GENERAL DESCRIPTION AND TECHNICAL OPERATION OF THE MIST & WEAN CONTROLLER

Pages:

ELECTRONIC & TECHNICAL SERVICES LTD.

40 ACREVILLE ROAD, BEBINGTON,
WIRRAL. CH63 2HY
TEL/FAX: 0151 645 8491
www.ets-controls.co.uk
email john@ets-controls.co.uk

PLEASE REFER TO PAGE 3 FOR SETTING LEAF SENSITIVITY

IMPORTANT

IF USING YOUR OWN SOLENOID VALVE ENSURE THAT MAXIMUM WATTAGE DOES NOT EXCEED 6 WATTS.

GENERAL DESCRIPTION AND TECHNICAL OPERATION OF THE MIST WEAN UNIT

Design Concepts:
To produce a control to provide a cutting with the optimum conditions of growth. In the early stages of growth the control can be set to give predominantly mist conditions. As the cutting matures, the interval between misting can be increased thereby effectively weaning the plant.

General Description
If the HDR1 Leaf Override link is selected the grower must remember that the leaf always overrides the burst timer.
If the HDR2 No Leaf Override link is selected, the misting valve will be on for the time selected Mist Seconds control

The control section of the unit consists of a Wean Minutes timer, a Mist Seconds timer, a Timer (leaf control) or continuous switch, a manual start tactile push switch and a leaf sensitivity control.

Safety controls consist of a mains fuse and a secondary fuse on the low voltage supply to the valve. The Wean Timer determines the time in between misting bursts, irrespective of whether the leaf is dry. The Mist Seconds timer determines the time for the operation of the irrigation valve. When HDR1 selected, should the leaf become sufficiently wet, the leaf will always override the burst timer.

Operation:

OPTION 1 TIMER ONLY

By disconnecting the leaf the controller can be used as timer with no sensory (wet leaf) feedback. If for example the Wean Minutes timer is set to 10 minutes the Mist Timer length timer set to 10 seconds, after the 10 minute period the misting valve will be on for 10 seconds. The manual push to burst switch is always active.

OPTION 2 MIST ONLY

Set the Wean Minutes timer to zero, when the leaf is dry the mist burst length timer runs for the time set. If HDR1 is selected, wet leaf will override Mist Timer. If HDR2 is selected the mist burst length will run for the time set by the Mist Timer

OPTION 3 MIST AND WEAN

If the Wean Minutes timer is set at l0 minutes, the Mist Seconds timer set at l0 seconds and the leaf is dry; after l0 minutes the Mist timer is initiated and opens the irrigation valve. The Mist timer will run for its full length of l0 seconds as long as the leaf remains dry. If HDR1 selected and the leaf becomes sufficiently wet, during the l0 seconds period, the leaf will override and turn off the burst timer. If HDR2 is selected the mist will run for the time set by the Mist Timer.
The sensitivity of the leaf can be adjusted by the front panel control. Clockwise increases the sensitivity, and anti-clockwise decreases the sensitivity.
The manual burst push switch will operate the Mist timer for the time indicated on the scale, but only when the leaf is dry.

<u>The Timer/Continuous switch</u>
When this is in the "timer" position the unit is controlled by the leaf, when in the "continuous" position the misting valve is on continuously.

Making the leaf DRIER reduces the frequency of misting, making the leaf WETTER increases the frequency of misting, especially when HDR2 selected.

With HDR2 selected, the manual burst push switch will operate the Mist timer for the time indicated on the scale - if HDR1 selected the leaf will override if sufficiently wet.

VERY IMPORTANT

The leaf sensitivity depends on a number of factors, importantly the distance between the two carbon sensors and the hardness of the water to be applied. Distilled water for instance is very pure and has a low conductance. Mains water will have variable conductance, both factors affect leaf sensitivity. Practically you must take care when setting the leaf sensitivity control. It is possible that when the control is set to WET the leaf will NOT override the mist and has no control, i.e., the green LED is not extinguished. This may cause over wetting of the benches.

