Summary

1 GENERAL INFORMATION

1.1 Manufacturer

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1.2 Copyright

2 GENERAL WARNINGS

2.1 General information and safety warnings

2.1.1 Important warnings

To safeguard the operator and prevent any damage to the equipment, before carrying out any kind of operation it is important to have read and fully understood the instruction manual.

2.1.2 Symbol used in this manual

The following symbols are used in this manual to highlight indications and warnings which are of particular importance:

WARNING

This symbol indicates health and safety regulations designed to protect operators and/or any exposed persons.

CAUTION

This symbol indicates that there is a risk of causing damage to the equipment and/or its components.

NOTE

This symbol is used to highlight useful information.

2.1.3 Rules and regulations for the user

WARNING

Any failure to observe the warnings provided in this manual may lead to equipment malfunctions or damage to the system.

2.1.4 Limitation of liability

PANAZOO. S.p.A. declines all liability for damage to persons, animals and/or things caused by incorrect use of the equipment.

2.2 Prior using the product

2.2.1 Requirements and rules for personnel and Safety Rules

WARNING

Before using the device, the operator must carefully read the manual.
The person using the device must be of legal age and be trained and physically and mentally fit. He or she must also have been provided with adequate information on how to operate the device.
During the assembly and activation of the device, follow the instructions in the manual and rules and regulations applying to health and safety at the workplace.

2.3 Disposal

2.3.1 General regulation

The appliances must be disposed of only and exclusively by specially authorized waste disposal companies in accordance with all relative legislation and prescriptions.
The packaging must be consigned to the relative authorized companies to be recycled.

2.4 Fire prevention

2.4.1 Fire prevention

NOTE

The machine is not equipped with fire extinguishers.

The operator must make sure that the place in which the appliance is installed is equipped with an adequate number of suitable fire extinguishers. The extinguishers must be positioned where they are clearly visible and protected from damage and improper use.

2.4.2 Safety regulations

WARNING

It is strictly prohibited to extinguish fires involving electrical equipment with water!

2.4.3 Characteristic of extinguishers

Use powder, foam or halogen extinguishers which must be positioned next to the device.
Operating personnel must receive adequate instruction on how to use the extinguishers.

2.5 Normative references applied

Europe:

- Directive no. 1935/2004/EC Food Safety Regulation - related to materials and articles intended to come into contact with foodstuffs
- Directive no. 10/2011/EC Food Safety Regulation - related to plastic materials and articles intended to come into contact with foodstuffs

Italy:

- Ministerial Decree 21/03/1973 Hygienic requirements of packages, containers and tools destined to come into contact with food or substances for personal use

Germany:

- LFGB (Lebensmittel-, Bedarfsgegenstände- und Futtermittelgesetzbuch) – BfR (Bundesistitut fur Risikobewertung) Food Safety Regulation on materials and articles intended to come into contact with foodstuffs

USA:

- FDA Food and Drug Administration

2.6 Safety decals

WARNING

The removal or damaging of safety decals is strictly prohibited.

3 DESCRIPTION OF THE DEVICE

3.1 General features

The MODULAR Volumetric Milk Meter is a device designed to perform the following functions:

- Measure the quantity of milk that has been milked from the dairy cow and the relative milking flow
- Identify the detachment point of the milking cluster
- Specify the temperature of the milk during milking or of the washing solution
- Specify the conductivity of the milk during milking or of the washing solution

The MODULAR is designed to operate in combination with the following milking control panels:

- MODULAR MPC panel
- MODULAR TOUCH panel

These milking control panels:

- Control pulsation
- Control opening and closing:
  - of the milking point shut off valve
  - of the MODULAR dump valve
- Control detachment of the milking cluster, receiving the input data from the MODULAR

Refer to the relative manuals for more details on operation of the milking control panel.

The MODULAR has also been designed to be controlled by an PANAZOO IC1 Control Valve

The following can be combined:

- ATM/ATM Control Valve (recommended option)
- VAC/ATM Control Valve

When the MODULAR is combined with the MODULAR MPC

It can only be combined with a VAC/ATM Control Valve when the MODULAR is combined with an MODULAR TOUCH panel

3.2 Technical features

Technical Specifications	
Operating vacuum	From 20 to 60 kPa (from 5.9 to 17.71 ‘’Hg)
Vacuum consumption	0 l/min @ 50 kPa (0 ft^3/min @ 14.76 ‘’Hg)
Measurable milk flows	From 0 to 12 l/min (from 0 to 0.42 ft^3/min)
Operating temperatures (environment)	From +3°C to +40°C (from 37.4°F to 104°F)
Transport/storage temperatures	From -20ºC to +50ºC (from -4°F to 122°F)
Accuracy when measuring the quantity of milk*	±0,2 kg (±0,44 lb) for quantity of milk milked <10kg (<22.04 lb) ±2% for quantity of milk milked >10 kg (>22.04 lb) up to 9 l/min (0.31 ft^3/min)
Accuracy when measuring the temperature*	±2°C (±35.6°F)
Accuracy when measuring the conductivity**	±0.5mS
Temperature of the washing mixture	Max 90°C (max 194°F)
Electrical part protection class	IP67
Dimensions (HxLxD)	320x180x170 mm (12.59x7.08x6.69 in)
Device weight	1.1 kg (2.42 lb)

**Accuracy achieved only in combination with the MODULAR MPC and MODULAR TOUCH panels and after having calibrated the system*

*** Accuracy achieved only in combination with the MODULAR MPC panel*

4 INTENDED AND NON INTENDED USE

4.1 Intended use

- The MODULAR Milk Meter is a device designed to milk dairy cows and buffaloes.
- The MODULAR has been designed to work in combination with the MODULAR MPC panel or in combination with the PANAZOO. MODULAR TOUCH panel.
- The MODULAR has been designed to work in combination with the PANAZOO. Control Valve.

4.2 Non intended use

- The MODULAR is not to be used for milking Sheep-Goats
- The MODULAR is not to be combined with Panels other than the ones specified in paragraph 4.1 Intended use
- It is not to be combined with a Control Valve NOT manufactured by PANAZOO.

WARNING

Any use other than the one covered in this manual is considered improper use and is therefore forbidden. PANAZOO. S.R.L. declines any liability associated with any use of the device other than the one covered in this

5 INSTALLATION

5.1 General

The most recommended installation for a “Herringbone” or “Parallel” parlour foresees the following positions: (for details see general diagram in paragraph 5.4 Diagram of general connection with MODULAR and 5.5 Diagram of general connection with MODULAR):

- of the MODULAR and of the CV which controls the MODULAR in low line
- of the CV which controls the cylinder and the pulsators in high line (we also suggest installing a centralised filtered air line for the pulsators and the CV which controls the cylinders)

Pulsators can also be installed in low line (for example, tunnel or rotational) or MODULAR sensors can be installed in high line (for example, Swing over plants), while following the instructions below.

CAUTION

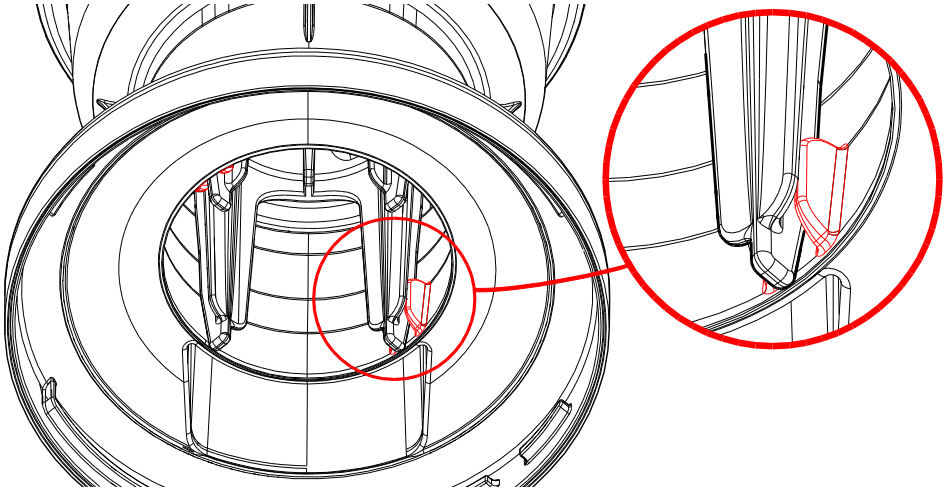
We also suggest installing a centralised filtered air line (suitably sized for the number of stations) for the pulsators and the CV which control the cylinders.

