

Efcon[®] Water

Installation & User Manual Sampling systems



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1.1 General

Efcon[®] is developed by A.V.M. (Netherlands) as a complete package for Effluent Control Systems. Efcon[®] products are designed for measuring and controlling wastewater flows.

Efcon[®] products meet the tough Dutch regulations (NEN 6600-1) and the international standards according ISO 5667-2/3&10.

Products from the Efcon[®] program

Samplers (several types), level controllers, pump controllers, registration equipment, sample distributor systems, flowmeters (industrial and sewers), measurement pits, cool units, mobile systems, etc.

BEFORE YOU START



Read the manual before you connect the unit to a power supply or install.

In case of illegal use or use in non-defined areas, any form of warranty will be denied. The user needs to be informed about the user manual and application dangers.



Installing and adjusting parameters of the sampling system should be done by qualified personnel.

Check transported equipment for any transport damage. In case of damage, directly contact your supplier and do not install the equipment. The equipment is tested (different quality tests) in the AVM factory (Heien Boeicop, Netherlands) before it is transported. Required maintenance or repair, which will not influence the warranty period, will have to be carried out by trained Efcon[®] specialists. All equipment returned to AVM needs to be cleaned, sterilised and transported in a safe enclosure to avoid health-threatening situations. In case of service or repair, the equipment will not be accepted by AVM if there is no declaration of origin and safety added to the equipment. Extra cleaning can be refused or will be charged! Warranty will be denied if there are mechanical, electronic or software changes in the unit which are not performed by AVM.

BASIC WARRANTY PERIODS

When used and installed according specifications, not used for more than 150 samples and 24 distributor turns a day in a non-aggressive well ventilated environment.

- 48 months for thermoplastic enclosures for stationary use
- 24 months for electronic components
- 12 months for moving parts, such as pumps, pinchers & actuators.
- 3 months under courtesy for wearing Parts such as Seals, Rotor & discs of the vacuum pump.

1.2 Application area Efccon[®] equipment

Be aware! Wrong application or misuse can damage the equipment or the surrounding of the unit and is not covered by any form of warranty.

Surrounding conditions

- Temperature: 0°C / +40°C (-25°C / + 55°C optional).
- Well ventilated place.
- Efccon[®] advises not to place the enclosure into direct sunlight, for an optimal cooler output. Systems in direct sunlight cool less efficient due to a higher surrounding temperature!



Use in explosion hazardous environment is prohibited unless mentioned on product and manual!

Sample Medium

- Free of solid parts (guillotine excluded).
- Free of air inclusion.
- Temperature: +0,1°C / +50°C. (higher optional).
- Minimal conductivity: 50µS (only for vacuum systems).

1.3 Transportation

- Transport all systems, equipped with a cool unit, straight up.
- For warranty claims, send the system packed in the original package and on the supplied pallet.

1.4 System set up

Efccon[®] sampling systems are available in different thermoplastic enclosures and are standard equipped with a Unitronics Jazz controller. Efccon[®] sampling systems can be supplied in various operation principles, for different circumstances, according NEN 6600-1 & ISO 5667-2&10.

Standard enclosures

- **Efccon[®]omy Monoblock:** on request in mobile version available (with wheels and carry brackets).
- **Efccon[®] Industrial:** industrial model with Plug-In-Cool unit. Bigger compartment for electronic components like recorders / measurement electronics etc.
- **Efccon[®] CarryBox:** portable enclosure for vacuum samplers without cooler.
- **Efccon[®]omy SystemBox:** enclosure for built-in flowmeters, samplers, air compressors etc. To combine with Efccon[®]omy Monoblock enclosure.
- **Efccon[®] Industrial SystemBox:** enclosure for built-in flowmeters, samplers, air compressors, CIP installations, switch boxes etc. To combine with Efccon[®] Industrial enclosure.

CPU's

- Jazz controller: with basic functionality.
- Vision controller: custom made controllers on request.

Sampling principles

- **Vacuum principle:** suction system from open channels
- **In-line principle:** In-Line-Sampler (ILS) are suited for wastewater sampling from 100% filled pipes and available in different types:
 - ILS Guillotine: pneumatic driven SS 316 sampler, for raw wastewater.
 - ILS 3WP *22: pneumatic driven, SS 316 flush system for raw wastewater, available in multiple diameters and pressure classes.
 - ILS 3WE *12: electric driven, cost-effective PVC flush system, with SS 316 sample bullet, available in multiple diameters and pressure classes.
 - ILS 2WE 412: electric, cost-effective PVC-sampler with SS 316 sample bullet.

2 Efccon® omy enclosure



2.1 Technical specifications

Efccon®omy	
Electric <ul style="list-style-type: none"> • Power supply / current • Power 	230V AC ±5% / 2,5 A / 50 Hz ± 400 W
Enclosure <ul style="list-style-type: none"> • Height • Width • Depth • Material enclosure • Material window • Material plates • Isolation 	Thermoplastic Green (different colours optional) <ul style="list-style-type: none"> • 1100 mm ± 2% • 600 mm ± 2% • 600 mm ± 2% • LLDPE double wall according AVM patent • Polycarbonate • SS 316 / PE • 40 tot 60 mm PUR foam
Surrounding conditions <ul style="list-style-type: none"> • Protection class • Ambient temperature • Direct sunlight • Zone 	<ul style="list-style-type: none"> • IP 54/ Cool shaft IP23 • (option -25°C) 0 / +40°C (optional +55°C) • Allowed, if possible avoid • Not in explosion hazardous environments.
Cooling characteristics <ul style="list-style-type: none"> • Principle • Coolant • Evaporator spiral • Compressor • Condenser • Cool temperature • Defrost cycle • Heater 	<ul style="list-style-type: none"> • Forced 24VDC ventilator moist protected • R134A • Efccon® SS 316 / V4A • Electrolux coated • Coated • +3°C tot +5°C according NEN6600-ISO 5667 • Automatic (adjustable on controller) • 24VDC-25W SS spiral (option)
Sample container <ul style="list-style-type: none"> • without distributor • with direct distributor • CE-Declaration 	Material Polyethylene - White (optional glass) <ul style="list-style-type: none"> • from 2L till 50L • 2x25L / 4x13,5L / 12x2L / 24x1L • Yes



Efcon[®] Carrybox (vacuüm monsternemer)	
Elektrisch : • Voedingsspanning / stroom • Vermogen	230V AC ±5% / 1 A / 50 Hz ± 100 W
Behuizing • Hoogte • Breedte • Diepte • Gewicht • Materiaal • Afsluitplaat	Thermoplastisch Groen draagbaar model • 412 mm± 2% • 340 mm ± 2% • 302 mm ±2% • ± 9 kg • LLDPE • Aluminium met ophang spring
Omgevingscondities • Protectie klasse • Omgevingstemperatuur • Zon instraling • Zone	• IP 41 • 0°C tot +40°C • Mogelijk, bij voorkeur voorkomen • Niet in explosiegevaarlijke ruimtes.

2.2 Measurements and parts Efcon[®]omy enclosure

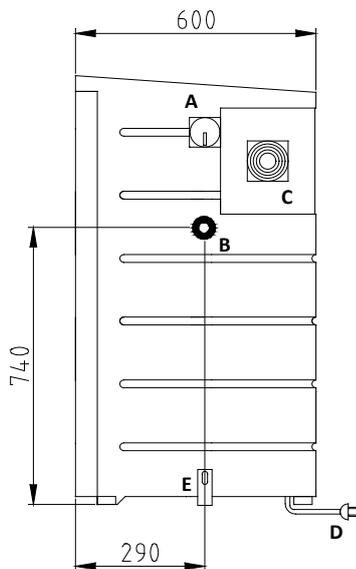
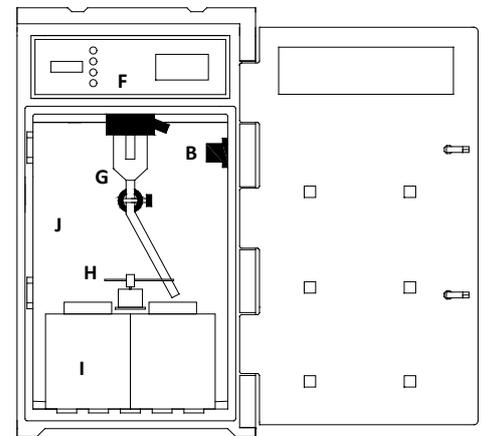
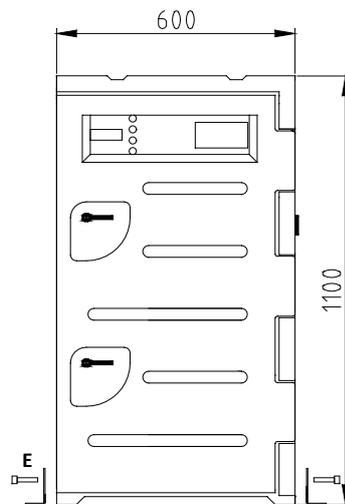


Fig. 2.2a



- A) Main switch (left side standard)
- B) Sample / suction hose inlet
- C) Protect cover of the cool shaft
- D) Power supply
- E) Mounting brackets
- F) Electrics front plate with buttons and display
- G) Sample garniture (only for vacuum systems)
- H) Distributor engine with bracket
- I) Sample container
- J) Cooled sample storage compartment

Carry-Box Enclosure

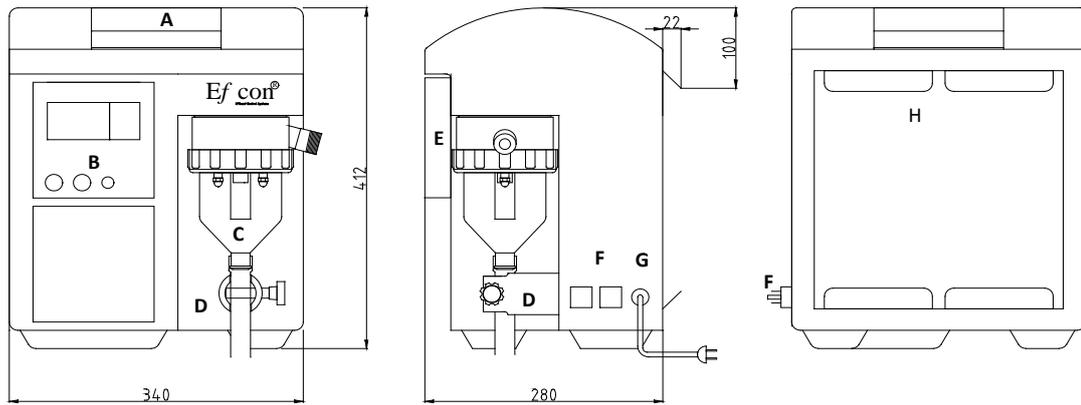


Fig. 2.2b

- A) Handle
- B) Operating panel
- C) Vacuum chamber
- D) Pincher
- E) Splash board
- F) Connectors
- G) Power supply
- H) Suspension bracket

2.3 Installation

2.3.1 Mechanical



First determine where the sampler must be placed (in case of an ILS system) before installing the enclosure. This way you can check if the sample hose (from sampler to enclosure) has a gradual slope.

Efcon[®] omy enclosure

Place the enclosure on a firm horizontal (water-levelled) ground and fix the enclosure with the two supplied SS mounting brackets, bolts and plugs. **BE CAREFULL!** Don't turn the M6 bolt too tight in the enclosure.

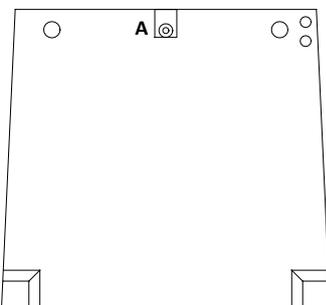


Fig. 2.3a

Beneath the enclosure a condensate drain outlet is fitted. The outlet has a push-in fitting for 8 mm tubing. See fig. 2.3a.

