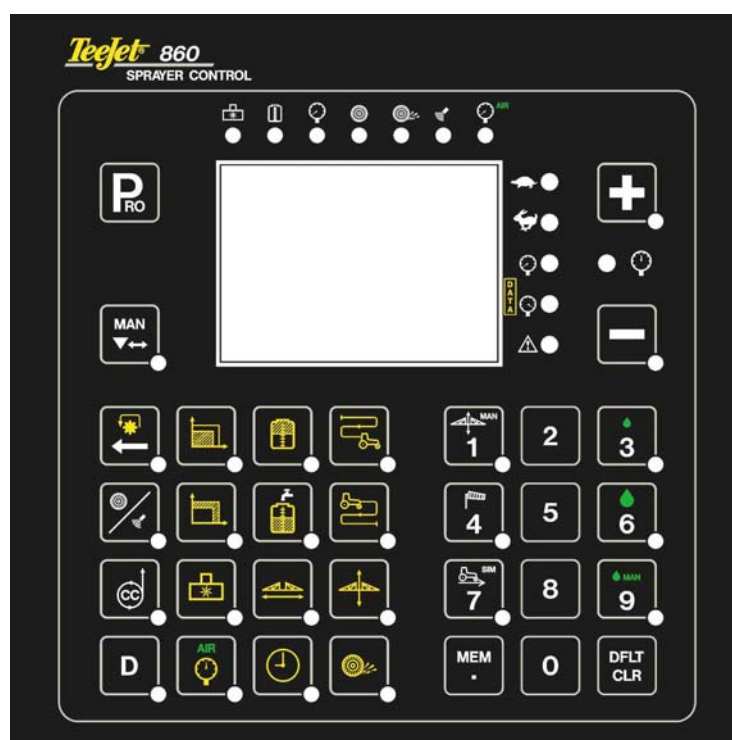


USERS MANUAL

TeeJet 860



Agrifac 8250683

v1.11

19-04-2005

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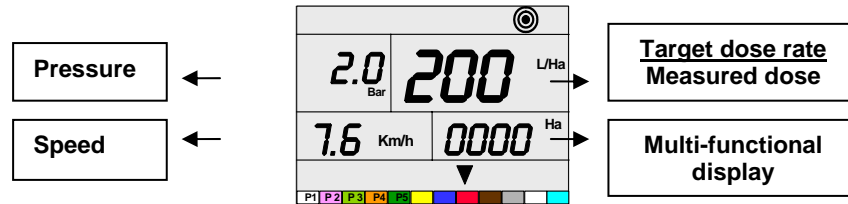
7 Printer-option..... 29

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
1 Normal use

1.1 Screens, indications

1.1.1 Screens



The display shows 4 different data simultaneously. Three data are fixed on the screen (pressure, dose rate and speed), a fourth one depends on the function keys (see §1.3). The standard readout, which is coupled to the data-screen, is worked surface (Ha), and sprayed volume (vol).

The symbol  on the bottom of the display shows which tip is used.

1.1.2 Sensor LEDs.



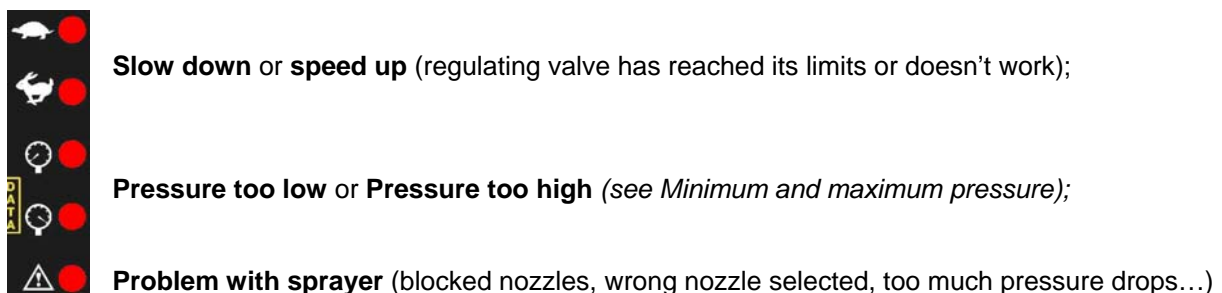
An LED showing the proper operation of for each possible sensor is provided. From left to right: flow meter, tank content (pressure sensor or flow meter), pressure sensor, wheel speed sensor, wheel slip indication, radar speed sensor, and optionally air pressure sensor in case of AirJet operation.

When an LED lights up, this indicates the correct operation of the sensor. When the LED is off, this indicates either a not- connected sensor, or a sensor that is not working properly.

1.1.3 Alarm-LEDS

The alarm-LEDS are off during normal operation. If one or more LEDs are on, this indicates a problem with the sprayer.

Possible problems are:



An audible alarm is generated when one of these alarms occur. Pressing the CLR key will stop the audible alarm.

1.2 Special functions during the regulating process.



1.2.1 Minimum and maximum working pressure.

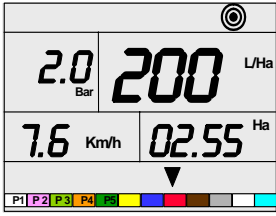


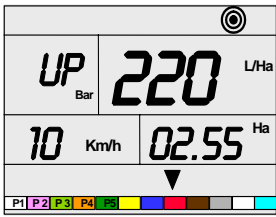


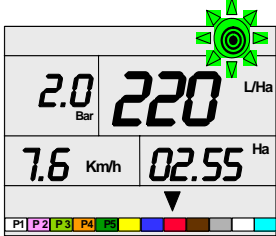


The computer will always try to keep the working pressure between the programmed minimum and maximum operating pressure. When one of these limits is exceeded, the corresponding alarm-LED is lit, and an audible alarm is given.

1.2.2 Minimum-speed.

When the measured speed becomes equal or lower than the programmed minimum value, the regulation stops and the main valve closes. From the moment the speed is within the normal working range again, the regulating process resumes.

1.2.3 Over-and under-applying.

It is possible to boost the target dose during normal operation by depressing the keys  or  in steps of 10%.

Screen:	Explanation:
	<p>After first press of  or , the target dose rate is shown.</p>
	<p>Each subsequent depressing of  or  changes the target rate in steps of 10%, defined by the OEM.</p>
	<p>The new (temporary) target rate is shown. The corresponding symbol flashes. The integrated LEDs in the keys  or  indicate if the dose rate is higher or lower than 100% of the initial value. Pressing the CLR key reverts back to 100%.</p>

1.3 Additional function keys.

1.3.1 Tank level/Pump-RPM (option).



The spraying fluid level will be shown after this key has been depressed (TankControl). Optional pump RPM can be shown.

When the key is depressed for about 3 sec, the programming step for setting the pulses/rev (=22,9 for TankControl) for the PTO readout is selected. (See H4).

1.3.2 Worked surface.



By depressing this key, the actual worked surface is shown in the data-field.

1.3.3 Sprayed volume.



By depressing this key, the actual sprayed volume is shown in the data-field.

1.3.4 Covered distance.



By depressing this key, the actual covered distance is shown in the data-field.

1.3.5 Remaining surface.



By depressing this key, the actual remaining surface is shown in the data-field. This value is based upon the actual dose rate (l/ha) and actual tank content.

1.3.6 Remaining tank content.



By depressing this key, the tank content is shown in the data-field (calculated value, or measured value with TankMatic).

When this key is depressed for more than 3s, the fill function will be started (see H.3 Filling – tank content).