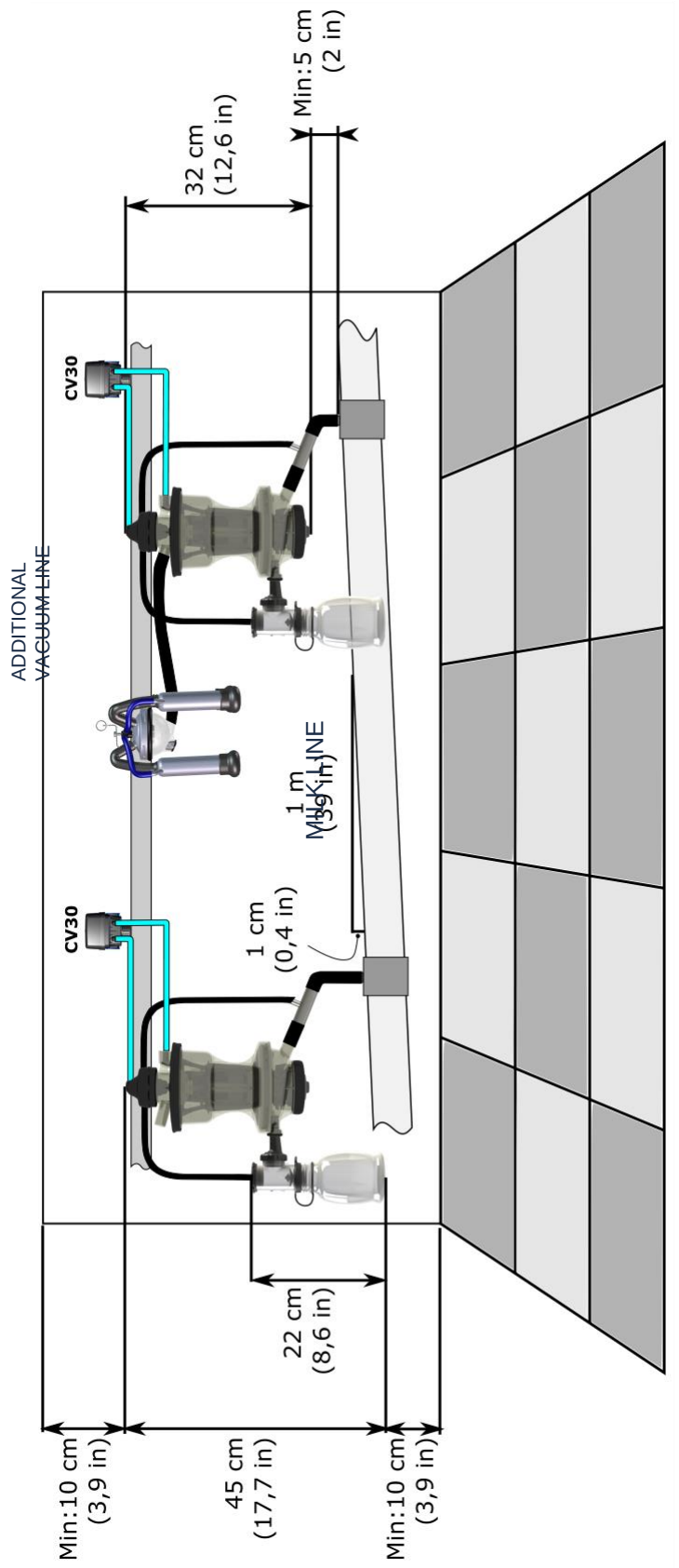
CAUTION

For correct operation the length of pipe connecting the CV in low line to the MODULAR dump valve must be max 3 m (9.84 ft) long. Beyond this measurement, the load losses affect the response times and consequently the accuracy of the meter
It is essential that the pipes connecting the CV and the MODULAR dump valve are the same length. If the lengths differ by more than 50 cm (19.68 in), calibration of the meters may not be consistent.
It is essential that the diameter of the discharge pipe output from the MODULAR and the subsequent milk intake on the milk pipe has an internal diameter of Ø19mm (0.74 in)

CAUTION

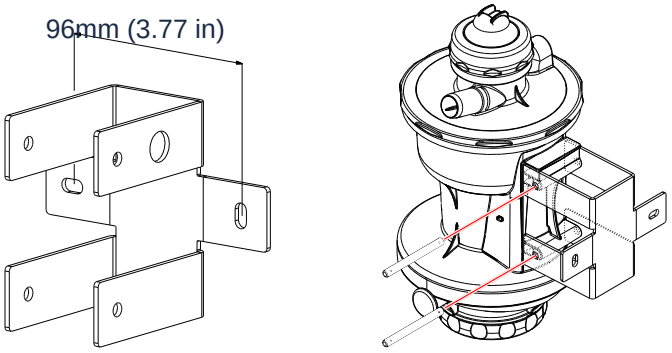
For a proper operation it’s important that the slides of the shutter are in the appropriate guide and the shutter doesn’t rotate inside the main body.



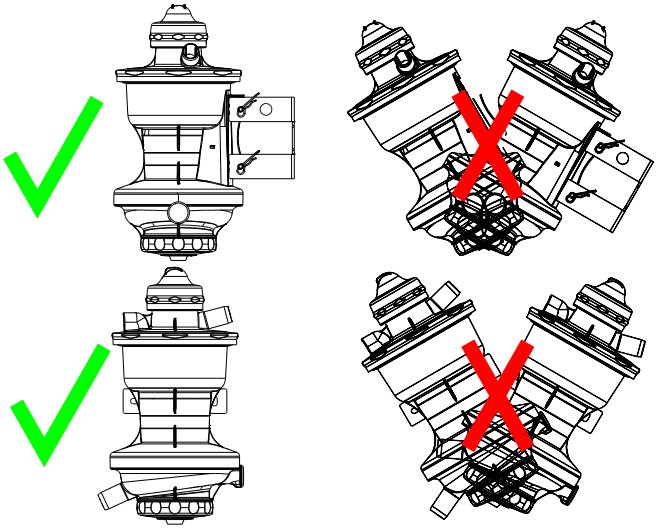


5.2 Wall bracket

The Volumetric Milk Meter has its own bracket for wall assembly. After having fixed the bracket to the wall, assemble the sensor using the pins and lock them with the split pins.



For correct operation make sure the sensor is assembled in an entirely vertical position (deviation permitted ±2° compared to vertical position).



5.3 Electrical connections

To operate, the MODULAR must be electrically connected to the milking control panel via the MODULAR 8-pin connector which is on the bottom of the MODULAR (protection degree of casing containing the terminal board is IP 67 if wired correctly).

NOTE

Open the bottom locking ring of the meter
Pierce the cable gland with a simple screwdriver and thread the cable through the cable gland assembled on the cover plate before connecting the MODULAR terminal board.

CAUTION

- **The MODULAR must be connected to the panel, as shown on the diagrams on the next pages, with an 8x0.35mm^2 shielded cable.**
- **The screen must be connected to the GND terminal from the panel side and not be connected from the sensor side.**
- **The maxim length for the connection cable is 50m (164.04 ft)**

- **After correctly wiring, close the bottom cover plate by screwing the locking ring with force until it stops to ensure the casing containing the terminal board has an IP 67 protection degree.**

