenance, the life of hydraulic systems will be determined by the life of mechanical elements.

In the case of pumps, it is the bearings, whose life is limited to 5,000 to 10,000 operation hours, that can normally guide us.

For valves, life will depend on the number of connections. Up to 10 million connections are not uncommon. The life of the pressure valves will become the working life of the facility. In some cases it is recommended to replace pressure valves in advance just in case after 2000 to 3000 hours operation time.

Any spare parts should be stored in a dry place with no humidity. The storage area should be free of corrosive products or oxidizing vapors. Proper storage of valves should be checked regularly.

If they are to be stored for more than three months time, the valves should be filled with preservative oil and closed.

#### **9.6 MAGNETIC LEVEL SENSORS**

Dirt or misalignment of the sensors due to external actions may cause malfunction of the system.

#### **9.7 PNEUMATIC SYSTEM**

Please ask. Based on optional features defined during the implementation.

## 10. TROUBLESHOOTING

PROBLEM	CAUSE	POSSIBLE SOLUTION
LEAKS BETWEEN THE GATE AND WALL	THE WALL DOES NOT MEET THE REQUIREMENTS	REMOVE THE DEVICE IN ORDER TO REPAIR THE WALL
	NOT ENOUGH SEALANT	APPLY A NEW COAT OF SEALANT
	THE ANCHORS ARE NOT TIGHT ENOUGH	TIGHTEN THE ANCHORS
	WRONG ANCHORS	USE THE RIGHT ANCHORS ONCE THE APPROVED DRAWING HAS BEEN CHECKED
THE SEAL LEAKS	THERE IS AN OBSTACLE IN THE GATE'S WAY	REMOVE THE OBSTACLE
	THE SEAL IS DAMAGED	REPLACE THE SEAL
IT TAKES A LOT OF FORCE TO OPEN THE GATE	THE OPERATING SHAFT IS NOT ALIGNED WITH THE SPINDLE EXTENSION AND BRACKETS	CHECK AND ADJUST THE ALIGNMENT OF THE SHAFT, BRACKETS AND SPINDLE EXTENSION
	THE NUT OR SPINDLE ARE DIRTY	CLEAN AND LUBE THE NUT OR SPINDLE

## 11. APPLICABLE REGULATIONS:

### SEALING

In accordance with American AWWA C561-04 Standard (1.24 liters/minute per linear meter) and European DIN 19569/4 Standard - Class 4 of 5 for wall mounted penstocks for clean water (allowed leakage values shall be between 0.05 and 0.1 liters/minute per linear meter).

Under clean water conditions, VICAN penstocks meet the requirements of Class 4 under that standard. Moreover, practical knowledge of use in sewage systems has shown that the same kind of sealing is also obtained with sewage.

## Vicente Canales S.A.

Pol. Armentera Parc. 86  
22400 Monzón (Huesca - Spain)

Phone: +34 974 401 548

Fax: +34 974 401 448

[info@vicentecanales.com](mailto:info@vicentecanales.com) / [www.vicentecanales.com](http://www.vicentecanales.com)