1.3.7 Remaining distance.



By depressing this key, the actual remaining distance is shown in the data-field. This value is based upon the actual dose rate (l/ha), actual working width and actual tank content.

1.3.8 Flow



By depressing this key, the actual flow rate (l/min) is shown in the data-field. When the key is depressed for about 3 sec, the programming step for setting the pulses/l for the flow meter is selected.

Screen:	Explanation:	Value:
	<p>Press + of – to change the value. Press PRO to store the value and go to the next step, or keep PRO depressed to store the value and to exit.</p> <p>Note: For the calibration of the Flowmeter, see §6.2 Spraying Flowmeter.</p>	<p>_____ p/liter</p>
	<p>Low flow limit.</p> <p>Press + of – to change the value. Press PRO to store the value and go to the next step, or keep PRO depressed to store the value and to exit.</p>	<p>_____ l/min.</p>
	<p>High flow limit</p> <p>Press + of – to change the value. Press PRO to store the value and to exit.</p>	<p>_____ l/min.</p>

1.3.9 Working width .



By depressing this key, the actual working width is shown in the data-field.
For programming in a shortened working width, keep key depressed for app. 3 sec.

	<p>Press + of – to change the value. Press PRO to store the value and to exit.</p>
--	--

1.3.10 Height of spray boom. (future option, not active)



1.3.11 Air pressure.



By depressing this key, the measured HTA/AirJet pressure is shown. Is only functional when an air pressure sensor is mounted (e.g. with AirMatic).

1.3.12 Elapsed time.



By depressing this key, the elapsed time is shown. This readout is connected with the surface counter and the sprayed volume. Units: minutes.

1.3.13 Wheel slip.



By depressing this key, the actual wheel slip is shown in the data-field. This is only possible when both the wheel speed sensor and the radar are installed.

1.3.14 Choice between Wheel speed sensor and radar sensor



By depressing this key, the operator can choose between 3 different wheel speed parameters and the Radar input. The Agrifac self propelled spraying machines use standard the Radar input as Wheel sensor.

Screen:	Explanation:	Value:
	<p>Choose the used sensor/setting.</p> <p>With PUL1, PUL2 & PUL3 you can choose a Wheel sensor (with 3 different calibrations) ; RADR is for the radar input.</p> <p>Press + of – to change the value. Press PRO to store the value and go to the next step, or keep PRO depressed to store the value and to exit.</p>	
	<p>When spraying regulation is based on the radar speed input, the slip can be calculated. Select here the corresponding wheel sensor setting for slip calculation.</p> <p>Press + of – to change the value. Press PRO to store the value and to exit.</p>	

While keeping this key depressed, you can go to the wheel sensor calibration section (see §6.1).

1.3.15 Circulation



By depressing this key, you can select the type of circulation for the selected tip at that moment.

Keep the key depressed for 3 sec. to change the value for the calibration plates.

1.3.16 Density (fertilizer)



By depressing this key, you can select a density different from 1.

To modify the density figure, keep the key depressed for 3 sec. and modify the value.

Screen:	Explanation:	Value:
	Press + or - to change the value. Press PRO to store the value and to exit.	_____

1.3.17 Wind speed sensor (option)



When this key is depressed, the measurement of the mean wind speed is started.

This function is only possible when the master switch is off and when forward speed is 0.

Screen:	Explanation:	Value:
	This screen is shown as long as the measurement takes place.	
	After measurement, the mean wind speed is shown in meter/sec.	

1.3.18 Speed simulation.



Depress this key to activate speed simulation. From now on, the controller uses the low speed value for regulation. Press the key once more to go to the high value. The change between low and high speed goes smooth, and simulates the acceleration of the machine. By depressing the key once more, the controller goes back to the low speed value.

By keeping the key depressed, you enter the programming step for the simulation speed values.

Screen:	Explanation:	Value:
	<p>High value simulation speed.</p> <p>Use + or - to modify the value. Press PRO to go to the Low value, or keep PRO depressed during 3 sec to exit the programming mode.</p>	<p>_____ km/h</p>
	<p>Low value simulation speed.</p> <p>Use + or - to modify the value. Press PRO to go to the High value, or keep PRO depressed during 3 sec to exit the programming mode.</p>	<p>_____ km/h</p>

1.3.19 Memories.

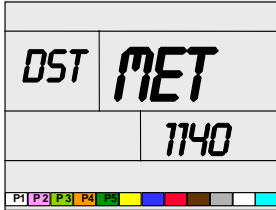
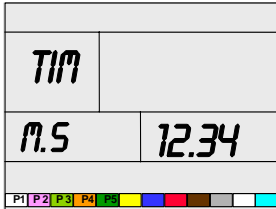


When the memories are active, a press on this key accesses the memories.

This is only possible when the master switch is off.

Screen:	Explanation:
	<p>Depress PRO several times until the desired memory location is selected.</p>
	<p>Press the + key to store the actual value in the selected memory location.</p> <p>Press the CLR key to erase a memory location. If this is not done before the + key is pressed, the actual value is added to the value in the chosen memory location.</p>

When the memory key is kept depressed, the working time, as well as the covered distance can be read out.

Screen:	Explanation:
	<p>Read out of covered distance.</p> <p>Depress PRO to go to the next screen (working time).</p>
	<p>Read out of working time (min.sec).</p> <p>Depress PRO to go back to the covered distance. Keep PRO depressed during 3 sec to go back to normal operation.</p>

1.3.20 Resetting of the counters.



The counters can only be reset when the master valve is off and when the data-field has surface or volume selected (ha or vol). Keep the CLR key depressed until 0 is shown (app. 3 sec).

1.3.21 Decrease drop size.



When AirMatic is installed, the drop size can be decreased with this button.

1.3.22 Increase drop size.



When AirMatic is installed, the drop size can be increased with this button.

1.3.23 Manual drop size regulation.



Depress this button to switch off the automatic drop size regulation. The regulation valve can be driven by the + and – keys. This can only be done when the computer is manual regulation mode.

1.3.24 Manual regulation.



Depress this key to activate manual operation. The regulating valve is now driven by the + and – keys.

Depress the key for 3 sec to modify the regulating valve speed in manual mode. Now a value between 0.0 (minimum) and 12.0 (maximum) can be programmed in. This value corresponds with the voltage across the valve motor when the valve is operated in manual mode.

Screen:	Explanation:	Value:
	Regulating valve speed in manual mode. 0.0 = minimum (stopped) 12.0 = maximum	_____ volts

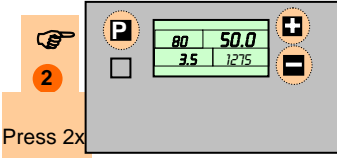
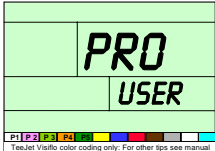
When the computer is in manual operation, also the drop size (when AirMatic is installed) can be adjusted manually.

