Erection Work, Operating and Maintenance Instructions

Machine:	**AhlCleaner RB 300 HD**
Manufacturing No.	D-14-815751-010-3660/132206529 132206552
Date of manufacture:	2013
Order code:	Dong Tien Paper,Vietnam
Order no.:	PPF 40025865

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1 INTRODUCTION

This manual is part of the technical documentation of Andritz TC. It is intended as a supplement to the training provided, to supply the basic knowledge required for proper, safe and economical use of the equipment delivered by Andritz TC. Observing these instructions helps avoid hazards and reduce repair and downtime costs, as well as increasing the reliability and useful life of machines.

1.1 Use

Target group

This operating manual is intended for users with a knowledge of mechanical engineering and is for the exclusive use of the operator of the mill and his personnel.

Personnel entrusted with work on the machine must have read and understood these operating instructions and comply with them. This refers in particular to the following tasks:

- Handling, starting and stopping
- Troubleshooting
- Maintenance and upkeep
- Haulage
- Handling process materials, cleaning of machine and area around the machine

The following sections are especially important:

- the chapter on SAFETY
- the safety instructions contained in various other chapters

Supplementary instructions

The mill operator shall complete this manual by adding national regulations on safety at work, health protection and environmental protection.

Instructions on any special operational conditions concerning work organization, sequence of work/operations and the personnel assigned to the job shall also be added. This also includes instructions on supervising and reporting obligations.

Safe keeping

Keep the entire operating manual near the place where the machine is installed and within easy reach.

1.2 Standards and guidelines

The machine/plant has been built in accordance with state-of-the-art standards and the recognized safety rules. The equipment conforms with the equivalent appropriate standards.

1.3 How to use the manual

Pictograms

The following pictograms are used in the manual:

Warning signs

Warning signs are shown with an explanation of the type of the hazard.

The meaning of the different graduations of hazards are described in the chapter on SAFETY.

Marks an instruction on handling of the machine or system.

Marks a useful information.

► Marks a cross-reference to other sections, figures and tables in brackets.

Examples:

(► Sec. 6.4, Start-up on page 6-3)

(► Fig. 9-2/**123.1**) with reference to an item after the slash (*/*)

(► Tab. 3-1, Construction weights on page 3-2)

Work steps (operations)

Work steps are presented in tables. Work steps are numbered and must be carried out in the order specified.

Listings

Lists without numbering do not require operations to be carried out in a certain order.

Numbering of pages, tables and figures

Pages	Consecutive numbering of chapters	2-1
Tables	Tab. + Consecutive numbering of chapters	Tab. 2-1
Figures	Fig. + Consecutive numbering of chapters	Fig. 2-1

Abbreviations

Dwg.	Drawing
Fig.	Figure
Sec.	Section
Tab.	Table

Illustrations and graphic charts

The illustrations and graphic charts show the basic design of the machine. This may not necessarily correspond exactly to the design supplied.

1.4 Warranty and guarantee

Andritz TC's general terms of delivery and sale shall apply.

Guarantee and liability claims on Andritz TC shall become void if personal injury or material damage is caused by one or several of the following:

- Use of the machine/system for any purpose other than its designated use
- Non-conformity of erection work, start-up and handling of the machine/system
- Non-observance of the safety instructions in the manual
- Non-authorized structural changes to the machine/system
- Non-observance of the maintenance and upkeep instructions

In the event of a claim for repair under guarantee, Andritz TC reserves the right to assess the damage to the machine/system.

1.5 Copyright

2 SAFETY

2.1 General safety regulations

The chapter on safety contains general safety regulations which must be observed when working on the machine/plant.

In addition, the chapters in the operating manual contain further safety regulations. These are marked by warning signs.

Safety instructions on components not supplied by Andritz TC are contained in the descriptions of the components provided by sub-suppliers. The safety instructions supplement Andritz TC's operating instructions.

All safety instructions must be observed. Disregarding the safety instructions may cause a risk to life and limb, environmental pollution hazards and damage to property.

2.2 Danger and warning signs

The entire SAFETY chapter is of extreme importance and relevant to safety. The information in this chapter, therefore, is not marked with special danger symbols.

In the following chapters of this manual, warnings are marked by a pictogram. The following warning signs are used:

DANGER

This symbol indicates there may be a risk to life and limb.

Non-compliance with the warning signs may lead to serious health problems or even fatal injuries, and can cause extensive damage to property.

WARNING

This symbol points to an imminent health risk, as well as a risk of environmental pollution and of damage to property.

Non-compliance with the warning signs may cause moderate health problems and/or extensive environmental pollution and damage to property.

