DIAM 3100

Compact Single-phase Constant Current Regulator

Constant Current Regulators

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Compliance Standards

Constant Current Regulators

ICAO Aerodrome design manual, part 5
FAA (AC150/5345-10G - L828 & L829)
IEC (61822)

Applications

DIAM3100 series CCRs are compact and stackable fully static devices controlled by two thyristors. They are designed to maintain a constant, pre-displayed and adjustable output current independently of load or power supply fluctuations. These devices are specifically designed for airfield lighting on runways, taxiways or aprons. They meet FAA and IEC standards.

Electronics, using the latest digital technology, can be controlled and monitored by mean of serial networks with or without redundancy, as well as the most simple universal multiwire interface.

Advantages

- **Flexibility of operation** :

The large semigraphic alphanumeric display combined with a menu type keyboard allows the CCR to be configured without connecting a computer. Regulation is fully digital, which enables parameters to be simply adapted in case of particular load or special application. Auto-calibration eliminates the use of tedious setting, in case of long-time scheduled maintenance.

Alarm and warning messages are clearly displayed, as well as the current state of the CCR or all input or output electrical measurements.

Up to three units can be piled-up, in order to save space on the floor.

- **Maintenance optimisation** :

DIAM3100 series CCRs are designed to be used with the lowest cost of maintenance. In order to achieve this goal, regulators show a very simplified architecture both for electronics, LV part and HV power unit: It has been optimised to keep the number and variety of spare parts to a minimum, in order to facilitate maintenance. Software tools and auto-calibration allow a fast fault diagnosis and test, without dismantling.

- **Purchase and life-cycle costs** :
DIAM3100 series constant current regulators represents the best compromise on the market between high performances, maintenance services and the most reduced cost, thanks to an optimised design and a latest state-of-the-art digital electronic technology.

DIAM 3100 : Technical Characteristics

GENERAL PRESENTATION

Each DIAM3100 is delivered into a metal frame with lifting rings. It includes 3 distinct parts: an "electronic" compartment, a "Low voltage" compartment and a "high voltage" compartment.

- The **Electronic part** includes an electronic board whose design uses latest digital technology; it is mounted on the front panel of the device. This front door supports the user interface delivering any useful information, and allowing all local or remote operations. Internal parts are accessible from the front or the top.

- The **Low voltage compartment** includes all components involved in supplying and controlling the device, as interface boards, fuses, terminals, thyristors. It is located in front, and can be accessed opening the front panel.

- The **High voltage compartment** is located at the rear of the device, and includes power components connected to the lighting loop, such as the power transformer, lightning arrestors, load tapping and load terminals. It can be accessed opening the rear panel of the CCR.

MECHANICAL FEATURES

- Protection index: IP 20.

- Dimensions (1unit without legs or rollers) : H 550 mm, W 500 mm, D 700 mm

- 2 or 3 CCRs can be piled up together.

- Use: -40°/+55°C (FAA), -20/55°C (IEC) - humidity max. : 95%.

- Natural air cooling.

- Accessibility: Distance min. between back and wall > 20 cm. (For opening panels).
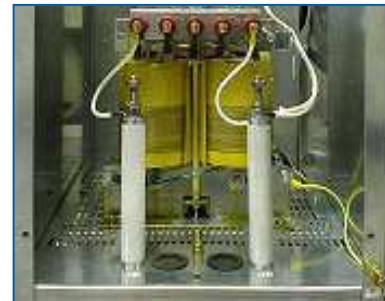
DIAM 3100 : Technical Characteristics

ELECTRICAL FEATURES

- Supply: single-phase 220V, 230V, 240V -5/+10% (FAA) +/-10% (IEC)

- Frequency: 50/60 Hz

- Rated output current: 6.6 A

- Output power : 2.5kVA, 4kVA, 5kVA, 6.5kVA

- Power factor: > 90% at nominal voltage and rated resistive load

- Efficiency: > 90% at rated parameters

- Output current accuracy : better than ±1% under the following conditions :
  Power supply voltage: –5/+10% (FAA) or +/-10% (IEC) Frequency: ± 5%,
  and Load: from 0 to 100%.

- Remote control : Voltage, from 20V to 60V DC, or dry contacts, or serial network

- Back indication: Compliant with L828 or L829

- Black current (1.8A): offered in standard.

PROTECTIONS

- Lightning arrestors on outputs (option)

- Input power and auxiliary fuses

- Overcurrent (3 programmable levels with restart)

- Open circuit, (1 programmable level)

- Under/Over voltage.

TERMINALS

Supply and remote control connections can be accessed from the front door.

Earth connection is made outside or inside the cabinet, at the back right side.

Load connections are made at the back, directly on lightning arresters.

DIAM 3100 : Display and Menus

USER INTERFACE

Made up of a flat polyester keypad on the front plate, it includes a wide display of 16 x 140 pixels with screen saver, showing preferably on the upper line the installation state, warnings and parameters, and on the lower line the 4 keys definition, depending of the present menu
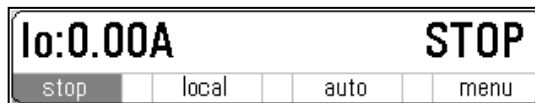
DISPLAY FUNCTIONALITY

