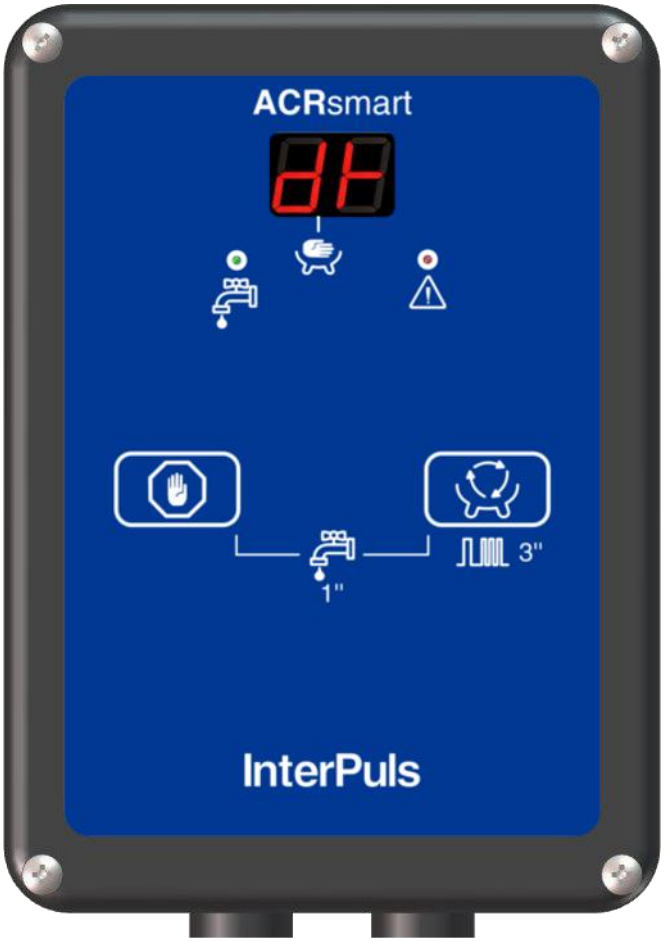
Instruction Manual, Operation and Maintenance
original instructions

# ACR Smart

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| PRODUCT | Automatic Cluster Removal |
| MODEL | ACR Smart |
| YEAR OF MANUFACTURE | 2017 |

# Summary

# 1 GENERAL INFORMATION

## 1.1 General information and safety warnings

### 1.1.1 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.

### 1.1.2 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.**

### 1.1.3 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.**

### 1.1.4 Limitation of liability

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

## 1.2 Prior using the product

### 1.2.1 Requirements and regulations for personnel

**ATTENZIONE**
**Prima di utilizzare il dispositivo, l'operatore è tenuto a leggere attentamente il manuale.**
**Il dispositivo deve essere utilizzato da persona maggiorenne, istruita, fisicamente e psichicamente idonea e che abbia ricevuto indicazioni adeguate in merito al funzionamento dello stesso.**
**Nel corso del montaggio e dell'attivazione del dispositivo, occorre seguire le istruzioni del manuale, le norme e i regolamenti concernenti la sicurezza sul luogo di lavoro e la salvaguardia della salute.**

## 1.3 Disposal

### 1.3.1 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.

## 1.4 Fire prevention

### 1.4.1 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.**

### 1.4.2 Safety regulations

**WARNING**

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

### 1.4.3 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.

## 1.5 Normative references applied

**Europe:**

- Directive no. 2004/108/EC Electromagnetic Compatibility (EMC)

**USA:**

- FCC Federal Communications Commission

**Canada:**

- IC Industry Canada

## 1.6 Marking

### 1.6.1 Dataplates affixed to the machine

# 2 DESCRIPTION OF THE DEVICE

## 2.1 General features

The ACR-Smart panel is designed to control all the milking, detachment and washing functions of the unit.

The ACR-Smart is able to control the milking frequency and the pulsation ratio in a wide range of values in order to meet the needs of all systems (both in the high line and low line) and of all types of animals (cattle - sheep - goats).

The ACR-Smart is able to perform a stimulation that can be forced, automatic (dependent on the flow of milk) or manual (activated directly by the milker at any time).

The panel is compatible with swing-over systems in which the unit is detached by moving the arm. In fact, with the ACR-Smart you can control the pneumatic cylinder responsible for moving the unit from the right hand row to the left hand row and vice versa.

It is suitable for milk transport systems thanks to the alarm indicating the end of the milking process and the possibility to restart the panel from the last active stage.