5.4 Diagram of general connection with MODULAR

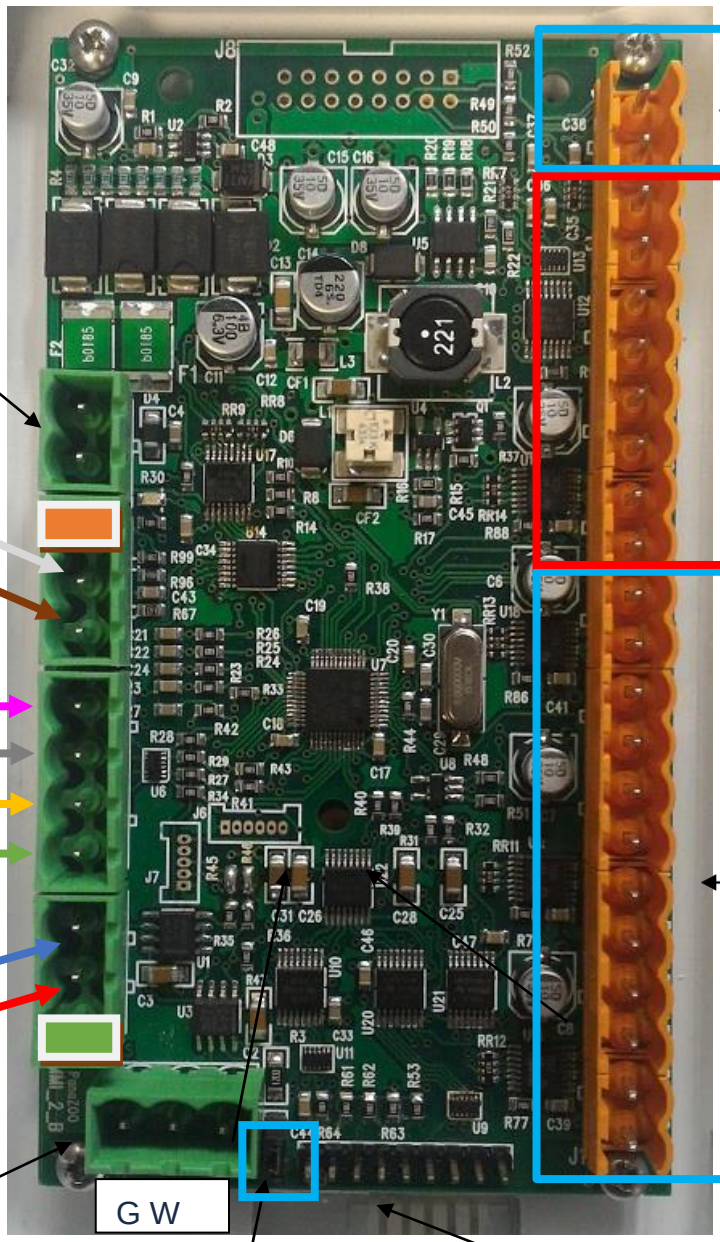
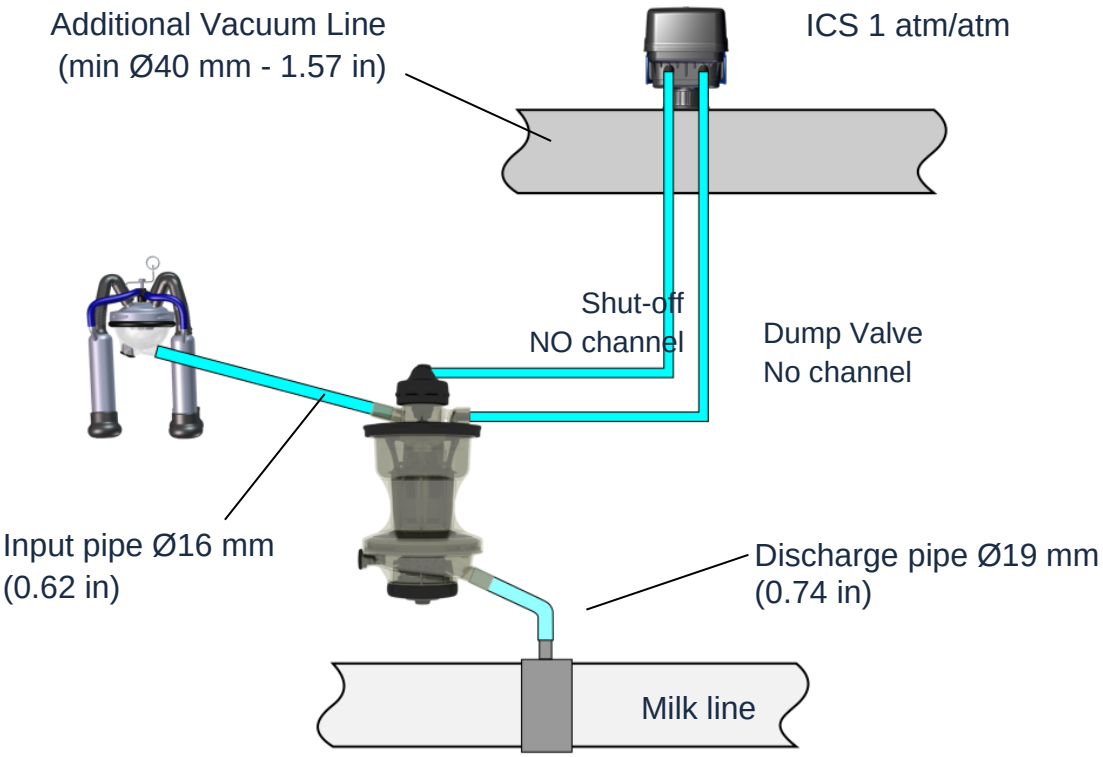
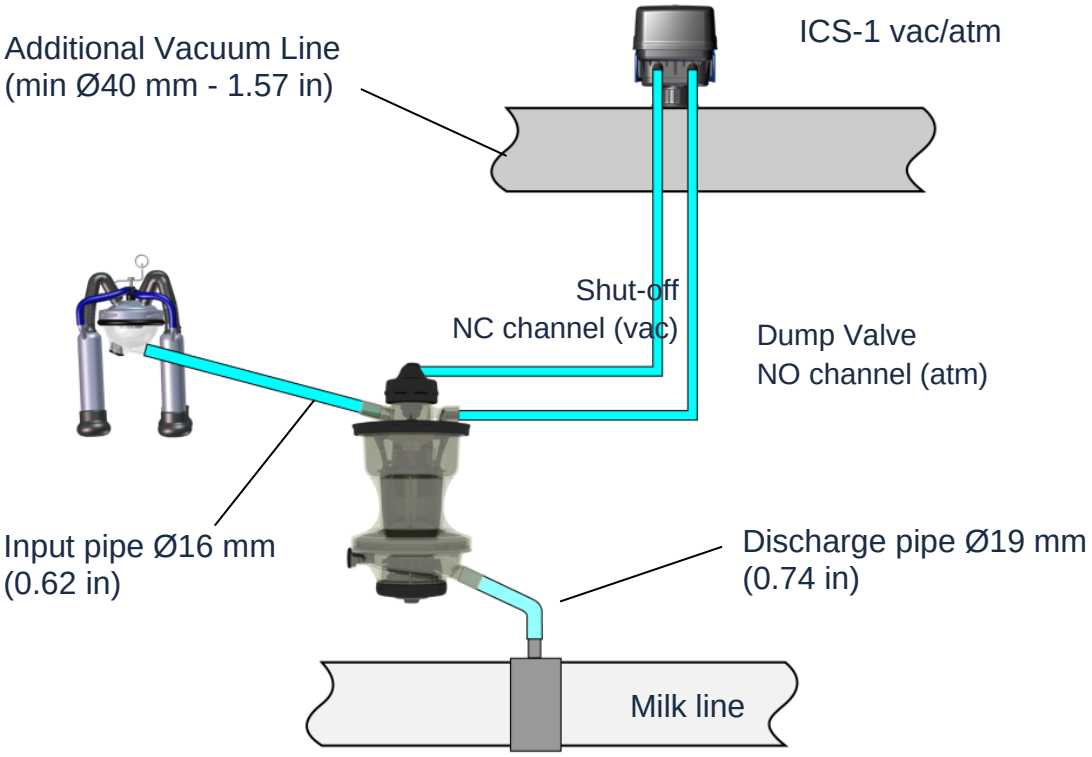


Diagram of general connection with MODULAR

5.5 Pneumatic connections with MODULAR - MODULAR MPC



5.6 Pneumatic connections with MODULAR TOUCH



6 WASHING

The MODULAR must be washed at the end of each milking session to remove the bacteria and any solid deposits inside the milk line and inside the sensor. It is therefore necessary to put each panel in the washing mode and start the washing program on the washing machine.

During the washing cycle, the control panels manage washing of the meter by alternating the FILL phases, in which the meter completely fills without actuating the dump valve, and the EMPTY phases, in which the meter reaches the drain level and actuates the dump valve.

By alternating the FILL and EMPTY phases during initial rinsing, recirculation with chemicals and final rinsing, thorough cleaning of the meter is ensured.

Depending on the plant configuration, it may be necessary to set different FILL and EMPTY parameters (refer to the manual of the associated panel for further details) so that all of the sensors are washed correctly.

In the stations farthest from washing water input, if there is not enough water to completely fill the sensor (fill phase), the FILL TIME will have to be increased in the same way; to have more water reach the farthest stations, the empty time in the first stations can be increased.

