

MAXIMA

MPG



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1 FIRST OF ALL

1.1 WELCOME

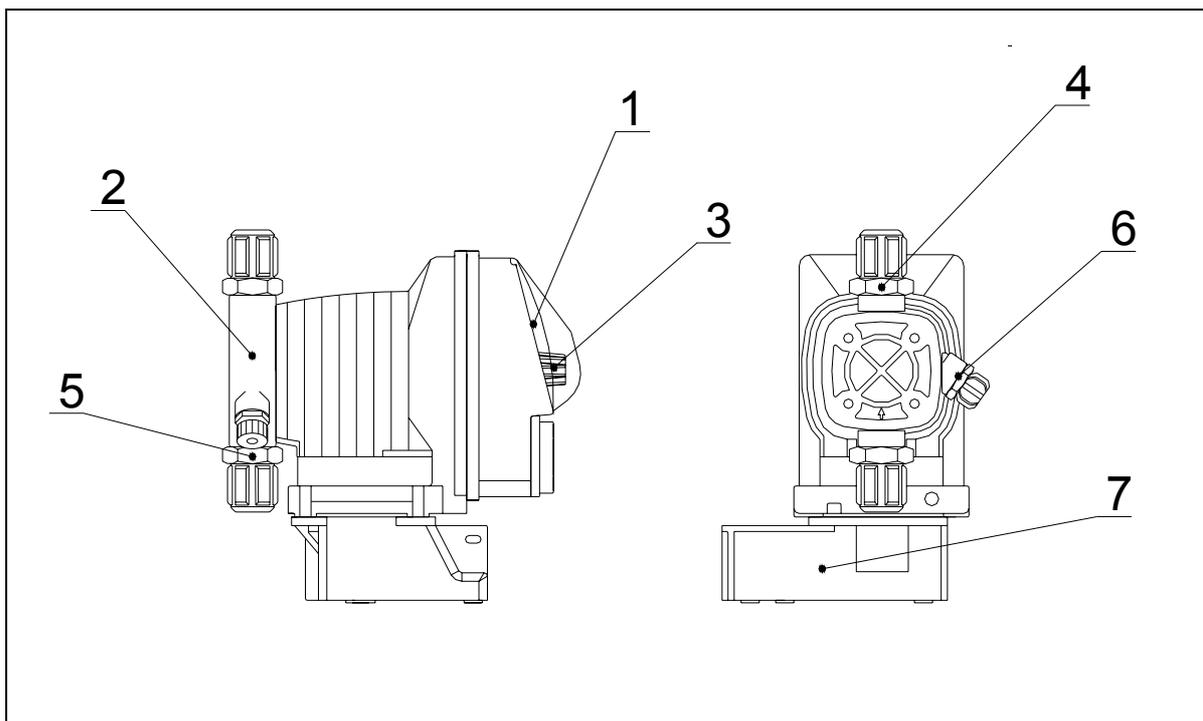
Thank you for buying a Seko product.

This dosage pump is made up of a control part that houses the electronics and the magnet and a hydraulic part that is always in contact with the liquid to be dosed.

The parts that come into contact with the liquid are chosen to guarantee full compatibility with most chemical products, normally used. Due to the variety of chemical products on the market, we recommend checking chemical compatibility between the product dosed and the materials in contact with it. The materials that make up the pump are listed in **Paragraph 1.3.1**, while all membranes are made of PTFE.

➡ Pay particular attention to the warnings and precautions indicated in this manual.

1.2 COMPOSITION OF THE SYSTEM



| | |
|---|-------------------------------|
| 1 | Control Panel |
| 2 | Head |
| 3 | Knob for adjusting the stroke |
| 4 | Delivery connector |
| 5 | Suction connector |
| 6 | Priming valve |
| 7 | Support for sides and base. |

1.3 PACK CONTENTS

| MAXIMA MPG |
|---|
| Complete pump |
| Foot filter (Fig. 1) |
| Injection fitting(Fig. 2) |
| 4 m of PVC hose (transparent and soft) for suction and for connecting the bleeding valve up for manual priming (Fig. 3) |
| 2 m of PE pipe (opaque and rigid) for connecting the pump's outlet to the injection point (Fig. 3) |
| Anchors for securing the pump. |
| Support for wall mounting (Fig. 4) |
| Instruction Manual |

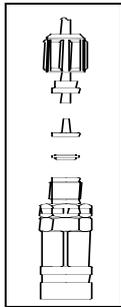


Fig. 1: Foot filter

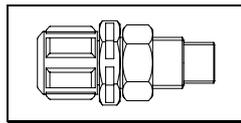


Fig. 2: Injection fitting

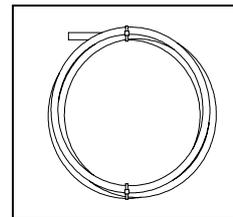


Fig. 3: Hoses (suction, delivery, bleeding)

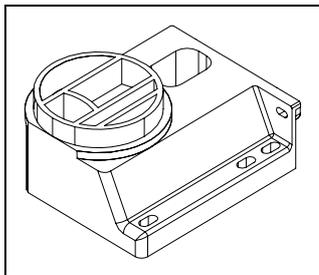


Fig. 4: Support

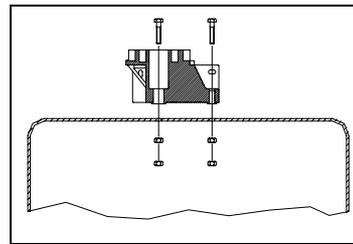


Fig. 5: Fitting the support to the tank

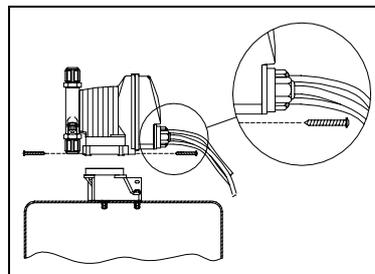


Fig. 6: Fitting the pump onto the support



WARNINGS

CAREFUL HANDLING, INSTALLATION AND COMMISSIONING OF THE PUMP HELPS TO PROVIDE A TROUBLE-FREE INSTALLATION.

 **READ THE FOLLOWING WARNINGS BEFORE PROCEEDING TO INSTALL OR DO MAINTENANCE WORK ON THE PUMP.**

- All our pumps are tested using water. To dose chemical products that may react with the water (e.g. H₂SO₄ = Sulphuric Acid) all the internal parts of the hydraulic section must be dried. To do so:
 - a Switch the power to the pump on and run it at maximum frequency with the delivery valve facing downwards.
 - b After it has run for a few minutes check that no more water is coming out.
- Install the pump in a place where the temperature does not exceed 40°C and the relative humidity is below 90%. This pump has a protection level of IP65 and so can be installed outdoors. This pump must never be immersed in liquid. To prevent overheating do not install the pump in direct sunlight.
- Install the pump in such a way that inspection and maintenance are easy, and then secure the pump well to prevent vibrations.
- Check that the power supply voltage fed to the plant is as indicated in the label on the pump.

 **WARNING: BEFORE DOING ANY WORK ON THE PUMP, ALWAYS FIRST DISCONNECT THE POWER SUPPLY CABLE.**

- When handling the pump after it has been used to dose chemical products, remember to use protective clothing and gloves and to provide suitable protection for your eyes.
- If you are dosing using pressurised piping, before starting the pump always check that the pressure in the plant does not exceed the maximum working pressure shown on the dosage pump label.

1.4 TECHNICAL CHARACTERISTICS



Check the main characteristics of you pump on the plate.

| | | | | |
|------------|---------------------------|-------|-----------|-----|
| MAXIMA | | | 240 Spm | |
| Type | bar | lit/h | Gph | Psi |
| MPG912 | 10 | 8.5 | 2.25 | 145 |
| 230VAC | 6 | 9.8 | 2.59 | 87 |
| 50/60 Hz | 2 | 11 | 2.91 | 29 |
| 40 W | Code MPG912ASC0M00 | | Serial N° | |
| Fuse 2 A L | XXXXXX | | | |

Your pump is one of the family of pumps listed in the table below:

| Model | Pressure | Flow Rate | cc/stroke | Connections (mm) | Strokes/min | Weight |
|-------|----------|-----------|-----------|---------------------|-------------|--------|
| | bar | lit/h | | IN / OUT | | kg |
| 611 | 10 | 1.80 | 0.13 | 4 / 6 | 240 | 1,7 |
| | 6 | 2.00 | 0.14 | | | |
| | 3 | 2.20 | 0.15 | | | |
| 612 | 7 | 5 | 0.35 | 4 / 6 | 240 | 1,7 |
| | 4 | 5.5 | 0.38 | | | |
| | 1 | 8.4 | 0.58 | | | |
| 911 | 18 | 4.5 | 0.31 | 4 / 6 | 240 | 3,1 |
| | 16 | 5 | 0.35 | | | |
| | 11 | 5.6 | 0.39 | | | |
| 912 | 10 | 8.5 | 0.59 | 4 / 6 | 240 | 3,1 |
| | 6 | 9.8 | 0.68 | | | |
| | 2 | 11 | 0.76 | | | |
| 913 | 5 | 15 | 1.39 | 8 / 12 | 180 | 3,2 |
| | 4 | 18 | 1.67 | | | |
| | 3 | 20 | 1.85 | | | |
| 914 | 2 | 35 | 2.43 | 8 / 12 | 240 | 3,2 |
| | 1 | 44 | 3.06 | | | |
| | 0 | 63 | 4.38 | | | |

1.5 WARNINGS



Check the model of the equipment bought, when using the dosage calibration references indicated in this manual.