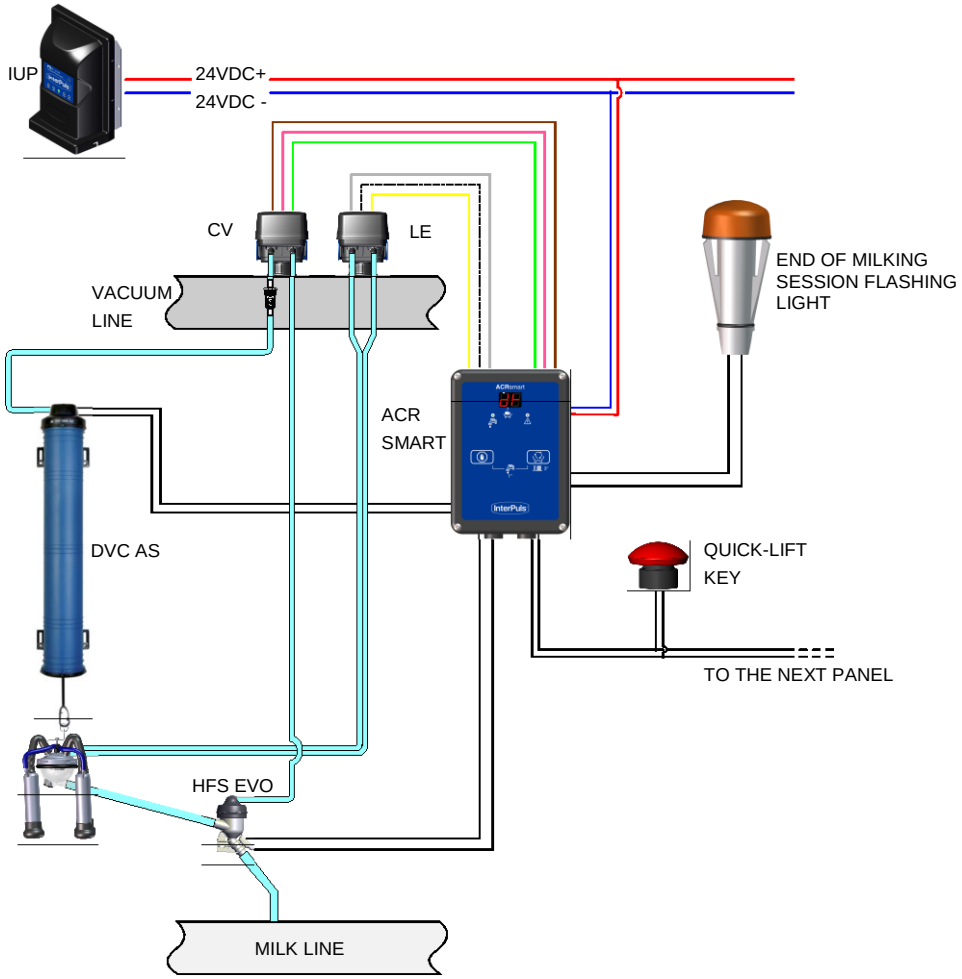
The ACR-Smart can be connected to remote start-up devices (AutoStart) and remote stop devices (Quick Lift Line).

## 2.2 Technical characteristics

| **General technical characteristics** | |
|---|---|
| Dimensions | 130x180x38 mm (5,12x7,08x1,49 in) |
| Weight | 0.45 kg (0,99 lb) |
| Power supply | 24 VDC |
| Power consumption of the panel only | 100 mA |
| Power consumption of the system | ACR Smart + CV + LE: 600 mA |
| Protection rating (cables installed properly) | IP 67 |
| Operating vacuum | between 36 and 60kPa (10,63 and 17,71 “Hg)<br>typically 50kPa (14,76 “Hg) |
| Operating temperatures (environment) | -5ºC ÷ +40ºC (23ºF ÷ 104ºF) |
| Transport/storage temperatures | -20ºC ÷ +50ºC (-4ºF ÷ 122ºF) |