The **easy** solution is to thoroughly soak the wet leaf until a 'bubble' is formed which covers both carbon sensors. Adjust the wet leaf sensitivity until the green leaf sensitivity indicator is illuminated, **do not turn the sensitivity control any further to the WET region**.

The **correct** solution is to thoroughly soak the wet leaf until a 'bubble' of water is formed which covers both carbon sensors. Taking great care remove the front panel screws and remove the panel. **MAINS IS APPLIED SO TAKE GREAT CARE.**
Turn the leaf sensitivity control to WET and adjust the board mounted preset VR1 on FIG 2 until the leaf sensitivity indicator turns off, wait for **2 minutes** to allow the leaf circuitry to stabilise. Repeat this process until you are satisfied that the sensitivity is correct – LED off when leaf sensitivity control is fully ACW, LED on when leaf sensitivity control is minimally turned CW. Replace front panel.

Leaf care
Once a month redress the leaf sensor by turning upside down and offering the surface of the leaf to a sheet of horizontal fine 220 grit emery paper. Keeping the sensor flat to the face of the emery paper make several circular motions to remove any sediment accumulation. If the water source is very hard it is recommended that you carry out the cleaning process once a week.

Do not trail the leaf sensor cable on the ground and do not run alongside or parallel to cables carrying mains voltage.

Operational Hints

To check the satisfactory operation of the unit, do the following;

1. Timer/Continuous switch is in "Timer" position.
2. Turn Wean Minutes time to max.
3. Select a Mist time.
4. Dry leaf and check that leaf sensitivity indicator is extinguished.
5. Push manual burst, irrigation valve should be on for Mist time.
6. Check that the leaf is wet and the green leaf sensitivity LED is illuminated
7. Push manual burst, nothing should happen.
8. Turn interval to zero and dry leaf, Mist time will initiate
9. Select continuous position irrigation valve should be permanently on.

Technical Specifications:

1. Integral 3-way mains terminal block connected to a 240V ac 50/60 Hz supply
2. Safe 24v AC 50/60 Hz to irrigation valve. Output rated at 0.5 amp.
3. Wean timing range from 0 seconds to 30 minutes.
4. Mist Seconds timer range from 0 to 10 seconds.
5. Can be used solely as a mist controller.
6. Timer or Continuous control, switch selectable.
7. Manual trigger for mist burst.
8. Adjustable leaf sensitivity control with LED indication.
9. Fused on primary input and secondary outputs.
10. Misting output indicator.
11. Accurate timing by micro controller.
12. Smooth leaf sensitivity control.
13. Dimensions L 150mm W 110mm D 80mm.
14. Solenoid valve rating 24Vac maximum power 9 watts.

ELECTRICAL CONNECTIONS FOR MIST WEAN UNIT

WE STRONGLY ADVISE THE USE OF AN E.L.C.B. ON THE MAINS SUPPLY TO THIS UNIT

Unscrew the four plastic corner screws and with great care remove the 14 way IDC cable connector from lower P.C.B. do not put any undue strain on cable.

Mount base of box utilizing the mounting points shown in **Fig1**.

A fused mains supply of 240v needs to be connected to TB1 3 way terminal block
labelled:
Live 240Vac
Neutral
Earth
Live fused at 500mAmp, slo blo

Valve Connection

Valve must be of a 24V a.c. type, maximum rating 9 watts.
Connect to TB3 labelled ‘24Vac to valve’ using 2 core cable rated at 3 amps size 7/0.2 mm squared

Connect the electronic leaf to TB2 terminal block labelled "LEAF".
DO **NOT** OVERTIGHTEN the terminal screws as this will damage the copper track on the PCB.

SEE ATTACHED DIAGRAM FIG 2.