CAUTION

This symbol points to a dangerous situation.

Non-observance of these signs may cause environmental pollution and damage to property.

Further symbols and pictograms used are described in the chapter INTRODUCTION.

2.3 Designated use

The equipment should only be used according to the specifications forming part of the purchase order.

Using the machine/plant for other purposes is considered contrary to its designated use.

Any modifications to the scope of supply made without the agreement of Andritz TC are considered contrary to the designated use.

The term designated use shall also include adherence to the operating instructions, observance of the operating, inspection and maintenance conditions and of the regulations on cleaning and upkeep.

2.4 General remarks on machine/plant safety

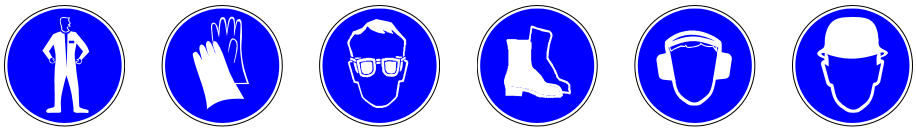
The machine/plant has been built in accordance with state-of-the-art standards and the recognized safety rules. Nevertheless, its use may constitute a risk to life and limb of the user or of third parties, or cause damage to the machine/plant and to other material property.

The machine/plant may only be operated when in perfect condition and with due consideration to safety and the risks involved. All protective devices and the emergency cut-out devices must be in place and fully functional.

Malfunctions and unforeseen changes to the machine/plant must be remedied immediately.

2.5 Personal protective apparel

General protective apparel



The following must always be worn when performing work on the machine/plant:

- Protective clothing to prevent the fiber pulp from coming into contact with the skin
- Gloves to prevent hand injuries
- Goggles to prevent eye injuries
- Safety shoes as protection against foot injuries
- The required personal ear protection to avoid hearing defects
- Standard hard hat as protection against head injuries

2.6 Safety at the machine installation site

- Adequate lighting must be provided (industrial lighting)
- The foundations must be sized to withstand the loads caused by the machine. Customer will be provided with a load plan
- Area around machine and marked escapes to be kept free. Area around machine must be marked as danger zone
- Make sure machine and surrounding area are kept clean. In particular, oil and grease on the floor and on machine elements may cause slipping. This is therefore a considerable source of injuries, as are tools
- The floor around the machine must be provided with a non-slip finish
- In order to prevent any falls from or damage to the machine, it is forbidden to climb onto machine elements or on the machine (except for the treading areas provided). Use ladders or similar equipment in accordance with recognised standards
- Ramps, platforms and lifts must be used to avoid injury or excessive physical effort

2.7 Safety during erection

Prior to lifting, check the weight of each bank from the documents provided.

2.8 Safety during start-up

- The equipment has been correctly assembled and the connections have been tightened.
- The discharge side valve of the feed pump for the cleaner bank is closed, i.e. the pump will start against a closed valve, and that the valve will open gradually to the set value within 30 to 45 seconds.
- The cleaner bank has been correctly aligned. Do not start the feed pump if the accept valve is closed.
- The deaeration valves are closed and those pressure gauge connections which not in use are equipped with a plug.

2.9 Safety during operation

The cleaners must not be opened during operation, nor must parts be detached during operation for replacement.

The pressure sensors must not be detached during operation.

When closing an AhlCleaner bank while other equipment is operating, remember that the accept valve must not be closed before the feed valve is closed.

2.10 Safety during maintenance

Prior to any maintenance work on the cleaners, make sure that the cleaner bank is not pressurized.

Make sure that the feed pump for the cleaner bank cannot be started during maintenance work. Locking the safety switch of the pump ensures this.

The cleaner must not be opened if the stock inside has been hot, i.e. above 50°C.

3 DELIVERY

3.1 Mode of delivery

The AhlCleaner centrifugal cleaner bank is usually delivered from the manufacturing plant completely assembled, with the cleaners already mounted. When the cleaners are delivered separately in different packages, the cleaner bank is assembled at the customer's premises (► Sec. 4, ERECTION on page 4-1). Prior to the delivery, all connections of the AhlCleaner have been protected with cover plates or plugs.

3.2 Packaging

The AhlCleaner bank has for longer transportation and shipment been packed and supported securely to avoid damage. The shipping crate is marked with lifting points, and the shipping documents show the weight and dimensions of the crate.

3.3 Removing from the crate

DANGER

The cleaner bank must be lifted by the frame. Prior to lifting, check the weight of the cleaner bank from the documents provided and make sure that the lifting equipment used, is appropriate for the weight.