6.1 Washing requirements for Milk Meter proper cleaning

Topic	Requirements	Caution
Daily washing routine	- After every milking session: run the washing procedure using detergent during recirculation time with hot water - At least 3 times per week: run the washing procedure using acid during recirculation time with hot water	It is highly recommended to use an automatic washing system (for example, PANAZOO. MINI WASH-THERMOWAS-MASTER WASH) and to inject air during washing to increase washing fluid turbulence
Washing phases	Ensure at least the following phases every time you wash the parlour: - Initial rinse with warm water - Recirculation with hot water and chemicals - Final rinse - Drying phase	Always run a rinse phase between a recirculation with hot water and detergent and a recirculation with hot water and acid. It is recommended to dry the system as final stage of washing - Always run a rinse phase between an alkaline wash and an acid wash (especially with peracetic acid) because the mix of the two chemicals can demage seriously plastic components.
Water	Use always clean and good quality water Dimension the wash trough in order to ensure at least 7 litres (0.24 ft^3) per milk meter	Ensure that the quantity of water is sufficient to complete at least 10 Filling fase during recirculation to properly clean the device
Chemicals Acid, Detergent and Disinfectant	- Use only chemicals (acid detergent or disinfectant) that are suitable to wash milking parlour - Always use a suitable concentration of chemicals as indicated on the label of the chemical container.	- Always check the intended use of the chemical - Don not exceed the concentration indicated on the label of the chemical container otherwise you can cause damages to the Milk Meter. - Do not use nitric acid
Temperature	Always use a suitable temperature for the chemicals as indicated on the label of the chemical container.	- Do not exceed the temperature indicated on the label of the chemical container otherwise you can cause damages to the Milk Meter. - Always do not exceed 90°C (194°F)
Vacum during washing	During the washing cycles there must be a minimum vacuum of 20kPa (5.9 ‘’Hg) to ensure that the sensor empties during and at end of washing	

7 CALIBRATION

The panels that can be combined with the MODULAR are factory set with a typical average calibration parameter.

Each parlour may require a different setting due to the different vacuum level, pipe length, type of claw and installation of the MODULAR (in high or low line).

For an average accuracy calibration, it is sufficient to calibrate 1 or 2 stalls of the milking parlour and extend the calibration parameter to the rest of the parlour.

To ensure the maximum measurement accuracy specified in the "Technical features" of the MODULAR, proceed with calibration of one station at a time as indicated below.

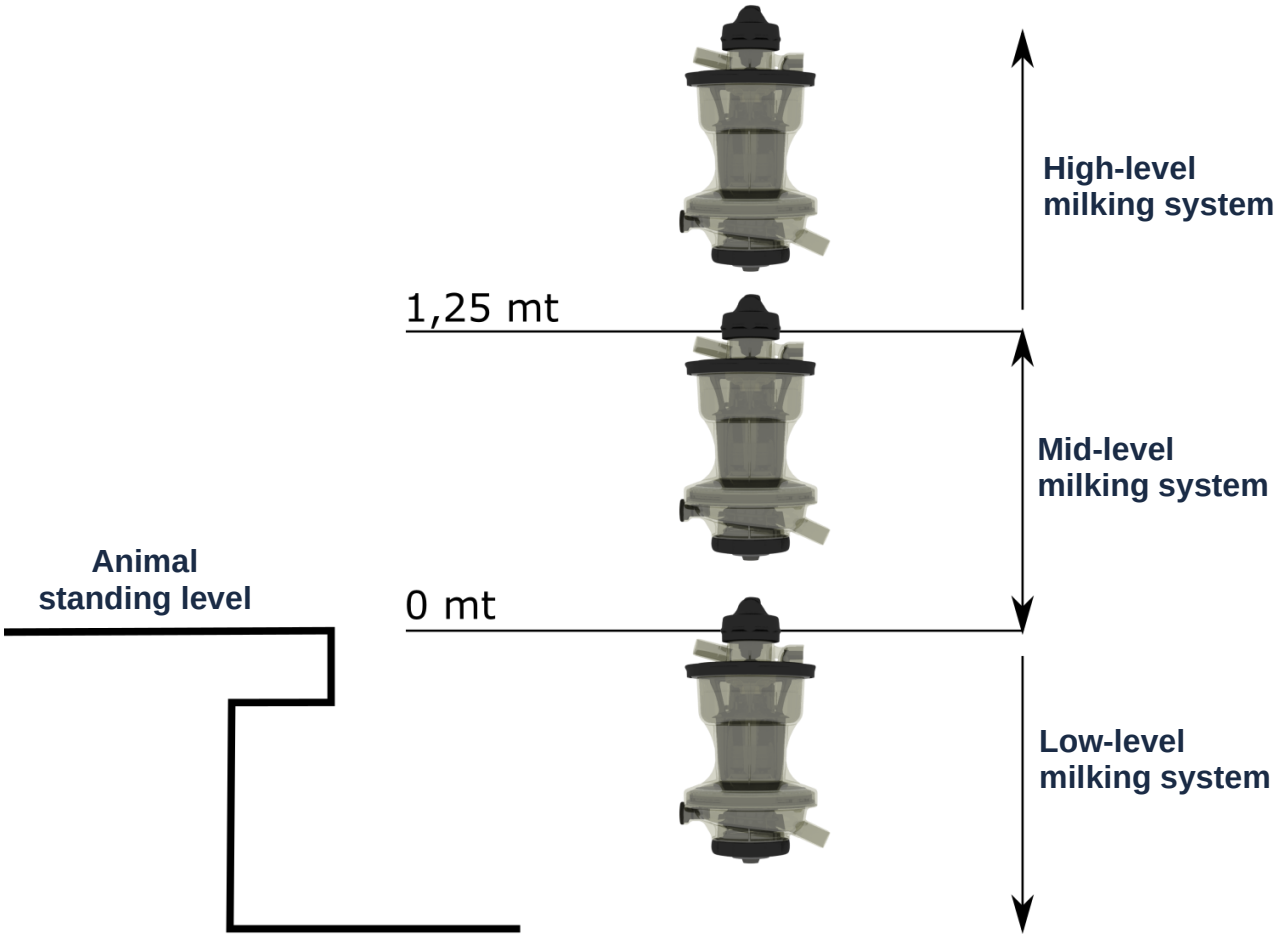
CAUTION

We suggest calibrating the system after one week of system operation because the parts must adapt to function properly. On average, the calibration parameter fluctuates by 2 points after the parts have settled.
We suggest calibrating the system at least once a year for best operation.

7.1 Definition of low-level, mid-level and high-level milking system

A milking plant is considered:

- Low-level milking system if the milkline is situated below the animal standing level;
- Mid-level milking systems if the milkline is situated between 0 and 1,25mt (4,10 ft) above the animal standing level;
- High-level milking systems if the milkline is situated more than 1,25mt (4,10 ft) above the animal standing level.



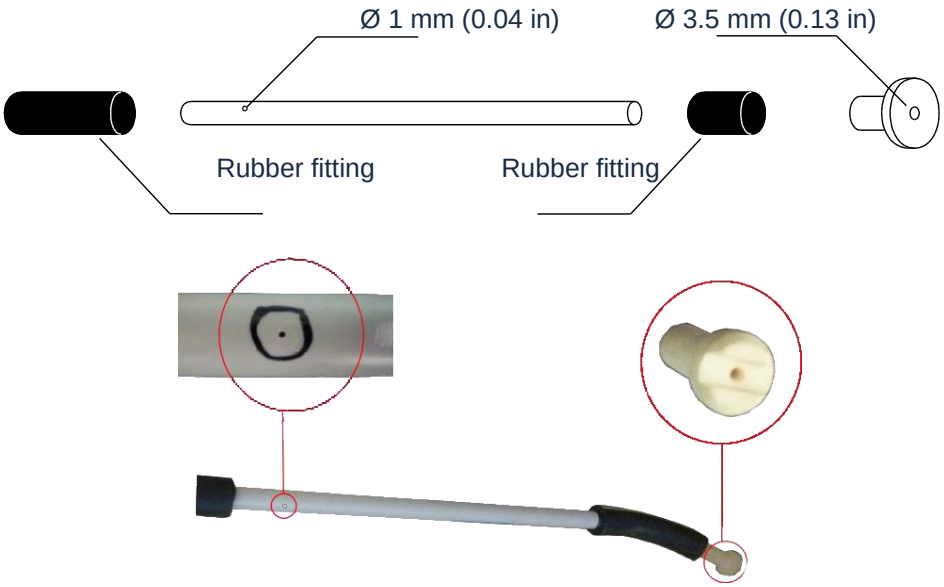
7.2 Procedure for low-level milking system

7.2.1 Equipment required

SUCTION SET consisting of:

- Plastic pipe with Ø 3.5 mm (0.13 in) suction hole
- Plastic pipe with 1 mm (0.04 in) air inlet

Connect the two parts with a piece of rubber pipe and prepare a second pipe to connect the set to the sensor.



