De Sisti Ligthing S.p.a. Head Office & Factory
Via Cancelliera # 10a Cecchina, 00040 Albano Laziale
(Rome- Italy). Tel. **..39/(0)6/934991** Fax.
..39/(0)6/9343489
INTERNET E-mail address: **desisti@desisti.it**

DEB 575

Electronic Flicker Free Ballast
CE IP23

MOD. 2505

INSTRUCTION AND MAINTENANCE MANUAL

De Sisti Ligthing S.p.a. Head Office & Factory
Via Cancelliera # 10a Cecchina, 00040 Albano Laziale
(Rome- Italy). Tel. **..39/(0)6/934991** Fax.
..39/(0)6/9343489
INTERNET E-mail address: **desisti@desisti.it**

INDEX

De Sisti Ligthing S.p.a. Head Office & Factory
Via Cancelliera # 10a Cecchina, 00040 Albano Laziale
(Rome- Italy). Tel. **..39/(0)6/934991** Fax.
..39/(0)6/9343489
INTERNET E-mail address: **desisti@desisti.it**

SECTION 1

1.1 - GENERAL

The new DEB 200/400 and 575 electronic ballasts are designed to provide a compact, lightweight, flicker free power source for metal halide discharge lamps.
The new electronic circuit founded on the new MICROCHIP small microprocessors is very compact and with little components number. The input voltage is automatically switched between 110V and 220V. The inverter frequency is generated from a 4MHz quarz oscillator and is automatically switched between 100 or 120 Hz in accordance with the mains frequency. The output power is stabilized to compensate the lamp voltage variations due to the different maker or lamp aging.
Each ballast is contained within housing metal box comprising heat sink. The only one electronic board and power components are mounted on the heat sink, a top plate which contains all the cotrol and a lateral plate which contains the mains connector, mains fuse and mains power swich.
Each ballast is given a unique serial number which can be found on the identification plate riveted to the ballast.
The casing finish is a gray, anti scratch epoxy powder paint, with a gray plastic covered top plate.

1.2 - CONTROLS

The controls for the ballast are all mounted on the gray top plate and comprise the on / off button, the loc/rem selector and the dimmer potentiometer.

De Sisti Ligthing S.p.a. Head Office & Factory
Via Cancelliera # 10a Cecchina, 00040 Albano Laziale
(Rome- Italy). Tel. **..39/(0)6/934991** Fax.
..39/(0)6/9343489
INTERNET E-mail address: **desisti@desisti.it**

SECTION 2

OPERATION & ROUTINE MAINTENANCE

2.1 - OPERATION

2.1.1 Ensure that a correctly sized connector has been fitted in relation to both the ballast output rating and the size of the mains supply.

CONNECTORS: 110 Volts (*) 8.6 Amp
220 Volts 4.3Amp

2.1.2. Ensure that the LOCAL - REMOTE slide switch is set for the control mode required.

LOCAL =Control is from the ballast or the lamp fixtures using the appropriate on off buttons.
REMOTE = Lamp fixtures will operate immediately upon connection to the mains supply or operation of the MCB.

2.1.3. Ensure that the lamp fixtures is fitted with an operational lamp.
2.1.4. Connect the lamp fixtures to the ballast using the cable supplied with the lamp fixtures, ensuring that the groove of the military specification connector along the inner body aligns with the pin on the internal face of the outer housing of the outlet, (on the face of the ballast) and push home. Take a grip of the outer sleeve of the cable connector and rotate clockwise. The

twist lock will rotate through approximately 90o and then come positively to a stop.
2.1.5. Connect the ballast to the power supply and switch the power supply on.
2.1.6. Lift the mains circuit breaker from the off position into the ON position. CAUTION If remote has been selected the lamp fixtures will immediately operate, therefore ensure that the barn doors are open and that the lamp fixtures is not in proximity of any combustible material and not facing any persons.
2.1.7. The system is now ready for use and operation can be initiated from the on switch on the lamp fixtures or ballast.
2.1.8. The lamp fixtures will ignite irrespective of the dimmer setting and will reach its stable position after approximately 1 - 2 minutes from cold when it will automatically revert to the dimmer setting dialed up. Full clockwise rotation gives maximum rated output while full contraryclockwise rotation will dim the light output by nominally 30% of its maximum rated value.

