

Dflow Crimpmaster Liquid Applicator

The multi-purpose applicator for grain preservative



USER MANUAL

Description

The Crimpmaster applicator is purpose built for applying preservative to grain. It is capable, in conjunction with the digital control and electronic flowmeter, of applying precise quantities of preservative.

Supplied

- Digital control box
- Flow sensor box assembly
- Crimpmaster stem pump
- Filter
- 10 meters of tubing (to be cut to required lengths)
- 5 meter pump cable
- 5 meter power cable

Setting up (Refer to the assembly schematic)

Mount the pump upright in the additive container.

Mount the control box for easy access.

The pump must be mounted upright in the additive container. The foot filter must be fitted to prevent damage to the pump gears and blockages in the system.

Mount the control box assembly allowing for easy access. **Avoid mounting the controller where it will be subject to vibrations!** Please note that we have taken steps to make the control box water resistant but it should be mounted in a sheltered location and under no circumstances spray with water.

Mount the flow sensor assembly close to you application point away from the controller. **Avoid mounting it where it will be subject to vibrations!**

Connecting the hose

Connect the tube from the pump to the in-line filter on the left hand side of the flow sensor box assembly and secure with the pipe clip provided.

Connect the tube from the application point to the in-line hose tail on the right hand side of the flow sensor box assembly and secure with the pipe clip provided.

10 meters of 1/2 inch bore hose is supplied this should be cut to length and used to connect the pump to the control box assembly and control box assembly to application point. The length of hose will effect the maximum flow rate so keep lengths to the minimum required.

The direction of flow is shown by the arrow on the front of the flow sensor box. It is important to connect the inlet and outlet hose to the correct side otherwise the flow sensor will not operate correctly. **You must have the filter in place on the inlet side of the flow sensor box!**

Connecting the cables. Dress all cables to avoid pinch points and hot spots!

Using the pre made 5m cable with 4 pin socket one end and 4 pin plug the other end, connect the flow sensor assembly to the 4 pin socket (centre) on the control box.

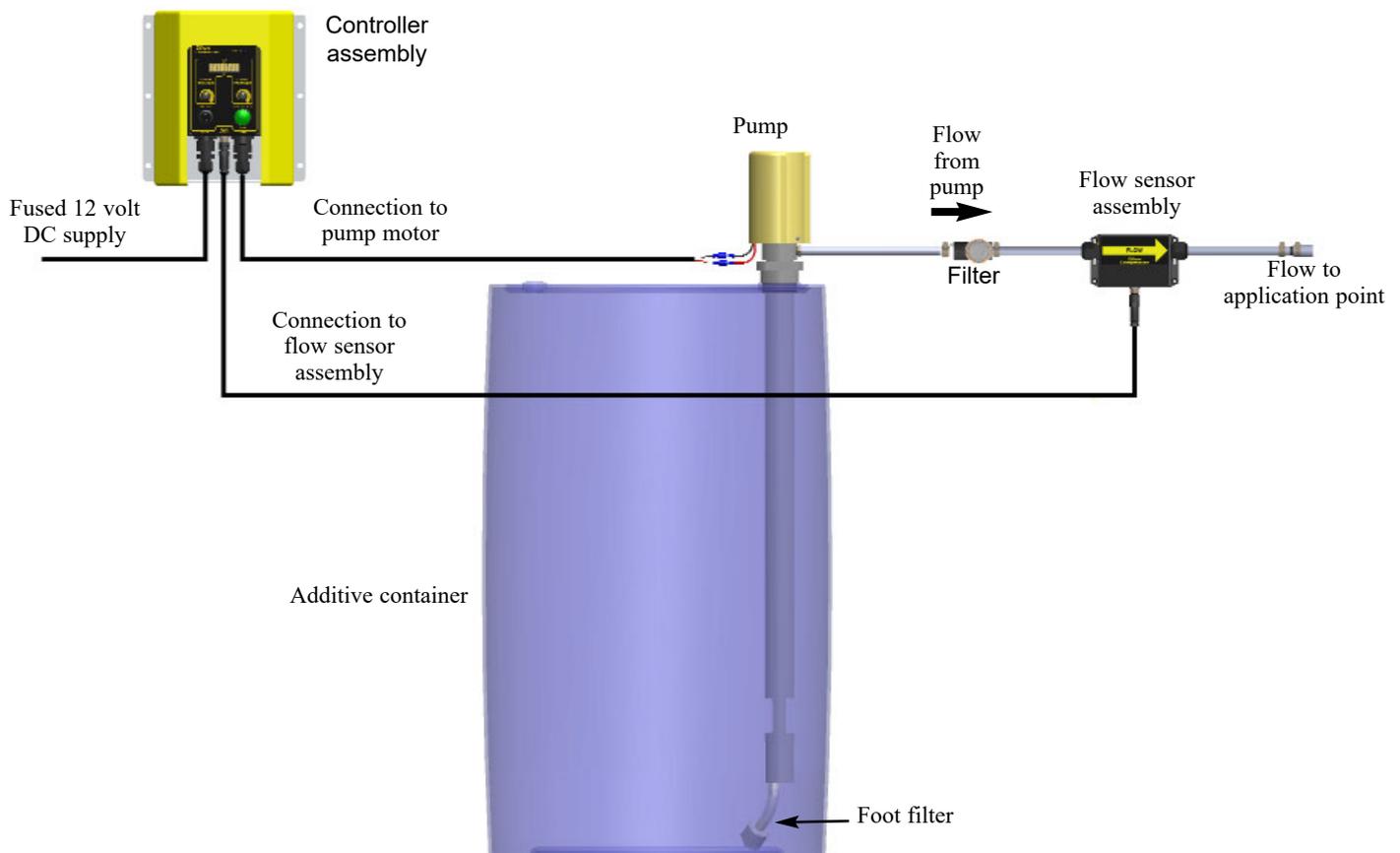
Plug in the 4 pin plug to the pump socket in the control box