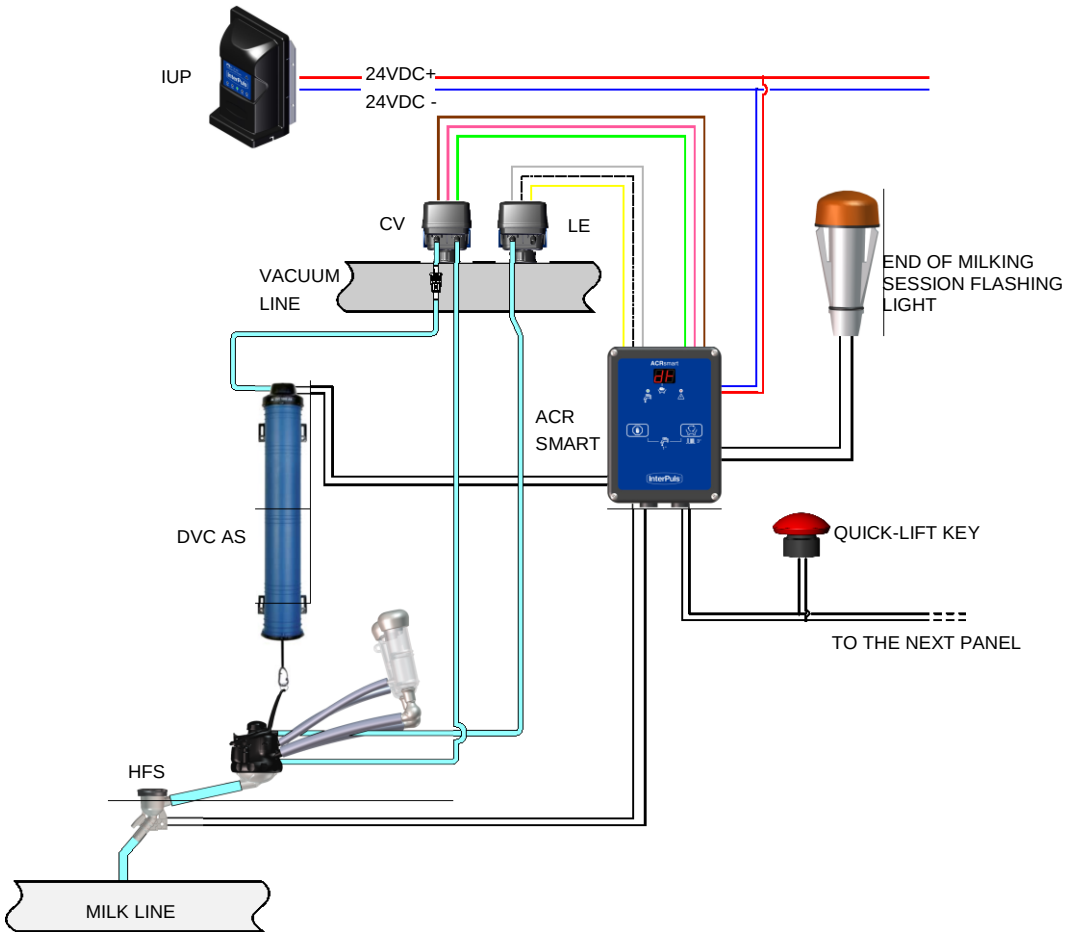
## 2.3 WIRING DIAGRAM

### 2.3.1 General connection diagram

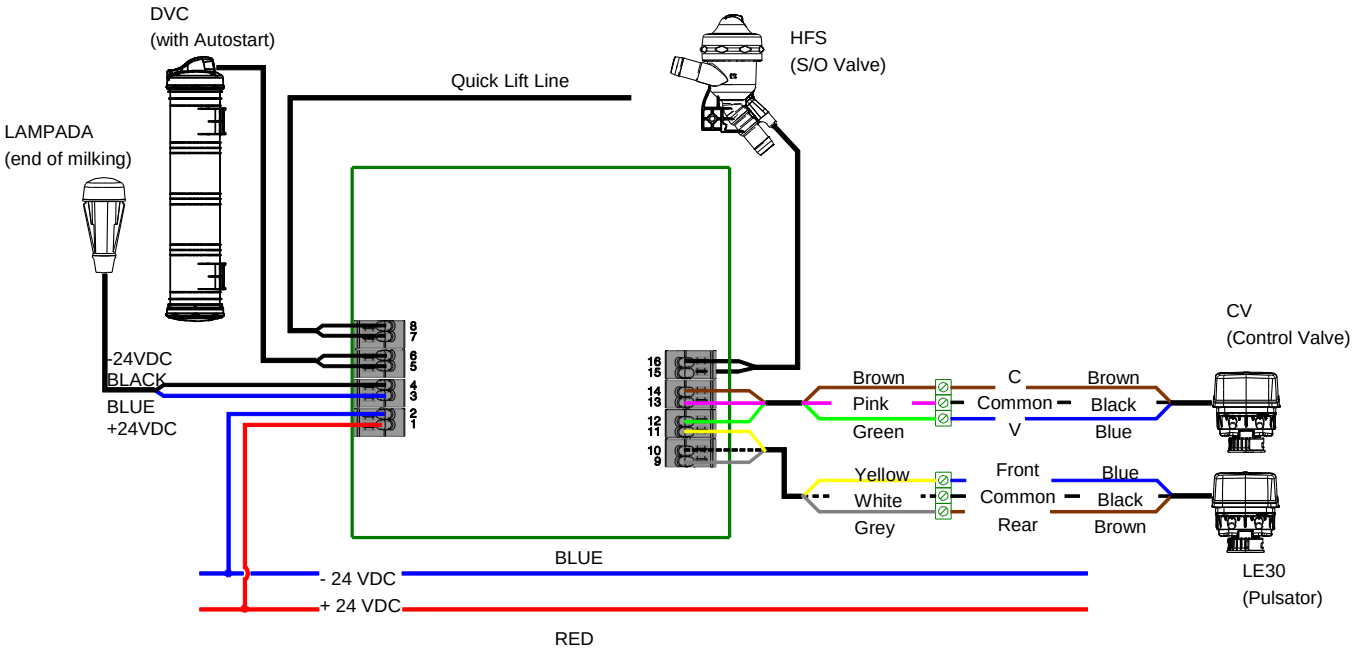



| Terminal | Colour | Electrical connection | |
|---|---|---|---|
| 1 | Red | 24VDC (+) | |
| 2 | Blue | 24VDC (-) | |
| 3 | Blue | Flashing light 24VDC(+) | |
| 4 | Black | Flashing light 24VDC (-) | |
| 5 | | Remote start-up key (AutoStart) | |
| 6 | | | |
| 7 | | “Quick-Lift” key | |
| 8 | | | |
| 9 | Grey | “Rear” LE pulsation | Brown |
| 10 | White | LE “Common” | Black |
| 11 | Yellow | “Front” LE pulsation | Blue |
| 12 | Green | CV (to valve) | Blue |
| 13 | Pink | CV “Common” | Black |
| 14 | Brown | CV (to cylinder) | Brown |
| 15 | | HFS sensor | |
| 16 | | | |

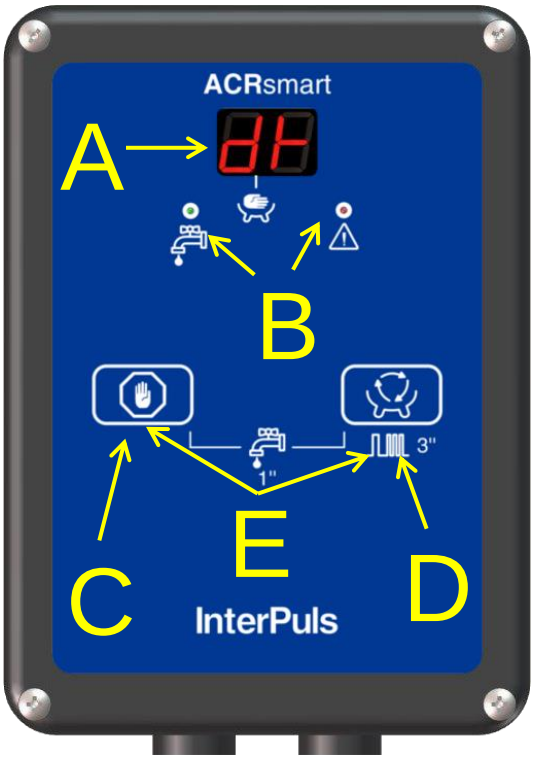
## 2.3.2 Connection diagram for sheep and goat