Carrybox enclosure

This enclosure is only available for vacuum and peristaltic samplers. Mount ±300 mm DIN-rail horizontal to the wall on which the enclosure is placed. Make sure there is sufficient height for an gradual, siphons free and nod free sample drain to the container.

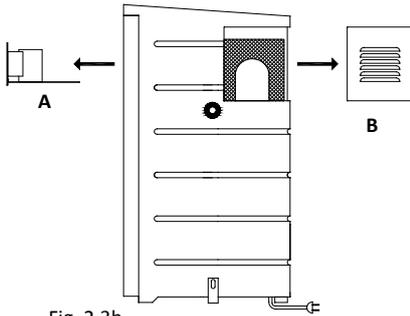


Fig. 2.3b

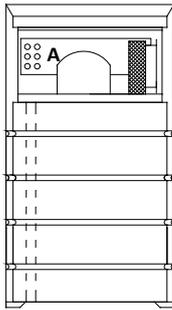


Fig. 2.3c

2.3.2 Electric:

Work as followed when installing the enclosure:

- Remove the protection cover (B in fig.2.3b) from the cool shaft by loosening the four bolts which hold the cover. If necessary remove the connector and earth cable from the fan on the cover to create more working space. Loosen the two grip nuts from the electro front plate (A in fig.2.3b). Unplug the connectors to remove the plate from the enclosure
- Pull the connection cable through the cable tubes which run through the enclosure (A in fig.2.3c).
- Pull the cable through the cable glands (B in fig.2.3c) on the separation plate between the cool shaft and electronic compartment. Strip the cables long enough to reach the terminal.

Terminal connections

Power supply

Connect the power supply cable (230VAC/50Hz) to contacts 1 (ground), 2 (live) and 3 (null) of the terminal (see sticker in fig.2.3d).

Pulse Input

Connect the potential free pulse / batch contact to contacts 4 and 5. (pulse input) for pulse registration and pulse proportional sampling. Be aware: keep the pulse input frequency <1 Hz. Use a pulse length of ±100 msec.

When using the pulse input for batch control sampling, the pulse counter in the display counts every batch contact.

Digital Input 1 & Digital Input 2

Connect a potential free contact to contact 4 & 6 (DI1) and/or 4 & 7 (DI2), check §3.5.6 to configure the inputs.

Analogue Input (current)

Connect the 4—20mA flow signal cable to terminals 8 (+) & 9 (-). Check §3.5.5 to configure the analogue input.

Digital output 1 (2= optional)

Terminals 10 and 11 are used for the programmable digital output 1, The relay output is normally open. Check §3.5.6 to configure the digital output.

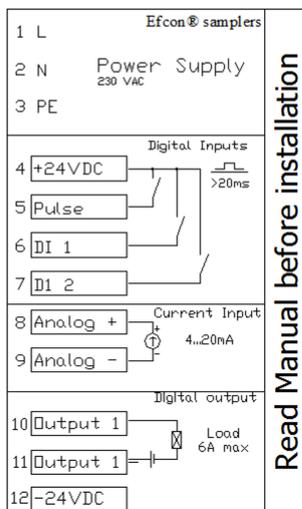


Fig. 2.3d

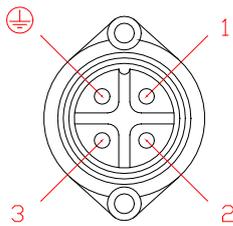


Fig. 2.3e

In-/output Connectors (optional)

Optional for Efccon[®] systems are connectors on the side. Connect the pins of the connectors according fig. 2.3e. Place the cable inlet downwards to prevent moisture inside the connector.

230VAC Power supply in (male connector)

- Pin 1 = L 230V AC 50Hz
- Pin 2 = N 230V AC 50Hz
- Pin PE = GND

24VDC Power supply in (female connector)

- Pin 1 = +24V DC
- Pin 2 = 0V DC (gnd)

Flow Input (female connector)

- Pin 1 = + 4-20mA
- Pin 2 = - 4-20mA
- Pin 3 = potential free contact
- PE = potential free contact

Distributor Output (female connector)

- Pin 1 = + 24V DC
- Pin 2 = 0 V (Gnd)

Sampler Output (female connector)

- Pin 1 = +24VDC sampler
- Pin 2 = -24VDC sampler
- Pin 3 = sampler response signal (24VDC pulse) optional

Alarm Output (male connector)

- Pin 1 = Alarm output (potential free contact)
- Pin 2 = Alarm output (potential free contact)

230VAC Power supply out (female connector)

- Pin 1 = L 230VAC 50Hz
- Pin 2 = N 230VAC 50Hz
- Pin PE = GND

2.4 Maintenance



Be aware! Switch off power supply before maintenance or revision. Remove compressed air couplings and remove pressure and medium from wastewater piping.



Maintenance and reparations should be done by qualified personnel.



Avoid direct contact with wastewater. Wear protective gloves during use, maintenance and reparations.

The maintenance frequency depends on wastewater characteristics. Clean (or replace if necessary) all parts which come in contact with the sampled medium regular.

Check if the cool shaft of the cooler is clean / not clogged by dust. Cleaning the enclosure can be done with a moist cloth, but avoid all electrical parts.

Check annually if the screws of all the electronic connection are tightened.

2.5 Trouble shooting

Problem	Diagnose	Solution
Cooler freezes the containers	Wrong settings controller Door not closed Door "leaks" air 24VDC circuit out of range	Check setting (→ §3.5.7) Close door, check rubber seal of the door with a flash light. Adjust the pot. meter on the power supply to 24,00 VDC ±0,10 VDC.
Cooler doesn't cool	Wrong settings controller Fan inside the protection cover doesn't work	Check settings (→ §3.5.7) Check / replace fan
Distributor does not turn (properly)	Wrong distributor settings	Check settings (→ §3.5.7)
	Hex. bolt on the distributor engine is loose	Fasten bolt
	Silicon hose doesn't turn free in rotation	Shorten silicone hose

3 Program settings

Be aware! Incorrect settings may lead to defect hardware.

Adjusting parameter settings should be done by qualified personnel.



3.1 Technical specifications

Setting	Range
Display	2 lines 16 characters, 16 keys, Totalizer 300000,00 m ³ max (autom. resets)
I/O hardware	8 digital inputs, 4 analogue inputs, 11 relay outputs
Basic operation	Manual sample button, Next container button, Reset button
Inputs	Pulse input, Current flow input (4-20mA), 2x digital inputs (free config.)
Outputs	1x 24VDC relay output (free config.) (2x optional)
Sample principle	ILS / Vacuum / Peristaltic
Sample program	Volume / Time / Batch
Sample interval	0,01- 250,00 m ³ / sample 2- 250 minutes / sample
Max error samples	0-999
Sample Volume	1-9999 ml
Vacuum settings	Purge time 1-99 sec
Peristaltic	Max suction time 1-99 sec Dose time 1-99 sec
ILS settings	Activation time 1-99 sec
Turn time	00:00 - 23:59
Select day	(MTWTFSS)
Turn Interval	00:00:00 - 99:59:59 (HH:MM:SS)
Container config.	1-24 containers, volume 0,01-99,99 l
Overflow protection	Off, move next container, stop sampling
Program settings	Start program according date & time (0=Off) Stop program according date & time (0=Off)
Stop after xx containers	0-99 (0= Off)
Password	Yes, (1-9999)
Date & time	Changeable (no automatic summer / winter time)
Cool unit set points	On = 1-99°C, Off = 1-99°C
Defrost cycle	Interval 1-99 hours, duration 1-99 minutes
Offset	-99-99 °C
Defrost time	0-99 hours (0= continue cooling)
Eco cool	On/Off
Flow signal	Pulse / current / pulse + current
Pulse input	0,01 – 100,00 m ³
Current	20mA = 1,0 – 360,0 m ³ /h
Input Options (2 inputs)	Program on/off, Start program, Stop program, take sample, next container, start cool unit.
Output Options (1 output) (2 nd output optional)	General alarm, sample alarm, sampling active, sample ok, high temperature, sample error, 1m ³ Pulse, 0,1 m ³ pulse, 0,01 m ³ pulse, Containers full

3.2 Operation explanation

3.2.1 Sampling

Sampling system can take samples on three different principles:

- Manual sample, by pushing a button on the operation panel.
- Automatic sample, as programmed:
 - Time proportional sampling
 - Volume proportional sampling (by pulse input or current input)
 - Batch sampling (start time prop. sampling when the pulse input is active).
- Automatic sample on programmed start- and stop date.

3.2.2 Container distributor system (optional)

The distributor ensures a proper sample distribution across different sample containers.

Systems with multiple sample containers are equipped with a direct distributor. The distributor positions the sample hose from the sampler (clockwise) above the container. This operates automatically (by program) or manually (by push button). The distributor is programmable to turn on:

- Fixed time (example: set on 10:00) & selected days.
- Time interval (example every 2 hours), time interval starts after programmed fixed time.
- After a number of taken samples, dependable on sample and container volume (overflow protection).*

* When the distributor turns the cycle totalizer & sample counter are reset. These values are stored in the jazz controller.

3.2.3 Cycle data (optional)

The display totalizes the cycle's m³ and taken samples. These values reset when a new cycle is started (the distributor rotates to the next container). The values are stored with the average temperature and date & time. The controller stores up to 24 cycles.

3.2.4 Alarm function (optional for In Line Samplers)

After multiple sample failures or power failure the alarm output relay of the sampling system closes.

When a sample cycle is not completed the CPU registers an error sample. After a set number of error samples (default = 3) the sampler stops taking automatic samples and switches to alarm condition. The alarm is perceptible on 2 ways:

- A programmed output relays switches.
- Display describes current alarm status.

Push the **Reset** button on the controller to reset the alarm. After resetting, the system will sample according program. Also when power failure occurs, the alarm contact closes.

3.2.5 Sampling on programmed periods

By activating this setting it is possible to start and stop automatic sampling on a programmed date and time. This way the system can be programmed (→§3.5.11) to take samples only.

3.2.6 Stop sampling after xx containers

When activated the sampler stops sampling after a programmed number of containers. By pushing **Reset**, the system samples further until the same number of samples are taken →§3.5.12.

3.3 Manual operation

The sampling system can be manually operated by 3 numeric keys on the sampler controller. But only when the menu is not entered.

- **(1) Manual Sample**, push to take an manual sample.
- **(2) Next Bottle**, push to sample in the next container (The distributor will wait 3 seconds).
- **(3) Reset alarm**, if the alarm is activated (too many error samples), push this button to reset an alarm.

3.4 Display & cycle data read out

The display changes every 5 seconds between:

Total	00000,00m3
Program	stopped

1st row: Totalizer in m³, this totalizer doesn't reset.
2nd row: Program status, this shows the status of the program.

Cycle	00000,00m3
Samples	236

1st row: Cycle totalizer in m³, resets when turning to next container.
2nd row: Samples taken this cycle, also resets when turning.

16:55	0,0m3/h
10/07	3°C

1st row: Time & current flow (in m³/h).
2nd row: Date & current temperature (in °C).

Access stored cycle data:

When one of the above displays is active, press ▼ to read the previous cycle data, press ▼ again to read the cycle before that, press ▼ again etc..

#1	31.12	08:00h
>	1000,00m3	

1st row: Data cycle number, end date & end time of the cycle
2nd row: Total m3 counted this cycle

Press ► to check the number of taken samples & average temperature

#1	100	S
<		4°C

1st row: Data cycle number, number of taken samples this cycle
2nd row: Average temperature during this cycle

3.5 Changing Sampler settings

To change settings it is necessary to enter the program of the Jazz controller. The controller is password protected (default 5555), this password can be changed or canceled.