ATTENTION – Stroke adjustment

The knob must not be rotated when the pump is not working; otherwise the adjustment shaft could become deformed thus causing a flow rate loss.



WARNING: Always follow the necessary safety procedures, including the use of adequate protection for the eyes, face, hands, and clothing.



WARNING: When installing or carrying out maintenance on this equipment, always disconnect it from the power supply.



Seko is constantly striving to perfect all its products, and we therefore reserve the right to make changes at any time without notice.



Failure to abide by the standards laid down in this manual could result in damage to property or people, as well as damaging the equipment or compromising its operation.

2 INSTALLATION



WARNING: Before proceeding to install the pump, read all the paragraphs referring to it carefully.

This pump must be installed in a position that makes connecting it to the chemical product tank and the injection point easy.

This pump has a protection level of IP65 and so can be used outdoors. This pump must never be installed in positions in which it may be submerged. It must also not be installed where the temperature exceeds 40°C for long periods of time.

2.1 RECOMMENDED INSTALLATION LAYOUTS

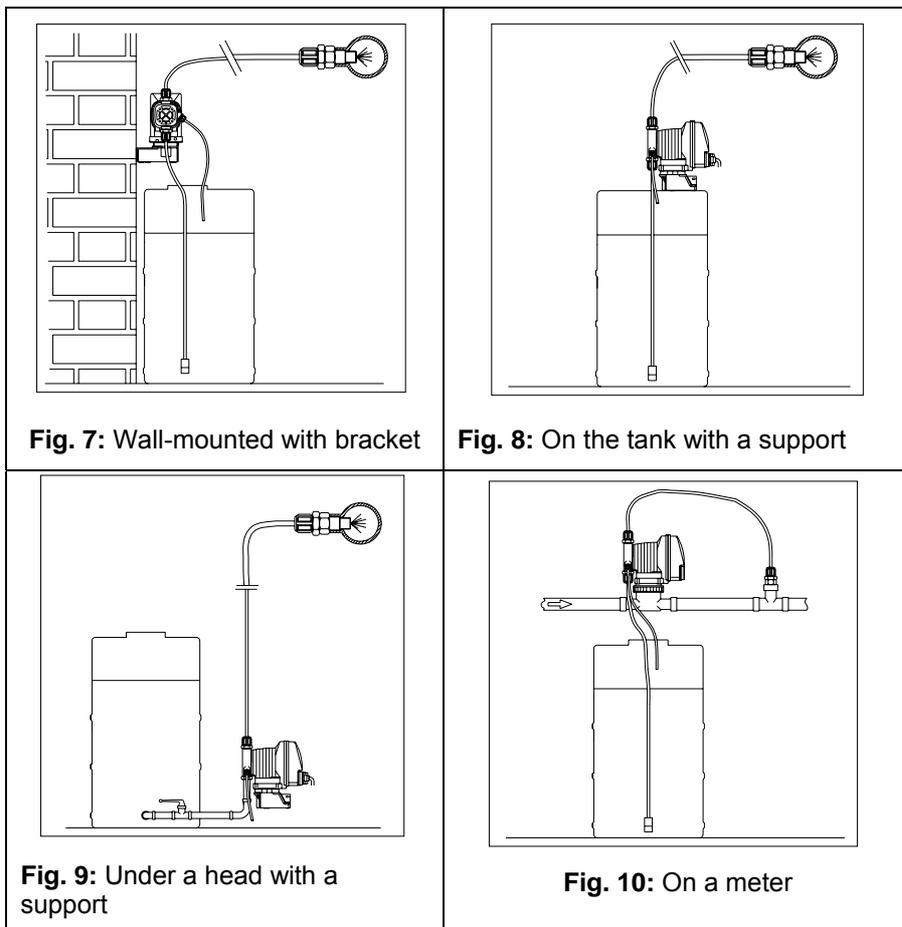


Fig. 7: Wall-mounted with bracket

Fig. 8: On the tank with a support

Fig. 9: Under a head with a support

Fig. 10: On a meter

2.2 OVERALL DIMENSIONS AND DRILLING TEMPLATE

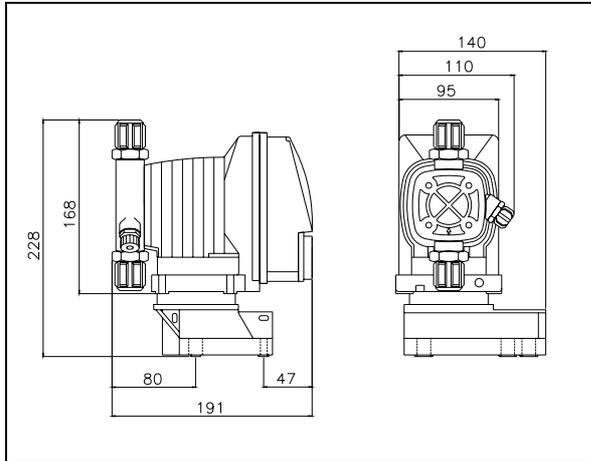


Fig. 11: Overall dimensions – 610 series

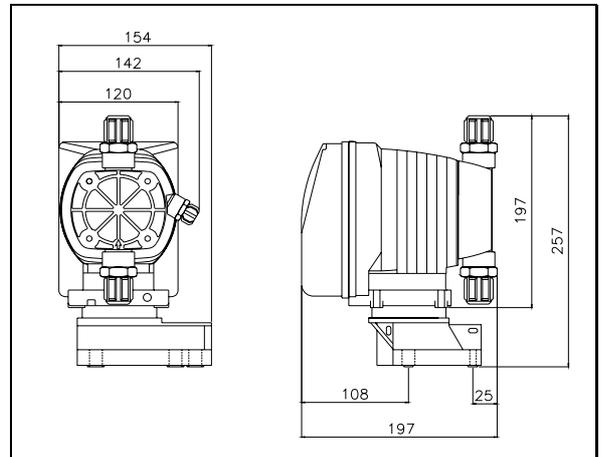


Fig. 12: Overall dimensions – 910 series

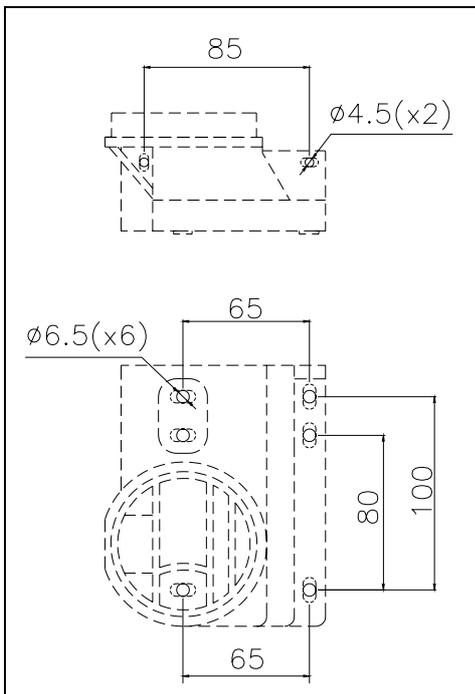


Fig. 13: Drilling template for support

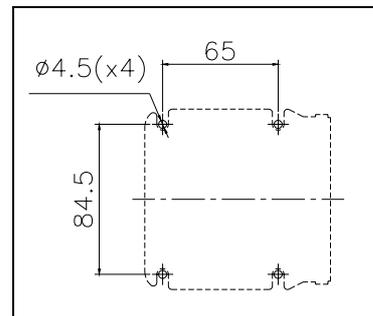


Fig. 14: Drilling template for 610 series

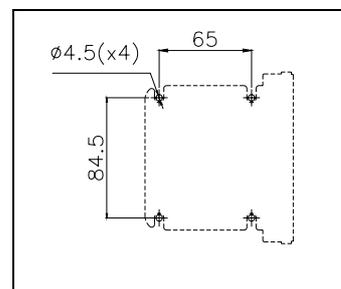
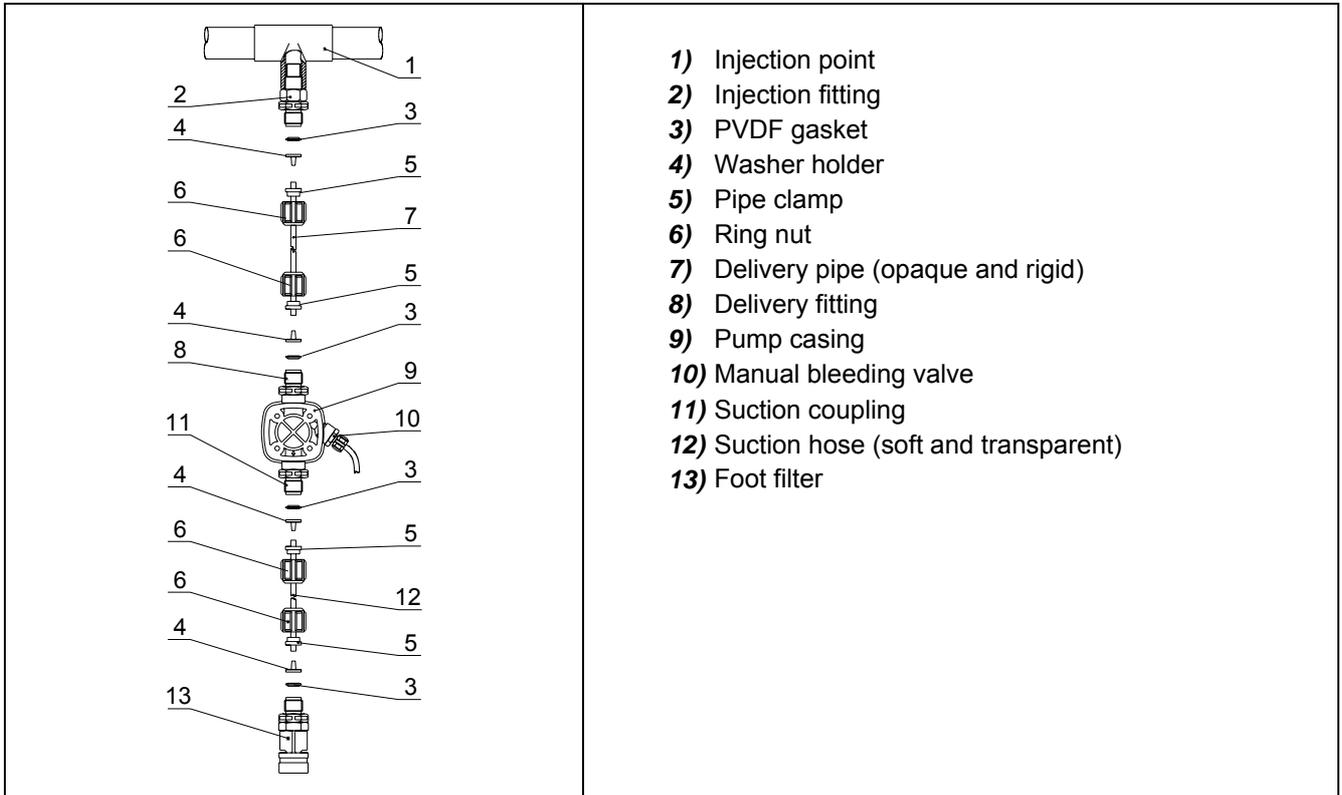


Fig. 15: Drilling template for 910 series

2.3 PLUMBING CONNECTIONS



When forming the plumbing connections, follow these instructions:

- The **FOOT FILTER** must be installed in such a way that it is always 5-10 cm from the bottom to prevent any deposits clogging it and damaging the hydraulic part of the pump.
- Installing the pump under a head is always best and is recommended for pumps with a very low flow rate as it solves all priming problems. **Installation under a head is specifically recommended when dosing sodium hypochlorite (NaOCl) and hydrazine (N₂H₂) or any other product that tends to develop gas.**