Connect the pump cable (Blue female spade and Blue female bullet connector end) to the pump

Plug in the 4 pin socket to the 12V/DC plug in the control box

Connect the power cable to a fused 12 volt DC supply either via a connector or directly to the battery. There is a 15 amp fuse inside the control box.

Cable is supplied to connect the pump to the control box and control box to a 12 volt DC supply. It is important to ensure that maximum output is produced by the electrical system of the tractor, if not, the maximum pump output will be reduced. The control box will display "LOW VOLTS" the voltage is less than 10 volts. Keep cable lengths to the minimum required.



Operating the control box

Turn on the controller. The previous setting will be shown and then HOLD. The pump will not start pumping until the RUN/HOLD button is pressed

Follow these instruction to set and run the applicator



Set how many tonnes of forage per hour you are treating with the “TONNES PER HOUR” knob.

Use the LITRES PER TONNE knob to set the application rate of your additive.

This can be done when the pump is running or when it is in HOLD



Press and release the RUN/HOLD button to start pumping. The PUMPING indicator lamp will be illuminated.

Pumping can be stopped at any time by pressing and releasing the RUN/HOLD button. HOLD will be displayed. Pressing again will restart pumping.

Displaying and resetting the total litres dispensed

This can be done when the pump is running or when it is in HOLD



Press and hold the TOTAL button until “Total” is displayed then release. The total litres dispensed will now be displayed. After a few seconds the display will revert to its previous setting

With the total litres displayed. Press and hold the TOTAL button until “Reset” is displayed and then release. The display will then return to its previous setting.

Warning messages

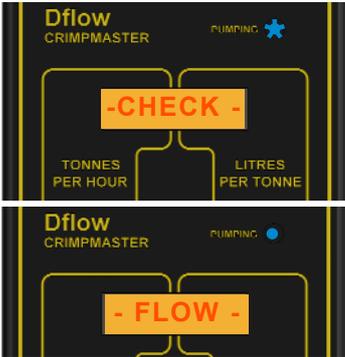
The pumping indicator will flash to alert the operator that there is a problem at the same time as showing one of the following warning message on the display.



Warning message - CHECK FLOW

A warning message CHECK FLOW is displayed and the LED will flash if the flow rate set can not be achieved.

If CHECK FLOW is displayed frequently it could mean there is a blockage in the system or a fault with the flow sensor (Refer to Fault finding section).



Warning message - SYPHON

If the application point is lower than the pump outlet, siphoning can occur! At low application rates this can mean that more additive is being dispensed than the target rate set. If this happens a warning message SYPHON ! is displayed on the control box and the LED will flash.