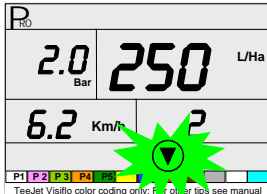
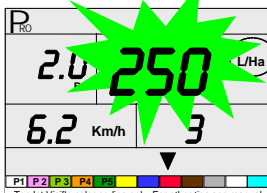
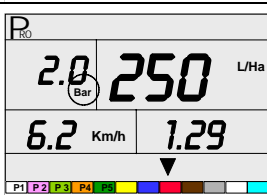

2 User setup mode.

2.1 Usage.

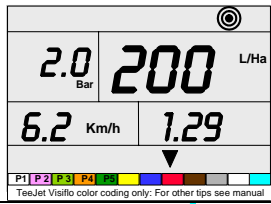
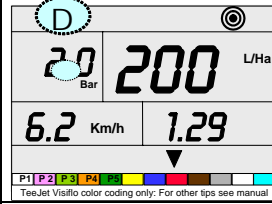
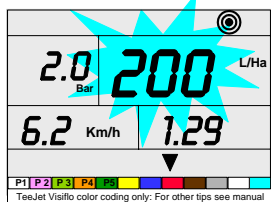
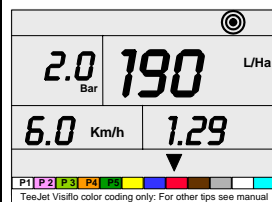
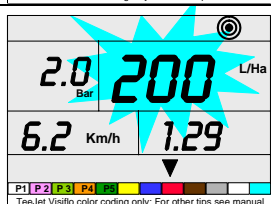
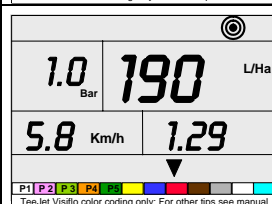
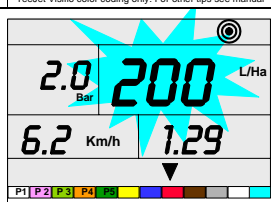
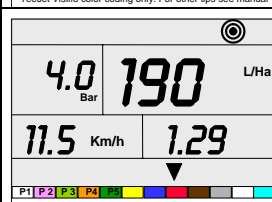
In this mode, the chosen tip can be selected, as well as the desired application rate. Also calculations can be done to find out if the chosen settings are within limits for the estimated speed and pressure.

To access the work preparation screen, depress the Pro key twice.

Access:	Action:	Temporary screen:
Main switch off		

Parameter: Press Pro to go to next parameter.	Screen:	Description:
1. Tip-selection.		<p>Choose the correct tip with the  key. Advance to the next step by pressing Pro.</p> <p>Note: When using AirMatic, the tip P1 must be selected. With all other tips AirMatic is switched off.</p>
2. Target dose rate.		<p>Choose the correct dose rate with + or - , or key in the value with the numeric keys. Advance to the next step by pressing Pro.</p>
3. Calculation, based on pressure.		<p>Select your operating pressure with + or - (or use numeric keys). The corresponding speed for that pressure and application rate is given.</p> <p>Note: These are theoretic values only.</p>
4. Calculation, based on forward speed.		<p>Select your speed with + or - (or use numeric keys). The corresponding pressure for that speed and application rate is given.</p> <p>Note: These are theoretic values only.</p>

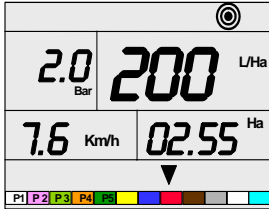

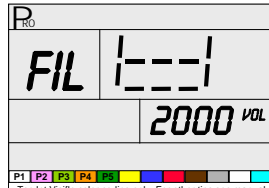
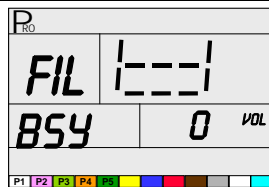
2.2 Special functions.

When the D key is depressed in User setup mode, the density different from 1 is selected. Pressing D once more reverts back to density = 1.			
When the target dose rate flashes, and the CLR key is depressed, then the application rate (l/ha) is shown for a speed of 6 km/h with the selected tip.			
When the target dose rate flashes, and the Pro and - key are depressed simultaneously, then the minimum allowable speed is shown, depending on the target rate and the minimum operating pressure for the selected tip.			
When the target dose rate flashes, and the Pro and + key are depressed simultaneously, then the maximum allowable speed is shown, depending on the target rate and the maximum operating pressure for the selected tip.			

Exit this mode by pressing the Pro key for 3 sec.

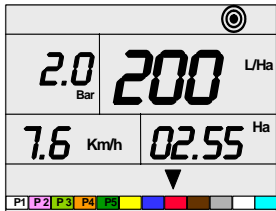

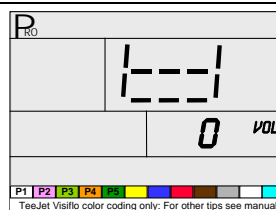
3 Filling – tank content.

3.1 Automatic filling.

Screen:	Explanation:
	 Keep key depressed (3 sec).
	Enter the desired tank content (liters in tank after filling) and press PRO. Press Clr to select nominal tank content. Keep Clr depressed (3 sec) to reset tank content to 0.
	Press PRO to start automatic filling. When the desired value is reached, an audible alarm is given, or the fill valve is shut off automatically. Press PRO once more to go back to normal operation.


3.2 Manual filling.



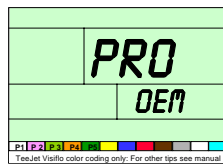
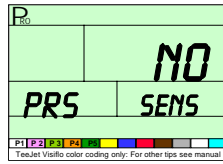
The tank content can be programmed in manually when no tank level sensor or filling flow meter is present.

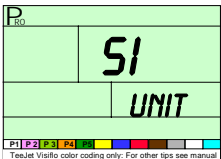
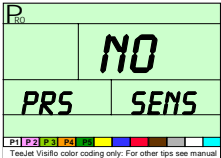
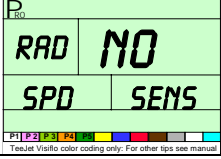
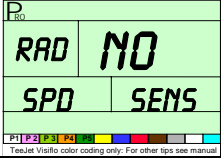
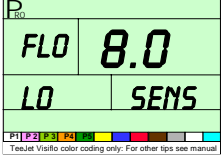
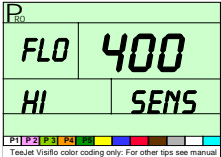
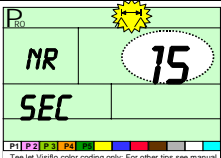
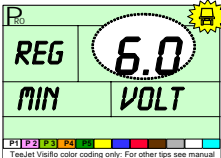
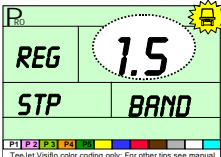
Screen:	Explanation:
	 Keep PRO depressed and press .
	Enter the desired tank content in l. Press Clr to enter the nominal tank content. Keep Clr depressed (3 sec) to clear the tank content (0). Press PRO to enter the value and go back to normal operation.