- Pumps are supplied standard with entry and exit pipes that are sized to suit the pump's hydraulic characteristics. Should you need to use longer pipes, it is important to use pipes with the same internal and outside diameter as those supplied with the pump.
- For outdoor applications, where the **DELIVERY PIPE** may be exposed to direct sunlight, we recommend using black piping that is resistant to ultraviolet rays.
- It is advisable to position the **INJECTION POINT** towards the top of the pump or the tank. In all cases, to guarantee the pump's performance, always use the **INJECTION VALVE** supplied with the pump.
- **THE INJECTION VALVE MUST ALWAYS BE INSTALLED AT THE END OF THE DELIVERY LINE FOR THE DOSAGE FLOW.**

2.4 ELECTRICAL CONNECTIONS

The pump must be connected to a power supply that is as indicated on the label on the side of the pump. Failure to respect the limits indicated may result in the pump being damaged.

The MAXIMA range of pumps do not need to be earthed as they are made using components and technology that ensures that all electronic components are double insulated.

The pumps are designed to absorb small extra voltages, but to avoid the pump being damaged it is always preferable to avoid using a power supply in common with electrical equipment that generates other voltages.

The connection with the 380V three-phase line is formed exclusively between phase and neutral. No phase-earth connections are to be formed. (Fig. 16 and Fig 17)

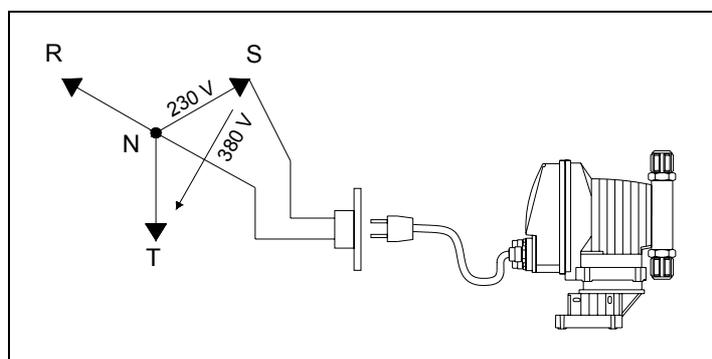


Fig. 16: CORRECT CONNECTION

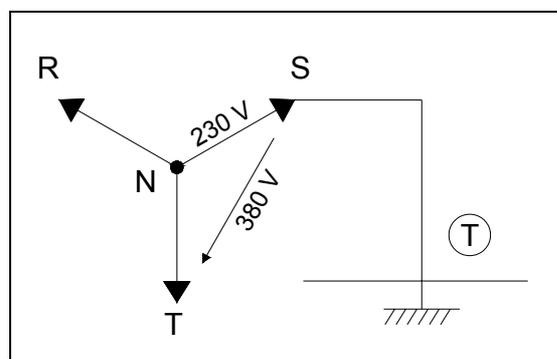


Fig. 17: WRONG CONNECTION

3 SETTING AND OPERATION

3.1 GENERAL DESCRIPTION



Fig. 18: Display

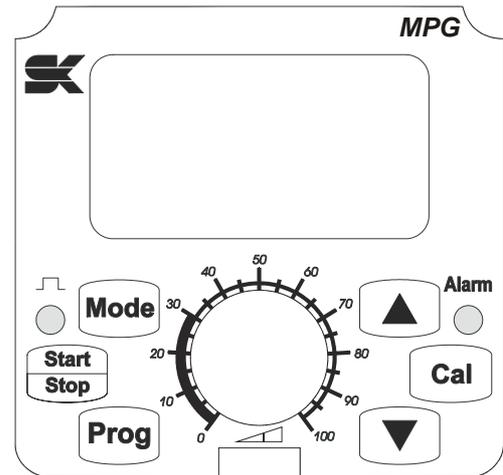


Fig. 19: Control Panel

| DISPLAY (icon lit) | |
|--------------------|--|
| Icon | Pump Functions |
| Level | The level sensor has detected that the liquid has fallen below the preset level. |
| Flow | Flow Alarm Enabled |
| Pause | Pump paused |
| Stop | Pump stopped |
| Memory | Memory Function Active |
| 0/4...20 | Pump in direct 0/4...20 mA mode |
| 20...4/0 | Pump in inverse 20...4/0 mA mode |
| % | Flow Rate shown in % |
| C | Pump in constant mode |
| n:1 | Pump in n:1 proportional mode |
| 1:n | Pump in 1:n proportional mode |
| 1:c | Pump in 1:c manual mode |
| ml/min | Flow Rate shown in ml/min |

| KEYBOARD | |
|------------|--|
| Key | Pump Functions |
| Prog | Key for selecting Operating Mode |
| Start/Stop | Pump On/Off Switch |
| Mode | Regulation and flow rate display key |
| Cal | Change the dosage calibration parameters |
| ▲ and ▼ | Change the parameters shown on the display |