Control box extended set up options

The control box has a set of extended options that allow you to go into menus and make changes. These can be accessed in the following order. When the option you want is displayed release the button and refer to the instruction in the appropriate section of this manual.



Hold down the RUN/HOLD button and switch on the control box. Continue to hold down the RUN/HOLD button and the display will scroll through these extended options. The current software version will be displayed here.



As you continue to hold the RUN/HOLD button down a series of dashes appear on the display before the next option.



The first option will be Adj-Cal which is where you can adjust the calibration factor by +/- 10% about the default calibration.

Refer to *Adjusting the preset calibration* section



As you continue to hold the RUN/HOLD button down a series of dashes appear on the display again before the next option.



The next option is DiagMode. This can be used to investigate problems. For example, if the flow sensor is reading the flow, the operating voltage, drive to the pump, calculated amount being dispensed.

Refer to *Diagnostic Mode* section.



As you continue to hold the button down a series of dashes appear on the display again before the next option.

Control box extended set up options continued

7



The next option is Set-Up. Here you can select the operating mode. There are two options Auto or NFS.
Refer to *Changing operator mode* section

8



Finally when you reach the end of the extended set up options without releasing the RUN/HOLD button Exit will be displayed and the control box will go into the run display.

Adjusting the preset calibration

If it is considered that the output of the pump is slightly inaccurate there is a function that allows the calibration factor to be adjusted. This can be done by following the instructions shown below. This can be repeated until you are happy with the accuracy: -



Scroll through the extended option as described in the **Control box extended set up options** section. Release the RUN/HOLD button when the display shows “Adj-Cal”



Now a number between -100 and +100 will be shown.

This depends on the position of the “LITRES PER TONNE” knob.

Turning the “LITRES PER TONNE” knob will change the number. “00” is the default calibration setting.



If the applicator is dispensing high turn the “LITRES PER TONNE” knob to the left .



If the applicator is dispensing low turn the “LITRES PER TONNE” knob to the right



When you have made the adjustment press the “START/STOP” button to save the setting and exit the adjust calibration routine.

The calibration will now remain at this setting until it is changed.

+/-100 will be
approximately
+/-10% about the
default calibration
figure.

Diagnostic Mode

The control box has a Diagnostic Mode that can be useful for fault finding if a problem occurs with the applicator.

This should only be used with the consultation of one of Selmech's engineers.

Enter the Diagnostic routine by releasing the RUN/HOLD button when DiagMode is displayed as shown in the “Control box extended set up options” section.



When the RUN/HOLD button is released and an incremental count of pulses from the flow sensor will be displayed. It can count from 0 up to 600000 . if it gets to 600000 it will start over.

001345 P

What does this mean: -

If it is counting up it shows that the flow sensor is registering pulses which means that fluid is flowing and being recorded. If the display is a series of zeros then it shows that the flow sensor is not registering any pulses which could mean there is no fluid flowing because the pump is not running or there is a blockage. It could also mean that the flow sensor is not working this could be because a wire has broken or that it has developed a fault.

Press and release the “RUN/HOLD” button and next the current drive to the pump will be displayed as a percentage. *(Turning either knob in this display can make the figure change)*

050 %

What does this mean: -

The percentage drive to the pump shows how hard the pump is being asked to work. This depends on the setting you have entered into the control box. If the percentage drive is 100% but your application rate is well within the maximum range of the pump it could mean that there is a blockage or the flow sensor is not sending a signal back to the control box. This would have showed up in the previous section with a zero count of pulses.

Press and release the “RUN/HOLD” button and next the current supply voltage level will be displayed.

13.80 V

What does this mean: -

To get an accurate reading of voltage it should be done when the pump is pumping and with the harvester/tractor running!

The voltage displayed should be between 12.00 volts and 14.00 volts it would normally be 13.80 volts. If the voltage is low or erratic it could mean a bad connection anywhere from the battery to the pump. If the voltage is high there could be a problem with charging system of the machine.

Press and release the “RUN/HOLD” button and next the current calibration factor will be shown and any adjustments that have been made to the calibration.

1360+100

What does this mean: -

The first 4 figures shown are the calibration factor. This is a preset figure relating to the flow sensor that determines the accuracy of the pump. This can be adjusted approximately +/- 10% about the default setting if required and the last 4 figures show any adjustments that have been made. Refer to the “Adjusting the preset calibration” section in this manual.