Upon completion of wiring, reconnect the 14 way IDC connector, it is biased and can only connect one way, **DO NOT FORCE**, look at the key which is a raised bump and connect to the header with the corresponding cut out. Also bend cable to the right, for clarity please refer to **FIG 3.**

FIG 1

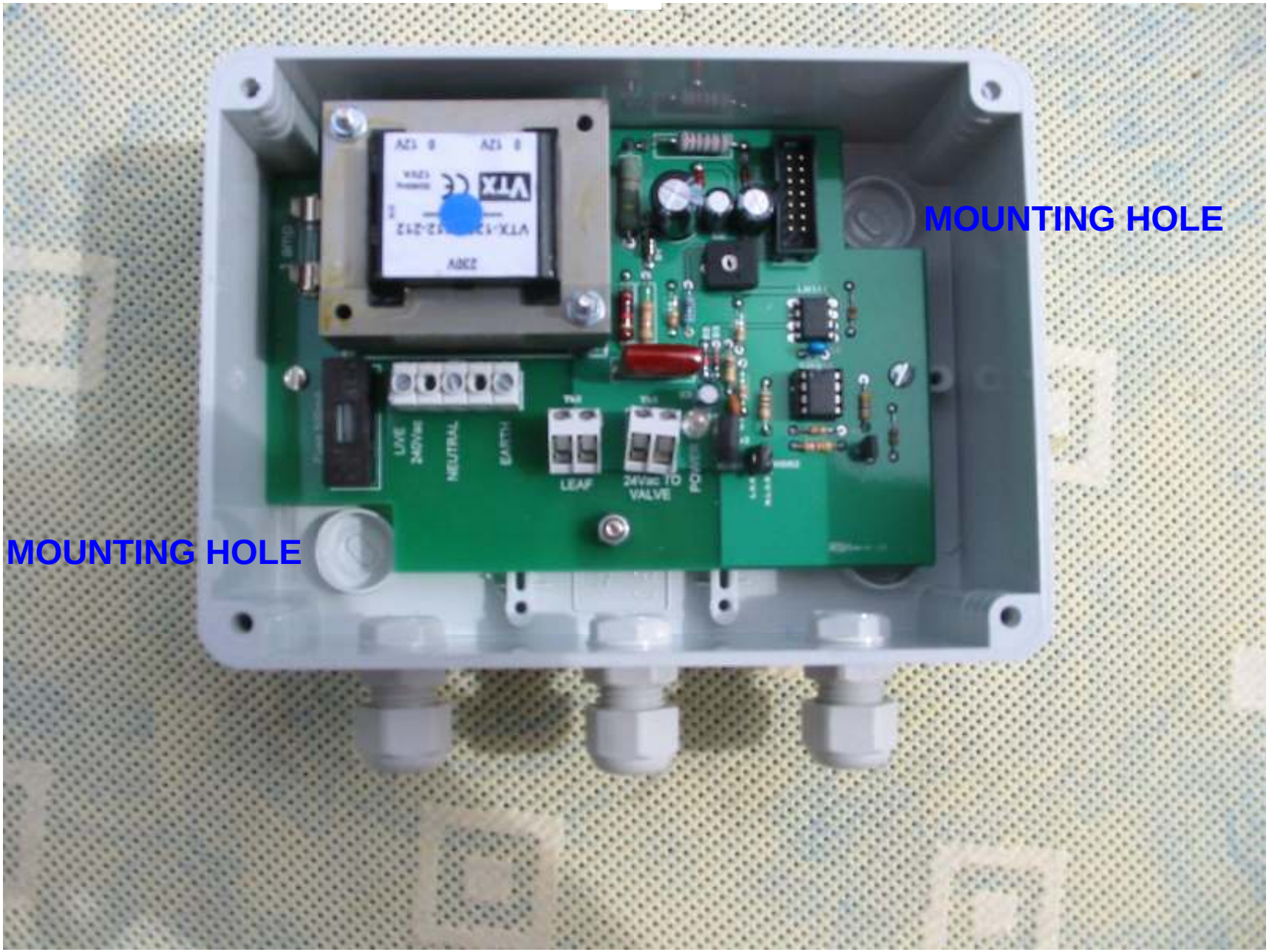
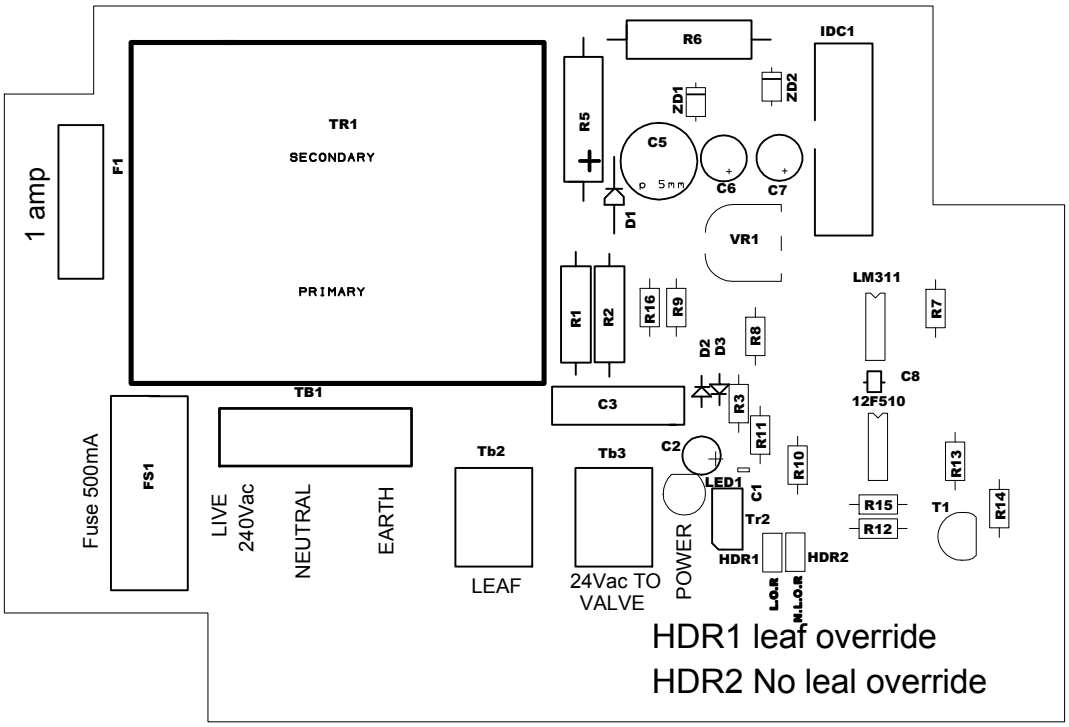