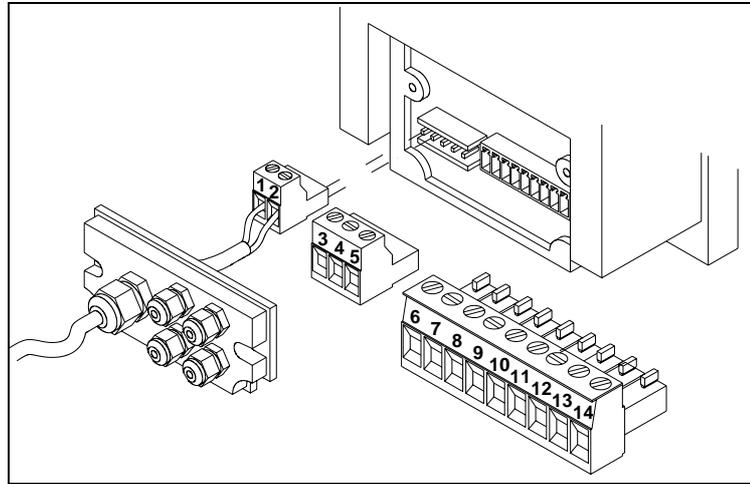


Fig. 20: Connection Diagram

POWER SUPPLY

| | |
|---|---------|
| 1 | Phase |
| 2 | Neutral |

ALARM REPETITION OUTPUT RELAY

| | |
|------------------------|--------------------|
| 3 Normally Open (NO) | NO = PIN 3 + PIN 4 |
| 4 Common | |
| 5 Normally Closed (NC) | |

PAUSE AND FLOW CONTROL

| | |
|----------------|------------------------------|
| 6 Pause | PAUSE = PIN 6 + PIN 8 |
| 7 Flow Control | FLOW CONTROL = PIN 7 + PIN 8 |
| 8 GND | |

LEVEL SENSOR

| | |
|--------------|--|
| 8 GND | Level alarm with pump cut-out = PIN 8 + PIN 9 |
| 9 Lev | Level alarm without pump cut-out = PIN 8 + PIN 10 |
| 10 Pre-alarm | |

EXTERNAL SIGNAL INPUT

| | |
|---------------------------|--|
| 11 GND | FREQUENCY SIGNAL = PIN 11 + PIN 12 |
| 12 Frequency signal input | CURRENT SIGNAL = PIN 11 (- pole) and PIN 13 (+ pole) |
| 13 Current signal input | |
| 14 NOT USED | |



WARNING: The level and frequency contacts **ONLY** accept voltage-free signals.

The **Maxima MPG** is designed to operate in various modes (C, n:1, 1:n, 1:c, 0/4...20, 20.../0/4). Passage from one to the other takes place after holding down the **Prog** key for three seconds, as shown in the layout shown, using the ▲ and ▼ keys.

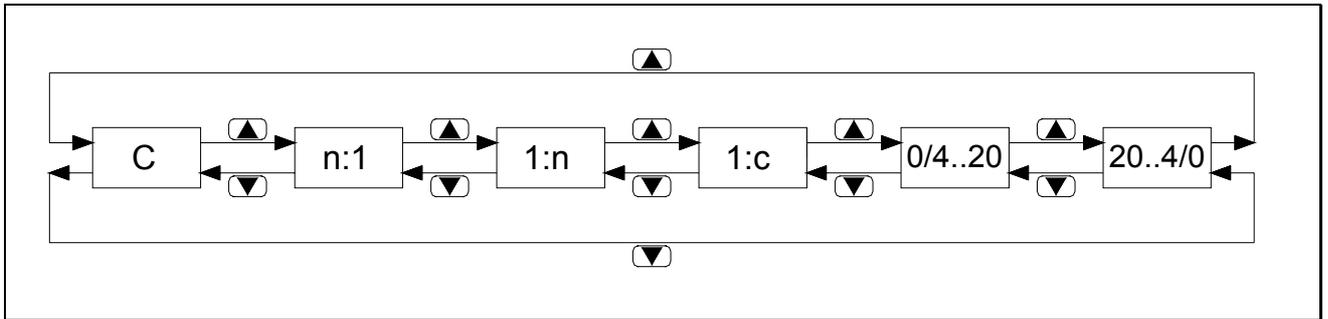


Fig. 21: Main Programming Menu

Once you have accessed programming and selected the required mode, to exit programming and return to operating mode, hold the **Prog** key down for three seconds.

Entry into programming mode is highlighted by the flashing **STOP** icon.

You can exit programming at any time by holding the **Prog** key down for three seconds.

The modes available include:

| Icon | Display | Mode | Paragraph |
|---------|---------|-----------------|-----------|
| C | C | Constant | 3.2.1 |
| n:1 | F n 1 | Division | 3.2.2 |
| 1:n | F 1 n | Multiplication | 3.2.3 |
| 1:c | F 1 c | Manual | 3.2.4 |
| 0/4..20 | I | Direct current | 3.2.5 |
| 20..4/0 | I | Inverse current | 3.2.6 |

For a better understanding of the **Maxima MPG** functions and programming, we recommend referring to the Main Programming Menu shown in Fig. 21 and Figs 18 and 19, showing the display and the control panel respectively.

3.1.1 Displaying the flow rate

The flow rate can be displayed in three formats: Percentage (**P**), Frequency (**F**), **ml/min**.

To switch from one format to another hold the **Mode** key down for three seconds, to move from one to another as per the block diagram below.

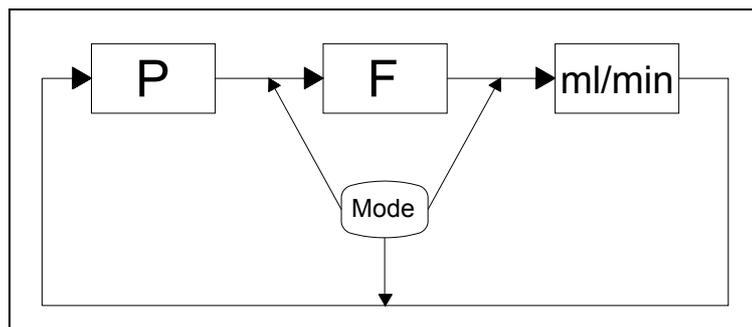


Fig. 22: Changing the Display

➤ Percentage Mode

The letter **P** appears on the Display followed by a number that indicates the percentage of the maximum flow rate. In this format the **%** icon is lit.

To adjust the flow rate hold the **Mode** pushbutton and the **▲** or **▼** keys down together to increase or decrease the flow rate value respectively.

This value can vary from 100 (corresponding to 100% of the max frequency) to 1% (corresponding to 2 imp/min).

➤ Frequency Mode

The letter **F** appears on the display, as well as the number of impulses per minute set. **F 160** means that the pump doses at a frequency of 160 impulses per minute.

The frequency varies from the maximum value to a minimum of 1 imp/min (minimum flow rate).

To adjust the flow rate hold the **Mode** pushbutton and the **▲** or **▼** keys down together to increase or decrease the working frequency value respectively.

➤ ml/min Mode

The display shows the flow rate expressed in ml/min and the **ml/min** icon is lit.

The flow rate is changed by pushing the **Mode** pushbutton and the **▲** or **▼** keys together. The change in the value depends on the model of the pump as well as the calibration of the pump (see **Par. 3.3** "Calibration Procedure").

NOTE: Adjustment is possible both with the pump stopped, **STOP** icon lit, and during dosing. These three display modes are not always available, depending on the operating mode set.

3.1.2 Factory settings

A new pump from the factory is set as follows:

| | |
|-------------------|-----------------------------------|
| Operating Mode | Constant |
| Flow Rate Display | Percentage (100%) |
| Working Frequency | Maximum (240) |
| Stroke | Maximum |
| Operation | STOP |
| Icons "lit" | STOP C and % |

3.1.3 Priming

The priming function is useful for speeding up installation of the pump as it makes the pump work at maximum frequency, independently of the parameter settings.

Priming can be activated both when the pump is running and when the pump is stopped (**STOP** icon lit).

Activate the pump by pushing the **START/STOP** button (**STOP** icon off). Press the ▲ and ▼ keys together. The pump starts at maximum frequency. The display reads: P100, F240 or XX.X (value taken from calibration). When the ▲ and ▼ keys are released the pump goes back to its previous state.

3.1.4 Adjusting the flow rate

The flow rate can be adjusted in two ways:

- By adjusting the operating frequency setting.
- By adjusting the stroke using the relevant knob of the front.

Fine tuning of dosing can be obtained by combining these two settings. By adjusting the stroke you can set the pump to maximum flow rate, which can be refined by adjusting the operating frequency.

It is advisable to set the stroke % at above 30%.

3.1.5 Checking the level of the liquid to be dosed

A level sensor can be used to check the level of the liquid to be dosed.

Two operating modes are available:

- 14) Level alarm with pump cut-out: Level sensor connected to pins n° 8 and 9 (see CONNECTION LAYOUT). When the liquid reaches the required level the pump cuts out (pump stopped and **Stop** icon lit). The **Level** icon and **Alarm** LED switch on, on the Display. Once the liquid level is corrected the **Level** icon and **Alarm** LED switch off and the pump starts working again (**Stop** icon off).