3.5.1 Changing date/time

- Press **Enter** to enter the password
- Enter **5555** and press **Enter**
- Select **Program settings** with 2x **▶**
- Press **Enter** to select
- Press 3x **▼** and press **Enter**
- Enter the date with **numeric keys** and press **enter**
- Enter the time with **numeric keys** and press **enter**
- Press 2x **ESC** to go back to the total display

3.5.2 Changing Settings

See the attached menu diagram (Appendix I) for a quick view of all the parameters.

To change settings:

- Press **Enter** to enter the menu,
- Enter password (default **5555**) & press **Enter**
- Select the submenu with **▶** or **◀** and press **Enter**
- Scroll with **▼** and **▲** trough the parameters
- Press **Enter** (**◀** or **▶** with parameters with **←** or **→** signs) to change the parameter value.
- Use **numeric keys** to enter a value & press **Enter** to store

Submenu	Parameters
Sample settings	Sample by, Sample Interval, Error Sample Max, Sample Volume, Purge time (VS/PS), Max. suction time (VS/PS), Dose (VS/PS), activation time (ILS)
Distributor settings	Turn Time, Turn Day, Turn Interval, Container Config., Overflow protection
Program settings	Start date/time, Stop date/time, Stop After xx full containers, Change date/time, Change password
Input/output settings	Flowsignal, Pulse Value, Current 20mA value, Input 1&2 config, Output 1&2 config.
Cool Unit Settings	Set points Cool unit, Defrost cycle, Temperature offset, Defrost Time, Eco Cool settings.

3.5.3 Changing Sample Settings

Select submenu **Sample Settings** and press **Enter**.

Select from the following parameters. Press **Enter** to change its value.

Parameter	Description
Sample by	Select with ◀ or ▶ the following: Volume Interval: sample every xxx,xx m ³ by flow signal (pulse or current). Time Interval: sample every xx minutes. Batch: sample every xx minutes when the pulse input is activated.
Sample interval	Enter the value of the desired interval.
Error sample max	Enter the max. number of consecutive error samples to trip the sample alarm.
Sample volume	Enter the sample volume.
Purge-, Max suction-, Dose- (VS only) & Activation Time (ILS only)	Purge time: time to clean the suction tube. Max suction time: maximum time to reach the level pins. Dose time: time to dose the sample. Activation time: time to activate the ILS sampler.

3.5.4 Changing Distributor Settings

Select submenu **Distributor Settings** and press **Enter**.

Select from the following parameters. Press **Enter** to change its value.

Parameter	Description
Turn Time	Enter the clock time the distributor needs to change the sample outlet to the next container.
Turn Day	Select the days the distributor needs to turn, M (Monday), T (Tuesday) etc. Fill in 1 to select, fill in 0 to deselect).
Turn Interval	Enter the desired time interval for the distributor to turn (0=off).
Container config.	Enter the number of containers & container volume.
Overflow protect.	Select what action to take when the container starts to overflow: Off (continue program), Next container, Stop sampling (& restart when the turn time is reached).

3.5.5 Changing Program Settings

Select submenu **Program Settings** and press **Enter**.

Select from the following parameters. Press **Enter** to change its value.

Parameter	Description
Start Date-time	Enter date & time to start sampling (00-00 = off).
Stop Date-time	Enter date & time to stop sampling (00-00 = off).
Stop after full containers	Enter desired number of container to be filled, the sampler then stop sampling & restarts when reset is pushed.
Date time.	Enter time & date. Change it when needed.
Password	Enter a number from 1-9999 to change the password.

3.5.6 Changing Input / Output Settings

Select submenu **Input / Output Settings** and press **Enter**.

Select from the following parameters. Press **Enter** to change its value.

Parameter	Description
Flow signal	Select with ◀ or ▶ to totalize the desired flow signal. Pulse = totalize contact (>50 ms) on the pulse input. Current = totalize a 4-20mA flow signal. Pulse + Current = totalize contact on the pulse input, current is only to display.
Pulse input value	Enter the value of the pulse contact, 0,01 -100,00 m ³ (0,01 for current flow signal).
Current Value	Enter the 20mA value of the current signal 260m ³ /h max.
Input 1 config. Input 2 config.	Select with ◀ or ▶ to configure the inputs. Choose from the following functions: Start/Stop PRG, Start Program, Stop program Take Sample, Next container, Start Cool unit, Not in Use.
Output 1 config. Output 2 config.	Select with ◀ or ▶ to config. the outputs. Choose from the following functions: General Alarm, Sample Alarm, Temperature High, Sampling Active, Sample OK, Error sample, 1 m ³ pulse, 0,1 m ³ pulse, 0,01 m ³ /pulse, containers full.

3.5.7 Changing Cool unit Settings

Select submenu **Cool Unit Settings** and press **Enter**.

Select from the following parameters. Press **Enter** to change its value.

Parameter	Description
Cool Unit On/Off	On and off set points cool unit.
Defrost cycle	Fill in the desired interval (F) in hours and how many minutes the Cool Unit needs to defrost (t).
Temperature. offset	Temperature offset, to correct the temperature measured inside the cabinet.
Defrost Time	Fill in the desired time (in hours) to stop the cool unit. Set to 0 hours to activate the Cool Unit again.
ECO cool	Not available.

4 Vacuum sampler
4.1 Technical Specifications



Vacuum sampler conform ISO 5667-2&10 and NEN 6600-1	
<p>Sample principle</p> <ul style="list-style-type: none"> • Max. suction height • Minimal suction speed • Air pump • Pincher 	<p>Principle Vacuum suction</p> <ul style="list-style-type: none"> • 4 meter (optional 6) • 0,5 m/sec • 24 VDC bi - directional ± 2800 rpm • 24 VDC bi - directional ± 30 Nm with Current Limiter.
<ul style="list-style-type: none"> • Sample volume • Repeatability • Dose accuracy • Medium temperature • Max. sample frequency • Diameter suction hose • Coupling suction hose • Material vacuum chamber • Sample settings 	<ul style="list-style-type: none"> • 20 ml tot 250 ml adjustable, 50 ml prefab • 2% (at 50 ml and more) • 4% (at 50 ml and more) • max 50°C (higher on request) • 1 sample / 2 minutes (software blocked) • 16 mm (minimal 12 mm) inside • 3/4" • Polycarbonate • Adjustable purge, suction time out, dose time

4.2 Parts

Hardware of the vacuum sampler is located in the sample storage compartment, with exception of the air pump.

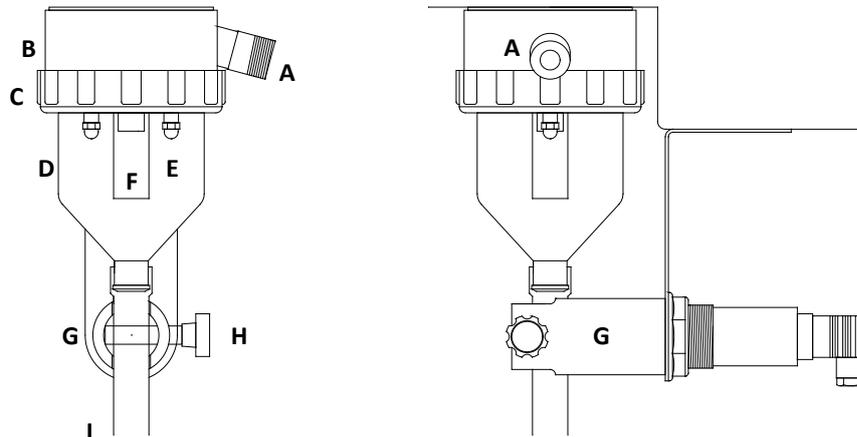


Fig. 4.2a

- A) Coupling suction hose
- B) Vacuum head
- C) PP glass holder
- D) Vacuum glass
- E) Contact pins
- F) Sample volume hose
- G) Pincher
- H) Pincher nut / bolt
- I) Sample drain hose

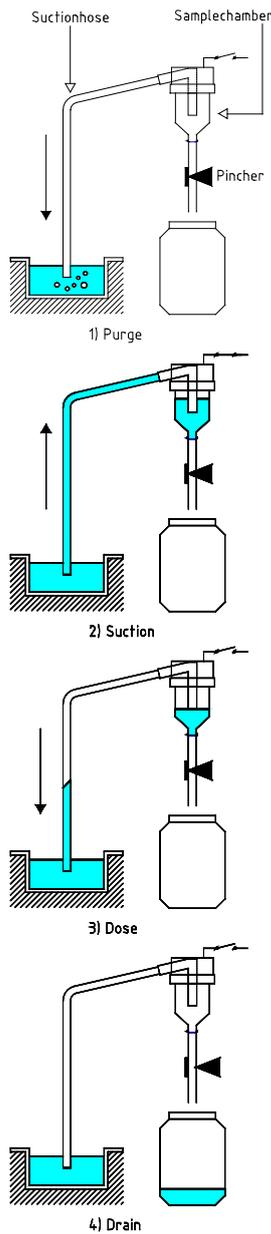


Fig. 4.4a

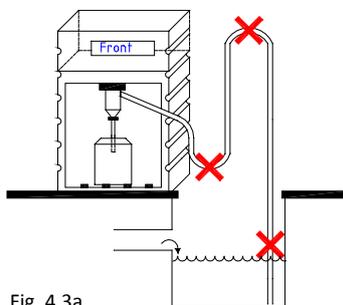


Fig. 4.3a

4.3 Operation principle

The sampling cycle from a vacuum sampler:

- **CLOSING PINCHER:** the pincher squeezes the silicone hose air tight.
- **PURGE:** the air pump starts and generates pressure in the sample chamber. From the end (inlet) of the suction hose air bubbles will escape. Which is a sign the 'old wastewater' has left the suction hose.
- **SUCTION:** the air pump changes rotation and a vacuum is created inside the sample chamber. Wastewater will be sucked up through the suction hose until it reaches the level pins. If the pins aren't reached within a programmed time (**default 30 sec.**) the sampling system will count an error sample and will wait until the next sample must be taken. After (**default setting 3**) error samples the sampling system will switch in alarm.
- **DOSE:** The level switch changes the rotation direction of the pump. This creates pressure in the sample chamber and will blow the excess volume back through the suction hose. After a short period (**default 10 sec.**) air bubbles escape from the end (inlet) of the suction hose.
- **PINCHER OPEN:** the pincher opens and the sample will drop to the container. After several seconds the air pump stops and the cycle is complete. The sampler waits a minimum of 1 minute* (due to cooling period air pump) till the next automatic sample is taken.

* All vacuum samplers have a 1 minute pause time between two taken samples to give the air pump time to rest / cool.

4.4 Installation instructions

Follow the following procedures during installation

- Connect the suction hose to the supplied suction hose coupling. Feed the hose through the inlet and fasten the gland air tight.
- Mount the end (inlet) of the suction hose on a fixed representative turbulent point to sample homogeneous wastewater. Ensure the suction hose is always emerged in the wastewater / medium.

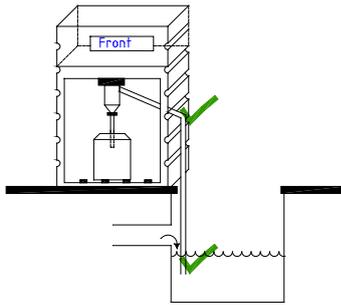


Fig. 4.4b

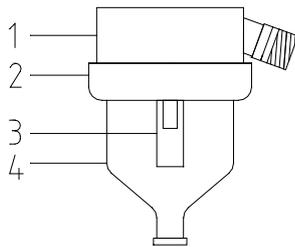


Fig. 4.5a

Keep in mind

- Maximum suction height: 4 meter.
- Maximum suction length: 20 meter.
- Avoid siphons in the suction hose.
- Mount the end (inlet) from the suction hose always downward and on a lower point than the sample chamber.

4.5 Changing sample volume

With vacuum systems the sample volume is adjustable by the length of the silicon hose (3 in Fig. 4.5a) inside the vacuum chamber (4). The longer the hose the smaller the sample volume. Standard sample volume is ± 50 cc. Follow the following procedures to change the sample volume.