4 Factory settings.

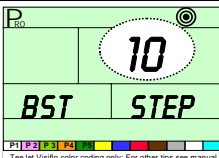
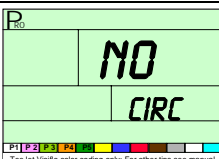
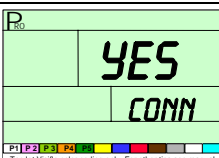
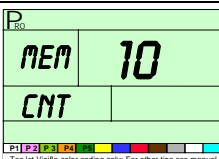
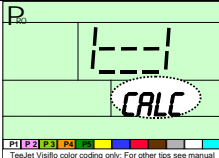
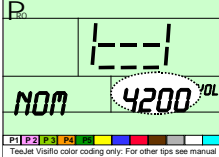
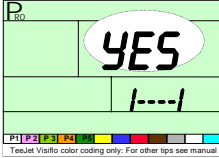
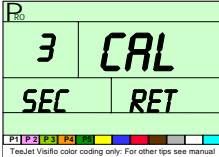
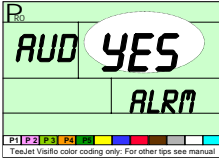
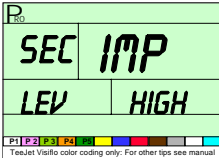
Note: following rules are applicable for all factory settings:

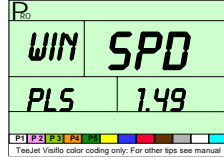
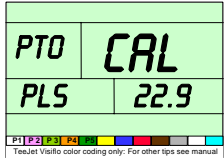
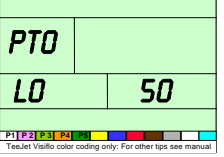
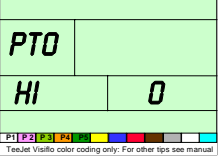
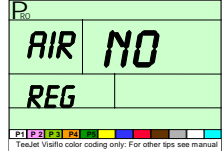
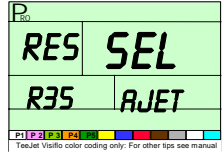
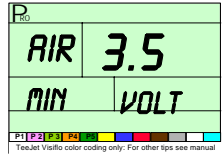
- **+** or **-**: to modify numeric values.
- Numeric values can also be modified with the numeric keys..
- **PRO**: to store a programmed value and go to the next step.
- Press  to return to the previous programming step.
- Keep **PRO** depressed (3 sec) to store the programmed values and return to normal operation.
- Press **CLR** to recall a default setting.
- Keep **CLR** depressed (3 sec) to reset a value to 0.
- When applicable, keep **+** and **-** depressed to start automatic calibration.

Condition:	Action:	Screen:
	Keep PRO depressed, Keep + depressed, Press  , and release, then press 3 x - key.	
	The first screen of the factory settings is shown.	

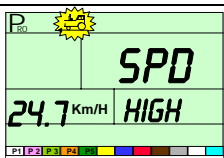
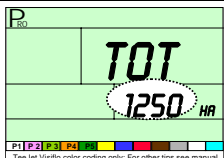
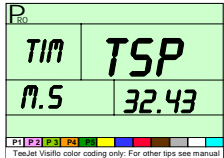
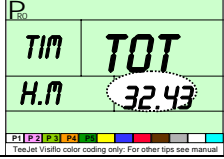
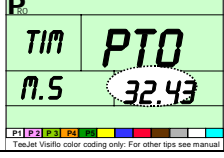
Parameter:	Screen:	Description:	Standard value	Your value
1. Measurement unit selection		Choose one of the following measurement systems: <i>SI</i> : metric <i>US</i> : US units <i>TRF</i> : turf spraying <i>IMP</i> : Imperial units	<i>SI</i>	
2. Pressure sensor		Choose YES if a pressure sensor is installed. Choose NO if not.	NO	
3. Radar speed		Choose YES if a radar speed sensor is installed. Choose NO if not.	NO Self-propelled: YES	
4. Wheel sensor (when Radar = YES)		Choose YES if also a wheel speed sensor is installed. Choose NO if not.	NO	
5. Minimum flow of flow meter		The minimum flow is the lowest flow at which the flow meter still works reliably. Note: If a pressure sensor is installed, and the flow drops below this value, then the controller switches automatically to pressure based regulation.	8.0	
6. Maximum flow of flow meter		The maximum flow is the highest flow at which the flow meter still works reliably. Note: If a pressure sensor is installed, and the flow drops below this value, then the controller switches automatically to pressure based regulation.	400	
7. Number of sections		Enter the number of sections on the machine.	15	
8. Minimum voltage of regulation valve		Enter the minimum voltage at which the regulating valve will run. Turn on the master switch and increase the value until the valve works in all circumstances	6.0 ZA3400: 3.5	
9. Regulation dead band		Enter here (in %) the dead band of the regulation. When the difference between the target dose rate and the actual dose rate is lower than this value, the regulation will stop.	1.5	

10. Regulation valve run time		This is the time (in sec) needed for the valve to go from fully closed to fully open (or from fully open to fully closed). Note: this value must be measured with a 12V power supply.	12	
11. valve backlash		Enter the time that elapses before the valve starts turning after a change in direction (in sec). Note: this value must be measured with a 12V power supply.	0.00	
12. Maximum capacity of the regulating valve		Enter here the nominal throughput of the valve (l/min) in fully open position.	102	
13. Regulation anticipation		Enter here a value between 0 and 100. The bigger the value, the stronger is the action. This value, together with the active sections, target rate, mean forward speed determines the set point of the regulating valve when the master switch is turned off. A value of 0 turns the feature off.	50	
14. Default position of regulating valve		When the master switch is turned off for 10 min, the regulating valve goes automatically to a position in % between fully open and fully closed. 0 is open, 100 is closed.	50	
15. Regulation delayed start		Enter the time delay between the turning on of the master switch and the moment that the regulation becomes active. Value between 0.0 and 2.0 sec.	0.5	
16. Minimum working pressure		Enter here the minimum allowed working pressure. If a lower pressure should be required by the regulation, the pressure is kept at this minimum value. If the pressure is lower than the minimum pressure, the regulation will increase the pressure until the minimum pressure is reached.	0.6	
17. Maximum working pressure		Enter here the maximum allowed working pressure. If a higher pressure should be required by the regulation, the pressure is kept at this maximum value. If the pressure is higher than the maximum pressure, the regulation will decrease the pressure until the maximum pressure is reached.	10.0	
18. Regulating valve speed in manual mode		Enter here the speed of the regulating valve in manual mode. 0.0 = minimum (stand still) 12.0 = maximum	9.0	

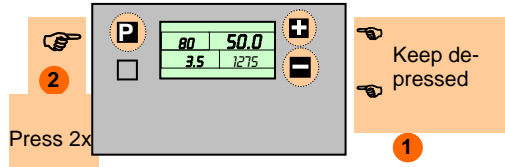
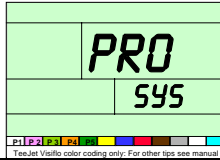
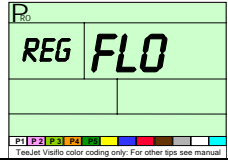
19. Boost mode		Each press on the + or - key increases or decreases the target rate by this value (in %).	10	
20. Circulation option		Enables the user to use the circulation mode. NO : no circulation SEM : semi continuous FUL : continuous	NO	
21. Option communication (serial port)		Choose NO if the computer has no serial port. Otherwise: YES .	YES	
22. Option memories		Configures the amount of memory locations available. 0 : no memories. 1 : one memory: total counter only. 2 : one total counter and one freely accessible memory location.... 16 : one total counter and 15 freely accessible memory locations (maximum)	10	
23. Option tank content		Enter here how the tank content is obtained. CALC : counting down with flow meter MEAS : by tank-level sensor	CALC	
24. Maximum tank content		Enter here the maximum content of the tank. Note: this step is not shown when the tank level sensor is installed.		
25. Reduced working width		Enables you to use the reduced working width feature or not. YES : possible NO : not possible	YES	
26. Calibration method for 3-way section valves		Enables you to set up the calibration method for 3-way section valves. CAL : pressure stays constant when a section is shut off (calibration per tip type). VAR : pressure depends on selected tip (fixed return calibration).	CAL	
27. Audible alarm		Gives audible alarm when an alarm is detected.	YES	
28. Voltage level for section inputs		Enables you to select the voltage level for an open section. HIGH : section open = 12V LO : section open = 0V	HIGH	