Level alarm without pump cut-out: level sensor connected to pins 8 and 10 (see CONNECTIONS LAYOUT). When the liquid reaches the required level the pump does **not** cut out. The **Level** icon switches on, on the Display and the **Alarm** LED starts flashing. Once the liquid level is corrected, the **Level** icon and **Alarm** LED switch off.

3.1.6 Flow Control

The Flow Control function is used to provide control over the correct dosage by the pump and can be enabled in all operating modes.

The flow sensor is connected to PINS 7 and 8 on the pump, which gives an impulse each time the pressure detected at the pump's intake varies. The software controls the relationship between the number of strokes made by the pump and the number of impulses picked up by the flow sensor. After 8 consecutive strokes by the pump for which there is no corresponding impulse by the flow sensor the pump stops, the **STOP** icon and the **Alarm** LED switch on.

When programming the functions, for each operating mode there is a step, indicated by the **Flow** icon flashing that allows you to enable Flow Control. In display mode, the Flow icon stays lit while Flow Control is enabled.



WARNING: Enabling Flow Control without connecting up the contacts causes the pump to stop after its first 8 dosing strokes.

3.2 OPERATING MODE

This paragraph describes the various operating modes available on the **Maxima MPG**. For changing from one mode to another, see the instructions in **Paragraph 3.1**.

3.2.1 Constant Mode

In this mode the pump provides constant, continuous dosing at the flow rate set.

During operation, to select **CONSTANT** mode, push the **Prog** key and hold it down. **PrG** appears on the screen for a few seconds, and then the main programming menu will open (**STOP** icon flashing). Push the **▲** and **▼** keys until the letter **C** appears on the screen, with the **C** icon flashing.

➤ Setting parameters from the C menu.

From the main programming menu, when the **Prog** key is pressed the **C** icon stays lit and a specific menu opens, as per the diagram shown below.

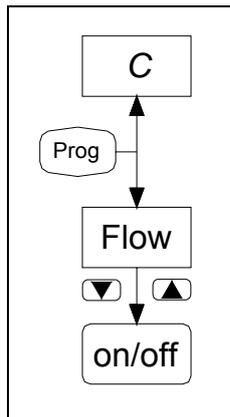


Fig. 23: Constant Mode Menu

In this mode the flow control function can be activated as follows: Access programming by holding the **Prog** key down for three seconds. **PrG** appears on the screen for a few seconds, and when you enter programming the pump is forced to stop and the **C** and **STOP** icons flash. Push the **Prog** key again to access a sub-menu (**C** icon lit and **STOP** and **Flow** icons flashing). Flow control can then be selected using the **▲** or **▼** keys. When Flow Control is active, the display reads ON, when it is inactive, the display reads OFF.

To exit programming hold the **Prog** key down for three seconds.

 **WARNING:** The pump may stop automatically due to a pump cut-out signal emitted by the level sensor (**Level** icon and **Alarm** LED lit), see **par. 3.1.5** “Checking the level of the liquid to be dosed”.

➤ **Displaying and Operation**

When operating in **CONSTANT** mode the display shows the flow rate set.

This can be displayed in three ways (**P, F, ml/min**) as explained in **Paragraph 3.1.1**.

The **C** icon is lit. When displayed as a percentage the **%** icon is also lit. The **STOP** icon must be off while the pump is running.

The pump is activated and stopped manually using the **START/STOP** button (the **Stop** icon is off or on respectively).

To adjust the flow rate hold the **Mode** pushbutton and the **▲** or **▼** keys down together to increase or decrease the flow rate value respectively.

3.2.2 n:1 proportional mode (Division Mode)

In this mode the pump doses one stroke every n impulses received, where n is a number that can be set by the operator.

To select **n:1 DIVISION** mode, push the **Prog** key and hold it down. appears on the screen for a few seconds, and then the main programming menu will open (**STOP** icon flashing). Push the **▲** and **▼** keys until **Fn1** appears on the screen, with the **n:1** icon flashing.

➤ **Setting parameters from the n:1 menu.**

From the main programming menu, when the **Prog** key is pressed the **n:1** icon stays lit and a specific menu opens, as per the diagram shown below.

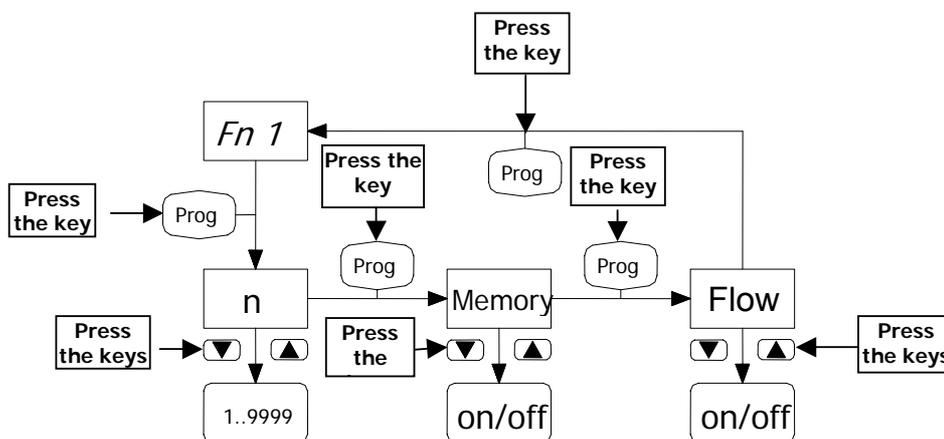


Fig. 24: n:1 division mode menu

To exit programming and save the parameters set at any time, hold the **Prog** key down for three seconds.

– **Selecting Impulses (See Fig. 24)**

The number **n** displayed represents the number of external impulses required for the pump to dose one stroke. This value can be changed between 1 and 9999 using the ▲ or ▼ keys.

For Example: If I have connected my pump to a CB1 series plunger impulse counter (1 imp/l) and have selected N=8, this means that every 8 impulses on the counter my pump will give one stroke, that is, for every 8 litres of water that pass the counter the pump will dose one stroke.

The set value is confirmed by pressing the **Prog** key and the programming moves on to selecting the **Memory** function.

– **Memory Function (see Fig. 24)**

The software continually monitors the arrival of external impulses. When these are at high frequency and the pump is not able to dose all the corresponding strokes the “missed” strokes can be recorded, up to a maximum of 65,535, so as to dose these as soon as possible.

- **Memory Function OFF** (**Memory** icon off).
The pump does not record missed strokes. The under dosage situation is indicated. A message reading **ALL2** appears on the screen and disappears as soon as the under dosing situation is resolved.
- **Memory Function ON** (**Memory** icon lit).
As soon as the pump starts recording excess strokes the **Memory** icon flashes until the recorded strokes have been completed.
If the memory is exceeded (more than 65,535 strokes recorded) the Alarm LED also switches on and the alarm repetition relay is activated.



WARNING: The recorded strokes are deleted under the following conditions:

- Switching the dosage pump off.
- Entering programming.
- Carrying out the priming procedure (pushing the ▲ and ▼ keys together).
- Activating the level alarm with pump cut-out.
- Activating the Flow Alarm.
- The pump temperature exceeds the safety limit and the pump goes into self-protect mode (when the temperature falls below the threshold the pump restarts with the memory zeroed).



WARNING: The pump may stop automatically due to a pump cut-out signal emitted by the level sensor (**Level** icon and **Alarm** LED lit), see par. 3.1.4 “Checking the level of the liquid to be dosed”.

The status set can be confirmed by pressing the **Prog** key, which also enables selecting the Flow function.

– **Flow Control Function (see Fig. 24)**

This can be enabled by pushing the ▲ or ▼ keys, and stored in the memory by pushing the **Prog** key.

➤ **Displaying and Operation**

On exiting programming the 100% default value will be displayed (% icon lit).

The number displayed shows the percentage flow for each stroke dosed by the pump, for every n external signals received.

The **n:1** and % icons are on and the **STOP** icon must be off while the pump is running.

The value displayed can be edited (between 100% and 1%) by pushing the **Mode** key and the ▲ or ▼ keys together.

The settings return to their default values each time the setting for the number of impulses is changed on entering programming. If this parameter is not edited the previous settings are reinstated.

EXAMPLE: setting n = 4

With n=4, if the pump is working at 100% it doses 1 stroke for every 4 external signals received.

If the percentage is set at 80% the pump doses 1 stroke every 5 external signals received (the flow rate will be 80% of the initial flow rate).

If the percentage is set at 50% the pump doses 1 stroke every 8 external signals received (the flow rate will be 50% of the initial flow rate).

3.2.3 1:n proportional mode (Multiplication mode)

In this mode the pump doses n strokes for every external impulse received, where n is a number that can be set by the operator.

To select **1:n MULTIPLICATION** mode, push the **Prog** key and hold it down. **F1n** appears on the screen for a few seconds, and then the main programming menu will open (**STOP** icon flashing). Push the **▲** and **▼** keys until **F1n** appears on the screen, with the **1:n** icon flashing.