BUCKET with sufficient capacity (more than 10l - 0.35 ft^3)
SCALES (resolution at least 0.1Kg - 0.22 lb)

7.2.2 Procedure

1. Remove the cluster from the milk pipe and connect the suction device with a rubber clamp.

2. Fill the bucket with 10 l (0.35 ft^3) of water (=10Kg - 22.04 lb). The temperature of the water should be approximately 25°C - 77°F (±10°C – ±50°F) without salt or acid.

3. Start a new milking cycle

4. Put the suction device in the bucket until the container has completely emptied; make sure the 3.5 mm (0.13 in) hole always remains below the water level while the air input hole remains above the water level.

5. When detached, take note of the quantity of milk measured on the panel.
   If it has been suitably calibrated, the display will show 9.6±0.1 kg (21.16±0.22 lb).

6. If the measurement deviates from the reference value (9.6 kg – 21.16 lb) by less than ±0.1 kg (±0.22 lb), then calibration is correct and no further assessments are required.

7. If the measurement deviates by more than ±0.1 kg (±0.22 lb), then another two suction cycles must be performed with 10l (0.35 ft^3) of water; take note of the values obtained each time.

8. Calculate the average value of the errors of the 3 measurements by rounding to the 1st decimal.

9. It is therefore necessary to change the calibration parameter until suction of 10l (0.35 ft^3) of water leads to kg 9.6±0.1 (21.16±0.22 lb). Each parameter point affects the measurement accuracy by ±100gr (±3.52oz) (1%). In the event the average value read from three milking clusters is higher compared to 9.6 kg (21.16 lb), lower the calibration parameter; on the contrary, if the average value read from three milking clusters is lower compared to 9.6 kg (21.16 lb), raise the calibration parameter.

CAUTION

If calibration is carried out during plant testing (or just after having carried out routine maintenance on the MODULAR), without waiting for the week suggested to allow the parts to settle, with 10 kg (22.04 lb) of water in the bucket the panel must measure 9.8±0.1 kg (21.6±0.22 lb) and not 9.6 kg (21.16 lb) as specified in the standard procedure.

Below is a table showing some examples of calibration:

Calibration result	Calibration N1 kg (lb)	Calibration N2 kg (lb)	Calibration N3 kg (lb)	Average value kg (lb)	Calibration parameter to be set
OK	9.6 kg (21.16 lb)	---	---	9.6 kg (21.16 lb)	0.0
OK	9.7 kg (21.38 lb)	---	---	9.7 kg (21.38 lb)	0.0
OK	9.5 kg (20.94 lb)	---	---	9.5 kg (20.94 lb)	0.0
OVERESTIMATION	9.9 kg (21.82 lb)	10 kg (22.04 lb)	9.8 kg (21.6 lb)	9.9 kg (21.82 lb)	-0.3
OVERESTIMATION	10 kg (22.04 lb)	10 kg (22.04 lb)	10.1 kg (22.26 lb)	10 kg (22.04 lb)	-0.4
UNDERESTIMATION	9.5 kg (20.94 lb)	9.4 kg (20.72 lb)	9.5 kg (20.94 lb)	9.5 kg (20.94 lb)	0.1
UNDERESTIMATION	9.4 kg (20.72 lb)	9.3 kg (20.5 lb)	9.4 kg (20.72 lb)	9.4 kg (20.72 lb)	0.2

7.2.3 Specific application: set-up of the MODULAR in application with admission that exceeds ISO standards (ref ISO 5707-2007) or using Impulse Air Liner

In application where air admission from the cluster is above the limit for ISO standards 5707-2007 (12 l/min - 0,42 ft^3/min) and in particular with **MilkRite | Impulse Air Liner Premium Technology** (air admission during milking 23-27 l/min - 0,81-0,95 ft^3/min per cluster) a particular setting of **Parameter CALIBRATION control panel** must be applied in order to have correct milk yield measurement.

Parameter CALIBRATION : for Impulse Air Liner or application with air admission is above the limit for ISO standards 5707-2007 (12 l/min - 0,42 ft^3/min): choose **LINERS VENT 1** in the menu (to modify the Parameter refer to MODULAR Technical manual)

min = …	MAX = …	DFLT = OFF		Transferred
Used to calibrate milk production at high flow rate (typically over 6 Kg/min or 13 lb/min) with vented liners. - **OFF:** standard algorithm - **LINERS VENT 1:** algorithm used for vented liners - **LINERS VENT 2:** algorithm used for vented liners (not used at the moment)				

NOTE

Please note that also for application with air admission is above the limit for ISO standards 5707-2007 (12 l/min - 0,42 ft^3/min) the calibration procedure remains exactly the same of what is described in Chapter 7.2.2 - Procedure

7.3 Procedure for mid-level milking system

This procedure must be done during milking for each milking point at least 15 days after the installation.
In fact, in mid-level milking systems, the variability between milking points does not permit to apply a calibration procedure with water without a reference value taken during milking.

1. Set parameters as follows

	MODULAR – MODULAR MPC	MODULAR TOUCH
Calibration	CALIBRATION = 0	CALIBRATION = 0
Liners	LINERS = VENT 1	

2. Remove the outlet tube from the MODULAR and connect it to a bucket.
3. Connect the bucket to the milk line
4. Start a new milking cycle
5. Wait until the end of milking with automatic detachment
6. When detached, take note of the quantity of milk measured on the panel.
7. Remove the bucket from the milk line and weigh the milk inside it
8. Take note of the weight of the milk
9. Repeat points from 2 to 8 for a total of 3 milking.
10. Calculate the average percentage error
11. For each percentage point modify calibration parameter of 0.1 (PAR= CALIBARTION) of the same value

Below is a table showing some examples of calibration:

	Panel (Kg)	Scale(Kg)	Error (%)
Milking 1	9.5	9.9	-4.04 %
Milking 2	21.6	22.5	-4.00 %
Milking 3	15.1	15.7	-3.82 %
		AVERAGE	-3.95 %

Average percentage error -4% ➔ Set calibration parameter at -0.4

7.4 Procedure for high-level milking system

This procedure must be done during milking for each milking point at least 15 days after the installation.
In fact, in high-level milking systems, the variability between milking points does not permit to apply a calibration procedure with water without a reference value taken during milking.

1. Set parameters as follows

	MODULAR – MODULAR MPC	MODULAR TOUCH
Calibration	CALIBRATION = 0	CALIBRATION = 0
Liners	LINERS = VENT 1	

2. Remove the outlet tube from the MODULAR and connect it to a bucket.
3. Connect the bucket to the milk line
4. Start a new milking cycle
5. Wait until the end of milking with automatic detachment
6. When detached, take note of the quantity of milk measured on the panel.
7. Remove the bucket from the milk line and weigh the milk inside it
8. Take note of the weight of the milk
9. Repeat points from 2 to 8 for a total of 3 milking.
10. Calculate the average percentage error
11. For each percentage point modify calibration parameter of 0.1 (par. 1100 or par. CAL) of the same value

Below is a table showing some examples of calibration:

	Panel (Kg)	Scale(Kg)	Error (%)
Milking 1	10.7	10.9	-1.83 %
Milking 2	7.8	8.0	-2.50 %
Milking 3	22.2	22.6	- 1.77 %
		AVERAGE	-2.03 %

Average percentage error -2% ➔ Set calibration parameter at -1.4 (-1.2 - 0.2)

8 GENERAL MAINTENANCE

WARNING

Do not carry out any maintenance if the Volumetric Milk Meter is connected to the mains.

Before performing any maintenance, disconnect it from the mains.

The only daily maintenance that must be performed with the device connected to the mains is washing the milking system.

8.1 Daily

It is essential to adequately wash the Volumetric Milk Meter in order to remove bacteria left in the milk line and inside the sensor after each milking. Said bacteria can contaminate the milk, damage the equipment and cause detachment of the clusters, resulting in incorrect reading of the milk flow.

After each milking session, wash the milking clusters and each surface of the milking system machine in contact with the milk, as follows:

1. Fasten the cluster to the washing unit
2. Put each panel into washing mode
3. Start rinsing and proceed with washing using temperature between 60°C ÷ 90°C (140°F ÷ 194°F) for the main washing (as described in chapter 6 WASHING of this manual)

8.2 Weekly

Three times a week wash with a solution of water + phosphoric or phosphonitric acid, in concentrations NOT exceeding 3%, or according to the instructions of the product's manufacturer (as described in chapter 6 WASHING of this manual).

8.3 Scheduled maintenance

For correct operation of the sensor, we recommend replacing the soft parts, especially the sensor's moving parts, as indicated in the following paragraphs (the hours include milking and washing hours).