- Disconnect power supply.
- Carefully loosen the PP glass holder (2) counter clockwise until the glass (4) is loose from the vacuum head.
- If necessary remove the white bolt from the pincher to create more working space.
- Determine the length of the silicon hose (3) (lengthen or shorten).
- Reassemble the parts and connect power supply.

4.6 Maintenance Vacuum samplers

Be aware! Remove power supply, compressed air supply and medium pressure before maintenance or reparations.



Maintenance and reparations should be done by qualified personnel.



Avoid direct contact with wastewater / medium. Wear protective gloves during use, maintenance and reparations of the sampler.



Be aware! When removing the sample drain hose from the pincher, the danger of fingers entering the pincher occurs. This can cause serious injuries.



Points of attention Vacuum samplers

- Clean the inside of the vacuum chamber.
- Check if the silicone sample hose is intact, replace if necessary.
- Check regularly if the suction hose is clean and intact, replace if necessary.
- Regularly check the air pump capacity.
- Check if the power supply is $24 \pm 0,1$ VDC.

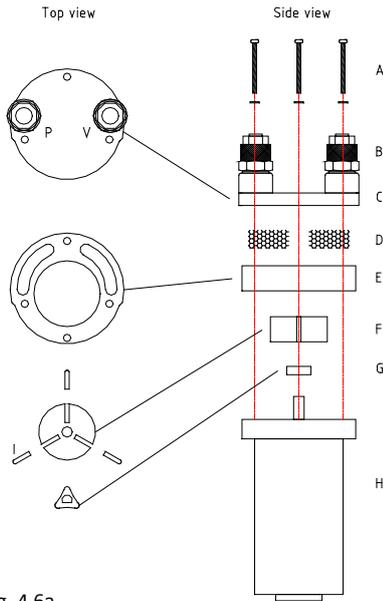


Fig. 4.6a

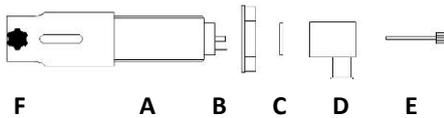


Fig. 4.6b

Revision Vacuum samplers

When the capacity of the air pump decreases, the filters inside the pump need to be cleaned. Remove the pump from the electronic compartment. Loosen the four M4 bolts from the pump head and remove the 2 filters (D) from the pump head. Clean the filters with tap water and let them dry.

Be aware! Reassemble the pump exactly as seen in fig 4.6a.

Replacing pincher

- Remove power supply
- Loosen the connector bolt (E) from the pincher connector (D) by hand. Remove the white bolt (F) which holds the silicon hose and loosen the nut (B) from the enclosure (A).
- Remove the pincher and replace the new pincher.
- Place the connector seal (C) and connector (D) and fasten the connector bolt (E) (**Be aware! Seal air tight**).
- Place the white bolt back in its position.
- Connect the power supply, check if the pincher works properly.

4.7 Troubleshooting

Problem	Diagnose	Solution
Sampler doesn't take any samples	Check sampling settings	→ §3.5
	End of suction hose not emerged	See installation instructions (→ §4.3)
	PP glass holder loose	Fasten glass holder
	Coupling suction hose leaks air	Fasten / replace coupling suction hose / replace O-ring
	Air pump not enough power	Check pump filters and rotor blocks (→ §4.6)
	Pincher doesn't fully pinch the silicon hose	Adjust the pot meter on the power supply to $24 \pm 0,10$ VDC
	To high pulse frequency	Max. pulse frequency: < 1 pulse / second
Air pump rotates but doesn't blow air	Rotor block inside pump is broken / worn down	Replace rotor block (→ §4.6)
Sampler skips suction	Polluted Pins inside sample chamber	Clean all wetted parts inside the sample chamber
Low sample volume	Sample volume too low adjusted	Lengthen silicon hose (→ §4.5)
	Medium enters sample chamber too quickly	Contact your supplier

5 ILS Guillotine G05
5.1 Technical specifications



ILS "Guillotine" 05 according ISO 5667-2&10 and NEN 6600-1	
Sample characteristics <ul style="list-style-type: none"> • Sample cycle • Wetted parts • Material plunjer • Material seals • Wastewater temperature • Maximum pressure • Minimal pipe diameter • Minimal diameter • Sample volume 	Principle Plunjer / Cutting device <ul style="list-style-type: none"> • ± 5 sec total • SS 316 V4A, PTFE, Viton, POM, Silicon • SS 316 V4A • Viton & PTFE • Max 35°C (higher on request) • 2 Bar (higher optional) • 100 mm smaller use special AVM fitting • 14 mm • 50 ml fixed volume (optional smaller volume)
Actuator <ul style="list-style-type: none"> • Air supply • Protection class • Enclosure cylinder • Air connection • Activation time • Response contact 	Pneumatic <ul style="list-style-type: none"> • 6-8 bar conditioned • IP 65 • Hard Anodized Aluminum cylinder • Coupling for 8 mm compressed air hose • 5 sec. • Optional
Valve (optional) <ul style="list-style-type: none"> • Power supply • Current 	5/2 Valve, with NAMUR <ul style="list-style-type: none"> • 24 VDC ±5% / 0.13A • 0.13A
Surrounding conditions <ul style="list-style-type: none"> • Ambient temperature • Zone 	<ul style="list-style-type: none"> • 0,1°C tot +40°C (lower optional) • Not in explosion hazardous areas

5.2 Maten en Onderdelen

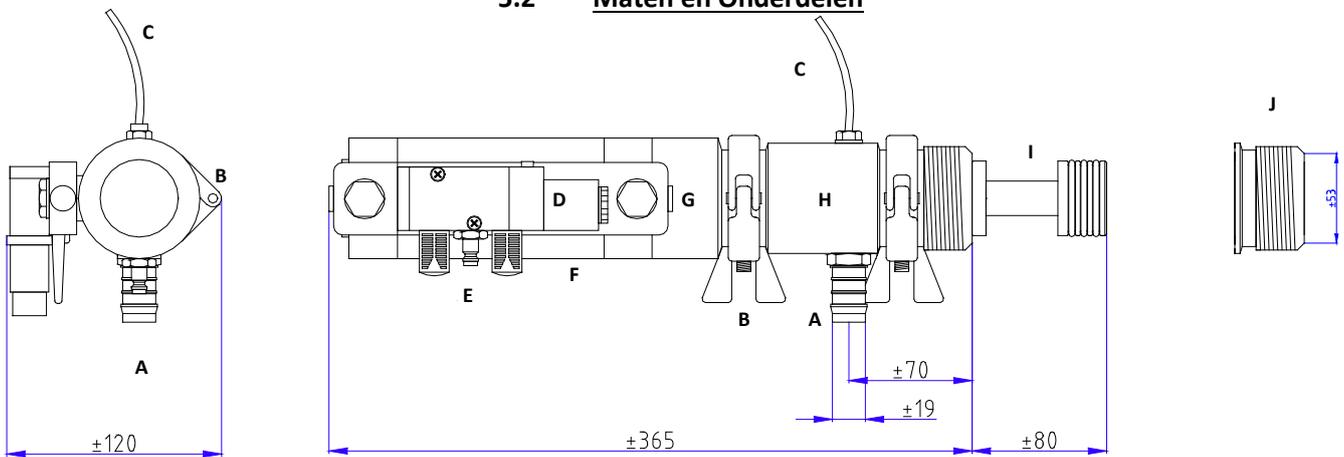


Fig. 5.2a

- A) Sample drain Pillar
- B) SS Tri-clamp couplings
- C) Exhaust
- D) Magnet for 5/2 valve (valve is optional)
- E) Air coupling
- F) Cylinder
- G) POM nose block
- H) SS 316 Enclosure
- I) SS 316 Plunjer
- J) Mounting welding ridge with 2" thread

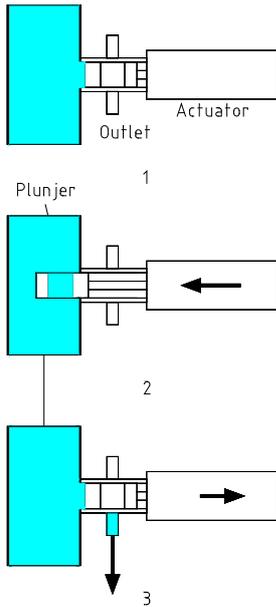


Fig. 5.3a

5.3 Principle of operation

The sampling cycle from a ILS Guillotine sampler:

- The sampler is in **standby position**, the plunger has its cavity above the outlet.
- When the actuator is driven by compressed air the plunger will “shoot” inward the piping and the cavity will fill with medium (**fill position**).
- After several seconds the plunger shoots back in the enclosure and medium from the cavity drains through the outlet. After draining the sample the sampler goes back in to **standby position**.

5.4 Installation instructions

See fig. 5.4 for installation instructions. Keep in mind:

- Place sampler in a 100% filled pipe free from air inclusion and in horizontal piping with a minimum flow velocity of 0,5/s.
- Ensure there is enough height for the silicon hose which enters the inlet in the enclosure.
- Do not place the sampler in turns or reduces.
- For safe maintenance and reparations the sample pipe needs to be empty.
- Don't place the sampler in or after a downward flow.
- Maximum pipe pressure 2 bar.
- Ensure the sampler doesn't stick in the piping in standby position.

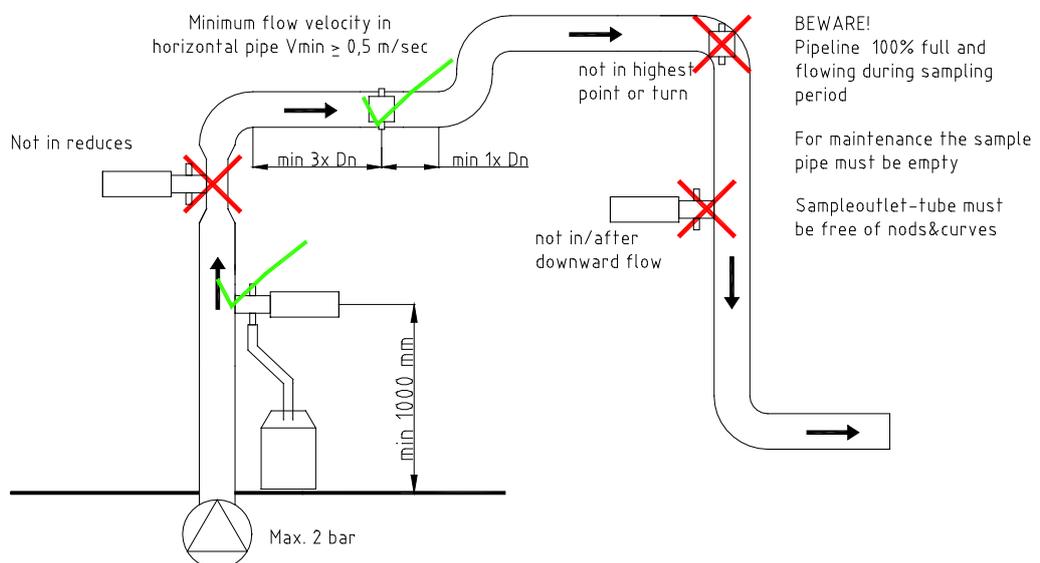


Fig. 5.4a

5.5 Changing sample volume

To change the sample volume from the ILS Guillotine Sampler the plunger needs to be replaced. There are different plungers with a sample volume < 50 cc available.

5.6 Maintenance

Be aware! Remove power supply, compressed air supply and medium pressure before maintenance or reparations.

Maintenance and reparations should be done by qualified personnel.

Avoid direct contact with wastewater / medium. Wear protective gloves during use, maintenance and reparations of the sampler.

Be aware! When removing the sample drain hose from the pincher the danger of fingers entering the pincher occurs. This can cause serious injuries.