➤ **Setting parameters from the 1:n menu.**

From the main Programming menu, when the **Prog** key is pressed the **1:n** icon stays lit and a specific menu opens, as per the diagram shown below.

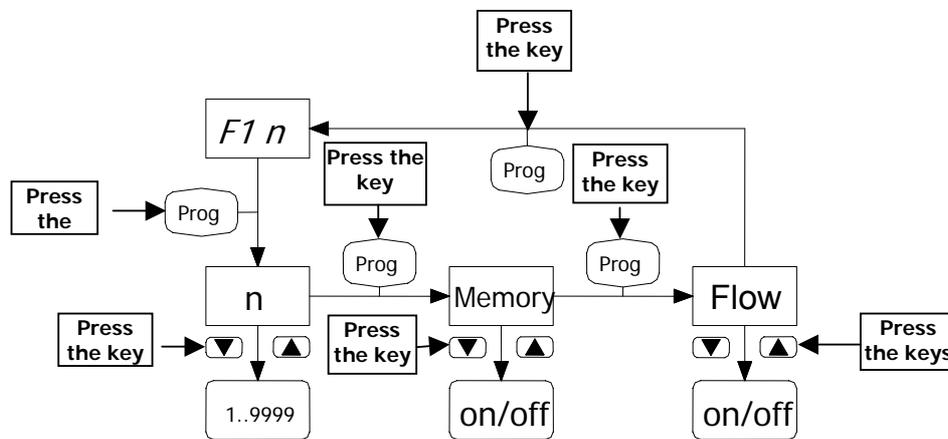


Fig. 25: 1:n Multiplication Mode Menu

To exit Programming and save the parameters set at any time, hold the **Prog** key down for three seconds.

– **Selecting Strokes (see Fig. 25)**

The number **n** displayed indicates the number of strokes the pump doses for each external impulse received. This value can be changed, between 1 and 9999 using the **▲** or **▼** keys.

Example: If I have connected my pump to a (1 imp/l) plunger impulse counter and have selected **n=8**, this means that for every impulse on the counter my pump will give 8 strokes, that is, for every litre of water that passes the counter the pump will dose 8 strokes.

The set value is confirmed by pressing the **Prog** key and the programming moves on to selecting the **Memory** function.

– **Memory Function (see Fig. 25)**

The software continually monitors incoming external signals. When the frequency of the impulses is high and the pump is not able to dose all the corresponding strokes, the outstanding impulses can be recorded, up to a maximum of 65,535, so as to dose these strokes as soon as possible.

- **Memory Function OFF** (**Memory** icon off).

The pump does not record outstanding impulses. The under dosage situation is indicated. A message reading **ALL2** appears on the screen and disappears as soon as the under dosing situation is resolved.

- **Memory Function ON** (**Memory** icon lit).

As soon as the pump starts recording outstanding impulses, the **Memory** icon flashes until all the recorded strokes have been completed.

If the memory is exceeded (more than 65,565.5355 strokes recorded) the Alarm LED also switches on and the alarm repetition relay is activated.



WARNING: The recorded impulses are deleted under the following conditions:

- Switching the dosage pump off.
- Entering programming.
- Carrying out the priming procedure (pushing the ▲ and ▼ keys together).
- Activating the level alarm with pump cut-out.
- Activating the Flow Alarm.
- The pump temperature exceeds the safety limit and the pump goes into self-protect mode (when the temperature falls below the threshold the pump restarts with the memory zeroed).

The set status is confirmed by pressing the **Prog** key and the programming moves on to selecting the Flow function.



WARNING: The pump may stop automatically due to a pump cut-out signal emitted by the level sensor (**Level** icon and **Alarm** LED lit), see par. 3.1.4 “Checking the level of the liquid to be dosed”.

– **Flow Control Function (see Fig. 25)**

This can be enabled by pushing the ▲ or ▼ keys, and stored in the memory by pushing the **Prog** key.

➤ **Displaying and Operation**

On exiting programming the **n** value set during programming will be displayed.

The number displayed indicated the number of strokes the pump will dose for each external signal received and can be edited. This can even be done without returning to programming by pushing the **Mode** and ▲ or ▼ keys.

The **1:n** stays on and the **STOP** icon must be off while the pump is running.

To ensure the most even dosing possible the pump measures the time interval between one external signal and the next and automatically spreads the **n** strokes programmed over this interval (for this reason the working frequency cannot be changed in 1:n mode).

3.2.4 1:c Manual Mode

In this Mode the pump does a settable number of strokes, C, on receiving an input impulse. This impulse may come from the outside (plunger impulse counter) or by pressing the ▲ key on the keyboard.

To select 1:c MANUAL mode, push the **Prog** key and hold it down. PrG appears on the screen for a few seconds, and then the main programming menu will open (STOP icon flashing). Push the ▲ and ▼ keys until **F1c** appears on the screen, with the 1:c icon flashing.

➤ Setting parameters from the 1:c menu.

From the main programming menu, when the **Prog** key is pressed the 1:c icon stays lit and a specific menu opens, as per the diagram shown below.

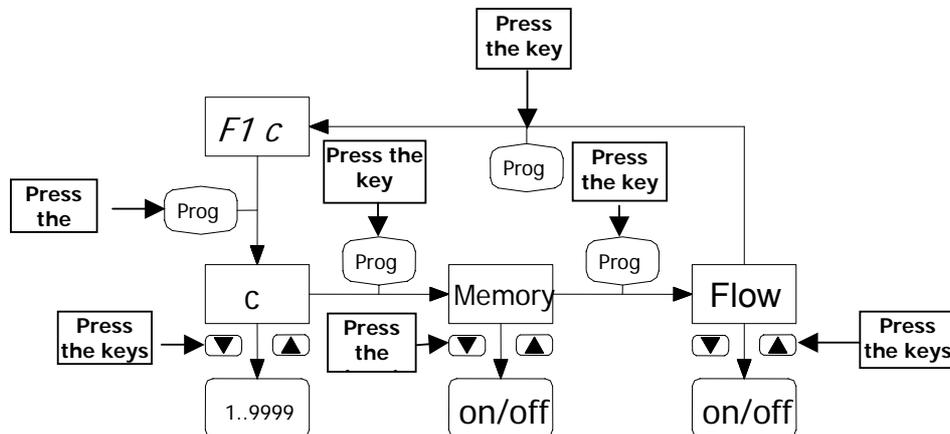


Fig. 26: 1:c Manual Mode Menu

To exit Programming and save the parameters set at any time, hold the **Prog** key down for three seconds.

– Selecting Impulses (See Fig. 26)

The number **c** displayed indicates the number of strokes the pump doses for each external impulse received or each time (▲) is pressed on the keyboard. This value can be changed, between 1 and 9999 using the ▲ or ▼ keys.

The set value is confirmed by pressing the **Prog** key and the programming moves on to selecting the **Memory** function.

– **Memory Function (see Fig. 26)**

The software continually monitors incoming external signals. When the frequency of the impulses is high and the pump is not able to dose all the corresponding strokes, the outstanding impulses can be recorded, up to a maximum of 65,535, so as to dose these strokes as soon as possible (for example - there is a reduction in the flow of water through the counter).

▪ **Memory Function OFF** (**Memory** icon off).

The pump does not record external impulses of (▲) keyboard strokes received. The under dosage situation is however indicated, with a message that reads **ALL2** appearing on the display. This will disappear once the under dosage situation has been resolved.

▪ **Memory Function ON** (**Memory** icon lit).

As soon as the pump starts recording outstanding external impulses or (▲) keyboard strokes, the **Memory** icon flashes until all the recorded strokes have been completed.

If the memory is exceeded (more than 65,565.5355 strokes recorded) the Alarm LED also switches on and the alarm repetition relay is activated.



WARNING: The recorded impulses are deleted under the following conditions:

- Switching the dosage pump off.
- Entering programming.
- Carrying out the priming procedure (pushing the ▲ and ▼ keys together).
- Activating the level alarm with pump cut-out.
- Activating the Flow Alarm.
- The pump temperature exceeds the safety limit and the pump goes into self-protect mode (when the temperature falls below the threshold the pump restarts with the memory zeroed).

The set status is confirmed by pressing the **Prog** key and the programming moves on to selecting the Flow function.



WARNING: The pump may stop automatically due to a pump cut-out signal emitted by the level sensor (**Level** icon and **Alarm** LED lit), see par. 3.1.4 “Checking the level of the liquid to be dosed”.

– **Flow Control Function (see Fig. 26)**

This can be enabled by pushing the ▲ or ▼ keys, and stored in the memory by pushing the **Prog** key.

➤ **Displaying and Operation**

On exiting programming the **N** value set during programming will be displayed.

The number displayed indicates the number of strokes the pump will dose for each external signal received. The dosage frequency can be changed by pushing the **Mode** key and ▲ or ▼ keys together.

The **1:c** stays on and the **STOP** icon must be off while the pump is running.