3.4 Receiving inspection

Upon arrival, immediately inspect the AhlCleaner bank and any separate parts delivered with it for any potential transport damage. Also make sure that the delivery conforms to the data on the shipping documents.

Immediately inform your contact person at Andritz TC about possible damages or missing parts so as to agree on further procedures and to determine possible compensation claims.

4 ERECTION

The following instructions and drawings are needed when installing the AhlCleaner bank:

- Construction and layout drawings for the site, showing the location of the cleaner bank.
- Piping drawings showing the direction and location of feed, accept and reject pipes.
- Assembly drawings of the cleaner banks
- Foundation drawing
- Machine manual

The AhlCleaner bank must be lifted by the frame.

CAUTION

Install the cleaner bank by securing it with the foundation screws included in the delivery (see foundation/dimensional drawing).

Each AhlCleaner bank is provided with:

1. Machine plate

The machine plate for an AhlCleaner bank shows:

- Name and address of manufacturer
- Type marking
- Manufacturing job number of the AhlCleaner bank
- Manufacturing year

2. Andritz nameplate

When the AhlCleaner bank is delivered in separate pieces, assemble the bank in accordance with the assembly instructions (► Sec. 4.1, Installing cleaners into the feed/accept manifold on page 4-2).

The AhlCleaner has to be installed on a solid, level foundation in vertical position and fastened to the foundation with foundation bolts.

All piping connected to the AhlCleaner has to be correctly lined and supported so that the cleaner remains unstressed.

The optional control box is fastened either to the AhlCleaner frame or to the building wall close to the cleaner and the pneumatic wiring from the control box to the valves is done using metallic or plastic instrument air tubing.

The reject connection for the junk trap dumping should be made according to the enclosed drawing to be able to collect samples from the rejects.

4.1 Installing cleaners into the feed/accept manifold

Step	Action
1	Install the feed head (▶Fig. 4-1/**5252**) to the feed and accept manifold (▶Fig. 4-1/**5151**). **Note the gaskets.**
2	Install the feed end clamps (▶Fig. 4-1/**5154.1**).
3	Install the cone (▶Fig. 4-1/**5270**) to the feed head (▶Fig. 4-1/**5252**). Make sure that the O ring (▶Fig. 4-1/**412.1**) is in its groove and that it is undamaged.
4	Install the spool piece (▶Fig. 4-1/**5286**) to the body. Make sure that the O ring (▶Fig. 4-1/**412.2**) is in its groove and that it is undamaged.
5	**Notice! Polyurethane spool piece has no O-ring seal.**
6	Install the discharge valve to the spool piece (▶Fig. 4-1/**5286**). **Note the gaskets(**▶Fig. 4-1/**400).**
7	Install the junk trap (▶Fig. 4-1/**5289**) to the discharge valve. **Note the gaskets(**▶Fig. 4-1/**400).**
8	Mount the junk trap (▶Fig. 4-1/**5289**) to the clamp (▶Fig. 4-1/**5154.2**) by its flange.
9	Mount the clamp (▶Fig. 4-1/**5154.2**) to the frame (▶Fig. 4-1/**5351**).
10	Install the discharge valve of the junk trap (▶Fig. 4-1/**5289**). **Note the gaskets(**▶Fig. 4-1/**400).**
11	Install the reject pipe (▶Fig. 4-1/**5165**) to the junk trap (▶Fig. 4-1/**5289**). **Note the gaskets(**▶Fig. 4-1/**400).**
12	Mount the junk trap (▶Fig. 4-1/**5289**) to the clamp (▶Fig. 4-1/**5154.2**) by its flange.
13	Mount the clamp (▶Fig. 4-1/**5154.2**) to the frame (▶Fig. 4-1/**5351**).
14	Mount the other cleaner in the same manner.