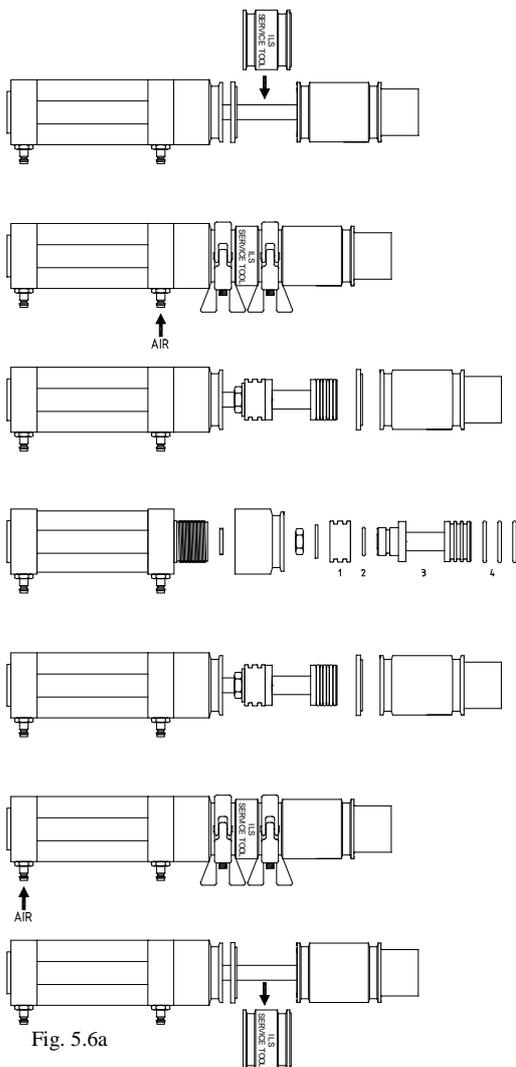


Fig. 5.6a

Maintenance:

Regularly clean the plunger, sample outlet pillar and sample drain hose with a soft brush and tap water (depends on use and sample frequency). Replace parts when necessary. Regular check if the seals on the plunger are worn.

Disassembly:

- Remove the front TRI-Clamp coupling and pull the sampler from the piping.
- Remove the 2nd TRI-Clamp coupling and pull the enclosure away from the cylinder.
- Place the ILS-service tool around the axle and mount it with 2 TRI-Clamp couplings.
- Place compressed air on coupling B and the plunger shoots backwards (**BE AWARE OF YOUR FINGERS!**).
- Remove the ILS-service tool and pull the enclosure loose from the last seals on the plunger.
- Loosen the locking nut from the plunger and loosen the plunger from the axle

Revision:

Replace the seals on the plunger (3 in fig 5.6a), 3x Viton large (4), 1 Viton small (2) and 1 Teflon (1). Loosen the black protection cover from the cylinder to replace the x-ring on the axle.

Mounting

Work opposite to the disassembly to assemble the sampler. When placing the seals make use of some form of lubricant.

5.7 Trouble shooting

Problem	Diagnose	Solution
Sampler doesn't sample automatic	Check sampling settings	→ §3.5
	No compressed air	Connect compressed air
	Connector not correctly connected	Rewire connector (→ §5.4)
	Cylinder leaks air	Replace cylinder
Low sample volume	Plunjer polluted	Clean plunjer (→ §5.6)
	Sampling in a downward flow	See installation instructions (→ §5.3)
Sampler works but doesn't discharge medium	Plunjer clogged with dirt	Clean plunjer (→ §5.6)
	Sample drain outlet clogged	Clean sample drain (→ §5.6)
Sampler leaks medium from sample outlet	Leaking / worn seal / O-rings	Replace seal / O-rings (→ §5.6)
Sampler drops sample on activation	Air coupling wrongly connected	Switch couplings on cylinder

6 ILS 2-Way Electric PVC)

6.1 Technical specifications



ILS 2WE 412 conform NEN 6600-1 & ISO 5667-2&10	
Sample characteristics <ul style="list-style-type: none"> • Sample cycle time • Material enclosure • Material bullet/seals • Wastewater temperature. • Maximum pressure • Minimum diameter • Sample volume 	Principle 2 way rotating bullet <ul style="list-style-type: none"> • ±32 sec. total • PVC-C • SS 316 V4A/ PTFE + Viton • max. 35°C (higher on request) • 2 bar • 13 mm • ±50 ml
Actuator <ul style="list-style-type: none"> • Power supply • Current • Duty cycle • Protection class • Enclosure • Max. moment • Position-indicator • Connections • Activation time • Manual operation • Response contact 	Electric <ul style="list-style-type: none"> • 24 VDC • 1A • 35% at 20°C • IP 65 • Polyamide • 20 Nm max. 25 Nm • Visual • 3 P+E connector, DIN 34650 • 16 sec. + optional flush time • Yes, by position indicator • Yes
Surrounding conditions <ul style="list-style-type: none"> • Ambient temperature • Zone 	<ul style="list-style-type: none"> • 0,1°C till +40°C (lower optional) • Not in explosion hazardous areas

6.2 Measurements and parts

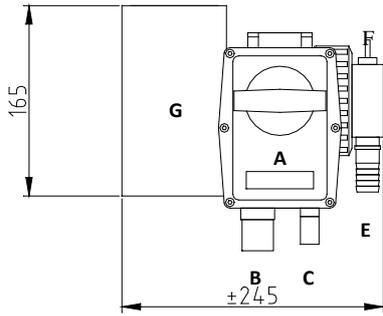
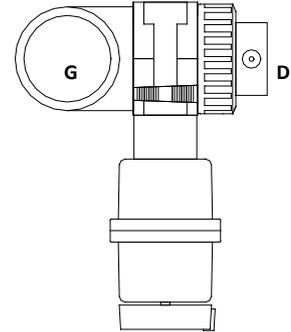
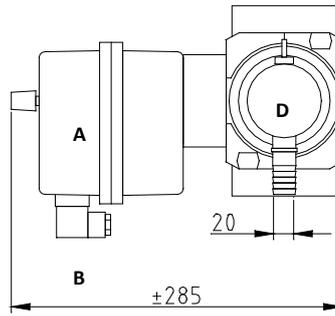


Fig. 6.2a



- A) Electric actuator
- B) Connector power supply
- C) Connector response contact
- D) End cap
- E) Sample drain
- F) Exhaust
- G) 75mm PVC glue socket

6.3 Principle of operation

The sample cycle from a ILS “2W” sampler works as followed:

- Standby position sampler, the sample ball has it’s cavity pointed to the drain outlet from the sampler.
- The sample bullet will turn 180° during activation and the cavity will fill itself with medium.
- When the activation stops, the sample bullet will rotate 180° back and drop the sample through the outlet and silicon hose to the sample container. See fig. 6.3a.

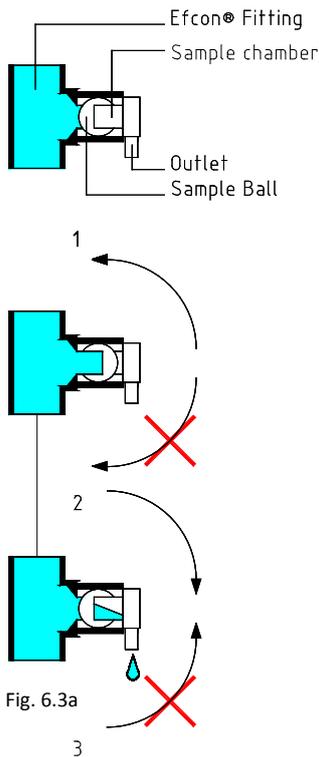


Fig. 6.3a

Be aware!

Ensure the cavity in the sample bullet (sample chamber) turns upside.

Manual operation

Set the switch beneath on the actuator to (B) MAN (manual) and turn the sample bullet in the sampler by turning the position indicator. Set the switch on the actuator to (A) AUTO (Automatic) for electric sampling.

6.4 Installation instructions

See fig. 6.4a for installation instructions, keep in mind:

- Place sampler in a 100% filled pipe free from air inclusion and in horizontal piping a minimum flow velocity of 0,5/s.
- Ensure there is enough height for the silicon hose which enters the inlet in the enclosure.
- Do not place the sampler in turns or reduces.
- For safe maintenance and reparations the sample pipe needs to be empty.
- Don't place the sampler in or after a downward flow.
- Maximum pipe pressure 12 bar.

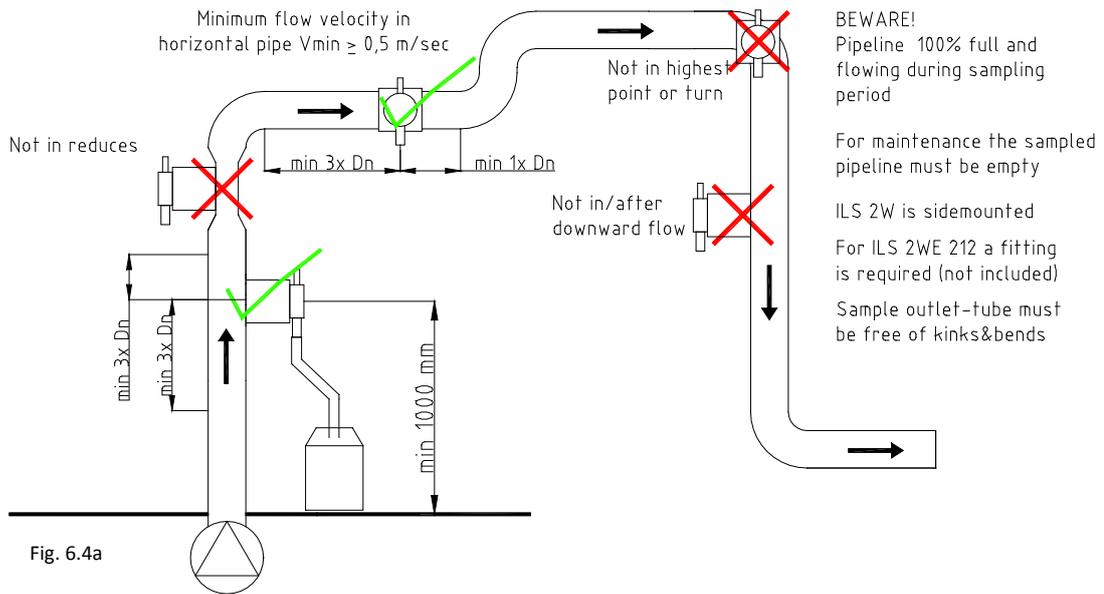


Fig. 6.4a

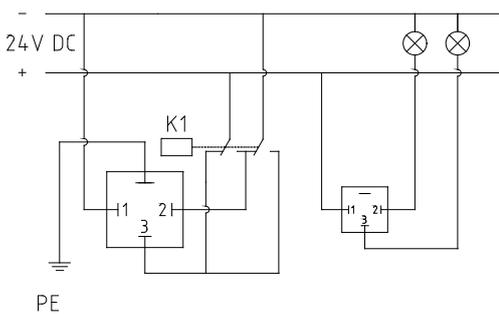


Fig. 6.4b

Electric sampler actuators

Follow the diagram in fig. 6.4b for wiring the connectors.

The relay K1 needs to be active during ±18 sec + flush time to take a sample.

The small connector is connected to 2 cam switches (upper 2 in actuator). By removing the locking plates, the cams can be positioned.

- Pen 1 = Common
- Pen 2 = Cam switch S3
- Pen 3 = Cam switch S4

To guarantee an IP 65 protection class, a power cable should be chosen with a correct diameter. Check the table below.

Connector small		Connector large	
Min. diameter	Max. diameter	Min. diameter	Max. diameter
5 mm	6 mm	8 mm	10,5



6.5 Maintenance

Be aware! Remove power supply, compressed air supply and medium pressure before maintenance or reparations.



Maintenance and reparations should be done by qualified personnel.