## 2.3.3 PCB connection



# 3 DESCRIPTION OF THE DEVICE




A) Display

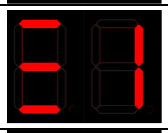
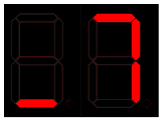
B) LEDs (green LED, red LED)

C) Stop key

D) Milking process start button with automatic detachment, continuous pressure for 3”, stimulation start

E) Combination of keys for accessing the washing or programming mode

## 3.1 Display during operation

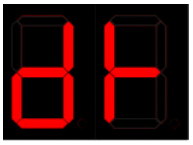
| Display | Indication | Meaning |
|---|---|---|
|  | Code **St** | Stimulation in progress |
|  | Code **CL** | Panel in washing mode |
|  | Left digit: the first segment at the top indicates the initial delay count<br>Right digit: milking time | Initial delay without continuous flow |
|  | Left digit: when all the horizontal segments are lit-up, it means that there is continuous flow during the initial delay<br>Right digit: milking time | Initial delay with continuous flow |
|  | Left digit: when the central segment lights up it means that there is continuous milk flow<br>Right digit: milking time | Milking with continuous flow |
|  | Right digit: milking time<br>Left digit: only the bottom segment lit-up indicates the final delay count | - Milking without continuous flow (final delay count)<br>- Detachment operations |
|  | The central point flashing indicates manual milking | - Manual milking |
|  | Code **dt** | Detachment |
|  | Code **AL** (flashing) | Milking without continuous flow alarm |

# 4 DESCRIPTION OF THE FUNCTIONS

Upon start-up the panel display indicates the software version installed. Depending on the configured parameters, the panel may then restart during:

- washing
- detachment (default)
- last active stage

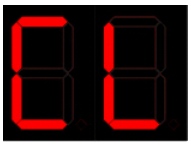
## 4.1 Detachment stage (stand-by)



The display features the code dt (Detachment) with the green LED switched on. During this stage the panel waits for the commands from the operator.
The S/O valve therefore stays closed, while the unit may switch from the release position to the removal position or vice versa via the key or via the Quick Lift control

| Key | Function |
|---|---|
| | Start automatic milking |
| | Removal or release of the milking unit |
| + | Start washing |
| + x 5” | Access programming mode |
| QUICK-LIFT operation | Removal or release of the milking unit |
| AUTO-START operation | Start automatic milking via remote control (cylinder with AS or remote button) |

## 4.2 Wash



The wash function may be operated

- manually, when the system is in the detachment position, by pressing the two + keys instantaneously
- automatically if pre-set as a start-up function on the programming menu (parameter **I.P.** set on **L.p.**).

The display features the code **CL** and the green LED starts flashing. The unit is released and the count relating to the shut-off closure delay starts (parameter **c.S.**). When it has elapsed, the valve is opened and the washing stage starts.
You can set a different frequency during the washing cycle (parameter **U.F.**).
Press the key to stop the washing cycle and retract the unit.

**CAUTION**

**At the end of washing phase it's recommended to power off the ACRSmart panels to avoid that the coils of control valves stay powered for long time and being damaged. Upon start-up, the panel may restart in washing phase or detachment phase according to the parameter I.p.**

**WARNING**

**Do not press the key and do not press the quick-lift switch during the washing cycle: the unit would be removed from the washing plate.**

## 4.3 Milking

### 4.3.1 Milking with automatic unit removal

To start the milking process with automatic detachment press the key during the detachment stage or operate the Auto-Start contact.

**NOTE**

**Terminals 11-12 may be used to connect a REMOTE KEY or an AUTO-START device to start the milking process without having to press the key on the panel**

When the automatic milking process starts:

- the cylinder releases the unit.
- after the vacuum/pulsation delay (parameter **P.d.**), the pulsator is activated and the valve (shut-off) of the flow sensor is opened.

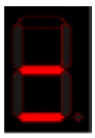
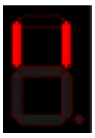
The display then starts counting the milking time. The upper horizontal segment indicates the initial delay count (parameter **I.d.**). At the same time, the two vertical segments indicate the opening of the pulsator channels, flashing alternately.

When the milk presence signal constantly exceeds the value defined by the position of the jumpers, the panel detects a continuous flow and the horizontal segment of the left hand display lights up.

When the initial delay has elapsed (parameter **I.d.**), the upper horizontal segment switches off.

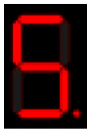
When there is no longer any milk flow, the central segment switches off and the final delay count starts (parameter **F.d.**). The detachment operations start when the delay has elapsed.

| | |
|---|---|
|  | The upper line indicates the initial delay count<br>The central line switched off indicates the absence of milk |
|  | The upper line indicates the initial delay count<br>The central line indicates the presence of milk |

| | |
|---|---|
|  | The upper line switched off indicates the end of the initial delay<br>The central line indicates the presence of milk |
|  | The sole lower line indicates the absence of milk and therefore the final delay count |
|  | In each milking stage, the two vertical lines flash following the frequency of the pulsator |

During all milking stages, press the  key to switch from automatic milking to manual milking and vice versa.

Throughout milking, the right hand display indicates the duration of the milking process in minutes. The lit-up dot indicates that milking has exceeded 10 minutes.