CAUTION

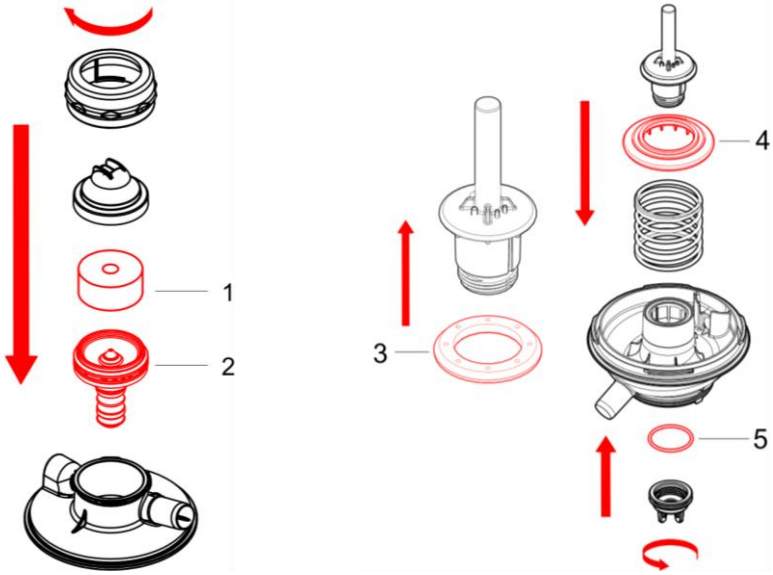
Special tools are not required for maintenance of the MODULAR, but we highly recommend retesting and recalibrating the meter after maintenance, as described in chapter 7 CALIBRATION of this manual.

For correct maintenance of the sensor, we recommend a tightening torque of 400±10 Ncm (35.4±0.88 lbf·in).

8.3.1 Every 2 years or every 5000 h of operation

The following components must be replaced every 2 years or every 5000 h of operation:

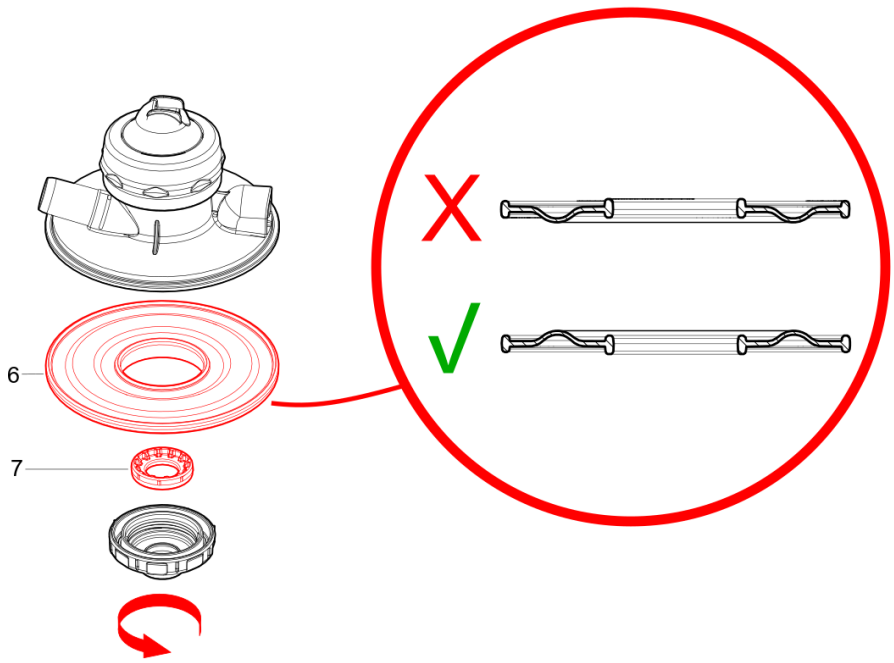
- Filter media (ref. **1** in the picture below)
- Shut off valve shutter (ref. **2** in the picture below)
- Bottom shutter (ref. **4** in the picture below)
- Lip gasket (ref. **3** in the picture below)
- O-ring (ref. **5** in the picture below)



8.3.2 Every 1 year or every 3000 h of operation

The following components must be replaced every year or every 3000 h of operation:

- Sheath (ref. **6** in the picture below)
- Gasket sheath (ref. **7** in the picture below)



9 APPENDIX I – MILK SAMPLER

9.1 Technical features

Technical Specifications	
Operating vacuum	From 20 to 60 kPa (from 5.9 to 17.71 ‘’Hg)
Vacuum consumption	Max 10 l/min @ 50 kPa (max 0.35 ft^3/min @ 14.76 ‘’Hg)
Operating temperatures (environment)	Da +3°C a +40°C (from +37,4°F to +104°F)
Transport/storage temperatures	Da -20°C a +50°C (from -4°F to +122°F)

9.2 Installation and operation

- Remove the plug from the MODULAR and place it on the bracket in order not to lose it (Fig. 1).
- Mount the Sampler on the MODULAR as indicated in fig. 1-5.

WARNING

Pay attention at the correct installation of the bypass (Fig. 2 and 3).

- During the sampling operation the shut-off valve (ref.41) opens automatically (Fig. 6)
- At the end of sampling operations unscrew the bowl, mix the total milk, and collect the quantity requested for sampling.
- During this operation the shut off valve ref. 41 closes the vacuum (maximum vacuum consumption 10 l/min @50kPa (0.35 ft^3/min @ 14.76 ‘’Hg) – Fig. 6). The shut off valve opens again automatically and enables the milk transit for sampling only when the user screws the bowl.