The external impulses can be provided via a contact connected to PINS 11 and 12 or by pressing the ▲ key.

3.2.5 Direct Current Proportional Mode (0/4...20)

In this mode the pump doses a proportional amount based on a 0/4—20 mA input signal, connected to PIN 11 (- pole) and PIN 13 (+ pole).

the current at which the pump will dose can be set to its minimum (0 imp/min) and a current value that corresponds to the pump dosing the maximum flow rate, equal to a flow rate established in the factory.

To select **0/4...20 Direct Current** mode, push the **Prog** key and hold it down. PrG appears on the screen for a few seconds, and then the main programming menu will open (**STOP** icon flashing). Push the **▲** and **▼** keys until the image  appears on the display, with the **0/4...20** icon flashing.

➤ Setting parameters from the 0/4...20 menu.

From the main programming menu, when the **Prog** key is pressed the **0/4...20** icon stays lit and a specific menu opens, as per the diagram shown below.

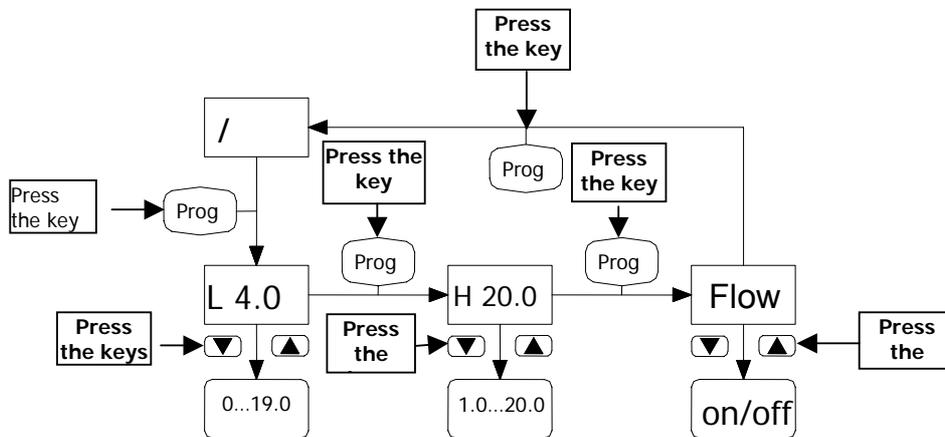


Fig. 27: 0/4...20 Direct Current Mode Menu

To exit Programming and save the parameters set at any time, hold the **Prog** key down for three seconds.

NOTE The limits **L = LOW** and **H = HIGH** refer to the pump's functioning mode as follows:

L => Lower Limit: The pump doses at minimum frequency (0 strokes/minute)

H => Upper Limit: The pump doses at maximum frequency set.

– **Selecting the Lower Limit (see Fig. 27)**

Once this mode has been selected, when the **Prog** key is pressed the letter **L** is displayed, followed by the lower limit (expressed in **mA**) for the current signal (default 4.0) at which the pump runs at minimum frequency. This limit can be changed in 0,1 mA steps by pushing the **▲** and **▼** keys.

– **Selecting the Upper Limit (see Fig. 27)**

Once this mode and the lower limit (L) have been selected, when the Prog key is pressed the lower limit is stored in memory and the letter **H** is displayed, followed by the upper limit (expressed in **mA**) for the current signal (default 20.0) at which the pump runs at the maximum frequency set. This limit can be changed in 0,1 mA steps by pushing the ▲ and ▼ keys.

 **WARNING:** before selecting the **L** and **H** limits check that actual current levels exiting the generator used.

 **WARNING:** The minimum difference between the **L** and **H** limits is **1 mA**, with **H>L**.

 If the pump receives a current that exceeds the **H** value it will dose at the maximum flow rate set. However, the flow rate displayed will begin to flash indicating that the incoming current exceeds the upper limit.

 If the pump receives a current that is lower than the **L** value it will not dose. However, the flow rate displayed will begin to flash indicating that the incoming current is below the lower limit.

 **WARNING:** The pump may stop automatically due to a pump cut-out signal emitted by the level sensor (**Level** icon and **Alarm** LED lit), see par. 3.1.4 “Checking the level of the liquid to be dosed”.

– **Flow Control Function (see Fig. 27)**

This can be enabled by pushing the ▲ or ▼ keys, and stored in the memory by pushing the **Prog** key.

➤ **Displaying and Operation**

On exiting programming the flow rate for the input current signal will be displayed. This can be viewed in percentage (**P**) or frequency (**F**) mode, which can be selected by holding the **Mode** key down.

The **0/4...20** icon stays on. When displayed as a percentage the **%** icon is also lit. The **STOP** icon must be off while the pump is running.

The maximum dosage frequency can be changed by pushing the **Mode** key and ▲ or ▼ keys together.

EXAMPLE: Model MPG912 with limits set at L = 4,2 and H = 10,5.

If the pump runs at 100% (maximum frequency) the pump will stop when the input signal is at 4,2 mA or lower and it will work at maximum frequency (240 strokes/min) for signals at 10,5 mA or higher.

If the percentage is set at 80% the pump will stop when the input signal is at 4,2 mA or lower and it will work at the working frequency (0,8 x 240 strokes/min) for signals at 10,5 mA or higher.

3.2.6 Inverse Current Proportional Mode (20...4/0)

In this mode the pump doses an inverse amount based on a 0/4—20 mA input signal, connected to PIN 11 (- pole) and PIN 13 (+ pole).

The current at which the pump will dose can be set to its minimum (0 imp/min) and a current value that corresponds to the pump dosing the maximum flow rate, equal to a flow rate established in the factory.

To select **20...4/0 Inverse Current** mode, push the **Prog** key and hold it down. PrG appears on the screen for a few seconds, and then the main programming menu will open (**STOP** icon flashing). Push the **▲** and **▼** keys until the image  appears on the display, with the **20..4/0** icon flashing.

➤ Setting parameters from the 20...0/4 menu.

From the main programming menu, when the **Prog** key is pressed the **20..4/0** icon stays lit and a specific menu opens, as per the diagram shown below.

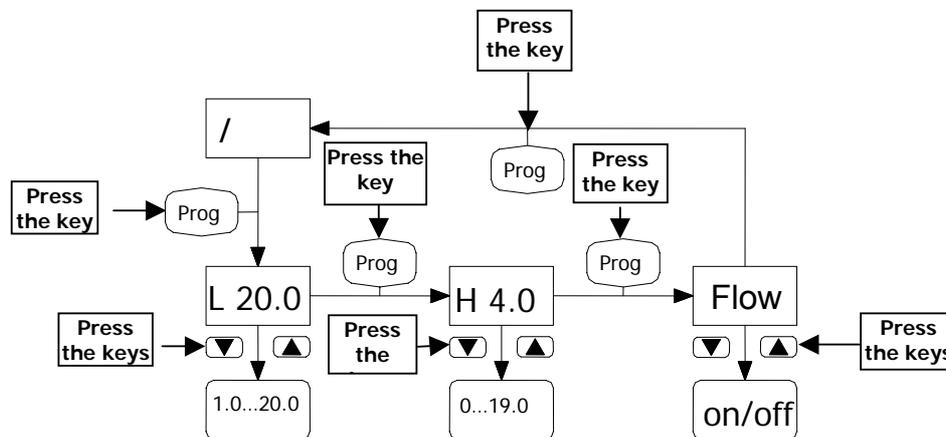


Fig. 28: 20..4/0 Inverse Current Mode Menu

To exit programming and save the parameters set at any time, hold the **Prog** key down for three seconds.

NOTE The limits **L = LOW** and **H = HIGH** refer to the pump's functioning mode as follows:

L => Upper Limit: The pump doses at minimum frequency (0 strokes/minute)

H => Lower Limit: The pump doses at maximum frequency set.

- **Selecting the Lower Limit (see Fig. 28)**

Once this mode has been selected, when the **Prog** key is pressed the letter **L** is displayed, followed by the upper limit (expressed in **mA**) for the current signal (default 20,0) at which the pump runs at minimum frequency. This limit can be changed in 0,1 mA steps by pushing the **▲** and **▼** keys.

– **Selecting the Lower Limit (see Fig. 28)**

Once this mode and the lower limit (L) have been selected, when the Prog key is pressed the lower limit is stored in memory and the letter **H** is displayed, followed by the lower limit (expressed in **mA**) for the current signal (default 4.0) at which the pump runs at the maximum frequency set. This limit can be changed in 0,1 mA steps by pushing the ▲ and ▼ keys.

 **WARNING:** Before selecting the **L** and **H** limits check the actual current levels exiting the generator used, as in this operating mode the pump only doses between the limits set in order to avoid unwanted doses should the current generator be damaged or an unconnected input current be received.

 **WARNING:** The minimum difference between the **L** and **H** limits is **1 mA**, with **L>H**.

 If the pump receives a current that is lower than the **H** value it will not dose. However, the flow rate displayed will begins to flash indicating the the incoming current is below the lower limit.