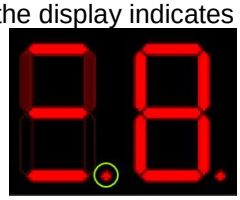
 >> 15 minutes

Press the  key (or activate the quick-lift button) to immediately stop the milking operations and start the detachment operations.

### 4.3.2 Manual milking

To start milking with manual unit removal, press the  key after the system has been started in automatic milking mode:

- The dot flashing in the left hand digit of the display indicates Manual Milking.



**Manual milking LED**

The panel stays in the manual milking mode as long as:

- the  button is pressed to switch to the automatic milking mode
- or the  button is pressed to start the detachment operations

Press the  key to switch from the manual milking mode to the automatic milking mode and vice versa, at any time.

### 4.3.3 Indication of milk presence

During milking, the left hand display indicates the current milking stage and the presence/absence of milk. The central horizontal segment indicates if milk is going through the sensor at that time. If the milk presence signal lasts for a period equal to the continuous flow time (parameter **c.F.**), the panel detects that there is an actual continuous flow.

### 4.3.4 Maximum milking time

**WARNING**

**You can envisage a maximum milking time, which can be set or disabled in the programming menu (parameter E.t.)**
**If this limit is reached, the unit detachment operations start automatically and, in the event of no flow during the milking process, the anomaly is signalled via an alarm**

## 4.4 Detachment operation

When the initial delay has elapsed, if the panel does not detect a continuous flow of milk, the final delay count starts (parameter **F.d.**).
If the continuous flow of milk is resumed, the delay is reset. The unit removal operations start when the final delay has elapsed.

The removal procedure can also be started manually by pressing the key

- The pulsator stops
- the S/O Valve closes the vacuum passage
- the detachment delay time count starts (parameter **d.d.**), in order to wait for a certain amount of air to leak through the collection unit hole, lowering the vacuum level under the nipples before removing the unit
- when the delay has elapsed, the cylinder gently removes the unit
- if the suction function has been activated (parameter **S.L.**) , when the suction delay time has elapsed (parameter **S.d.**) the residue milk in the collection unit and in the milk pipe is aspirated through the flow meter
- if the automatic unit release function has been activated, when the automatic release delay has elapsed (parameter **A.r.**) the unit is released automatically to start a new milking session.

During the detachment stage the green LED flashes and the display features:

- the milking time in the right hand digit
- the sole lower segment in the left hand digit

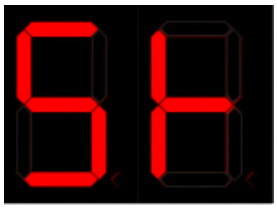
**Absence of continuous flow and indication of milking time**

After the detachment operation the green LED stays fixed on and the display features  .
At the end of the milking operations, the pair of terminals **3-4** is powered at 24VDC; the pair of terminals can be connected to a flashing light for indicating the end of milking.

Press the key to switch off the flashing light and switch to the actual detachment condition (stand-by); press the key to start a new milking session.

## 4.5 Stimulation

During the stimulation stage, the display features the code **St** and the LEDs start flashing.



On the programming menu you can define the type of stimulation (parameter **t.S.**) which may be:

- Forced (**F.S.**)
- Automatic (**A.S.**)
- OFF (**oF**) – can only be activated manually

- **FORCED STIMULATION**

  During programming you can set a forced stimulation cycle at the beginning of each milking process. For a certain period of time ("stimulation time", which can be set via parameter **S.t.**) the frequency and pulsation ratio are gradually modified in order to reach the set values (stimulation frequency **S.F.**, stimulation ratio **S.r.**)

- **AUTOMATIC STIMULATION**

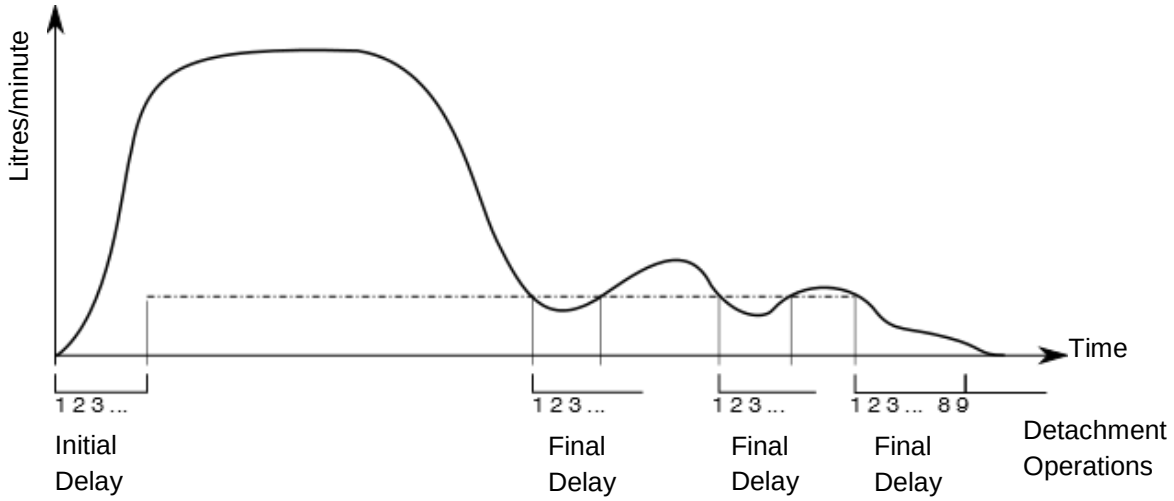
  Stimulation starts if the function is enabled and if during milking the s/o valve does not detect a "Continuous Flow" for a certain period of time (called "**neutral time**", which can be set via parameter **n.t.**).
  Therefore the frequency and pulsation ratio vary gradually until reaching the values set for stimulation (stimulation frequency **S.F.**, stimulation ratio **S.r.**)
  Stimulation stops when the flow meter starts detecting a "Continuous Flow" again or when the stimulation time elapses (parameter **S.t.**)