Avoid direct contact with wastewater / medium. Wear protective gloves during use, maintenance and reparations of the sampler.



Be aware! When removing the end cap from the enclosure, the danger of fingers entering the sample bullet occurs. This can cause serious injuries.

Points of attention

- Regular clean all parts which come in contact with wastewater / medium (sample hose and inside of sampler). Remove the end cap to access all wetted parts inside the sampler.
- Clean the cavity of the sample bullet, end cap and hose tail with a soft broom.

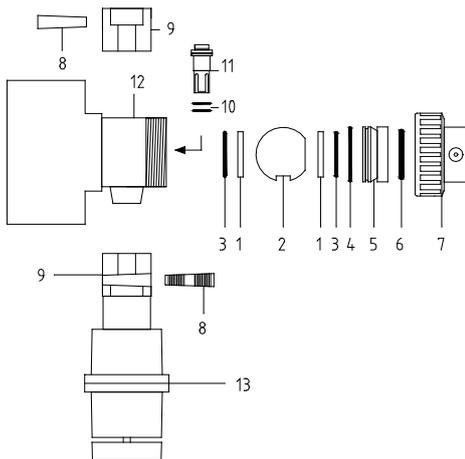


Fig. 6.5a

Revision

- Carefully remove the two wedges (8) from the valve holder (9), remove the actuator (13) from the enclosure (12).
- Loosen the end cap (7) from the enclosure. Loosen the left thread seal holder (5) with the handle from the seals set.
- Replace the seal (1) from the seal holder (8) from the enclosure and replace the seal (1) on the inside. Ensure O-rings (3) are placed behind the seals.
- Push the drive axle (11) from the ball to the inside of the enclosure and replace the 2 O-rings (10) on the axle.
- Check if the other O-ring (4&6) still seal, if not replace them.

6.6 Trouble shooting

Problem	Diagnose	Solution
Sampler doesn't turn	No power supply	Connect power supply (→§6.4)
	Wrong connector connection	Rewire connector (→§6.4)
	Sampler is on Manual control	Turn switch to (A) auto control
	Electric overload safety active, due to blockage	Disconnect power supply Remove blockage connect power supply
	Defect actuator	Replace actuator
Low sample volume	Sampling in a downward flow	See installation instructions (→§6.4)
	Sample bullet polluted	Clean sample bullet (→§6.5)
	Sample bullet cavity not filled	Lengthen the activation contact(→§3.5)

Sampler turns but doesn't discharge medium	Sample bullet clogged with dirt	Clean bullet / end cap (→§6.5)
Sampler leaks medium	Leaking seal / bullet / O-rings	Replace seals, bullet / O-rings (→§6.5)
Sampler discharges sample after 1 180° turn	Sample bullet misplaced	Open sampler, turn sample bullet 180° (→§6.5)
No response contact	Connector wrongly connected	Rewire connector(→§6.4)

7 ILS 3-Way Pneumatic SS

7.1 Technical specifications



ILS3WP 222& 3WP 422 according NEN 6600-1&ISO5667-2&10	
Sample characteristics <ul style="list-style-type: none"> • Sampler cycle time • Material enclosure • Material sample bullet • Material piping • Medium temperature. • Maximum pressure • Connection sample inlet • Diameter sample pipe • Minimum outlet diameter • Sample volume 	Principle 3 way flush system <ul style="list-style-type: none"> • Dependable • SS 316 • SS 316 V4A • SS 316 • max 60°C (higher on request). • 2 Bar (higher optional) • G¾" / G1½ • 20 / 40 mm, other diameters on request • 14 mm • fixed volume, manually controlled
Actuator <ul style="list-style-type: none"> • Air supply • Protection class • Enclosure • Max. torque • Position-indicator • Activation time • Response contact • Power supply valve • Current • Connection air supply • Exhaust • Connector 	Type ILS 3WP222 Pneumatic <ul style="list-style-type: none"> • 6-8 bar conditioned • IP 65 • Hard Anodized Aluminium • 50 Nm • Visual (optional) • 3 sec • Optional • 24 VDC ±5% / 0.13A • 0.13A • ILS coupling 8 mm tube fitting • With silencer and exhaust regulator • DIN43650-A
Surrounding conditions <ul style="list-style-type: none"> • Ambient temperature • Zone 	<ul style="list-style-type: none"> • 0,1°C tot +40°C (lower optional) • Not in explosive hazardous environment

7.2 Measurements and parts ILS 3WP SS

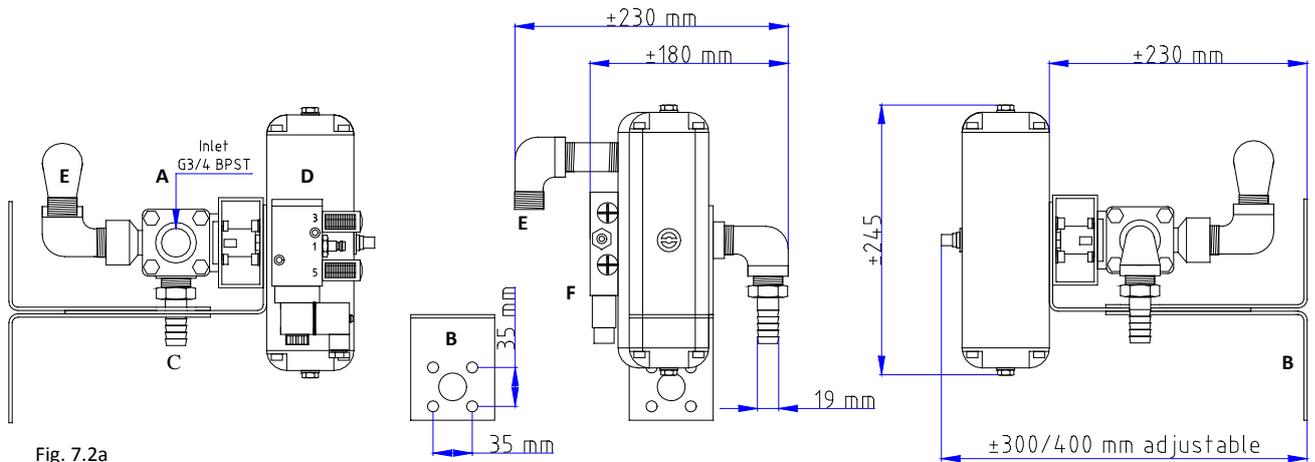


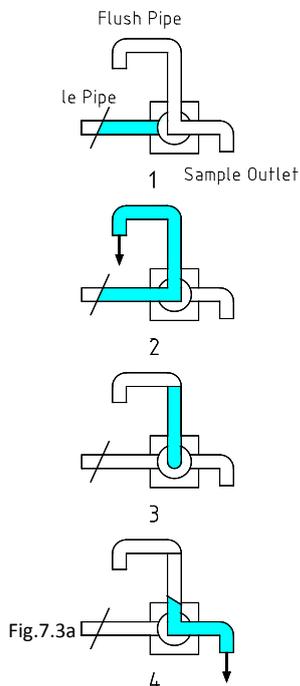
Fig. 7.2a

- A) Supply pipe fitting Inlet
- B) Mounting bracket
- C) Pillar for sample drain
- D) Pneumatic actuator
- E) Flush water drain
- F) Namur valve

7.3 Operation Principle ILS 3WP SS

The sample cycle of the ILS "3W" sampler works as followed:

- **Standby position** sampler, the sample bullet has its cavity pointed to the sample outlet.
- After closure of relay contact K1 (see diagram §1.7) the sample ball will rotate towards flush position and will stay there as long as contact K1 is closed. At this point the sample ball makes a passage between supply inlet and flush outlet: **flush position**.
- When contact K1 opens, the sample ball will rotate back towards its rest / drain position. The sampled medium will stay in the sample pipe.
- **Rest / drain position** and the sample pipe will drain empty.



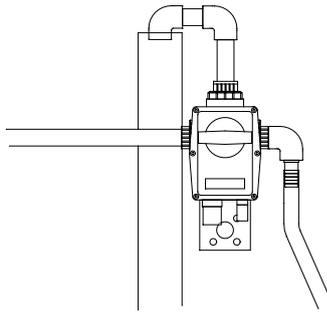


Fig. 7.4a

7.4 Installation instructions

- Mount the sampler water levelled to a vertical wall with the supplied bracket. Ensure there is enough height for a proper discharge of the sample to the container.
- Ensure a wide dimensioning of the flush pipe (minimum 50mm). **Be Aware! Flush for a representative sample min. 3x the volume of the supply pipe.**
- Mount the supply pipe to a 100% filled pipe (see fig 7.4a). Keep the supply pipe as short as possible. **Be aware! The supply pipe needs to be disconnected for safe maintenance and reparations.**
- Place the sample drain hose over the pillar from the sample outlet of the sampler. **Be aware! Keep the length of the sample drain hose as possible and free from siphons and nods.**

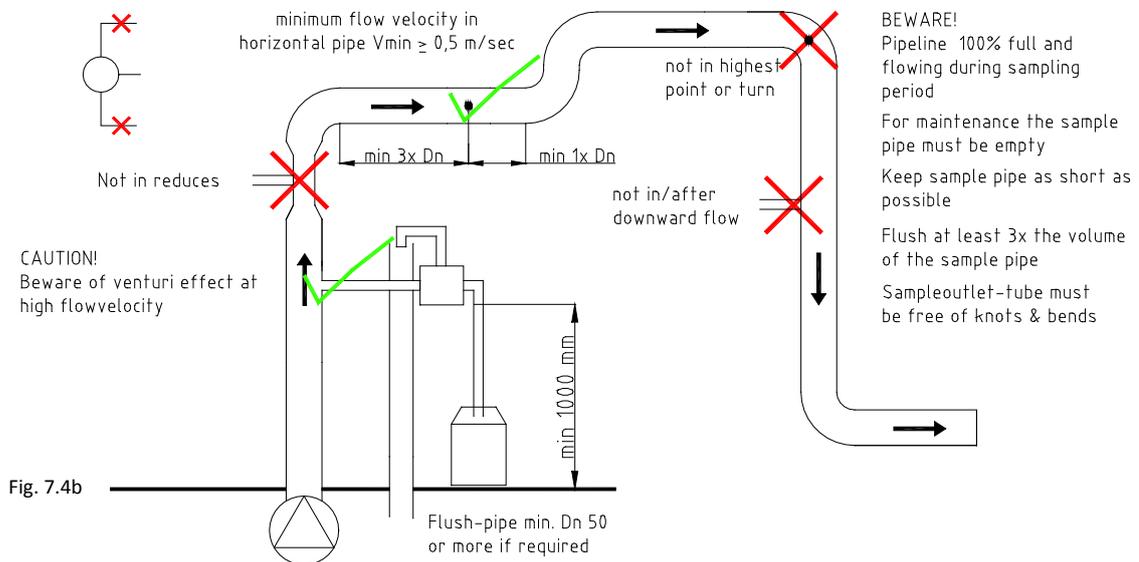


Fig. 7.4b

7.5 Changing sample volume

Contact your supplier.

7.6 Maintenance



Be aware! Remove power supply, compressed air supply and medium pressure before maintenance or reparations.



Maintenance and reparations should be done by qualified personnel.



Avoid direct contact with wastewater / medium. Wear protective gloves during use, maintenance and reparation of the sampler.



Be aware! When removing the inlet or outlet from the enclosure, the danger of fingers entering the sample bullet occurs. This can cause serious injuries.

Point of attention

- Clean the interior of the sample bullet, piping and hose tail with a soft brush and tap water.
- Replace sample hose if necessary.
- Check air connections.