MOUNTING HOLE
MOUNTING HOLE
LIVE 240VAC
NEUTRAL
EARTH
LEAF
24Vac TO VALVE
POWER

FIG 2

ELECTRICAL CONNECTIONS FOR THE MIST/WEAN



MAINS CONNECTIONS

BROWN LIVE 240Vac

BLUE NEUTRAL

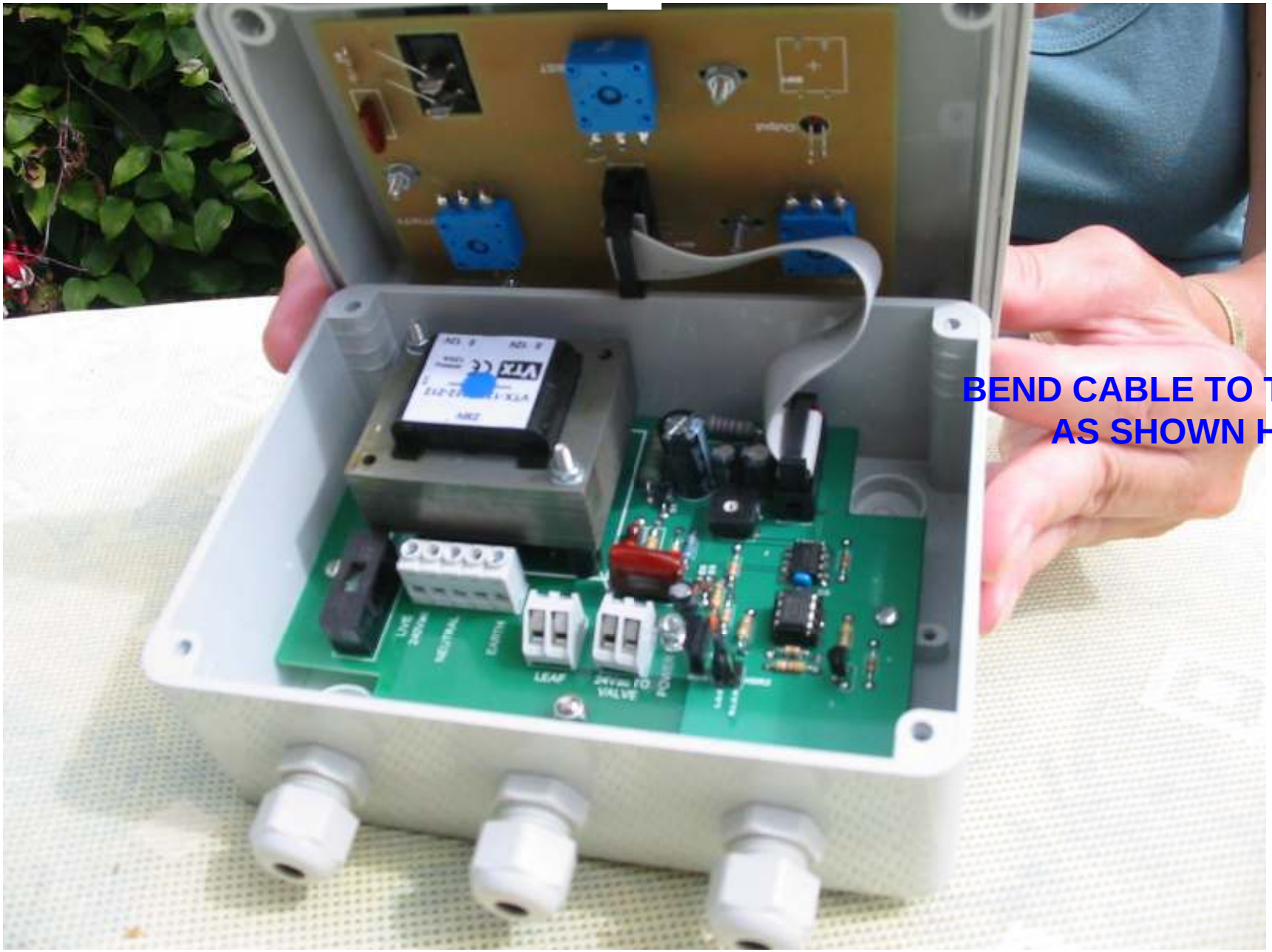
GREEN EARTH

ENSURE ALL CONNECTIONS ARE FIRM BUT AVOID OVERTIGHTENING

STANDARD VOLTAGE TO MISTING VALVE IS 24Vac

RECOMMENDED CONDUCTOR SIZE 7/0.2mm SQUARED

FIG 3


BEND CABLE TO THE RIGHT
AS SHOWN HERE
LIVE
NEUTRAL
EARTH
LEAF
VALVE

FOR GUIDANCE ONLY

- 1 -

Installation

It is important to connect the cable from the leaf to the control unit with no joints.

Various lengths of cable lead are available on request as we do not recommend the joining of cables anywhere in the electronic leaf circuit. Jointed cables will, in a very short time, result in either continuous misting or no misting at all depending on the type of joint made and is not to be recommended (see Fig.2).

Care must also be taken not to contaminate the leaf surface during installation. Do not test the leaf by wiping off the moisture with the finger or thumb as this will leave a greasy deposit and cause erratic operation.