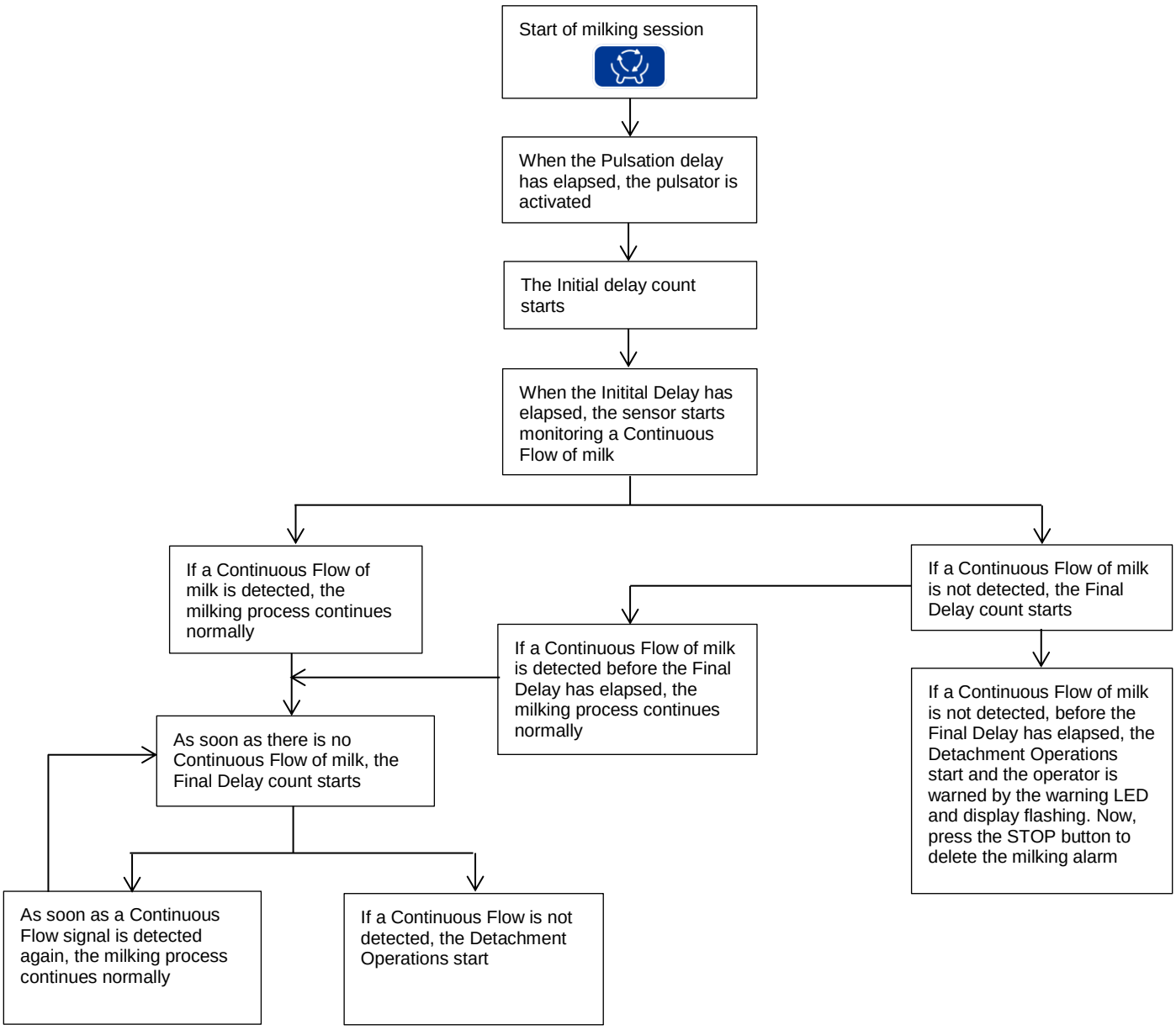
- **MANUAL STIMULATION**

  Press and hold the  key for 3" during the milking cycle (with any value set for parameter **t.S.**) to start the manual stimulation process: the frequency and pulsation ratio vary gradually until reaching the values set for stimulation (stimulation frequency **S.F.**, stimulation ratio **S.r.**). Stimulation stops when the stimulation time has elapsed (parameter **S.t.**) and the frequency and pulsation ratio gradually go back to the values set for milking.

**NOTE**

**By setting stimulation ratio (parameter S.r.) on value 0, upon start of the stimulation, the liners stay completely closed and the pulsation stops until the end of stimulation time (S.t.).**

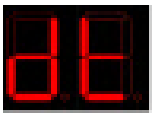


## 4.6 Alarm

If a continuous flow is not detected during the milking process, when the initial delay has elapsed and during the subsequent final delay time count, code AL and the red LED start flashing on the display.

The unit removal procedures start automatically, after which code AL still appears alternately with code dt on the display, and the red LED keeps flashing.

Press the  key to reset the alarm and switch to the detachment mode (stand-by).

## 4.7 Quick-Lift

The quick-lift button corresponds to pressing the  key on the panel
If terminals **7-8** on all the panels are connected to an external switch, by pressing this key you can lift or release all the units at the same time. This way, at the beginning of the milking process, you can release all the units at the same time.