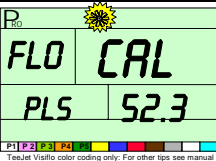
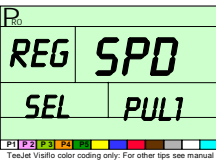
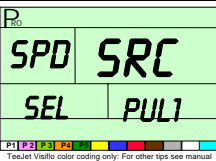
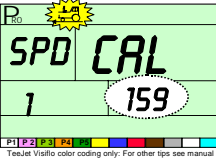
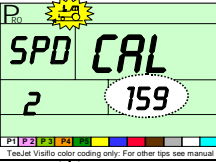
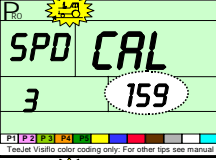
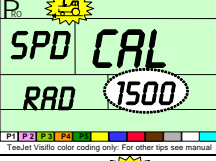
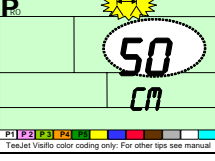
29. Wind speed sensor		Enter the number of pulses per m/sec for the wind speed sensor.	1.49	
30. PTO sensor		Enter here the pulses per rev for the PTO sensor.	22.9	
31. Low RPM alarm PTO		Enter here the low alarm level for the PTO RPM. Use the keys + or - to modify the value, or enter with the numeric keys.	50	
32. High RPM alarm PTO		Enter here the high alarm level for the PTO RPM. Use the keys + or - to modify the value, or enter with the numeric keys.	0	
33. AirMatic		Select YES , when AirMatic drop size regulation is used (option).	NO	
34. When AirMatic = YES : Select restrictor		Select the used restrictor. HTA: R35 AJET	R35 AJET	
35. When AirMatic = YES : Minimum voltage regulation valve		Enter the minimum voltage at which the regulating valve will run. Turn on the master switch and increase the value until the valve works in all circumstances	3.5	

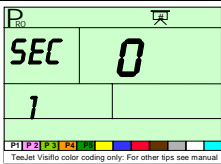
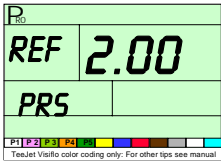
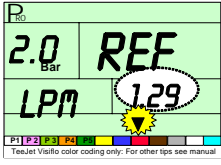
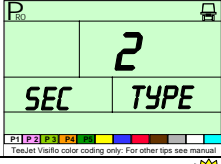
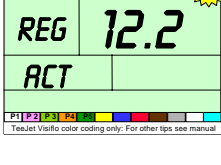
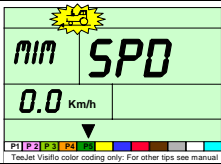
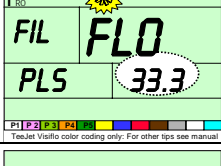
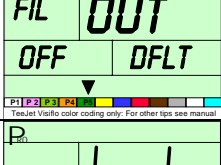
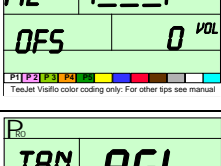
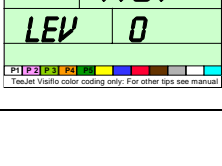
Here, some stored data will be displayed:

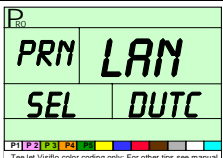
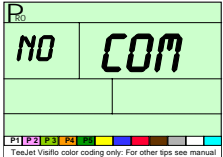
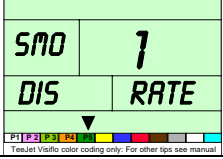
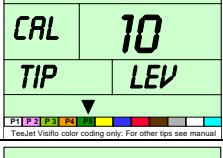
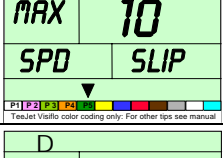
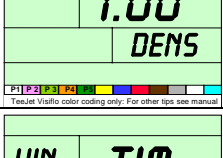
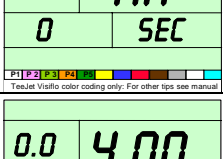
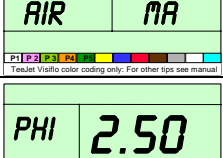
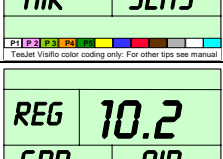
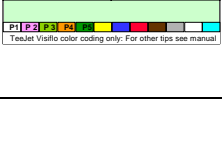
36. Maximum measured speed		This location shows you the maximum speed ever registered by the controller.
37. Total surface counter		This location shows you the total surface counted.
38. Total spraying time counter		This location shows you the total spraying time counted.
39. Machine hours counter		This location shows you the running hours of the controller.
40. PTO hours counter		This location shows you the total time the PTO has been working.

5 Machine - settings

Condition:	Action:	Temporary screen:	Screen:
Master off			

Parameter:	Screen:	Description:	Standard value	Your value
1. Pulses/liter Flowmeter		Enter the pulses/liter value here. Keep + and - depressed to start the auto calibration feature.	52.3	
2. Selection of speed sensor input		Select here one of the 4 possibilities: PUL1 , PUL2 et PUL3 : wheel sensor RAD : radar Note: The Agrifac self-propelled spraying machines always use the Radar input (also for the wheel sensor).	PUL1 Self-propelled: RAD	
3. Selection of wheel sensor parameter		Select here the used parameter for the wheel sensor: PUL1 , PUL2 or PUL3 . Note: This is only visible when the Radar and Wheel sensor are both installed.	PUL1	
4. Wheel sensor calibration 1		Enter here the amount of pulses per 100 m. Keep + and - depressed to start the auto calibration feature.	159	
5. Wheel sensor calibration 2		Enter here the amount of pulses per 100 m. Keep + and - depressed to start the auto calibration feature.	159	
6. Wheel sensor calibration 3		Enter here the amount of pulses per 100 m. Keep + and - depressed to start the auto calibration feature.	159	
7. Radar sensor calibration		Enter here the amount of pulses per 10 m. Keep + and - depressed to start the auto calibration feature.	1500	
8. Distance between tips		Enter here the distance between the tips. Unit : cm	50	

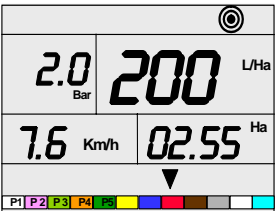

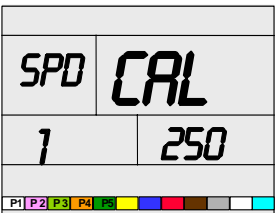
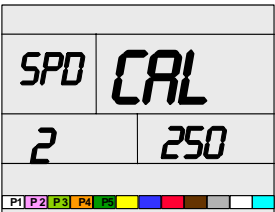
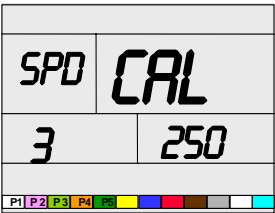
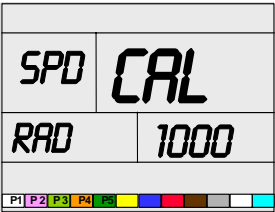
9. Number of tips per section		Enter here the amount of tips per section. Note: This step is repeated 15 times. A machine with 9 sections has always 1,2,3 and 13,14,15 set to 0!!!	0	
10. Reference pressure for tip calibration		Enter here the pressure (in bar) at which the flow is defined. This value applies to all tips.	2.00	
11. Tip output		Here, you can see the nozzle characteristics (in l/min). Do not modify these values. Note: When the value is different than the standard value, the + LED or – LED will blink.		
12. Section valve type		Select between 2-way or 3-way section valves.	2	
13. Regulation valve speed		a. The value to the left of the decimal point applies to the fast action of the regulating valve Note: 0 is very slow, 19 is very fast. b. The value the right of the decimal point applies to the fine regulation. Note: 0 is very slow, 9 is very fast.	12.2	
14. Minimum speed		Minimum value for forward speed.	0.0	
15. Fill flow meter (pulses/l)		Enter the pulses/liter value here. Keep + and - depressed to start the auto calibration feature.	33.3	
16. Automatic-filling valve status		Enter here the status of the filling valve output during normal operation. OFF : Closed ON : Open	OFF	
17. Fill valve shutoff anticipation		Enter here the amount of liters, which will still enter the tank after the fill valve is closed.	0	
18. Switch off level agitation valve		If a tank level sensor is installed, the agitation valve will be closed when the measured level drops below the programmed level. NOTE: this happens only when the master valve is switched off.	0	