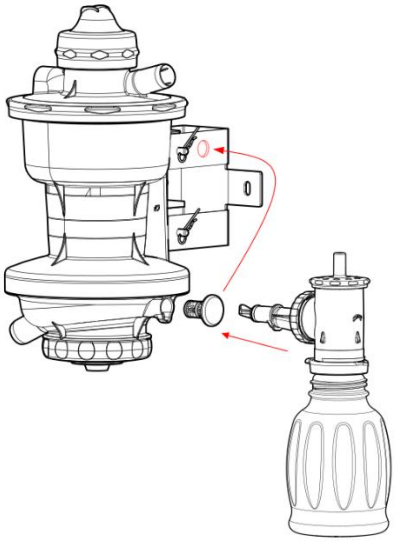


Fig. 1

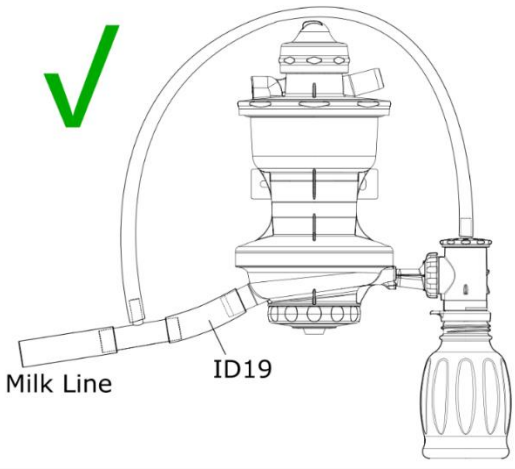


Fig. 2

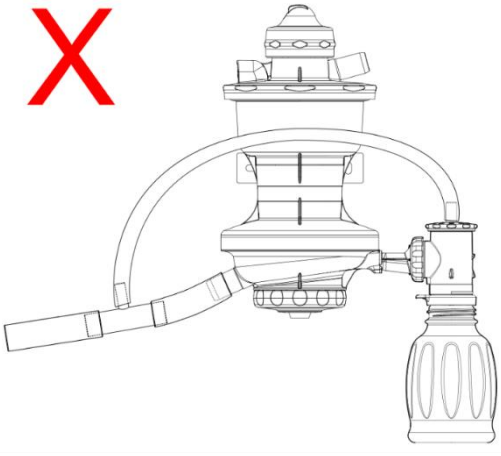


Fig. 3

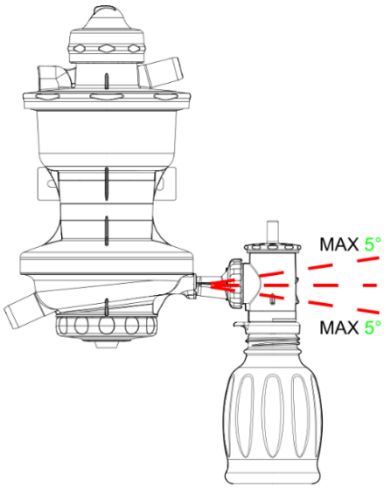


Fig. 4

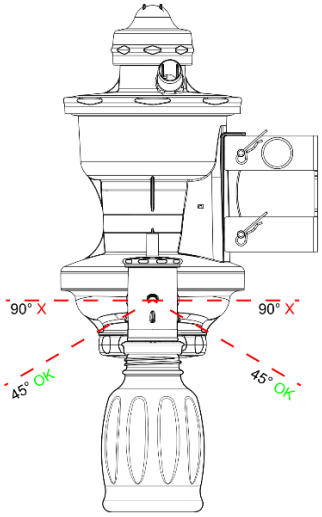


Fig. 5

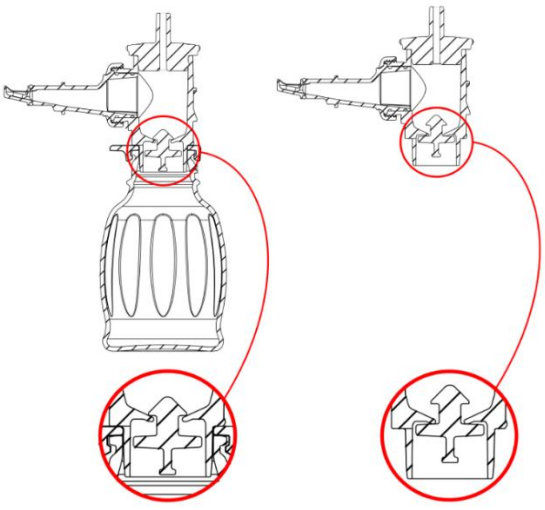


Fig. 6

NOTE

The residual quantity of milk available in the sampler that is not necessary for the analysis has to be re-introduced manually in the milk-line.

CAUTION

The Milk Sampler has been designed to work exclusively in combination with Milk Meter MODULAR PANAZOO. and according to the prescriptions available on the actual manual.

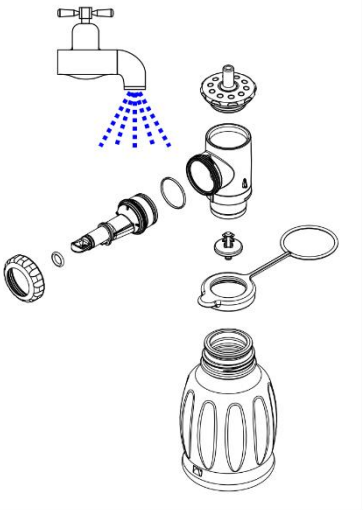
Pay attention at the right way to mount the sampling nipple (one way mounting)

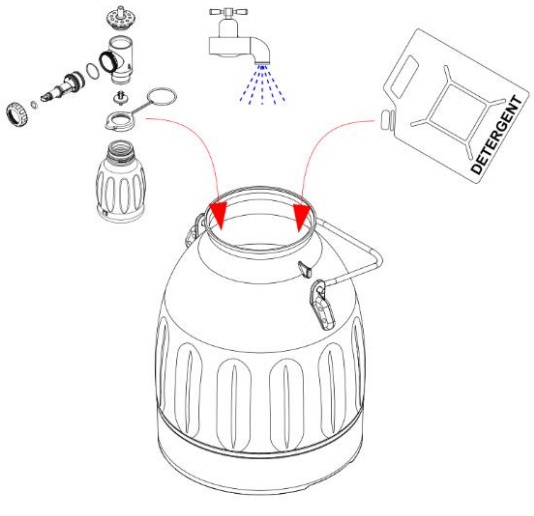
Before remounting the plug on the MODULAR, rinse it with copious water to prevent contaminations

9.3 Washing

Milk Sampler washing must be realized manually at the endo of each milking session in which Sampler Is used as follows:

- Dis-mount the Sampler
- Pre-rinse with copious warm flowing water the parts
- Place Sampler parts inside a bucket or a container with a solution of hot water and detergent to remove milk residuals.
- If you notice solid milk residuals on the sampler, repeat the above washing procedure with phospho-nitric acid or phosphoric acid instead of detergent.
- At the end run a final rinse with copious warm water
- Dry the parts with absorbent paper





CAUTION

Use only washing chemicals that are suitable to wash milking parlour

Use concentrations and temperatures of the chemicals as indicated in the foreseen use reported on the chemical label

Use DPI during washing (gloves or goggles)