Press and release the “RUN/HOLD” button and next the calculated amount being dispensed is displayed. *(Turning either knob in this display will make the figure change)*

1500 ml

What does this mean: -

When entering the amount of forage to be treated in TONNES PER HOUR and the application rate of your additive the controller works out how much additive is to be dispensed. This is displayed in millilitres or litres per minute depending on the resulting output. For example if you are treating 60 tonnes per hour and your application rate is 1.5 litres per tonne then the display will show 1500 ml.

Press and release the “RUN/HOLD” button and ExitDiag will be displayed and the controller will return to the run screen in the HOLD mode

ExitDiag

Changing operator mode

The controller is delivered and normally operated in Auto mode. Refer to the *Operating the control box* section for instruction on using the controller in Auto mode.



1 Scroll through the extended option as described in the **Control box extended set up options** section. Release the RUN/HOLD button when the display shows “Set-Up”.



2 Turning the LITRES PER TONNE knob left and right will scroll the display between - Auto - and - NFS -. Refer to the *Operating the control box* section for instruction on using the controller in Auto mode.



3 If there is a problem with the flow sensor the applicator can be run in NFS mode. Refer to the *Operating the control box in NFS mode* for instruction on using the controller in the mode.



4 When the mode is displayed you want to operate in press the “START/STOP” button to save the setting and exit the set up routine.

Operating the control box in NFS mode

If there is a problem with the flow sensor the applicator can be run in NFS mode. In this mode the controller ignores the flow sensor and just operates the pump directly. The output to the pump is displayed in % drive to the motor, 000 to 100. In this mode it will be up to the operator to carry out their own calibration check. *If operating the pump like this it is recommended to by-pass the flow sensor and connect the pump directly to the application point.*



Set the output rate of the pump in % drive to motor

Rotating the “TONNES PER HOUR” knob adjusts the percentage drive to the motor (000 to 100%) this in turn increases and decreases the output of the pump.

The output range of the pump is 1 - 10.0 litres per minute.

A calibration check must be carried out to establish your require output!

Total counts and calculated flow rate are not available in NFS mode

Applicator care and maintenance

Always refer to the additive manufacturers safety, handling and application rate guide.

Always use the pump with the foot filter in place.

Always use and store the pump upright. *Motor at the top and pump down.*

Always flush the system well with clean water before removing pipe work, dismantling the pump or when it is not going to be in use for long periods of time.

Fault	Diagnosis	Remedy
Motor will not run	Wire incorrectly connected or damaged	Check crocodile clips attached properly to the battery. Check control box wires.
	Fuse blow	Replace fuse – check for reasons for blown fuse before restarting.
	Defective motor	Contact Selmech Supplies.
Motor runs but no output	Pump leads wrongly connected	Connect leads correctly
	Jet blocked	Clean jet
	Tubing kinked	Remove kink and re-route tubing
	Drive shaft disconnected	Check Drive shaft rotates with motor
Motor runs but poor output	Suction filter blocked	Remove pump from barrel and clean filter
	Jet blocked	Clean
	Jet too small	Replace with larger jet
	Tubing kinked	Remove kink and re-route tubing
	Tube split	Replace tube
	Pump head worn or damaged	Call Selmech
Wrong application rate	Barrel empty	Fill barrel or replace
	Is the display showing check flow	Check for blockage in the system Clean Flow Sensor
	Is the calculated target within specified range of 1 to 10 litres per minute	Adjust t/h or l/t so that calculated target falls within limit.
No display on control box	Fuse blown	Check control box fuse
	wiring damaged	Check wiring
Display showing CHECK FLOW	Is the output set within the specified parameters	Set the output rate between 1 and 10.00 litres per minute.
	Is the pipe kinked or block	Check for blockage in the system
	Check the flow sensor propeller is spinning	Refer to flow sensor cleaning
Display showing SYPHON	If the application point is lower than the pump outlet, siphoning can occur.	Reposition application point higher than the pump. In some cases an anti syphon check valve could be used. Contact Selmech.

Warranty

Provided installation is carried according to the instructions a warranty of 1 year from date of delivery applies. This covers faulty manufacture or premature component failure but does not cover wear and tear through normal use or mechanical or chemical damage that has occurred to parts through misuse or unauthorised attempts to repair the unit. In the case of faulty manufacture or parts failure, claims are limited to replacement parts being sent or the applicators being returned to base for repair and its return to the customer. We DO NOT cover the cost of third party engineers carrying out repairs or the fitting of new parts.