19. Select printer language		Select here the language of the printed reports: <ul style="list-style-type: none"> DUTC: Dutch ITAL: Italian ENGL: English FREN: French GERM: German 	ENGL	
20. Communication		Enter here the usage of the serial port: <ul style="list-style-type: none"> NO COM: no communication CNT PRT: ticket printer for contractor (minimum) USR PRT: ticket printer for farmer (complete) GPS: connection with GPS system LOG: logging mode (sends data each second) 	NO COM	
21. Smoothing rate of l/ha readout		Enter here the percentage of smoothing of the l/ha readout. Min. 1, max. 50.	1	
22. System alarm		This value (in %) determines the maximum difference between the measured dose and the calculated dose.	10	
23. Wheel slip alarm		This value (in %) determines the maximum difference between the Wheel sensor and the Radar sensor. Note: Only when both sensors are installed.	10	
24. Density		Enter here the density of the products which are different from 1.	1.00	
25. Wind measurement		Enter here the time in sec that the wind speed is measured. When a wind speed sensor is mounted: 20	0	
26. Reference current air pressure sensor (AirMatic)		Enter the current (mA) from the air pressure sensor at 0 bar. Keep + and - depressed to start the auto calibration feature.	4.00	
27. Max. pressure air pressure sensor (AirMatic)		Enter the max. pressure (bar) of the air pressure sensor. This must be the pressure at the 20 mA signal from the sensor.	2.50	
28. Air regulation valve speed (AirMatic)		<p>a. The value to the left of the decimal point applies to the fast action of the regulating valve Note: 0 is very slow, 19 is very fast.</p> <p>b. The value the right of the decimal point applies to the fine regulation. Note: 0 is very slow, 9 is very fast.</p>	10.2	

6 Calibration of the different sensors.

6.1 Speed.

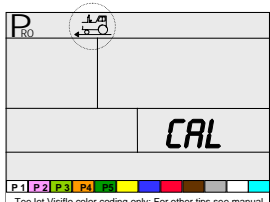
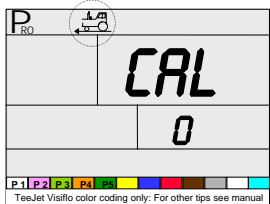
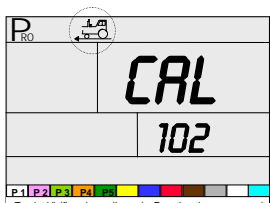
6.1.1 Manual.

Screen:	Explanation:	Value:
	<p>Keep  depressed for 3 sec until the next screen appears.</p> <p>Press + and - simultaneously to start automatic Calibration (see §6.1.2)</p>	
	<p>Use the + and - keys to alter the figure, or key in a new figure with the numeric keys. Press P_{RO} to save the value and go to the next parameter.</p> <p>Keep P_{RO} depressed to save the value and to go back to normal operation.</p>	_____ p/100m
	<p>Repeat the same procedure for speed calibration 2.</p>	_____ p/100m
	<p>Repeat the same procedure for speed calibration 3.</p>	_____ p/100m
	<p>Repeat the same procedure for radar sensor calibration.</p> <p>NOTE: this value is the amount of pulses per 10m.</p>	_____ p/10m

6.1.2 Automatic calibration.

Automatic calibration is based on the measurement of the pulses over a distance of 100 m.

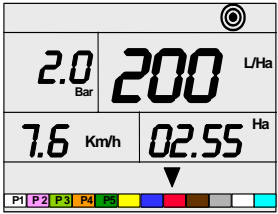
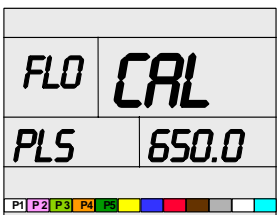
Therefore, place 2 marks 100m away from each other. Automatic calibration must be done **in the field** and not on the road, with a half full tank, and the tires at the correct pressure. Driving speed has no influence.

Step:	Screen:	Explanation:
1. Starting position.		Start driving from before the first mark and fix your view on a marking point on the machine (Mudguard, mirror...).
2. Start automatic measurement.		Press + to start the measurement when the marking point on the machine passes the first mark.
3. Automatic measurement		<p>Continue driving until the marking point on the machine passes the 2nd marker 100 m away from the first one. Press the + key to stop the counting.</p> <p>The computer will automatically detect if a radar sensor is installed, and will adapt its pulse value accordingly. In that case, RAD will be shown on the screen.</p> <p>Pressing the Pro key will store the value and go to the next step. Keeping the Pro key depressed, stores the value, and exits the programming mode.</p>

Note: Wheel sensor calibration must be done each time when tires are changed. The calibration process must be done for all 3 wheel parameters and for the radar sensor (when used).

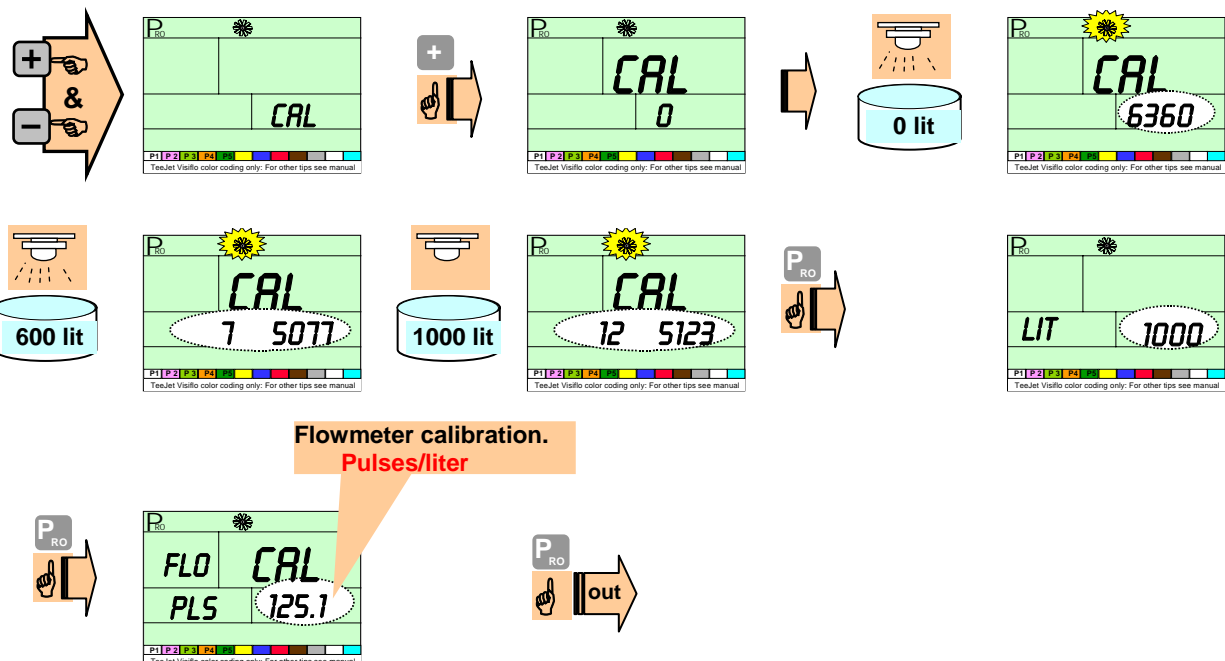
6.2 Spray-Flowmeter.