2.2 ROUTINE MAINTENANCE

2.2.1 Clean the ballast casing, removing all dust and grime.
2.2.2. Check the condition of the mains input cable and connector for signs of visible damage .
2.2.3. Check the multipin output socket for signs of damage ordeformation.
2.2.4.Check for the free rotation of the dimmer control.
2.2.5. Ensure that the selector switch is set to local.
2.2.6 Connect the ballast to the mains supply and switch on the MCB.
2.2.7. Isolate the ballast from the mains supply.
2.2.8 Switch off using the MCB.Disconnect the ballast from the mains.

DEB575PIC TEST PROCEDURE

3.1 Automatic voltage selector and power supply test

With the board without mosfet and rectifier bridge and not fixed to the heat sink.
Supply by variac from point J2/1, J2/2. Increase slowly the voltage and about at 70Vac the relè K1 and K2 should close, continue to increase the voltage and at about 150Vac the relè must to open.
Supply with 120Vac and check the two supply voltage +15Vdc and +5Vdc.
Repeat to supply with 220Vac.
The supply voltage must to be between 90 – 135 Vac and 190 – 260 Vac the values out can be dangerous.

3.2 Inverter test

Supply the board with 120 or 220 Vac.
Check with oscilloscope if in the pin 5 OP1 there is a square wave 5Vpp and mains frequency.
In the pin 6 and 7 of U14 will find two square wave with opposite phase and frequency 100 Hz if the mains is 50 Hz and 120 Hz if the mains is 60 Hz.
Test if on the zener Z14 and Z15 chatode there is a 15 V square wave with some precedent frequency.

3.3 On/off circuit and UC3843 test

Supply the board with 120 or 220 Vac.
Connect to M1 a tested command panel.
Connect the point A and B of the lamp connector with a wire bridge to close the safety circuit.
Connect a 1 kohm resistor between pin 12 U4 and +15V, the pin 14 U4 must be high to simulate lamp on failure.
With loc/rem in loc position press on, the relè k6 must close, the relè k5 must close only for 1 second, the pin 7 U13 will go low for 1 second, then at the end of the cycle the relè k6 must be open because U13 will stop the supply for about 100 msec by OP3.
Repeat now without the 1kohm resistor. Pin 14 U4 will be low and we will have the lamp on condition.
Press on, k6 must be closed, k5 will be closed only for 100 msec., pin 7 U13 must be low, pin 6 will go high for about 5 sec.
Check if in the pin 6 U12 there is a 25kHz 15V gate signal command.

Supply the U3 IR2125 with separated and floating 15Vdc power supply in parallel to Z17 zener diode with a 100 ohm resistor in series. Check the signal directly on the Q1 and Q2 gates (25 kHz, 15V).

Press off, the relè k6 will open and pin 7 U3 will go high.

With loc/rem in rem position we will have only 1 svitch on cycle also in case of amp on failure.

3.4 Final test

4.1Mount all the components and fix the board on the heat sink, connect M1, J1 and the faston in the point J2 and J3. Supply the ballast by the mains connector. Connect in the output a load (1.6 ohm 1kw), insert the RMS power meter and the amp transformer with oscilloscope to see the output current.
4.2 Close the mains switch, press on, adjust the power by P2 with dimmer max at about 575 W when the load voltage is 95V.
4.3 Repeat the test with the lamp and verify if the power is correct.