Tab. 4-1 Installing cleaners into the feed/accept manifold

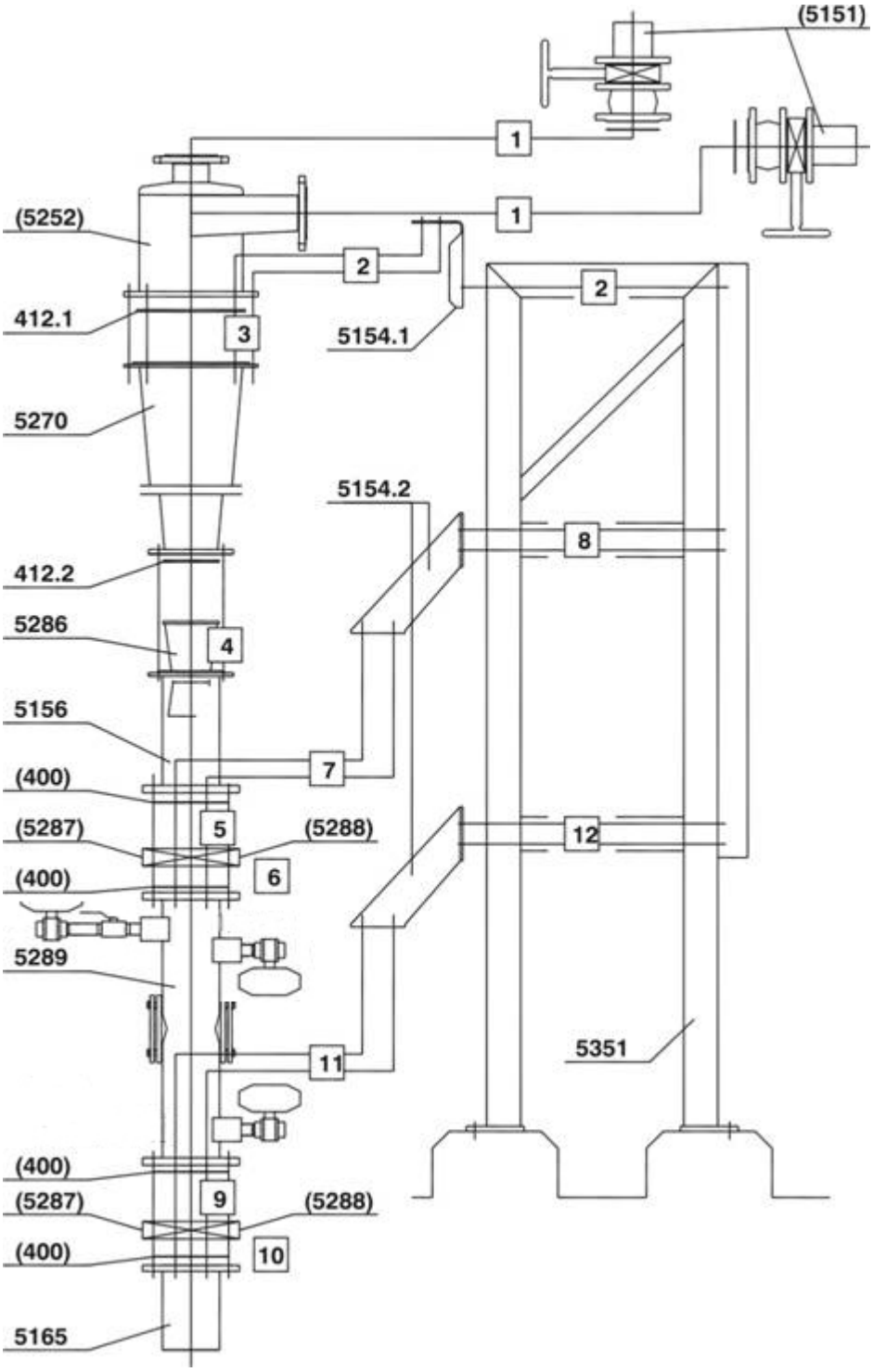


Fig. 4-1 Bank assembly, general instructions

5 OPERATION

The AhlCleaner needs the following valves and connection pipings:

- Feed valve to adjust the feed flow.
- Accept valve to adjust accept back pressure.
- Dilution water for the spool-piece(optional), fresh or white water.
- Flushing water for the junk trap flushing and filling after dumping, fresh or white water.
- dilution water for the junk trap fiber back-washing, fresh or white water.
- Deaeration connection for the junk trap.
- Reject connection for the junk trap dumping.

WARNING

Notice! Additional ON-OFF valve must be assembled to dilution water line (fiber back washing).

WARNING

Interlocking must be made so that the dilution water pressure can't pressurize the cleaner unit during shut-down or start-up.

5.1 Inspection before operation

WARNING

Read the safety instructions prior to start-up.

Prior to start-up, make sure that:

- The cleaners are correctly assembled.
- The feed, accept and reject pipes are connected to the pipelines and are properly tightened and supported.
- The foundation screws of the cleaner bank are tightened and grouting is made.
- The pipes and supports are correctly mounted.
- The pipes do not stress the cleaner bank.

5.2 Checking the instrumentation

Calibrate the instrumentation during a water run.