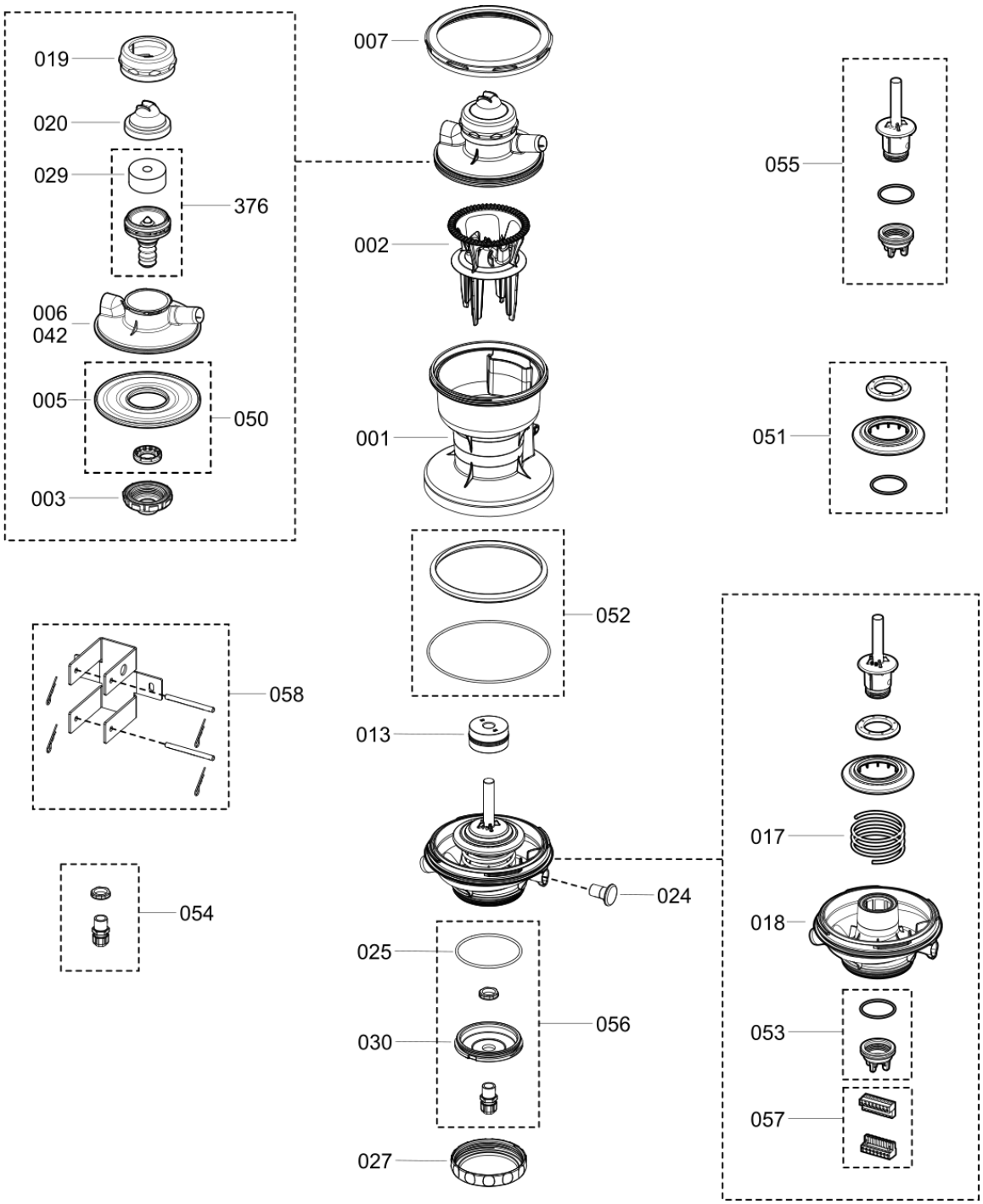
Never touch the washing solution

9.4 Maintenance

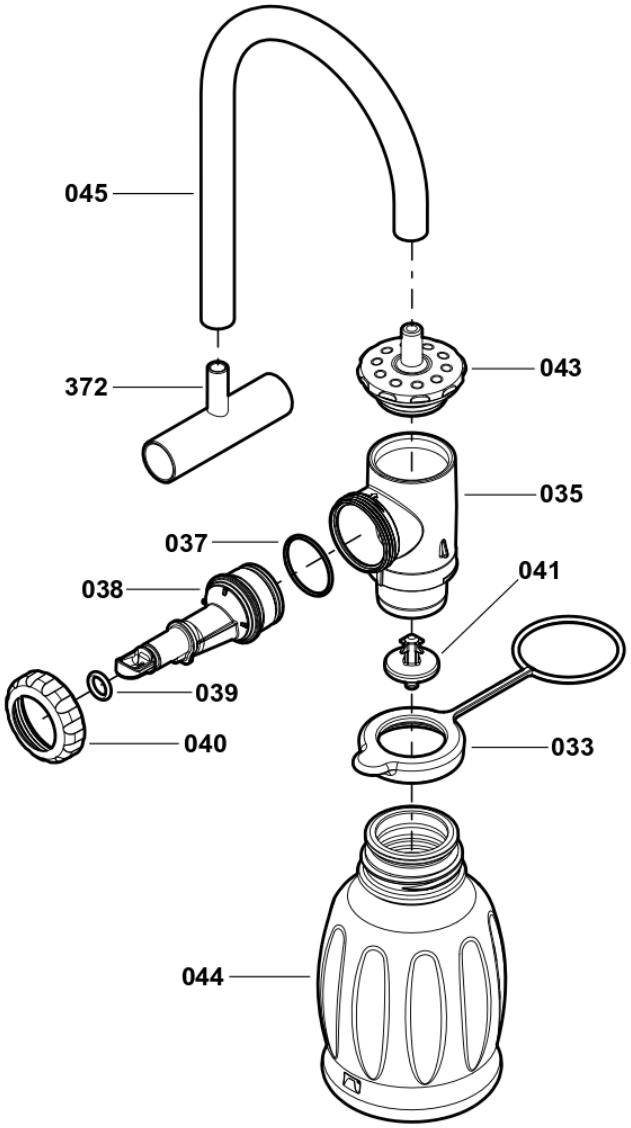
To ensure correct and efficient operations of the parts control the wear of the rubber parts once a year. It's recommended to replace the parts of service kit in case the rubber parts show cracks or cracking and anyway it's recommended to replace the parts of the service kit once every 2 years.

10 SPARE PARTS DIAGRAM

10.1 Milk Meter MODULAR



10.2 Milk Sampler



11 TROUBLESHOOTING

Problem detected with MODULAR	Possible cause	Solution
MODULAR underestimated compared to the scales	Calibration parameter not set correctly	Repeat the calibration procedure (see chap. 7 CALIBRATION) In the event of underestimation compared to the scales, the calibration parameter needs to be increased.
MODULAR underestimated compared to the scales	Float does not slide freely on the rod	-Check for impurities or burrs in the hole on the float and try to remove them -If the problem persists replace the float
MODULAR underestimated compared to the scales	Float damaged (e.g. full of water)	Replace the float
MODULAR underestimated compared to the scales	Lip gasket or bottom shutter (see components in paragraph 8.3.1 Every 2 years or every 5000 h of operation) do not guarantee the seal during milking (milk leakage in the bottom drain chamber when the shutter is closed)	-Try disassembling and reassembling the pieces (see paragraph 8.3 Scheduled maintenance for the warnings) - If the problem persists, replace both pieces (see paragraph 8.3 Scheduled maintenance for the warnings)
MODULAR underestimated compared to the scales and air bubbles escape from the bottom part during milking	Clamping locking ring of the probe not screwed correctly with consequent vacuum loss	Screw the bottom locking ring again making sure the tightening torque is 400Ncm (35.4 lbf·in).
MODULAR underestimated compared to the scales	Main clamping locking ring (ref. 007 in the diagram in paragraph 10.1 Milk Meter MODULAR) not screwed correctly with consequent vacuum loss	Screw the locking ring again (after having put the plant into vacuum), being careful to not tighten it too much.
MODULAR underestimated compared to the scales	Pipe connecting the CV and the MODULAR dump valve is longer that recommended (max 3 m - 9.84 ft)	If possible, move the sensor nearer to the CV which controls the meter, otherwise repeat the calibration procedure decreasing the value to be achieved to 0.1Kg (0.22 lb) every meter. Example with 4 m (13.12 ft) of pipe between CV and MODULAR, the correct calibration value is 9.5±0.1kg (20.94±0.22 lb)
MODULAR overestimated compared to the scales	Calibration parameter not set correctly	Repeat the calibration procedure (see chap. 7 CALIBRATION) In the event of overestimation compared to the scales, the calibration parameter needs to be decreased.

MODULAR overestimated compared to the scales	Dump valve opening time insufficient to drain the entire quantity of the milk	Increase the opening time of the dump valve (for details refer to the manuals of the relative control panels)
MODULAR overestimated compared to the scales	Air admitted from the vent of the claw too high or you are using Impulse Air Vented liner	Set Parameter CALIBRATION OF MODULAR to: **LINER VENT 1**
MODULAR does not DUMP during milking or during washing	Presence of foreign bodies (straw or residual solids) which prevent the float from sliding freely	Open the Milk Meter and remove the foreign bodies. Check the free sliding of the floater before reassemble the MODULAR If this issue occurs frequently install a filter to prevent these foreign bodies from ending up in the MODULAR
MODULAR does not DUMP during milking or during washing	Cables not connected correctly or interrupted	Make sure the wiring at the bottom of the MODULAR is correct
MODULAR does not DUMP during milking or during washing	Float positioned upside down (make sure the writing "UP" is facing upwards)	Put the float with the writing "UP" facing upwards
MODULAR does not DUMP during milking or during washing	Damage to the meter board inside the probe	Replace the entire probe (see paragraph 8.3 Scheduled maintenance for the warnings)
MODULAR does not DUMP at start of milking, then suddenly it unblocks and starts working properly	Float blocked on the rod due to ice	Pre-rinse with warm water before milking
Presence of water in the MODULAR at the end of the washing cycle	"EMPTY" and "FILL" times not set correctly	Lengthen the EMPTY times and/or reduce the FILL times (for details refer to the manuals of the relative control panels)
During the washing FILL phase, the meter does not completely fill	Not enough water reaches the sensor during washing	Increase the FILL parameter (for details refer to the manuals of the relative control panels)
Presence of water in the bottom containing the connection terminals	Clamping locking ring not screwed correctly, no O-ring, or cable gland not assembled correctly.	Ensure the O-ring is there, the cable gland is assembled properly, and tighten with force the locking ring. If, despite these controls, there are still water residues at the bottom of the MODULAR, then the presence of water is attributable to the formation of condensation.
Upper cover (ref. 006 in the diagram in paragraph 10.1 Milk Meter MODULAR) rotating during milking operations	Clamping locking ring (ref. 007 in the diagram in paragraph 10.1 Milk Meter MODULAR) not enough tightened	Tighten the clamping locking ring (re. 007 in the diagram in paragraph 10.1 Milk Meter MODULAR) when the MODULAR is under vacuum paying attention that after this operation it's possible to untighten the ring only with the MODULAR under vacuum
Presence of residual milk in the upper part of diaphragm (ref. 005 in the diagram in paragraph 10.1 Milk Meter MODULAR)	Clamping locking ring (ref. 007 in the diagram in paragraph 10.1 Milk Meter MODULAR) not enough tightened	Tighten the clamping locking ring (ref. 007 in the diagram in paragraph 10.1 Milk Meter MODULAR) when the MODULAR is under vacuum paying attention that after this operation it's possible to untighten the ring only with the MODULAR under vacuum

Problem detected with Sampler	Possible cause	Solution
Milk Sampler does not collect milk	Vacuum leakage between vessel and main body of the sampler	Ensure that the vessel is mounted properly and with the gasket (ref. 033 in the diagram in paragraph 10.2 Milk Sampler) in mounted in the proper position Ensure the O-Ring (ref. 037 in the diagram in paragraph 10.2 Milk Sampler) and the Or-Ring (ref. 039 in the diagram in paragraph 10.2 Milk Sampler) is in place and they are not weared If case the issue is not fixed replace the gasket (ref. 033 in the diagram in paragraph 10.2 Milk Sampler) or the O-Ring
Milk Sampler does not collect milk	Vacuum shut off valve (ref. 041 in the diagram in paragraph 10.2 Milk Sampler) on the sampler blocked in closing position due to bonding or ice formation	Unblock the vacuum shut off valve manually If case the issue is not fixed replace the vacuum shut off valve
Milk Sampler does not collect enough milk	Tilting not within the limits allowed	Check the tilting of the MODULAR (ref. paragraph 5.2 Wall bracket) or of the Sampler (ref. figure 4 and 5 APPENDIX I)
Milk Sampler collects too much milk (above the sampler capacity)	Air admitted from the vent of the claw too high	Check if the vacuum consumption of the vent of the claw is above ISO 5707 limit (12 l/min – 0,42 ft^3/min)