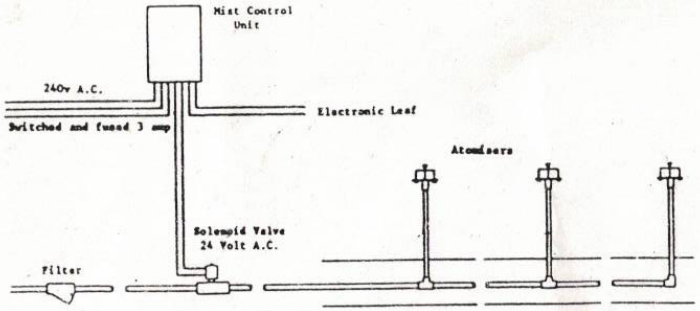


Fig.3 Installation Arrangement

Note: Always check that the control unit is switched off when the water supply to the solenoid valve is turned off.

The position of the leaf within the bench has a marked effect on the amount of water supplied by the atomisers. As soon as sufficient water is collected on the surface of the leaf, misting will cease.

The more quickly water is collected on this surface the shorter the burst length and vice versa.

The most suitable position for the leaf will therefore be elected by trial.

With the leaf set midway between jets, mist is collected by two atomisers, resulting in the shortest burst length (Fig.4 - 1). With the leaf set at the edge of a bench but opposite a mist jet, water is collected by only one atomiser resulting in the longest burst length (Fig.4 - 3).

Set at the edge of the bench midway between atomisers will give an intermediate burst length (Fig.4 - 2).

- 2 -

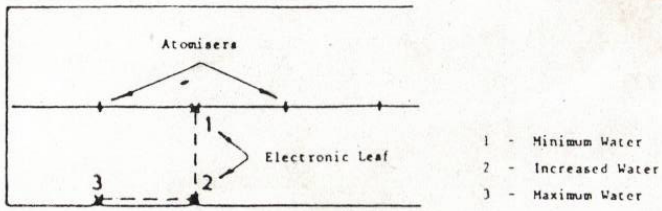


Fig.4 Relation of Electronic Leaf to Atomisers

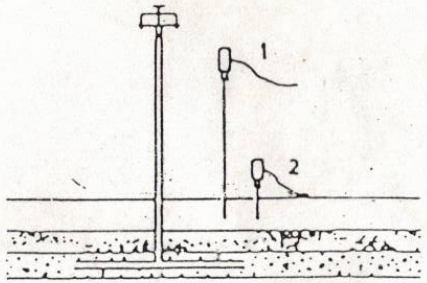


Fig.5 Height Setting - Electronic Leaf

Similarly the height at which the leaf is mounted has an effect on the precipitation rate.

A setting just below the atomisers (Fig.5 - 1) will result in a shorter misting time, and a setting lower down at the height of the cuttings (Fig.5 - 2) will result in a longer misting time.

By mounting the leaf on a cane it will be possible to vary the height and position and enable a fine tuning to be made, combined with a wide range of precipitation. Burst lengths of between 1.5 to 10 seconds can be achieved by a combination of leaf position and unit settings.

For continuous misting the mist unit should be switched to "manual". At this setting, misting will continue until the unit is switched back to minimum.

Maintenance

After a while, especially in hard water areas, it may be necessary to clean the surface of the leaf periodically. This is usually indicated by over frequent misting.

To clean the leaf the control unit must first be switched off and the leaf

To clean the leaf the control unit must first be switched off and the leaf disconnected from the unit. Dress the leaf by turning it upside down and on a flat service, clean by circular motion on a sandpaper grit of between 150 to 120. Give a final dressing with 220 grit emery paper.