Technical data

Supply Voltage	12V/DC (10.6V DC to 16.4V/DC)
Current consumption	10A
Fuse rating	15A
Output signal to pump	PWM approx 1.4 KHz

Repairs and spares contact: -

Selmech Supplies Ltd, 19 Norton Enterprise Park, Whittle Road, Churchfields, Salisbury, Wiltshire, SP2 7YS.

Tel: +44 (0) 1722 413 440. Email: admin@selmechsupplies.co.uk. Web: www.selmechsupplies.co.uk

Flow Sensor Cleaning

Warning! Please follow the appropriate safety precautions stated by the additive manufacture before carrying out the following procedure.

At no time should an air line be used on the flow sensor!

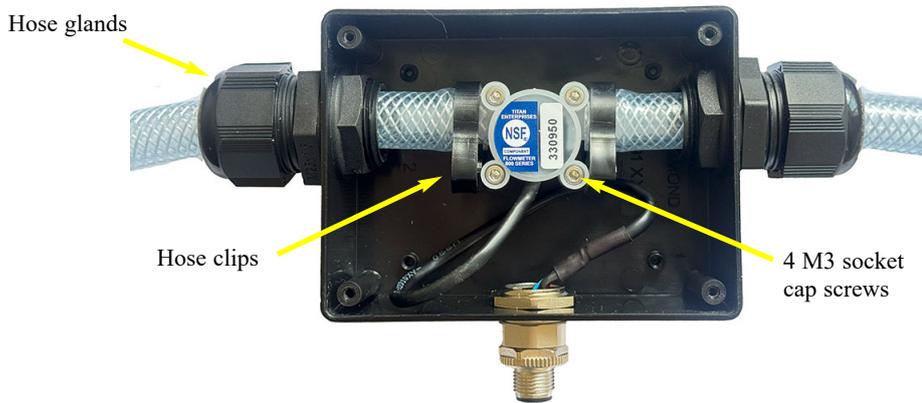
The pump and flow sensor should be thoroughly flushed through with clean water before disconnecting the hose. The flow sensor assembly should be removed from its box before taking it apart. Take care not to spill any liquid as this could cause damage.

At no time should an air line be used on the flow sensor!

Make sure the control box is turned off.

Disconnect the cable from the flow sensor box.

Remove the flow sensor box base this is held in place with 4 small cross head screws.



Loosen the hose glands each side to allow the flow sensor pipe work to turn giving more access to remove work on the flow sensor.

Remove the hose clips each side and gently remove the tubes from both sides.

Remove the 4 M3 socket cap screws and separate the two halves of the sensor body. Although robust when separated care should be taken with the flow sensor impeller.

Gently lift out the impeller (Mark the impeller with a marker to ensure it is replaced the right way up) and thoroughly clean it in water along with the body making sure the in-put and out-put ports of the internal chamber are clear.

Flow sensor



Impeller

Internal chamber

Check hole is clear

Reassemble, the impeller has 3 magnets molded into it. One side the faces a slightly bigger diameter. This is the side that goes down onto the half with the cable.

There is a raised part and recess on each half of the flow sensor mating halve that need to correspond to one another for correct alignment.

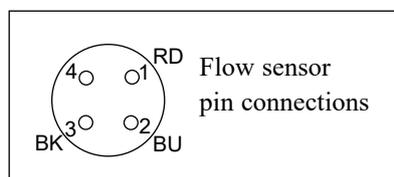
Make sure the impeller seats into its centre bearing in both top and bottom halves.

Check that the impeller spins by gently blowing into the inlet side of the flow sensor. You should hear it spin. If it does, refit the 4 M3 screws and nuts and gently tighten. Check again that the impeller spins as before.

Refit the pipes and replace the clips.

Replace the flow sensor assembly in to the box making sure that the arrow on the flow sensor is pointing in the same direction as the flow.

In the event of a flow sensor failure the control box can be set in "NFS" mode (no flow sensor). where the percent pump drive can be entered "050%". Refer to changing operation mode for instructions on setting the control box in this mode.