 If the pump receives a current that is higher than the **L** value it will not dose. However, the flow rate displayed will begins to flash indicating that the incoming current exceeds the upper limit.

 **WARNING:** The pump may stop automatically due to a pump cut-out signal emitted by the level sensor (**Level** icon and **Alarm** LED lit), see par. 3.1.4 “Checking the level of the liquid to be dosed”.

– **Flow Control Function (see Fig. 28)**

This can be enabled by pushing the ▲ or ▼ keys, and stored in the memory by pushing the **Prog** key.

➤ **Displaying and Operation**

On exiting programming the flow rate for the input current signal will be displayed. This can be viewed in percentage (**P**) or frequency (**F**) mode, which can be selected by holding the **Mode** key down.

The **20..0/4** icon stays on. When displayed as a percentage the **%** icon is also lit. The **STOP** icon must be off while the pump is running.

The maximum dosage frequency can be changed by pushing the **Mode** key and ▲ or ▼ keys together.

EXAMPLE: Model MPG912 with limits set at L = 14.3 and H = 5.5.

If the pump runs at 100% (maximum frequency) the pump will stop when the input signal is at 14,3 mA or above and it will work at maximum frequency (240 strokes/min) for signals at 5,5 mA.

If the percentage is set at 80% the pump will stop when the input signal is at 14,3 mA or above and it will work at the working frequency of 192 strokes/min (0,8 x 240) for signals at 5,5 mA.

Currents of less than 5.5 mA will cause the pump to stop. This fault is indicated by the display flashing.

3.3 CALIBRATION PROCEDURE

The flow rates on your pumps can be calibrated in situ in order to take the specific characteristics of the installation into account, such as the actual operating pressure, the product to be dosed, the stroke setting, etc. The **cc** stored in memory during calibration are used for displaying the **ml/min**. Three calibration modes can be used: Automatic, Manual, and Default.



WARNING: When the calibration function is accessed the equipment is reconfigured as follows:

- The strokes and impulses recorded in 1:n, n:1, and 1:c modes with the memory function active, are zeroed
- External impulses coming from the counter are not managed and so the calculation of the frequency of external impulses is zeroed. On exiting calibration the first impulse will be handled as the start of a new series of impulses.

While in any operating mode, from the display mode (pump ready to dose) the Calibration menu can be accessed as follows:

- Push the **Cal** key and hold it down. **Cal** appears on the screen for a few seconds, and then the main calibration menu will open (**ml/min** icon flashing).

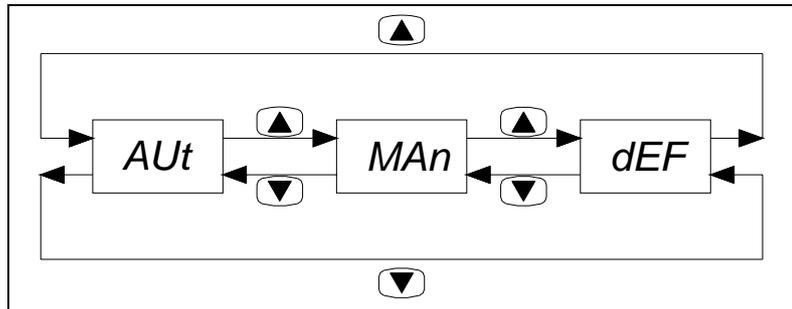


Fig. 29: Main Calibration Menu

Select the relevant calibration mode using the ▲ or ▼ key.

– **Automatic Mode (Aut) (see Fig. 29)**

To carry out calibration a capacity graduated container is required of a resolution that is adequate for the presumed flow rate of the pump in its working conditions. Indicative values can be found in **Table 1**.

Having selected “Aut” mode, push the Cal key to activate the preset strokes, which will be done at maximum frequency.

Once the strokes have been completed the display will show the cc value for the previous calibration or the default setting. Use the ▲ or ▼ keys to set the quantity of product dosed during calibration in **cc**. This value can be set between 0,1 and 999,9 cc.

Press the **Cal** key to save the settings and to return to display mode. The pump returns to its status before calibration.

– **Manual Mode (Man)** (see Fig. 29)

Having selected “Man” mode push the **Cal** key. **No strokes will be made** and cc value for the previous calibration or the default setting will be displayed.

Use the ▲ or ▼ keys to set the quantity of product expressed in **cc**. Values for the various pump models can be found in **Table 1**. This value can be set between 0,1 and 999,9 cc.

Press the **Cal** key to save the settings and to return to display mode. The pump returns to its status before calibration.

– **Default Mode (Def)** (see Fig. 29)

Having selected “Def” mode push the **Cal** key. **No strokes will be made** and cc value for the default setting will be displayed. The value displayed **cannot be edited**.

Press the **Cal** key to save the settings and to return to display mode. The pump returns to its status before calibration.

Table 1: Reference values for calibration

| Model | Pressure | cc dosed |
|-------|----------|----------|
| | bar | cc |
| 611 | 10 | 0.13 |
| | 6 | 0.14 |
| | 3 | 0.15 |
| 612 | 7 | 0.35 |
| | 4 | 0.38 |
| | 1 | 0.58 |
| 911 | 18 | 0.31 |
| | 16 | 0.35 |
| | 11 | 0.39 |
| 912 | 10 | 0.59 |
| | 6 | 0.68 |
| | 2 | 0.76 |
| 913 | 5 | 1.39 |
| | 4 | 1.67 |
| | 3 | 1.85 |
| 914 | 2 | 2.43 |
| | 1 | 3.06 |
| | 0 | 4.38 |

4 MAINTENANCE

This pump requires minimal maintenance only when products are dosed that tend to form crystals or when the pump is to be inactive for a period of time.



WARNING: Before carrying out any maintenance on the pump, see to the following:

- Wear adequate protection for the dosed product (gloves, glasses, etc.).
- Disconnect the pump from the power supply.
- Release the pressure in the delivery pipe.
- Disconnect and empty the suction pipe.

Remove the pump's fixings and turn it upside down to remove any product in the pump casing.
Wash the pump casing out with water to remove any product residue.

Before a period of inactivity flush out the pump and the foot filter using a reacting agent suitable for removing the dosed product.

In the case of products that tend to form crystals, wash the foot filter from time to time, using a reacting agent that is suitable for removing the product.

5 TROUBLESHOOTING

| DISPLAY | PUMP STATUS | CAUSE | REMEDY |
|--|--------------------------------|--|--|
| Level icon + Alarm Led on – STOP icon flashing | Stopped | The liquid has reached the preset level. | Top up the jerry can of the product dosed. Once the liquid level is corrected the Level icon and Alarm LED switch off and the pump starts working again (STOP icon off). |
| Level icon on + Alarm Led flashing | Active (STOP icon off) | The liquid has reached the preset level. | Top up the jerry can of the product dosed. Once the liquid level is corrected the Level icon and Alarm LED switch off. |
| Flow and STOP icons flashing + Alarm LED lit. | Stopped | The flow sensor does not detect the passage of liquid in the delivery pipe. | Check that the flow sensor is connected and set correctly. Check that the pressure in the system is compatible with the characteristics of the pump installed. Check that there is liquid in the suction pipe. |
| 0/4..20 or 20..4/0 icon lit and display flashing | Active (STOP icon off) | The input signal current exceeds the set limits. | Check that the current generator is connected and set correctly. Check the L and H limits set during programming. |
| Memory icon flashing | Active (STOP icon off) | The pump's memory has recorded strokes for external impulses that have not yet been processed by the pump. | The icon stops flashing (stays lit to indicate that the memory function was enabled during programming) only once all the strokes in the memory have been processed. |
| Memory icon flashing + Alarm Led on | Active (STOP icon off) | The pump's memory contains 65,535 strokes (maximum that can be stored). The memory is full and cannot store any other outstanding strokes. | The icon stops flashing (stays lit to indicate that the memory function was enabled during programming) only once all the strokes in the memory have been processed. The LED switches off when the memory contains fewer than 65,535 strokes. |
| ALL2 message flashing on the display | Active (STOP icon off) | The Memory function is disabled and the pump receives external impulses that it cannot process (under dosing). | The ALL2 message disappears when the set parameters are reinstated, that is, when the pump is able to process all the impulses it receives once again. |
| t°C message on the display + Alarm Led lit. | Stopped | The pump's internal temperature is too high (over 90°C). | This message appears and the pump is reactivated automatically once the temperature drops. |
| Err message on the display + Alarm Led lit. | Stopped | Parameter error: The pump has lost the operating settings. | Push the START/STOP key. The pump starts working again on the default settings. |
| ml/min icon flashing | Active (STOP icon off) | Parameter error: The default flow rate has been lost. | Contact our Customer Services Dept |
| Fail message on the display + Alarm Led lit. | Stopped | Problems with parameter memory. | Contact our Customer Services Dept |

6 HOW TO CONTACT US

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