Hosetail connectors RS Stock146-3183

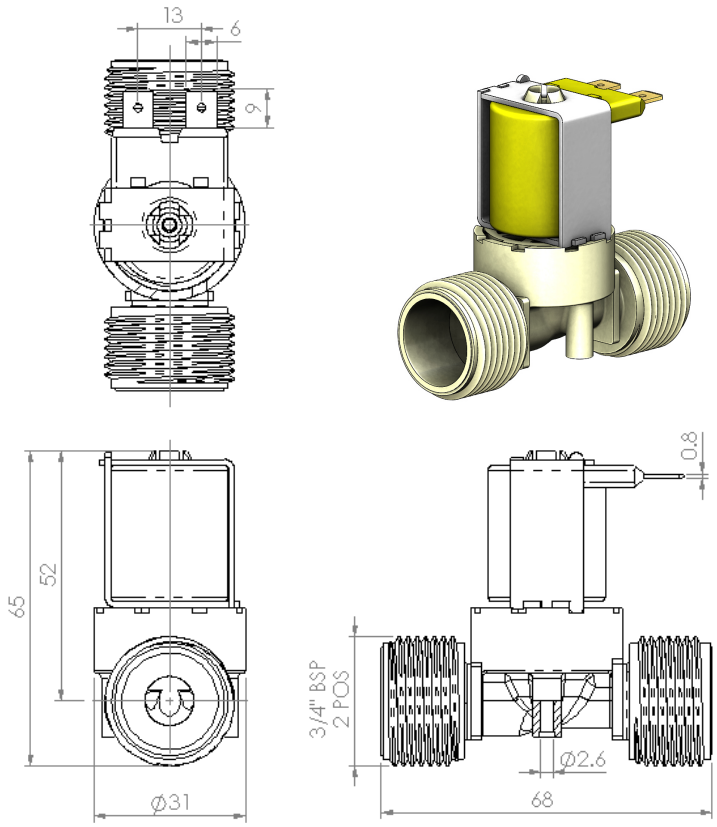
<-------- Direction of flow

ENGLISH

Datasheet

RS Pro Solenoid Valve
2 Port, NC, 24v AC/DC, ¾” BSP

RS Stock No: 1904137



SPECIFICATIONS:	
VOLTAGE:	24V
FREQUENCY:	AC/DC
POWER DRAW:	(2.8w at 12VDC) (9 w at 24Vac)
COIL INSULATION:	CLASS F (140°C OPERATING TEMPERATURE)
AMBIENT TEMPERATURE:	60°C Max
MEDIUM:	Potable water 90° Max
DUTY CYCLE 100%:	Tu 60°C, Tm 25°C
DUTY CYCLE:	3min ON / 5min Off - Tu 60°C, Tm 90°C
OPERATING PRESSURE:	0.2 - 10 Bar
EMC:	Fully Compliant
APPROVALS:	EN 60 730-2-8, WRAS, ACS.
TERMINALS:	6mm x 0.8mm Male tab terminals (x2)

PRACTICAL TROUBLE SHOOTING GUIDE
FOR THE MIST WEAN CONTROLLER
This guide is for new and existing installations

NEW INSTALLATION:

CAUTION, mains voltage can KILL if you are not confident of carrying out steps 1 and 2 utilise the services of a qualified electrician.

1. Connect, mains power and wet leaf.
2. With the front panel loose, apply mains power and check that the green POWER LED located on the bottom PCB is illuminated.
If not illuminated check that you have a good 240Vac power to the controller and that the enclosed 500mA and the 1 amp control fuse are intact. If there is 240V ac power and the fuses are intact, the transformer will be faulty and the controller will require repair.
3. On confirmation of POWER LED illuminated, remove mains power and fit solenoid valve. Solenoid valve must have a rating of no more that 6 watts and a ¾" orifice. Close front panel. Re apply mains power.
4. Ensure leaf is dry and kept away from the misting lines, i.e. have it on the bench in front of you. Set the leaf sensitivity to WET.
5. Set the rocker switch to the TIMER position and adjust the WEAN MINUTES to 15 and the MIST SECONDS to 5
6. The LEAF SENSITIVITY (green) and the OUTPUT (red) LED's should be extinguished.
7. Push the tactile labelled PUSH and release. The OUTPUT LED should be illuminated and the solenoid valve should open and misting will run for 5 seconds at the end of which the valve closes and the OUTPUT LED will be extinguished.
8. Now wet the leaf and adjust the LEAF SENSITIVITY towards DRY until the LEAF SENSITIVITY LED is illuminated Misting action is now inhibited. Try pushing the MANUAL START tactile and observe that no misting occurs.
Read the installation manual for an explanation of the setting times for the WEAN MINUTES and the MIST SECONDS.
If the controller has performed all the above steps it is fully functional. Position the leaf amongst the cuttings and read the installation manual for an explanation of the positioning of the HDR1 and HDR2 headers, setting times for the WEAN MINUTES and the MIST SECONDS.