The display shows 2 lines of text allowing to monitor many parameters, values and warnings. The lower line sets the definition of the keypad. The preferred information displayed can be changed in "STOP" mode, and can be chosen (long press on STOP) among the following possibilities :
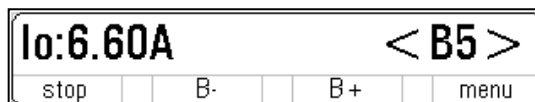
- "Output current Io" – "brightness state Bx"
- "Output current Io" – "Output power Po"
- "Output current Io" – "Output voltage Uo"
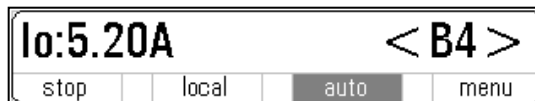
DISPLAY EXAMPLES AND KEYS DEFINITION:

- "Stop" mode:

Io:0.00A			STOP
stop	local	auto	menu

- "Local" mode : (B5 level). Press B+ or B- to increase decrease the brightness :

Io:6.60A			<B5>
stop	B-	B+	menu

- "Remote control" mode (B4 level):

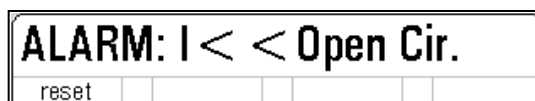| Io:5.20A			<B4>
stop	local	auto	menu

ALARMS AND WARNINGS

All *alarms* (the CCR failed to supply the loop) and *warnings* (only indicative, without incidence on the loop) are clearly displayed.
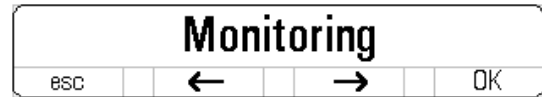
- Example :"Open circuit" alarm : In order to restart, first the fault shall be fixed and then the alarm cancelled, by pressing "reset" key.

ALARM: I< <Open Cir.
reset

DIAM 3100 : Display and Menus

MONITORING

Parameters can be seen scrolling through the top-level menu items using the ← and → keys:

CONFIGURATION MENU

The "*Configuration*" menu allows to set all basic parameters of the CCR to the processor (in case of mother board replacement, for example) :

- Rated input voltage
- Rated power
- Frequency
- Brightness number, from 1 to 8.

OPTION MENU

The "*Option"* menu allows the following definitions:

- Parameter access: *No*

A change from *No* to *Yes* allows to change all parameters of the DIAM3100, in order to avoid wrong operations.

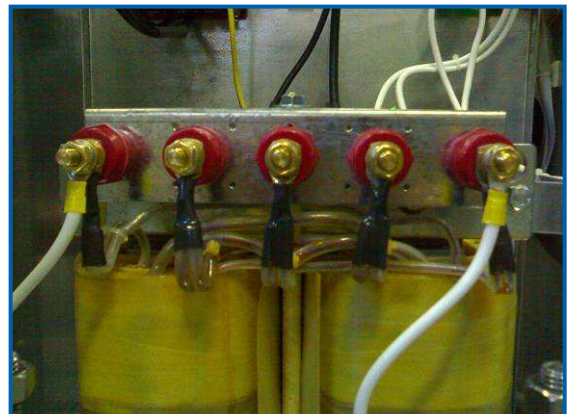- Scrolling items, all optional features of the CCR can be shown.

SETTING MENU

The "*Setting"* menu is used to assign all values of current and/or delays to brightness levels, current range (min. & max.), over current, open circuit fault detection, etc.

All these parameters are set in factory.

LOAD ADAPTATION

The output transformer is equipped with terminals allowing adjustment taps in order to adapt the rated output voltage of the CCR to the load. Moving a simple cable allows to make steps of 25%.

Constant Current Regulator - DIAM 3100

ORDERING INFORMATION

The DIAM3100 regulator is identified by a serialized ordering code which indicates its type and particularity. If needed, add all useful precision and options

Example : D31-IEC-1-5-60-06-240-04-060 = DIAM3100 compliant to IEC 61822, 6.6A, 5 brightness, 60Hz, 6.5KW, 240Vac, ETHERNET remote control, time meters and LFD.

D31 - IEC - 1 - 5 - 60 - 06 - 240 - 04 - 060

Series	D31 : DIAM 3100
Type	IEC : 61822 type
Class	1 : Class 1 (ouput current 6.6A)
Style	3 : Style 1: 4.8A; 5.5A; 6.6A 5 : Style 2 : 2.8A; 3.4A; 4.1A; 5.2A; 6.6A X : Number of brightness, up to 8 (not counting B0 = « black » current) : values of currents must be specified separately
Frequency	50 : 50 Hz 60 : 60 Hz
Output Power	01 : 1 kVA 02 : 2.5 kVA 04 : 4 kVA 05 : 5 kVA 06 : 6.5 kVA
Supply	XXX : Input voltage : 220, 230, 240, 380, 400, 415 Vac

Control

0X : No multiwire interface D2X : Cylindrical sockets (SOURIAU) (Only one letter must be selected)	XX0 : No communication network XX1 : 1 x JBus RS 485 port XX2 : 2 x JBus RS485 ports XX4 : 1 x ethernet port XX5 : 1 x JBus and 1 x ethernet port XX6 : 2 x ethernet ports (Only one letter must be selected)

Regular Options

0XX : No extra protection options 1XX : Lighting arrestors (outputs) 2XX : Lighting arrestors (inputs) 3XX : Circuit breaker (Final number : add all needed weights)	X0X : No extra monitoring options X1X : Earth fault detector (EFD) X2X : Lamp failure detector (LFD) X4X : Time meters (each brightness) (Final number : add needed weights)	XX0 : No extra options XX1 : Cut-out/earthing jumpers XX2 : Casters (unidirectional) XX4 : LV & HV connectors (Final number : add needed weights)