6.2.1 Manual.

Screen:	Explanation:	Value:
	Keep the flow meter key depressed or select the programming step in machine setup.	
	Use the + or - keys or use the numeric keys to enter the correct value. Keep Pro depressed to store the value and go back to normal operation. Keep + and - depressed to start the automatic calibration.	_____ p/liter

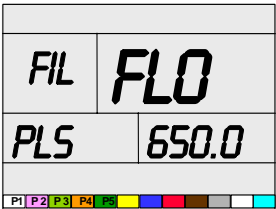
6.2.2 Automatic calibration

Follow the sequence below. Start spraying. The computer registers the measured pulses. Stop spraying when the desired volume has been sprayed. Press **PRO**; enter the sprayed volume in liters. The computer will now calculate the correct pulses/liter, and put it on the display. Press **PRO** to go on to the next step or keep **PRO** depressed to exit the programming mode.



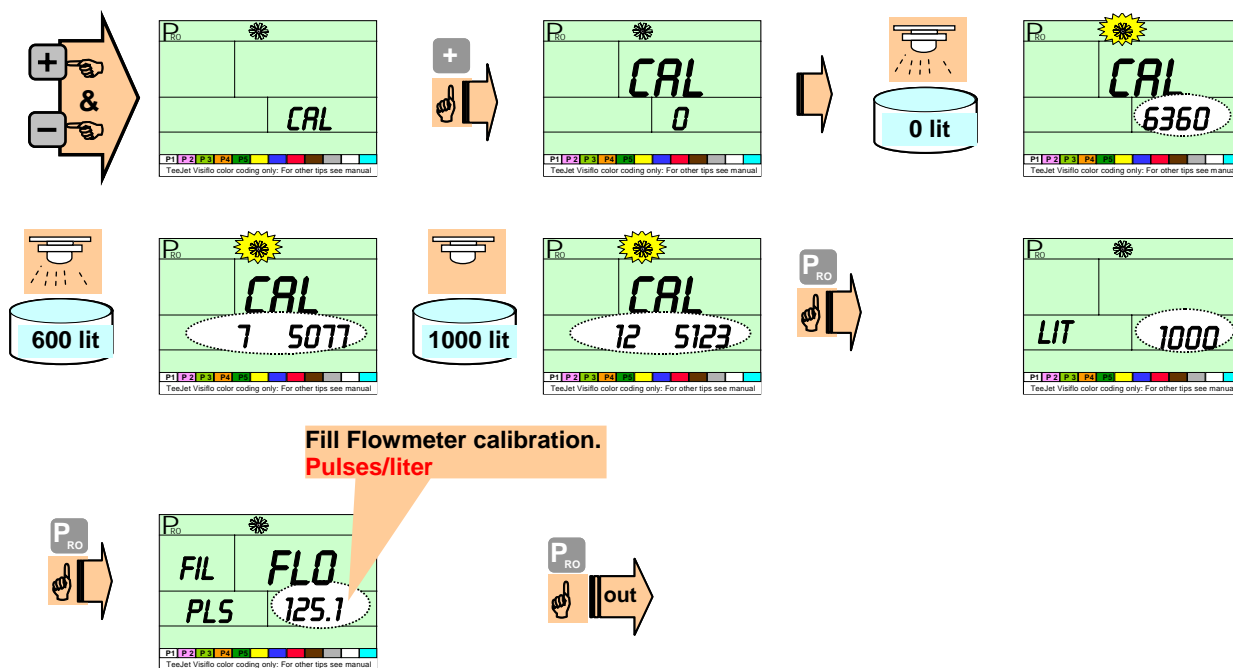
6.3 Fill-Flowmeter.

6.3.1 Manual.

Screen:	Explanation:	Value:
	<p>Use the + or – keys, or use the numeric keys to enter the correct value. Or use the numeric keys to enter the value.</p> <p>Keep Pro depressed to store the value and go back to normal operation. Keep + and - depressed to start the automatic calibration.</p>	<p>_____ p/liter</p>

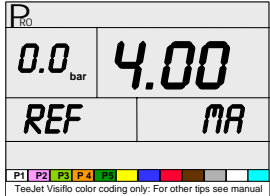
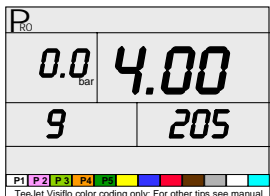
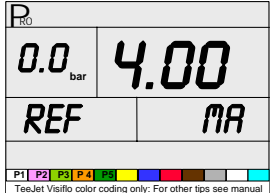
6.3.2 Automatic

Follow the sequence below. Start filling. The computer registers the measured pulses. Stop filling when the desired volume has been filled. Press **P_{RO}**; enter the filled volume in liters. The computer will now calculate the correct pulses/liter, and put it on the display. Press **P_{RO}** to go on to the next step or keep **P_{RO}** depressed to exit the programming mode.



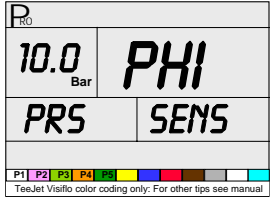
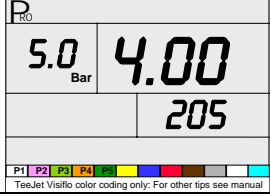
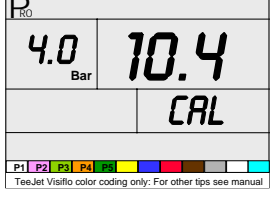
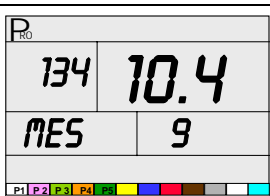
6.4 Pressure sensor.

6.4.1 Automatic calibration of the 0 bar reference signal.

1. No pressure at sensor!		<p>The current, delivered by the sensor at 0 bar will be measured. Make sure that the sensor is absolutely free of pressure before carrying out the calibration.</p> <p>Keep + and - depressed to start the automatic calibration.</p> <p>Standard value: 4.00 Units: mA</p>
2. Automatic measure- ment		<p>The current, delivered by the sensor at 0 bar is measured.</p> <p>205 = digital value 4.00 = current in mA 1 ... 10 = 10 subsequent measurements</p>
3. Result		<p>The result shown is the mean value of 10 measurements. The value must be around 4 mA.</p> <p>Continue programming by pressing P_{RO} or exit by keeping P_{RO} depressed.</p>

6.4.2 Automatic calibration of the maximum pressure

To compensate for pressure drops in the lines.