EXISTING INSTALLATIONS:
The most common problem is that of the valve remaining open and there are simple things that you can do to check whether the controller is faulty or whether there is a fault with the valve.

If the solenoid valve is continuously open, check that you do not have the rocker switch in the CONTINUOUS position, as this will do what it says on the label – mist continuously.
However if:
The rocker switch is in the TIMER position
The LEAF SENSITIVITY is illuminated
The OUTPUT LED is extinguished and the valve is still open and misting
Turn off the mains power to the controller. If the valve is still misting there will be foreign matter in the seat of the valve, which will necessitate stripping the valve down and removing the foreign object.
NOTE. The valve will only mist when the OUTPUT LED is illuminated.
However if:
The LEAF SENSITIVITY LED is illuminated
The OUTPUT LED extinguished
Rocker switch in the TIMER position and the solenoid valve cleared of foreign matter but still misting the controller will be faulty and requires repair.
OF OVER THE 1000 OR SO MIST WEAN CONTROLLERS MANUFACTURED, I HAVE NEVER EXPERIENCED THIS AS A FAULT.

If all aspects of the controller are functional by performing steps 3 through to 8 but no misting occurs when the leaf is dry, check:
Is the LEAF SENSITIVITY LED extinguished? If illuminated clean the leaf. Refer to the section headed LEAF CARE on P.3 and P.9 in the Installation manual on how to do this.
If cleaning does not resolve the problem, turn the controller off and disconnect the leaf.
Turn the controller on, the LEAF SENSITIVITY LED, should be extinguished, i.e. off.
If lit the controller needs to be returned for repair.

If the controller is unresponsive, i.e. dead, check steps 1. and 2. above. If the green POWER led is not lit and either one or both of the fuses have ‘blown’ and if there is a burning smell; it is most likely that the transformer has ‘burnt out’ due to a solenoid valve with a wattage greater than 6 watts or that there is a short in the cable to the solenoid valve.The controller must be returned for repair.
If the 1 amp fuse is blown and no signs of burning, the transformer is more than likely still intact but you must ensure that the solenoid valve is of the correct wattage and that there is no short in the solenoid cable before the new fuse is fitted.

Please refer to the section OPERATIONAL HINTS in the installation manual P.4

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WIRRAL. CH63 2HY

TEL/FAX: 0151 645 8491

www.ets-controls.co.uk

email john@ets-controls.co.uk

DECLARATION OF CONFORMITY

Name of manufacturer or supplier: E&TS Ltd
Full postal address including country of origin: 40 Acreville Rd, Bebington, Wirral CH63 2HY U.K.

Description of product: **Mist Wean Controller**
Conforms to the following product specifications:

Low Voltage Directive 2006/95/EC
Standard EN61558-1:2005

Safety EN 60950-1:2006+AC:2011+A11:2009+A1:2010+A12:2011+A2:2013
IEC 60950-1:2005+A1:2009+A1:2012+A2:2012

EMC and harmonised European and national standards

Standard	**2004/108/EC**
Emissions	EN6100-3-2/3/4
Immunity	EN61000-4-2/3/4/5/6/8/11/13/14
	EN61000-6-2

RoHS
This designated product is in conformity with the European Directive:
2011/65/EU
And does not contain substances which are listed as hazardous in EEE RoHS 2

Place of Issue: Bebington

Date: 15. 08. 2014

Name of authorised representative: John W Walker
Position of authorised representative: Managing Director
Declaration:
I declare that as the authorised representative, the above information in relation to the supply/manufacture of this product is in conformity with the stated standards and other related documents following the provisions of EEC Directives.

Signature of authorised representative:……..