## 4.8 Swing-Over

By activating the Swing-Over mode (**Type of System dt = S.O.** parameter) the ACR-Smart panel can manage systems in which the unit is detached via a pneumatic piston that moves the Swing-Over arm from one side to the other.
By connecting this piston to the CV output, normally dedicated to the DVC, and setting the ACR-Smart **Type of System** parameter, at the end of the milking process the panel will automatically move the arm in order to start milking again on the other side.

Therefore, via the  button or via the remote Quick-Lift switch, you can move arms from one side of the milking parlour to the other.

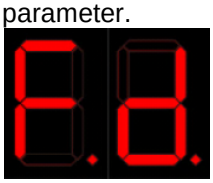
# 5 PROGRAMMING MODE

## 5.1 Accessing the programming mode

To access the Programming menu, press the  +  key for 10” while the system is in detachment mode.
The display features the first parameter identified by its code and the LEDs start flashing alternately.

## 5.2 Programming mode

In the programming menu you can edit the values associated to the parameters in order to optimise the milking, stimulation, detachment and washing operations.
The display features the code of the selected parameter.



Press the  or  keys to scroll the available parameters, each identified by its code.

Press the  +  keys to access the parameter and modify it. The current value of the selected parameter is displayed.

Press the  or  keys to scroll the parameter values.

Press the  +  keys to confirm the value assigned to the parameter and go back to the previous menu. If the parameter has been modified, the display flashes.

To exit the programming mode press and hold the  +  keys for 5”; the panel is then automatically restarted and the version of the software currently installed in displayed.

## 5.3 Programming parameter table

| Parameter name | Code | Description | Range | Unit of measure | Default |
|---|---|---|---|---|---|
| SHUT-OFF SOLENOID VALVE | ES | Select the type of solenoid valve used for shut-off, NO - normally open (vac channel) or NC - normally closed (atm channel) | N.O. – N.C. | // | N.O. |
| CYLIDER SOLENOID VALVE | EC | Select the type of solenoid valve used for DVC, NO - normally open (vac channel) or NC - normally closed (atm channel) | N.O. – N.C. | // | N.O. |
| INITIAL DELAY | Id | Time at the beginning of the milking process in which milk presence is not checked | 0÷19 (corresponds to 0÷190) | Seconds (10x) | 8 (= 80 seconds) |
| FINAL DELAY | Fd | If the panel does not detect a continuous flow of milk throughout the entire delay, it starts the detachment operations | 0÷30 | Seconds | 9 |
| DETACHMENT DELAY | dd | At the end of the milking process, it is the delay between the closure of the s/o valve and the unit removal | 0÷9 | Seconds | 3 |
| AUTOMATIC RELEASE DELAY | Ar | When the delay has elapsed, after detachment, the unit is released | of - 5 - 15 - 30 - 45 - 60 | Seconds | of |
| CONTINUOUS FLOW TIME | cF | If the sensor detects the presence of milk for a period equal to the continuous flow time, then there is an actual flow of milk | 0÷4.0 | Seconds | 1 |
| PULSATION FREQUENCY | Fr | Pulsation frequency during the milking process | 50÷180 LP | Ppm | 60 |
| REAR PULSATION RATIO | Pr | Pulsation ratio of the hindquarters during the milking process | 10:90 ÷ 90:10 | Pulsation ratio | 60 (= 60:40) |
| FRONT PULSATION RATIO | PF | Pulsation ratio of the forequarters during the milking process | 10:90 ÷ 90:10 | Pulsation ratio | 60 (= 60:40) |
| START-UP STAGE | Ip | Select in which stage the panel must start<br>- dt: start in detachment mode<br>- CL: start in washing mode<br>- LP: start from the last active stage | dt - CL - LP | // | CL |
| FINAL SUCTION DELAY | Sd | Delay between the end of the milking session and the opening of the s/o valve for suction | 0÷9 | Seconds | 3 |
| FINAL SUCTION DELAY | SL | During opening of the s/o valve to drain the pipe completely at the end of the milking session | 0f ÷ 9 | Seconds | of |
| STIMULATION FREQUENCY | SF | Pulsation frequency during the stimulation stage | 3÷25 (corresponding to 30÷250) | Ppm | 12 (= 120ppm) |
| STIMULATION TIME | St | Duration of stimulation | 10÷90 | Seconds | 20 |
| STIMULATION RATIO | Sr | Pulsation ratio during stimulation | 0:100 ÷ 100:0 | Pulsation ratio | 30 (= 30:70) |
| NEUTRAL TIME | nt | When this time has elapsed, if there has not been a continuous flow of milk, automatic stimulation starts if it has been set | 0÷24 (corresponding to 0÷240) | Seconds (10x) | 2 (=20 seconds) |

| | | | | | |
|---|---|---|---|---|---|
| TYPE OF STIMULATION | tS | Selection of type of stimulation<br>- FS: forced stimulation<br>- AS: automatic stimulation<br>- oF: stimulation that can only be activated manually | FS - AS - oF | // | AS |
| PULSATION DELAY | Pd | Delay between the beginning of the milking process and the pulsation starting | 0÷9 | Seconds | 0 |
| FREQUENCY IN WASHING MODE | UF | Pulsation frequency during the washing cycle | 0÷15 (corresponding to 0÷150) | ppm | 2 (= 20ppm) |
| MAXIMUM MILKING TIME | Et | The detachment operations always start when this time has elapsed | 10 - 15 - 20 | Minutes | 20 |
| SHUT OFF CLOSURE DELAY | cS | Before starting the washing cycle, the s/o valve stays closed throughout the delay period, in order for the system to create vacuum | Of ÷ 90 | Seconds | of |
| TYPE OF SYSTEM | dt | Definition of the type of system in which the panel is used:<br>– CY: Standard system<br>– SO: Swing-Over | CY - S0 | // | CY |

## 5.4 Parameter reading

**Shut-Off Solenoid Valve – E.S. and Cylinder Solenoid Valve– E.C.:**

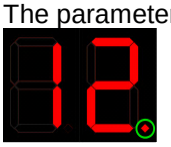
- With CV30 inversa set:
  - E.S. = N.C. (atm channel)
  - E.C. = N.O. (vac channel)
- With CV30 set:
  - E.S. = N.C.
  - E.C. = N.C.
- With CV20 set:
  - E.S. = N.O.
  - E.C. = N.O.