Revision

- Remove the actuator (1) by loosening the 4 hex bolts beneath the actuator.
- Remove the seals (9) and turn the rotation axle (13) 90° to remove the sample ball (8) from its enclosure.
- Push the lock plate (3) loose from the nut (2), loosen the nut from the axle (15) and take the axle from the enclosure. Replace the lower seal (14) on the axle and replace the axle.
- Replace the upper seal (7) from the axle and the washers (6), place the SS ring (5), the 2 spanners (4), the lock plate (3) and fasten the axle with the nut (2).
- Lock the nut by bending the lock plate backwards. Replace the 2 seals (10).
- Reassembly the sampler and check operation.

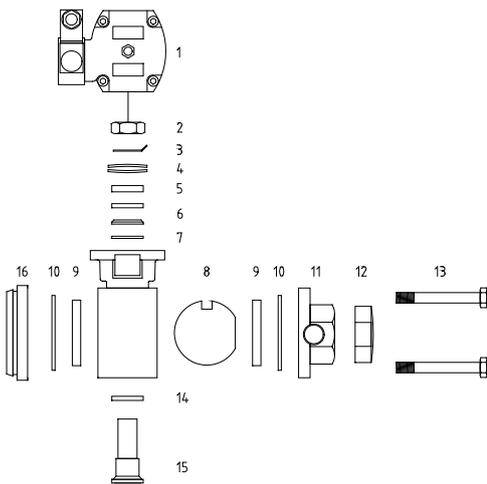


Fig. 7.6a

7.7 Trouble shooting ILS 3WP SS

Problem	Diagnose	Solution
Sampler doesn't turn	No compressed air supply	Connect air supply(→§1.7)
	Connector wired wrong	Connect wiring(→§1.7)
	Defect actuator	Replace actuator
Low sample volume	Bullet clogged	Clean bullet (→§2.2)
	Sampling in a downward flow	Installation error (→§1.5)
Sampler turns without discharging medium	Drain outlet clogged	Cleanse drain outlet (→§2.2)
	Bullet clogged	Cleanse bullet (→§2.2)
Sampler leaks medium	Leaking seal/bullet / O-rings	Replace seal, bullet/. O-rings (→§2.2)
Sampler discharges sample after a 180° turn	Bullet installed wrong	Open sampler and turn the sample bullet 180°

8 ILS 3 way PVC

8.1 Technical specifications ILS 3WE PVC



ILS 3WE 212 according NEN 6600-1 & ISO 5667-2&10	
Sample characteristics <ul style="list-style-type: none"> • Sample cycle time • Material enclosure • Material piping • Material bullet / seals • Wastewater temperature. • Max. medium pressure • Minimum diameter • Sample volume 	Principle 3 way flush system <ul style="list-style-type: none"> • ±32 sec + flush time • PVC-C • PVC-C • SS 316 V4A / PTFE + Viton • max. 35°C (higher on request) • 2 bar • 13 mm • 50 ml fixed volume (optional other volumes)
Actuator <ul style="list-style-type: none"> • Power supply • Current • Duty cycle • Protection class • Enclosure • Max. moment • Position-indicator • Connections • Activation time • Manual operation • Response contact 	Electric <ul style="list-style-type: none"> • 24 VDC • 1A • 35% at 20° C • IP 65 • Polyamide • 20 Nm m 25 Nm • Visual • 3 P+E connector, DIN 34650 • 16 sec. + optional flush time • Yes, by position indicator • Yes
Surrounding conditions <ul style="list-style-type: none"> • Ambient temperature • Zone 	<ul style="list-style-type: none"> • 0,1°C tot +40°C (lower optional) • Not in explosion hazardous areas.

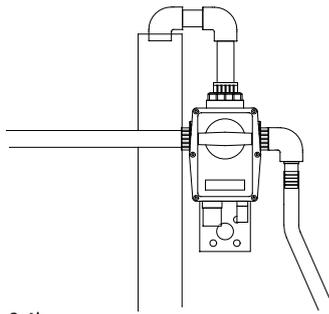


Fig. 8.4b

- Mount the sampler water levelled to a vertical wall with the supplied bracket. Ensure there is enough height for a proper discharge of the sample to the container.
- Ensure a wide dimensioning of the flush pipe (minimum 50mm). **Be Aware! Flush for a representative sample min. 3x the volume of the supply pipe**
- Mount the supply pipe to a 100% filled pipe (see fig 8.4a). Keep the supply pipe as short as possible. **Be aware! The supply pipe needs to be disconnected for safe maintenance and reparations.**
- Place the sample drain hose over the pillar from the sample outlet of the sampler. **Be aware! Keep the length of the sample drain hose as short possible and free from siphons and nods.**

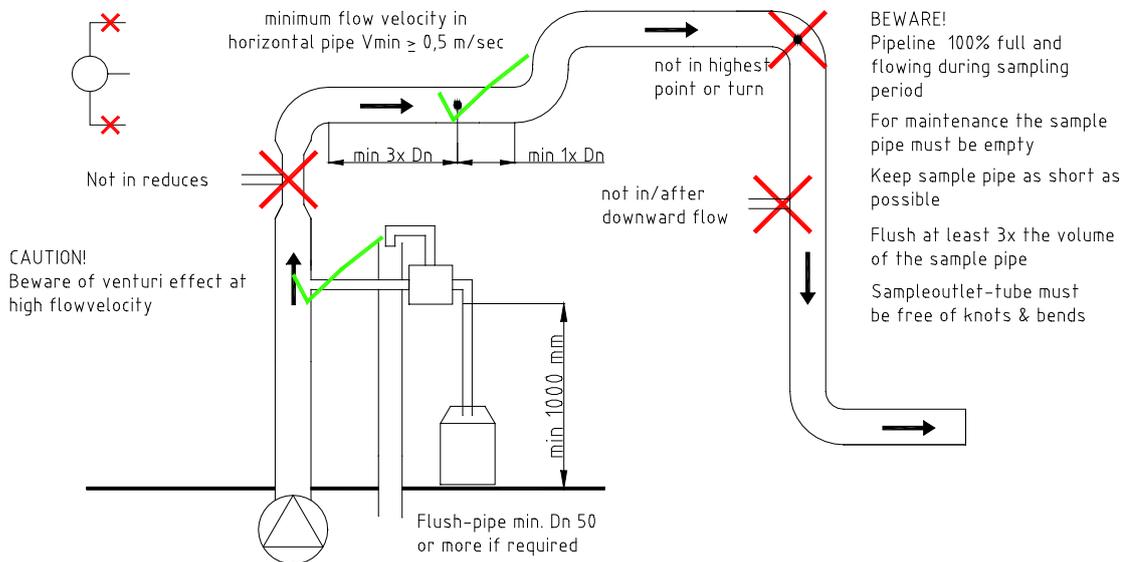


Fig. 8.3c

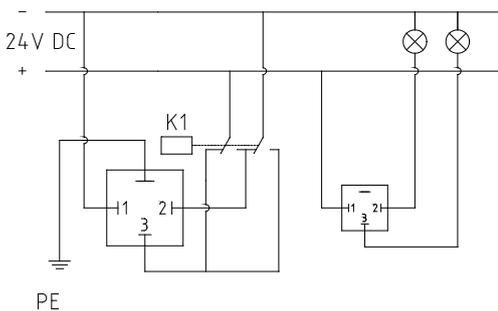


Fig. 8.4d

Electric sampler actuators:

Follow the diagram in fig. 8.4d for wiring the connectors.

Activate relay K1 is during ±18 sec + flush time to take a sample.

The small connector is connected to 2 cam switches (upper 2 in actuator). By removing the locking plates, the cams can be positioned.

- Pen 1 = Common
- Pen 2 = Cam switch S3
- Pen 3 = Cam switch S4

To guarantee an IP 65 protection class, a power cable should be chosen with a correct diameter, check the table below:

Connector small		Connector large	
Min. diameter	Max. diameter	Min. diameter	Max. diameter
5 mm	6 mm	8 mm	10,5

8.5 Changing sample volume

Contact your supplier.

8.6 Maintenance

Be aware! Remove power supply, compressed air supply and medium pressure before maintenance or reparations.

Maintenance and reparations should be done by qualified personnel.

Avoid direct contact with wastewater / medium. Wear protective gloves during use, maintenance and reparation of the sampler.

Be aware! When removing the inlet or outlet from the enclosure the danger of fingers entering the sample bullet occurs. This can cause serious injuries.



Points of attention

- Clean the interior from the sample bullet, piping and hose tail with a soft brush and tap water.
- Replace sample hose if necessary.
- Check air connections

Revision ILS 3WE

- Carefully remove the 2 wedges (8) from the valve holder (9) and remove the actuator (13) from the valve enclosure(12).
- Loosen the inlet and sample outlet (7) from the enclosure.
- Loosen the left threaded spanner (5) with the handle supplied with the seal set.
- Replace the seal (1) from the spanner (8). Remove the sample bullet (2) from the enclosure and replace the seal (1) on the inside.
- Be aware the O-rings (3) are replaced behind the seals.
- Push the axle (11) from the bullet to the inside, take it out and replace the O-rings (10) on the axle.
- Check if other O-rings (4&6) need replacements.

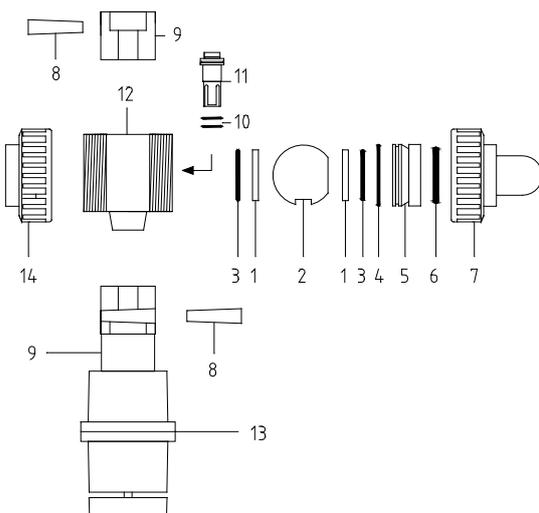


Fig. 8.5a

8.7 Trouble shooting

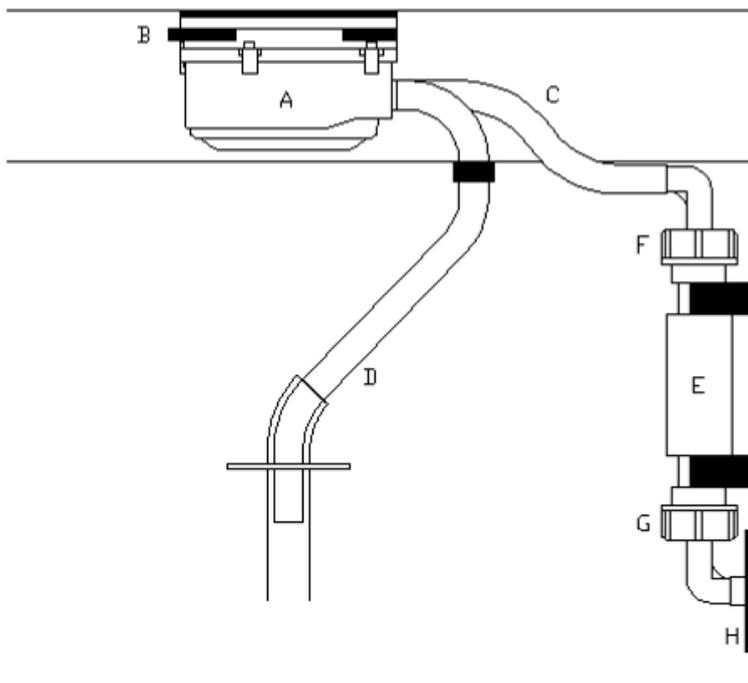
See §6.6 and §7.7.