5.3 Start-up

Prior to the start-up, make sure that:

Preconditions

- The cleaners are correctly assembled and the connections are tightened.
- The pipes connected to the AhlCleaner bank are correctly installed and supported.
- Any impurities generated during installation, such as welding remains, slag, building mortar etc., are flushed away.
- The accept and reject valves for each AhlCleaner bank as well as the accept and reject valves in the pipeline are completely open.
- The discharge side valve of the feed pump for the AhlCleaner bank is closed, i.e. the pump will start against a closed valve.
- The valves on the suction side of feed pumps are opened.
- The dilution water tank for the AhlCleaner is full of water.
- The deaeration valves are closed and the instrumentation is correctly installed.

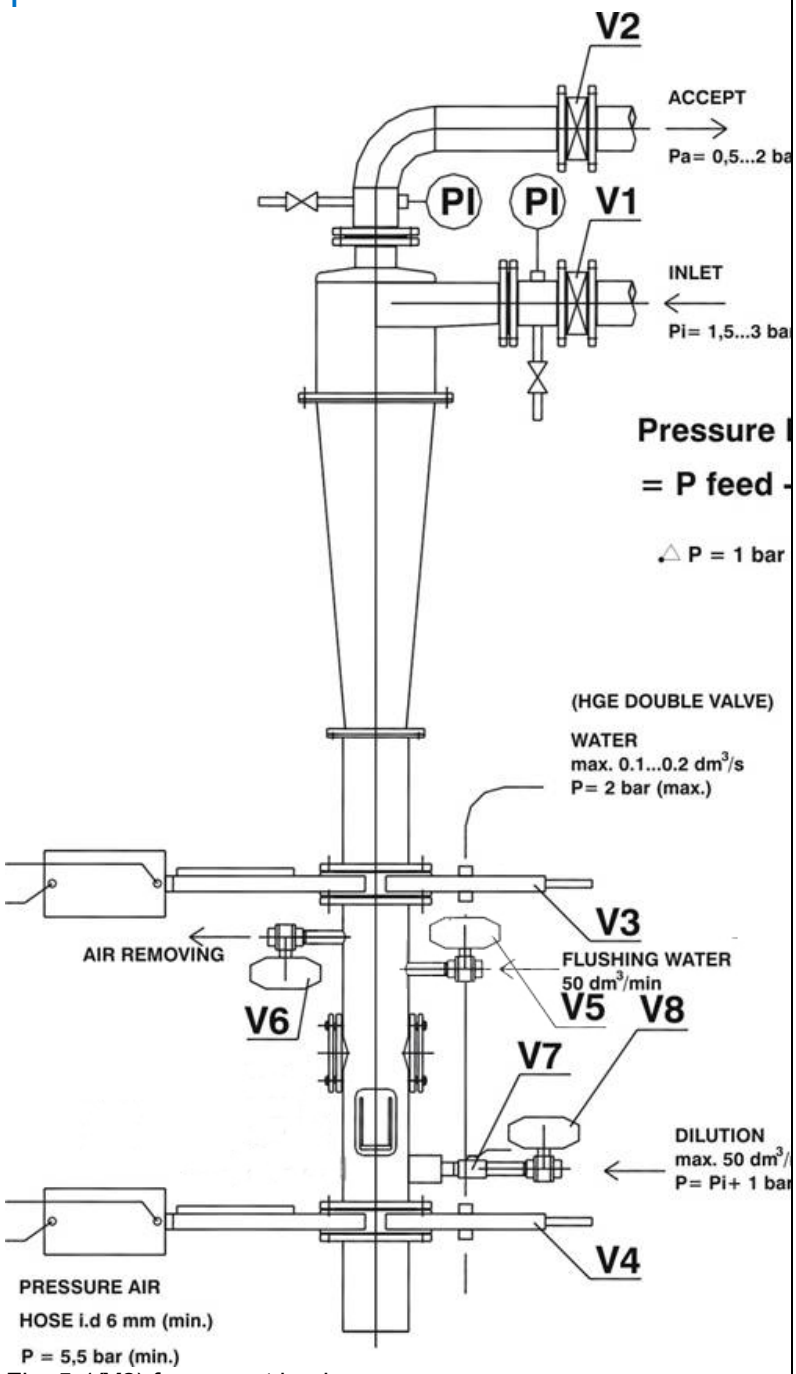
Start-up

WARNING

Before starting, the valve (Fig.5-1/**V2**) on the accept should be fully open, and the feed valve (►Fig.5-1/**V1**) fully closed. Valve (►Fig.5-1/**V3**) is open. The valves (►Fig.5-1/**V4/V5/V6**) are closed and the dilution water through valve (►Fig.5-1/**V7 and V8**) is stopped.