Cleaning the Strainer

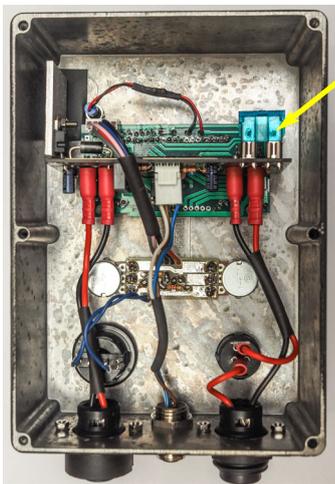
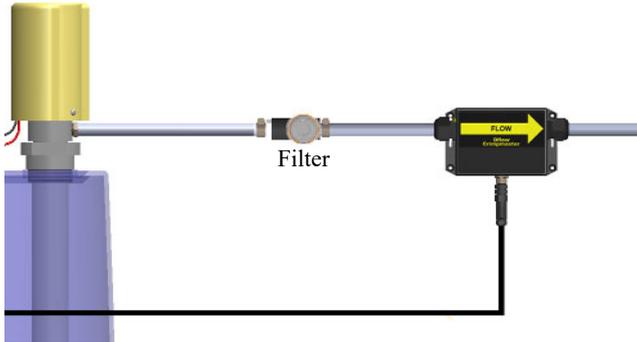
There is a filter in the application tube after the pump before the flow sensor box. This is to protect the flow sensor from being blocked or effected by debris. This filter should be cleaned regularly.

Unscrew the clear bowl and removed the strainer gauze.

Clean the gauze, body and bowl in clean water

There is a rubber seal in the filter bowl make sure this is in place and undamaged.

Re-assemble.



Control box fuse

There is a 15 amp fuse inside the control box

To gain access to this rear cover of the control box will need to be removed. To do this the yellow cover will need to be removed from the mounting bracket and the control box removed from the mounting bracket.

If for any reason this fuse has blown a check of the wiring and connections should be made before replacing it and turning the control box on again.

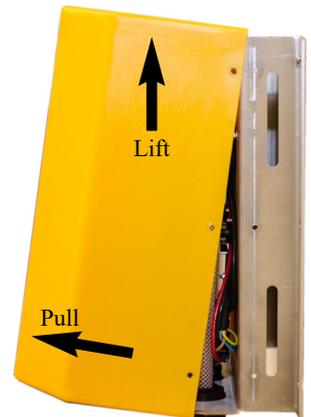
The 12 volt supply to the control box should always be independently fused!

Removing the yellow cover.

Disconnect all the cable from the controller

There are 3 self tapping screws each side holing the cover in place. Remove from both sides

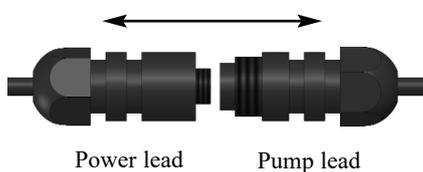
The cover is hooked over a flange at the top of the bracket so pull the cover at an angle from the bottom and lift off.



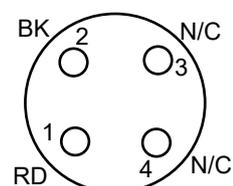
Pump test

If the pump is not running when connected to the control box you can check if the problem is with the control box or the pump by connecting the power and pump leads together. This connects the 12-volt supply directly to the pump. **Before doing so check the cables for any damage** as if it turns out the fuse is blown in the control box damaged cables could have caused this.

If the pump runs then it is most like the problem is with the controller. Check the fuse and if blown replace with one of the same value.



Power and pump lead pin connections



DFLOW CRIMPMASTER JET SELECTION GUIDE

Jet Selection

If using, jet selection is important . Each jet provides a 110 degree spray pattern but it is important to use the correct jet for the output required to achieve the optimum spray pattern. If the jet is too small for a high output the output will not be achieved.

! Please note that this is a guide and the operator is responsible for making sure the required output is being achieved with the jets fitted.

Fit the required jet to the jet body.

(Refer jet selection/flow rate guide)



High Volume		
SINGLE JET litres per minute		
Yellow	White	Black
0.5 - 0.9	0.9 - 3.3	3.0 - 4.5

TWIN JET litres per minute		
Yellow	White	Black
0.5 - 1.0	1.0 - 3.0	3.0 - 6.0

For rates higher than 6 litres per minute application should be open flow or use additional jets.

Crimpmaster stem pump