9 Peristaltic sampler

9.1 Technical specifications Peristaltic

Peristaltic pump	
Sample characteristics <ul style="list-style-type: none"> • Sample cycle time • Material enclosure • Material tubing • Dimensions tubing • Wastewater temperature. • Max. medium pressure • Maximum suction height • Suction velocity • Tubing life time • Suction hose 	Peristaltic <ul style="list-style-type: none"> • ±32 sec + flush time • POM • Norprene© • 9,5 x 2.4 • max. 50°C (higher on request) • 5 m H₂O • 5 m H₂O • 0,6 m/s at 4m height • 200 hours (depending medium) • standard 5m included
Peristaltic pump <ul style="list-style-type: none"> • Power supply • Current • Duty cycle • Max. moment • Connections 	Electric <ul style="list-style-type: none"> • 24 VDC • 1,5A • 35% at 20° C • 20 Nm - 25 Nm • Molex 2 pole

9.2 Parts



- A) Pump body
- B) Quick release pump body
- C) Intake tubing
- D) Outlet tubing
- E) Medium detector
- F) Intake tubing coupling
- G) Suction hose coupling
- H) Inlet for suction hose

Fig. 9.2a

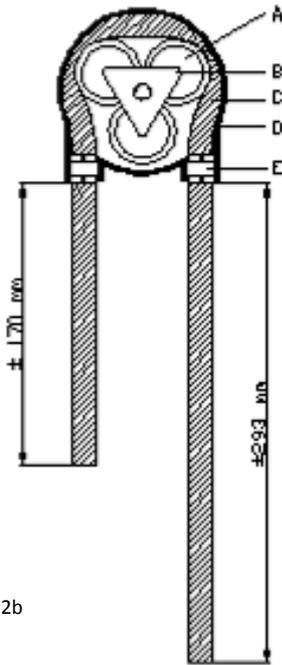


Fig. 9.2b



- A) Rollers
- B) Roller holder
- C) Tubing
- D) Pump body
- E) Tubing clip
- F) Pump lid
- G) Spring clip

9.3 Principle of operation

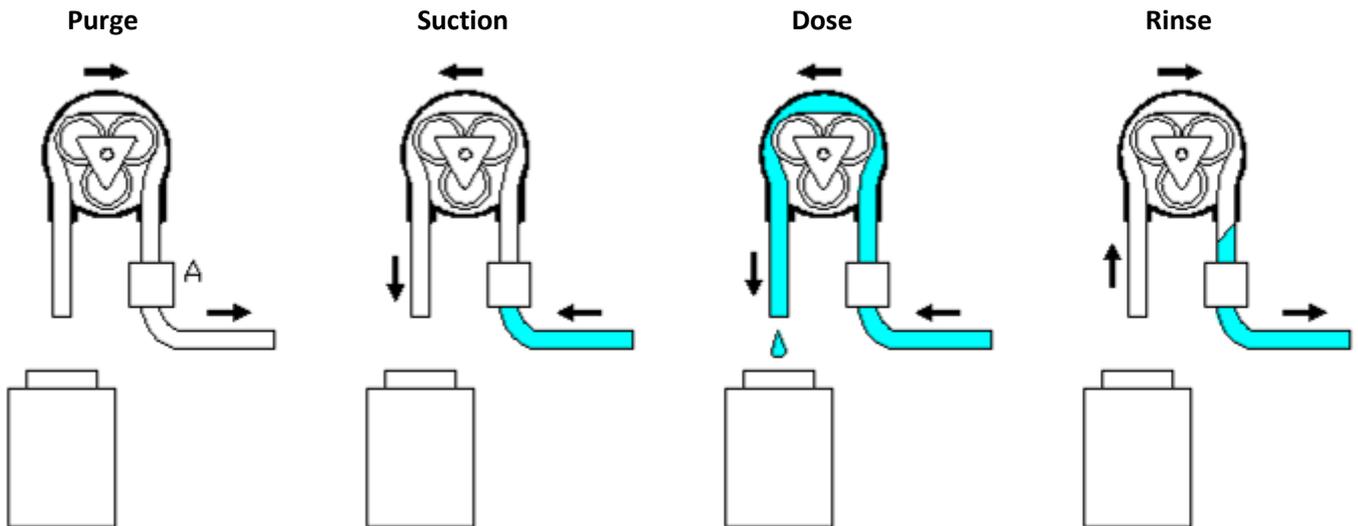


Fig. 9.3a

- 1) **Purge:** When taking a sample the sampler starts purging the suction hose during a set time (parameter PurgeT, default 10 seconds). This is to remove the old medium from the suction hose through the inlet.
- 2) **Suction:** The samplers starts creating a vacuum on the inlet until medium reaches the medium detector (A in fig 9.3a). When the sampler doesn't detect the medium within a set time (parameter Suction, default 30 seconds), an error sample is counted.
- 3) **Dose:** After the medium is detected the sampler doses the medium during a set time (Dose time: 6 seconds default).
- 4) **Rinse:** When a sample is dosed, the peristaltic pump creates pressure again on the inlet to rinse all the excess water from the tubing inside the pump and suction hose all during a set time (Parameter RinseT, default 10 seconds).

9.4 Installation instructions

Follow the following procedures during installation:

- Connect the suction hose to the supplied suction hose coupling. Connect the coupling to the medium detector. Feed the hose through the inlet and fasten the gland air tight.
- Mount the end (inlet) of the suction hose on a fixed representative turbulent point to sample homogeneous wastewater. Ensure the suction hose is always emerged in the wastewater / medium.

Keep in mind:

- Maximum suction height: 8 meter
- Maximum suction length: 30 meter

9.5 Changing the sample volume

To change the sample volume, change the Dose time with parameter DoseT. To increase the sample volume, lengthen the dose time.



Beware: Changing the suction hose length or diameter will change the suction velocity, which changes the sample volume as well.

9.6 Maintenance



Be aware! Remove power supply, compressed air supply and medium pressure before maintenance or reparations.



Maintenance and reparations should be done by qualified personnel.



Avoid direct contact with wastewater / medium. Wear protective gloves during use, maintenance and reparation of the sampler.



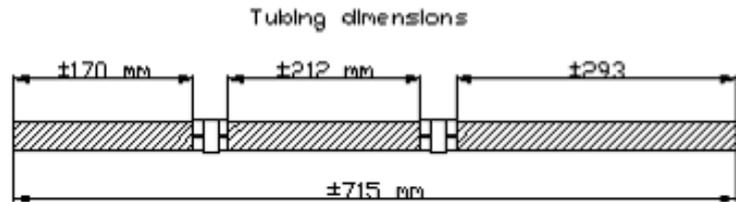
Be aware! When removing the inlet or outlet from the enclosure the danger of fingers entering the sample bullet occurs. This can cause serious injuries.

Points of attention

- Clean the interior of the medium detector, piping and coupling (all wetted parts) with a soft brush and tap water, on a regular basis. The interval depends on the sampled medium.
- Replace suction hose if necessary.
- Check condition of the tubing inside the pump, replace when necessary.

Replacing the tubing inside the pump body

- Loosen the tubing from the detect block and silicon hose.
- Remove the pump body from the sampler by pressing the quick release to the right.
- By carefully pressing (by hand) the clips on the side of the pump body, you can remove the lid from the body to access the tubing.
- Remove the rollers and holder and take out the tubing.
- Remove the tubing-clips.
- Cut new tubing with the dimensions shown below.



- Place the tubing clips with the correct spacing in between.
- Replace the tubing and rollers inside the pump body.
- Close the pump body with the lid.
- Replace the pump inside the sampler.
- Restore the tubing connections.
- Take a sample and check if everything functions.

10 Spare parts

Recommended spare parts

	Art. code	Description	SL1...	SL2...	SL3...	SL4...	SL5...	SL6...
1	SIL-21x15	Silicon sample hose (meter)	•	•	•	•	•	•
2	FUSE 250V T5A	Fuse T3,15A	•	•	•	•	•	•
3	FUSE 250V T3.15A	Fuse T5A	•	•	•	•	•	•
4	KEY-333	Key for Doorlock	•	•	•	•	•	•
5	SCC 001	Sample Container 1 litre	•	•	•	•	•	•
6	SCC 002	Sample Container 2 litre	•	•	•	•	•	•
7	SCC 013	Sample Container 13 litre	•	•	•	•	•	•
8	SCC 018	Sample Container 18 litre	•	•	•	•	•	•
9	SCC 020	Sample Container 20 litre	•	•	•	•	•	•
10	SCC 025	Sample Container 25 litre	•	•	•	•	•	•
11	SCC 050	Sample Container 50 litre	•	•	•	•	•	•
12	CON-A4P	Pulse input/alarm output connector	•	•	•	•	•	•
13	VS-PRB-4mwk	Pump rotor block + 3x Rotor discs	•					
14	VS-PRBH-4mwk	Pump rotor block holder	•					
15	VS-PRB-6MWK	Pump rotor block + 4x Rotor discs	•					
16	VS-PVC-21x16	PVC suction hose 16 mm (standard)	•					
17	VS-PVC-18x13	PVC suction hose 13 mm	•					
18	VS-CSH-16	Connector for 16mm suction hose	•					
19	VS-CSH-13	Connector for 13mm suction hose	•					
20	VS-GLASS-02	Sample Chamber Glass (Borosilicate)	•					
21	VS-PC-06	Sample Chamber Polycarbonaat	•					
22	ILS 60-P-SEAL	ILS Guillotine revision seals		•				
23	ILS-G05-SEAL	ILS Guillotine 05 revision seals		•				
24	AIR-5/2-VALVE	5/2 Valve for pneumatic samplers		•	•		•	
25	ILS-2W-SS-SEAL	ILS 2WP SS revision seals			•			
26	ILS-2W-PVC-SEAL	ILS 2WE PVC revision seals				•		
27	ILS-3W-SS¾-SEAL	ILS 3WP SS ¾" revision seals					•	
28	ILS-3W-SS1½-SEAL	ILS 3WP SS 1½" revision seals					•	
29	ILS-3W-PVC-D25-SEAL	ILS 3WE PVC D25/dn20 revision seals						•

Spare parts

	Art. code	Description	SL1...	SL2...	SL3...	SL4...	SL5...	SL6...
1	DISTR-ENG	Distributor engine	•	•	•	•	•	•
2	FAN-ISO-24V	Fan inside isobox 24VDC	•	•	•	•	•	•
3	TEM-ISO-TAR	Temperature controler	•	•	•	•	•	•
4	VS-PIN-06	Smartpinch valve model 2006	•					
5	VS-PUMP-5MWK	Vacuum pump 5 mWk	•					
6	VS-PUMP-7MWK	Vacuum pump 7 mWk	•					
8	ILS-G05-SERVICE-TOOL	ILS Service tool		•				
9	ILS-G05-P20CC	ILS Plunjer 20 cc sample volume		•				
10	ILS-G05-P50CC	ILS Plunjer 50 cc sample volume		•				
12	ILS-G05-ACT	ILS Guillotine 05 actuator		•				
13	ILS-RESPONSE	ILS Guillotine response contact		•				
15	ILS-2/3WP-ACT	ILS 2/3 WP Pneumatic actuator			•		•	
16	ILS-2WE-BALL	ILS 2WE sample ball				•		
17	ILS-2/3WE-ACT	ILS 2/3WE 24 V actuator				•		•

11 CE-declaration

Declaration of conformity with EC directives,

**AVM b.v.,
Nieuwe weg 3B
4126 RN Hei- en Boeicop, Netherlands
Phone +31-347 342 777
Web site:
E-mail: info@avm-efcon.nl**

Manufacturer of Effluent Control Systems,

Declare under our responsibility for manufacture and supply the

Efcon[®]omy type _ _ _ _ _ Serial Number _ _ _ _ _ software Version JZ _ _ _ _ _

To which this declaration relates, are in conformity with following directives:

Electrical according NEN-EN-IEC 60204-1

Mechanical according 98/37/EG

CE Label according 93/465/EEG module A

It is not allowed to use the product for any other purposes than described in the manual.

P. Verkroost
Man. Dir. AVM b.v.

Original signed copy is
added to the product.

Date _ _ - _ _ - _ _ _ _ _