WARNING

The system should always be started with circulating water (white water). If the start-up with water is not possible the cleaner must first be filled with water from the dilution line through valve (►Fig.5-1/**V7 and V8**). **N.B.! Stock must not be fed into an empty cleaner.**

Step	Action
1	Start the feed pump to the system. The dilution water through valve (►Fig.5-1/**V7** and **V8**) starts to flow. Open carefully the feed valve (►Fig.5-1/**V1**) until the correct pressure is obtained. Adjust (►Fig.5-1  Fig. 5-1/**V2**) for correct back pressure.
2	Lead stock into the circulation.
3	Adjust the dilution valve (►Fig.5-1/**V7**) so that impurities can be seen falling slowly past the sight glasses in the reject junk trap and the fibers get flushed back to accept flow.

4	Start the automatic dumping regulating equipment so that periodical dumping of the junk trap is in function.

Tab. 5-1 start-up

CAUTION

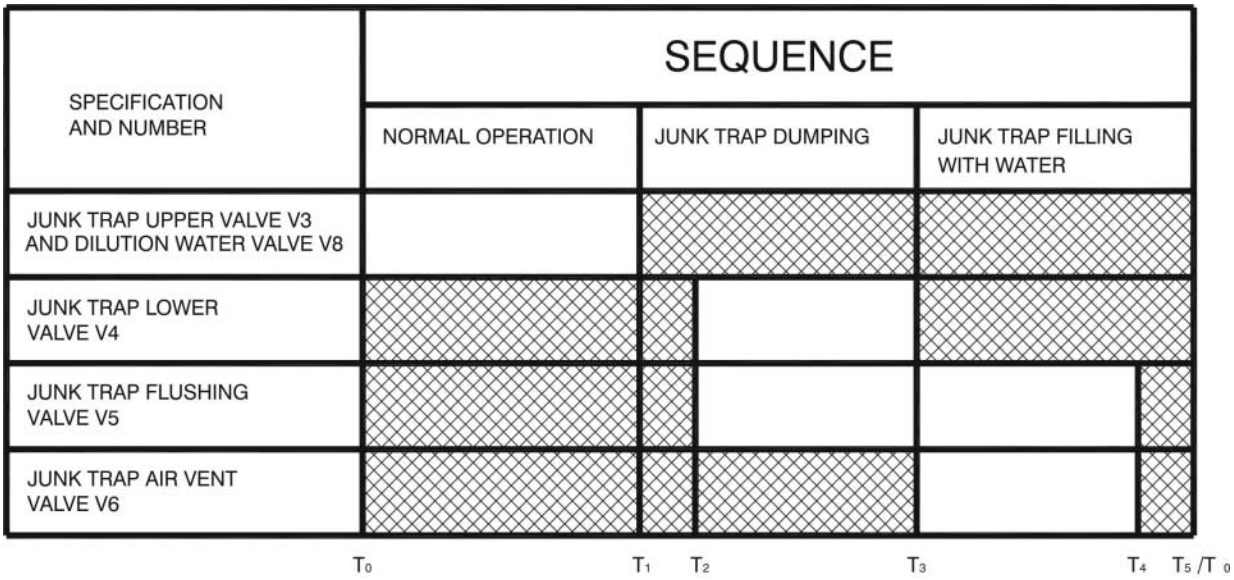
Excessive dilution water flow will flush impurities to accept (cleaning efficiency decreses) and increase cone wearing.

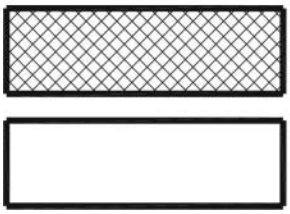
When sedimented reject can be seen through the upper sight glass, the junk trap should be emptied. The emptying sequence is as follows:

Step	Action
1	The valve (►Fig.5-1/**V3** and **V8**) close and the valve (►Fig.5-1/**V4**) opens. d.
2	The valve (►Fig.5-1/**V5**) which brings flushing water opens.
3	The flushing should take long enough so that the debris is removed from the junk trap.
4	After dumping, the bottom valve (►Fig.5-1/**V4**) closes and the deaeration valve (►Fig.5-1/**V6**) opens.
5	The junk trap fills up with water. The time required for junk trap filling is determined from case to case.
6	When the junk trap is filled, the valves (►Fig.5-1/**V5/V6**) are closed and the valve (►Fig.5-1/**V3** and **V8**) is opened and the filling of the junk trap with rejects is repeated.

Tab. 5-2 Junk trap emptying sequence

The automatic timing equipment should be set and adjusted after the correct times have been determined.


