

LUMINOUS FLUX REGULATOR FOR PUBLIC LIGHTING
PLANTS. CONSTANT CURRENT REGULATOR (CCR)



ELIGHT constant current regulators are expressly developed for the power supply of lamp series circuits dedicated to public lighting systems, conforming to the directives in force. Constant Current Regulators, ELIGHT CCR series, are outcome of a long experience static frequency converter both civil and military field (receiving the NATO code for the quality of his supplies).

All of our equipments distinguish themselves by the employment of advanced technological components, excellent reliability and easy maintenance.

The simplicity of working is the main feature of all of our products.

PRINCIPLES OF WORKING

The ELIGHT CCR Constant Current Regulator has the purpose to feed to series circuits a constant and sinusoidal current. The rectifier transforms the input alternate voltage in direct voltage, then the IGBT inverter transforms the dc voltage in alternate and sinusoidal current with a PWM modulation (Pulse Width Modulation).

With the ELIGHT CCR, keeping constant the current, the lamps don't feel the effect of reduction of the brightness for getting old, neither for drop line voltage nor for cold temperatures.

FEATURES

- Input power factor at full load > 0.95;
- Efficiency > 90%;
- Energy saving with reduction of luminous flux;
- Reduced cable cross section of plant system (9.6A or 20A): up to 100kVA;
- Absence of any stress on electrodes lamp during ignition;
- Certificated Insulation controller;
- 1% output current stabilization.

EQUIPMENT DESCRIPTION

The apparatus is composed by:

1. Input automatic circuit breaker with choke coil;
2. Rectifier;
3. PWM IGBT Inverter;
4. Transformer;
5. Control logic;
6. Parameter and control panel;
7. Continuity and insulation test;
8. Interface module (as option).

PROTECTIONS

- Cut off regulator within 1 second for series circuit interruption. (Series circuit open);
- Cut off regulator within 1 second for overcurrent higher than 10% of set up value;
- None stress on lamp electrode during the ignition with ramp starting;
- Programmable delay to restart from 0 to 10 minutes;
- Self test system.

TECHNICAL DATA

Input

- Voltage: **400V 3Ph**
- Window voltage: $\pm 15\%$
- Frequency: **50/60Hz**
- Window frequency: $\pm 10\%$
- Power factor at full load: 0.95
- Max input current distortion (THiD): 30%
- 12 pulses rectifier THiD<10%: optional

Output

- Rated power: see table
- Output constant single phase rated nominal current: **20A or 9,6A**
- Current waveform: **sinusoidal**
- Nominal voltage: see table
- Nominal current frequency: **50Hz**
- Dynamic stability (from shortcircuit to 100% load with nominal input rated voltage): $\pm 3\%$
- Static stability (for $\pm 10\%$ input voltage variations): $\pm 2\%$
- Recovery time for 1000V underseries shortcircuit: nearly zero
- Nominal rated system voltage: see table
- Insulation ground level:
 - # Voltage level for insulation: see table
 - # Held voltage toward ground for 60 sec. to 50Hz: see table
 - # Nominal rated voltage of output cables: see table
- Kind of lamps fed:
 - H.P. Sodium**
 - Low pressure Sodium
 - Mercury
 - Metal halide
 - Incandescent
 - Halogen incandescent
 - Fluorescent
 - LED**

Miscellaneous

- Minimum efficiency: 90%
- Max ambient temperature (max 8 hrs): 50°C
- Minimum ambient temperature: -10°C
- Altitude without downgrading: 1.000m slm
- Relative humidity (without condensing): 95%
- Noise at 1mt: 65dBA
- Protection degree: IP 20
- Color: RAL 7001
- Dimensions: see table
- Peso: see table
- Wheels
- Switch at two positions: local/remote
- Settable flux reduction: local/remote set
- Daily clock with functioning cycle:
 - Ignition with normal flux, working with normal flux, working with reduced flux, working with normal flux and shutdown
- Working hour counter



Insulation controller

- Working: on line
 - Measure of insulation resistance.
 - Two insulation thresholds (prealarm and alarm) with exchange contact.
- # Lamp series circuits with nominal voltage from 1000V to 6000V (group E circuits) must get an insulation resistance (Mohm) towards ground not less than:

$$\frac{2 \times (\text{nominal voltage towards ground in kV of the circuits})}{(\text{total length of lines in km}) + (\text{no. lamps})}$$

Commands

- Switch at three positions:
Disconnected - local - remote connected
- Settable flux selector
Normal flux / reduced flux selector

Signaling

- Set: local/remote
- Regulator: connected/disconnected
- Series circuit fault

Measure

- Voltage
- Current
- Insulation resistance (as option)

Remote control

- Connection/disconnection
- Normal flux/reduced flux.

MONITORING CONTROL SYSTEM (as option)

ELITLUCE monitoring control system allows to monitor the status and the working of street lighting series circuits.

Available functions:

- Display of voltage and current for each regulator: the voltage value allows to know the fault presence;
- Start up and shut down of the regulators;
- Setting the function of the start up, the shutdown and the working with reduced flux;
- Detection fault apparatus;
- Detection general alarms: steams, accesses, temperature;
- Power history: start up, shutdown, mains fault, flux reduced periods, max temperature.

The network offers a simply way to connect the existing infrastructures (meter sensor, control device for plant or other) allowing to business government and companies to delegate management and maintenance.

The net is Server-multi-Client and is based on TCP/IP protocol, in order to obtain maximum flexibility and every kind of expansion.....

The entire System has been developed with Java language, in order to permit higher

compatibility with every kind of apparatus and any existing operative system.

Either Server or Client can be hosted on PC or MAC, with Windows or Linux operative systems and with no use restriction.

Connectivity

ELITLUCE manages communication from and to remote devices, distributed in two ways:

- Physical connections;
- Wireless connections.

These two kinds of connections can be combined at any way, to use in the better way the available infrastructures for the application (telephone cable, ADSL/HDSL connections, optic fiber cable, GSM/GPRS modem, UMTS modem, HSPDA modem).

The System can use two dedicated lines by cable, optic fiber or it can use a point of access through LAN network or internet in remote plant allowing the management with automatic calling or through request of the control device.

The Workstation logs on Central System through LAN or Internet network allowing the complete compatibility of the System.

ELITLUCE has a Client platform, designed for mobile phones, with Java ELITMobile platform. It allows to access directly with the phone to all data of the Server and to perform all maintenance actions in remote.

The Central System controls every access with login procedure, classifying them in different levels according the operative level that you desire to give at each user.

STANDARDS

- EN 60662
- CEI 64-7
- EN 60071-1/2 (CEI 28-5)
- EN 50081-2
- EN 50082-2

CONSTANT CURRENT REGULATORS FOR STREET LIGHTING SERIES CIRCUITS SERIE ELIGHT									
Rated power (kVA)	30		40		50		60		110
Current (A)	9.6	20	9.6	20	9.6	20	9.6	20	20
Nominal Voltage (kV)	3	1,5	4	2	5	2,5	6	3	6
Voltage level for insulation (kV)	3.6	3.6	7.2	3.6	7.2	3.6	7.2	3.6	7.2
Held voltage Toward ground (kV)	10	10	20	10	20	10	20	10	20
Nominal voltage Output cables (kV)	2.3/3	2.3/3	6/10	2.3/3	6/10	2.3/3	6/10	2.3/3	6/10
Dimensions (mm)	800x800x1800								800 x 1000 x 1800
Weight (kgs)	400		450		500		600		900