**Start-up stage – IP :**

- dt upon start-up the panel retracts the unit and goes into detachment mode (stand-by)
- CL upon start-up the panel releases the unit and goes into washing mode
- LP upon start-up the panel starts from the last active stage (if it is switched off during the milking cycle it will restart in detachment mode)

**Initial delay – Id :**

- 10 second steps
- The parameter values must be multiplied by 10 (the dot lit-up indicates the x10 multiplication)



>> 120 seconds

**Pulsation frequency in milking mode – Fr :**

- LP indicates that the panel is not controlling pulsation and that it is only powering the pulsator
- The dot lit-up indicates that the value must be added to 100

>> 115ppm

**Pulsation frequency in stimulation mode – SF :**

- The dot lit-up indicates that the value must be multiplied by 10

>> 150ppm

**Neutral time – nt :**

- The dot lit-up indicates that the value must be multiplied by 10

>> 80 seconds

**Stimulation time – tS :**

- FS forced stimulation
- AS automatic stimulation
- Of no stimulation

**NOTE**
**It is always possible to activate manual stimulation with any value set in parameter tS.**

**Type of system – dt :**

- CY system with cylinder-operated detachment
- SO system with detachment via movement of the Swing-Over arm (the CV channel controls a piston that moves the arm from right to left and vice versa)

# 6 GENERAL RECOMMENDATIONS

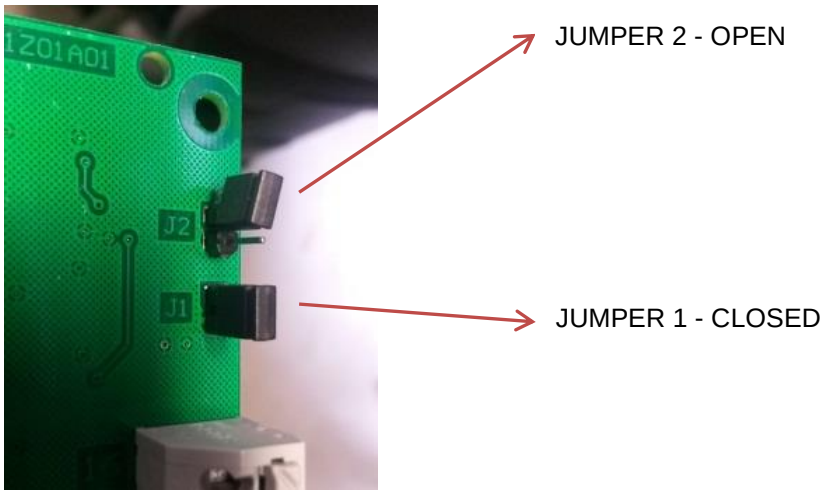
## 6.1 Positioning

Make sure that the HFS sensor is in a vertical position.

## 6.2 Sensitivity

The ACR panel is designed to detect milk flows below the 100 gr/min limit (preferably with the HFS sensor). It is possible (but NOT recommended) to increase or decrease this threshold via the jumpers on the board.

| Milk Flow | OHM | Volt | ACR Jumpers |
|---|---|---|---|
| **> 500 gr/min** | 700 | 6.10 +/- 0.07 | JUMPER 1 CLOSED<br>JUMPER 2 CLOSED |
| **300 gr/min** | 1270 | 6.20 +/- 0.07 | JUMPER 1 OPEN<br>JUMPER 2 CLOSED |
| **100 gr/min** | 2000 | 6.32 +/- 0.07 | JUMPER 1 CLOSED<br>JUMPER 2 OPEN |
| **< 100 gr/min** | 2660 | 6.42 +/- 0.07 | JUMPER 1 OPEN<br>JUMPER 2 OPEN |




## 6.3 Configurations

| Type of system | Recommended settings |
|---|---|
| High Line | Decrease the **Continuous Flow c.F.** parameter = 0.3 seconds |
| Low Line | Decrease the **Final Delay F.d.** parameter = 6 seconds |
| Goats or sheep | Decrease the **Continuous Flow c.F.** parameter = 0.2 seconds |
| | Decrease the **Final Delay F.d.** parameter = 8 seconds |
| | If the system continues to detach too soon, open both jumpers |

## 6.4 Troubleshooting

| Problem | Causa | Solution |
|---|---|---|
| The unit is detached too soon | Incorrect setting of ***Final Delay*** and/or ***Continuous Flow*** parameters | Increase the **F.d.** (***Final Delay***) parameter and/or decrease the **c.F.** (***Continuous Flow***) parameter |
| The unit is detached too late | Incorrect setting of ***Final Delay*** and/or ***Continuous Flow*** parameters | Decrease the **F.d.** (***Final Delay***) parameter and/or increase the **c.F.** (***Continuous Flow***) parameter |
| The shut-off valve stays closed during milking and during washing | Incorrect setting of ***Shut-Off Solenoid*** parameter | Check that the parameter **E.S**. is set on **N.O.** if is used a VAC channel (eg. CV20) or on **N.C.** if is used an ATM channel (eg. CV30) |