SPECIFICATION AND NUMBER
SEQUENCE
NORMAL OPERATION
JUNK TRAP DUMPING
JUNK TRAP FILLING WITH WATER
JUNK TRAP UPPER VALVE V3 AND DILUTION WATER VALVE V8
JUNK TRAP LOWER VALVE V4
JUNK TRAP FLUSHING VALVE V5
JUNK TRAP AIR VENT VALVE V6
T0
T1
T2
T3
T4
T5 /T 0


VALVE CLOSED
VALVE OPEN

T0 =2 - 30 minutes

T1 = 2 seconds

T2 = 10 seconds

T3 = 5 seconds

T4 = 2 seconds

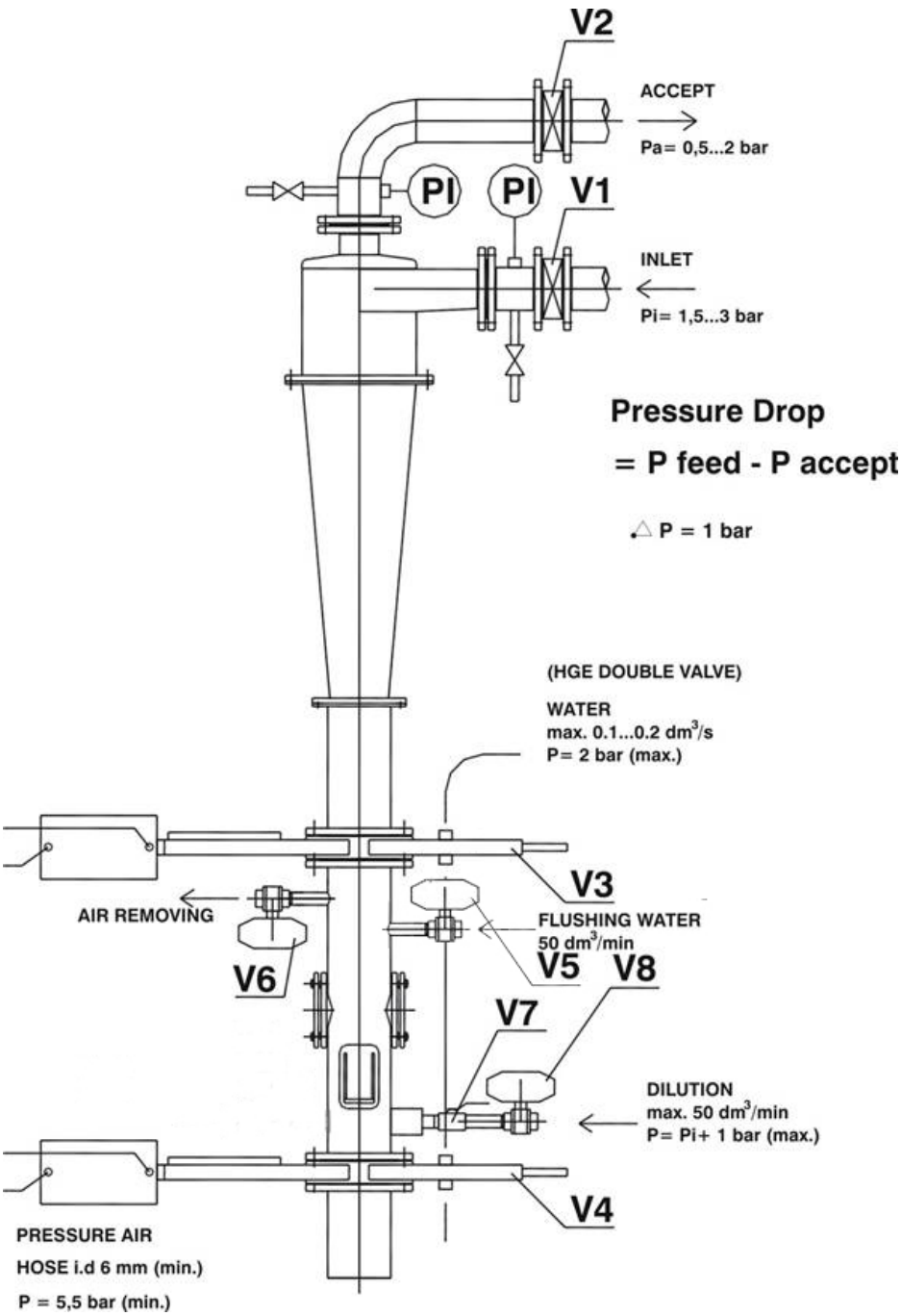


Fig. 5-1 Operation instructions

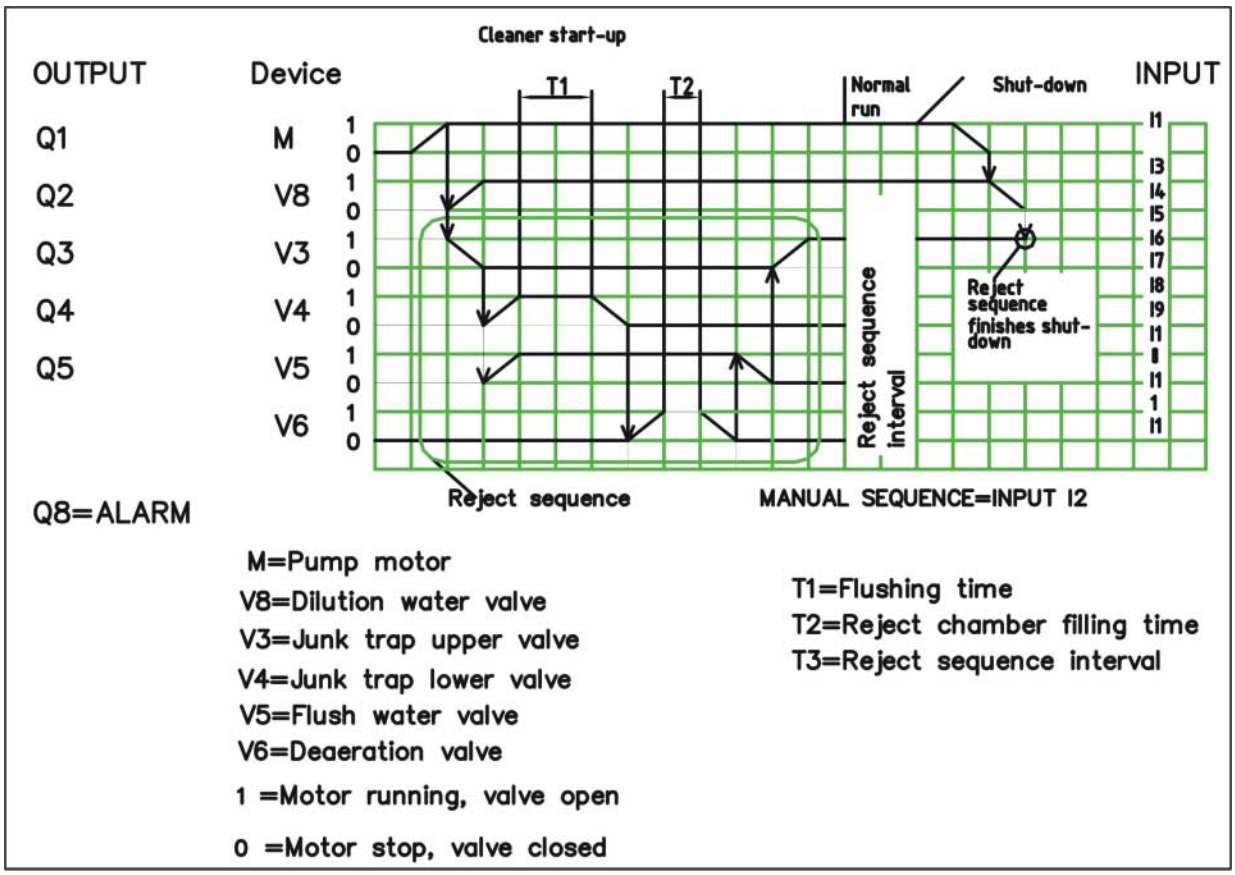


Fig. 5-2 Junk trap and its logic

6 INSPECTION AND MAINTENANCE

The AhlCleaner bank is usually maintained during shutdowns. Simultaneously, inspect the condition of the cleaners and replace any damaged parts. Perform a general overhaul every six months.

Overhaul

Proceed as follows when performing an overhaul:

Step	Action
1	Open the cleaners.
2	Flush the cleaners.
3	Inspect the cleaners for wear.
4	Replace parts that are severely worn.

Tab. 6-1 Performing an overhaul

Extent of wear

The extent of wear is measured by checking the smoothness of the inner surfaces of the cleaners(see technical data).

7 ACCESSORIES

7.1 Pressure gauges

Ready installed pressure gauges for remote control are supplied with the AhlCleaner bank on request.

7.2 Deaeration

The cleaner bank can be equipped with deaeration pipes led directly into reject pipes from the deaeration valves in the feed and accept pipes.

The feed and accept pipes are provided with deaeration valves R 1".

7.3 Stairs

On request, portable stairs are supplied with the AhlCleaner bank to facilitate maintenance and installation of the cleaners.