1. Maximum pressure of sensor		<p>Enter the maximum pressure of the sensor (corresponding with 20mA).</p> <p>Keep + and - depressed to start the automatic calibration.</p> <p>Standard value: 10.0 Units: bar</p>
2. Stop spraying Preparation of calibra- tion		<p>Master switch must be off.</p> <p>Select a reference pressure with + or - keys (or enter with numeric keys) as close as possible to the maximum pressure of the sensor.</p>
3. Start spraying Preparation of calibra- tion		<p>Start spraying with all sections open.</p> <p>Adjust the pressure with + or - keys, until the pressure, measured with a manometer close to a tip matches the previously programmed value.</p> <p>Press P_{RO} to start the automatic calibration.</p>
4. Automatic measure- ment		<p>The current, delivered by the sensor at a pressure equal to the previously entered value is measured.</p> <p>134 = digital value, 10.4 = value in mA MES 0 ... MES 9 = 10 subsequent measurements</p> <p>Continue programming by pressing P_{RO} or exit by keeping P_{RO} depressed.</p>

7 Printer-option.



The printer can only be used if one of the following options is selected in the communications menu: *USR PRT* of *CNT PRT*.

Printing is only possible when the master switch is off (not spraying).

Press the **PRINT** button on the printer to print out the results of the last job.

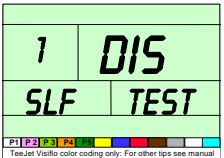
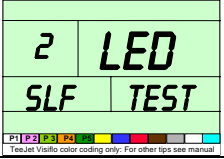
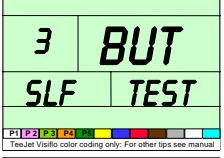
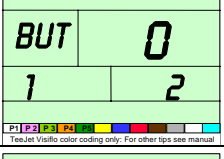
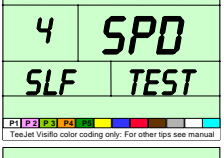
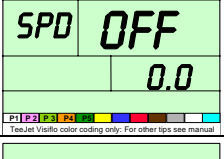
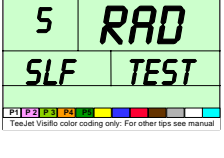
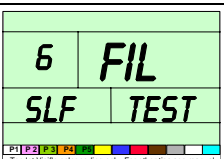
To print a job, saved in memory: first, make sure that the memory contents are shown on the screen, and then press **PRINT** on the printer.

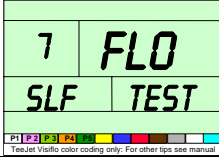
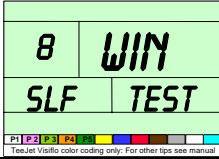
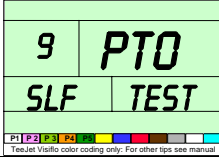
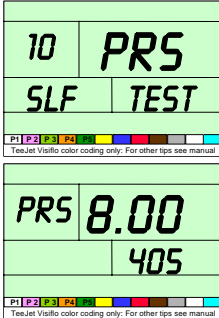
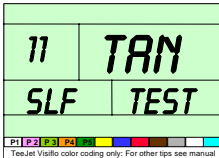
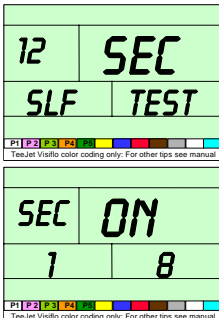
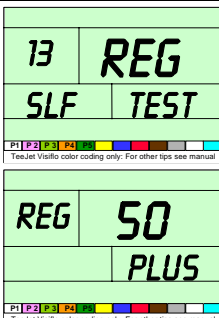
8 Built-in test facilities.

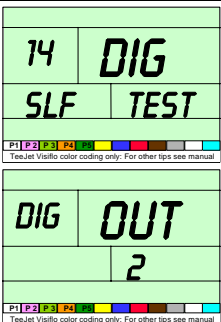
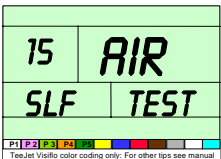
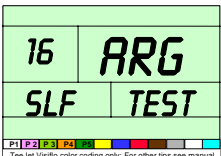
The 860 spray computer has a number of built-in test facilities, which enables the user to check the proper operation of the controller.

- The test mode is only accessible when the master switch is turned off.
- The test mode is accessed by pressing the Pro and MAN keys simultaneously.
- The first screen that appears after this key combination is the first test that can be performed. Each specific test has a number, which can be selected by pushing the + or – keys.
- When the Pro key is depressed after the selection, the test is carried out.
- The test can be stopped at any moment by pressing Pro again.

A list of the different tests is given in the table below, as well as a short explanation of the test:

1. Display		First, all segments are turned on. Then all are off, and one by one are turned on again.
2. LED		The LEDs on the front panel are turned on one by one, starting in the top left corner, to the lower right corner. The 5 LEDs to the right of the display come on last.
3. Keyboard	 	<p>When the test is entered, all keys must be depressed one after the other.</p> <p>The value in the lower left corner is 1 when no key is depressed, and 0 when a key is depressed. The value in the lower right corner shows the number of the last depressed key. The number in the top right corner shows the number of the key that is actually depressed.</p> <p>Exiting this test is done by pressing the Pro key for 3 seconds.</p>
4. Wheel sensor	 	<p>The frequency of the speed signal is shown on the lower right corner (in pulses/sec).</p> <p>As long as this value is lower than 2, the status of the input is shown in the top right corner: On = sensor active (sensor signal = low) Off = sensor not active (sensor signal = open circuit)</p>
5. Radar (= Wheel sensor at ZA2700 and ZA3400)		<p>The frequency of the speed signal is shown on the lower right corner (in pulses/sec).</p> <p>As long as this value is lower than 2, the status of the input is shown in the top right corner: On = sensor active (sensor signal = high) Off = sensor not active (sensor signal = low)</p>
6. Fill flow sensor		See test 4; Wheel sensor.

7. Flow sensor		See test 4; Wheel sensor.
8. Wind sensor		See test 4; Wheel sensor.
9. PTO sensor		<p>See test 4; Wheel sensor.</p> <p>When Tankcontrol is mounted on the machine it will be the signal from the Tankcontrol box.</p>
10. Pressure sensor		<p>The measured current is shown in the top right corner. This value must lie between about 4 and 20 mA. 0 mA is possible if no sensor is connected.</p> <p>The value in the lower right corner represents the internal digital value of the microprocessor and must lie between 0 and 1023.</p>
11. Tank level sensor		See test 10; Pressure sensor.
12. Section input		<p>The top right corner shows OFF when the master is off, and ON when the master is on. The lower left corner shows the amount of section valves that are on. When only one section valve is on, the corresponding number is shown in the lower right corner.</p> <p>In this example the master is on and only section valve 8 (centre section) is switched on.</p>
13. Regulating valve		<p>When the test is entered, the regulating valve can be driven with a percentage from 0 to 100% (plus) or from 0 to -100% (min) by pressing the + or - key.</p> <p>In this example the regulating valve is turning towards higher pressure, with a speed of 50% (6V).</p>

14. Digital outputs		<p>When the test is entered, each output can be driven separately by pressing on the + or – keys.</p> <p>The displayed value in the lower right corner shows which output is on. 0 = no outputs on, 1 = first output on, ... 4 = fourth output on.</p>
15. Air pressure sensor (AirMatic)		See test 10; Pressure sensor.
16. Air regulating valve (AirMatic)		See test 13; Regulating valve.

The test mode can be exited at any moment by keeping the Pro key depressed for 3 sec.