De Sisti Ligthing S.p.a. Head Office & Factory
Via Cancelliera # 10a Cecchina, 00040 Albano Laziale (Rome- Italy). Tel. **..39/(0)6/934991** Fax. **..39/(0)6/9343489**
INTERNET E-mail address: **desisti@desisti.it**

SECTION 4

BALLAST FAULT ANALYSIS

SYMPTOM	POSSIBLE CAUSE	REMEDY
• Lamp fixtures fails to light up and make one flash for a short time.	• Lamp not fitted or blown. • Connector not mated correctly or with oxidation in the contacts. • Ballast fails to operate	• Fit operational lamp • Re-make connection. • Clean the oxidation from the contacts .
• The lamp fails to light up and a noise is audible inside the housing of the lamp fixtures.	• Igniter in the lamp fixtures failed. • High voltage cable damaged. • Lamp holder damaged.	• Replace igniter. • Replace high voltage cables. • Replace lamp holder.
• The lamp turns on but it never reach full power and the ballast emits an high pitch noise. • The lamp turns on but shuts off after it has warmed up.	• Ballast fails to operate.	• Inverter circuit failure
• The lamp fails to light up and there is no noise audible inside the housing of the lamp fixtures.	• Ballast fails to operate	• Refer to dismantling, operate and test procedures: there may be some power components in short circuit inside the ballast on the chopper stage.

De Sisti Ligthing S.p.a. Head Office & Factory
Via Cancelliera # 10a Cecchina, 00040 Albano Laziale (Rome- Italy). Tel. **..39/(0)6/934991** Fax. **..39/(0)6/9343489**
INTERNET E-mail address: **desisti@desisti.it**

SECTION 5

SPECIFICATION & PRINCIPALS OF DESIGN AND OPERATION.

5.1 TECHNICAL SPECIFICATION.

5.1.1 Electrical Performance.

Input voltage automatic selection	95 – 135V 185 – 265 V
Nominal effective input current	8.6 A (RMS) at 110 V 4.3 A (RMS) at 220V
Efficiency (Average)	93 %
Power factor (Average)	0,65
Dimmer range	30 %
On/Off control	Either local or remote

5.1.2 Dimensions and Weight

Dimensions	Width 200 mm. Height 230 mm. Depth 105 mm.
Weight	3.5 kg.
Working position	Ballast with control panel facing top.
Environemental conditions	0…45° C - IP23

5.2 - GENERAL

5.2.1 Electronic ballasts have been designed to power Metal Halide Discharge and equivalent type discharge lamps.
5.2.2 Such lamps after the ignition and warm up period, work similarly to a bi-directional Zener diode, i.e. they fix the voltage at a constant value irrespective of the current they receive. Therefore to operate stability they require a current generator, a BALLAST.
5.2.3 The lamps steady (optimum) working voltage is lower than at the cold strike ignition and warm up period and is achieved approximately 2 minutes after a cold strike.
5.2.4 - A special igniter circuit is used to provide HIGH VOLTAGE (in the range of 15KV to 70KV dependent upon the lamp size) pulses for a few seconds to generate the arc between the lamps electrodes.

5.3 – BALLAST STRUCTURE

5.3.1 The structure of the DEB electronic ballasts can be sub-divided into three major elements, being :

(a) AC - DC Converter and automatic voltage selector (Input circuit)

(b) Power control circuit (Chopper circuit)

(c) DC - AC Converter (Inverter circuit)

5.4 – SUMMARY INPUT CIRCUIT DESCRIPTION

5.4.1 The function of the "AC - DC" converter is to transform the A.C. mains voltage (110 (*) /220/240V - 50/60Hz) input, to a continuous voltage of nominally 310V at the output.
5.4.2 A mains filter to prevent ballast generated noise from entering the mains.
5.4.3 A bridge rectifier
5.4.4 And a leveling electrolytic capacitor.
This circuit also works as a "voltage doubles" when the input voltage is set to 110V (*) (activated by the automatic voltage selector circuit) to provide the nominal 310V.

5.5 – SUMMARY CHOPPER CIRCUIT DESCRIPTION

5.5.1 The chopper is the circuit regulating the power supplied to the lamp. It works at high frequency and uses as a switch, a power Mosfet.

5.6 – SUMMARY INVERTER CIRCUIT DESCRIPTION

5.6.1 The DC - AC converter is a square wave inverter working at 100 or 120 Hz. The frequency is generated from a 4 MHz quarz oscillator and the final frequency of 100 or 120 Hz is achieved with a microprocessor and automatically switched in accordance with the mains frequency. Like power switch are used last generation power IGBT.