DIAM 4100

Single-phase Constant Current Regulator

Constant Current Regulators

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Compliance Standards

Constant Current Regulators

ICAO Aerodrome design manual, part 5
IEC (61822)
FAA (AC150/5345-10G – L829 - L828)
AENA (PPT002 ed4-2004)

Applications

DIAM4100 series CCRs are optimized static devices, controlled by two thyristors, 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 all international standards. DIAM4100 type CCR differs from the DIAM4000, (from which it takes all the electro technical and electric power part), by its electronics of innovating architecture built around an electronic board using a powerful DSP* processor, associated with an internal CAN* bus which links the different parts of the equipment.

A front USB* connector allows connection to a setting computer, this parameterization being possible *without live voltage.* Its control interface supports all series networks, with or without redundancy, as well as a universal multiwire interface.

Advantages

- **Use optimization :**

  The powerful numerical processing capability of its microprocessor DSP* allows the best adaptation to all kind of loads (such as signs, for example) or special application. Emergency, warning messages as the current state of the CCR are displayed, on a simple and friendly HMI*.

- **Maintenance optimization :**

  Its internal CAN* architecture has been designed to minimize the number and the variety of spare parts, and to allow the best flexibility of possible modification of options. Software tools are proposed in order to carry out fast parameter settings and/or diagnosis, without removing any parts. An automatic calibration avoids analogical adjustments, during maintenance operations.

- **Purchase and life-cycle costs optimization :**

  DIAM4100 series constant current regulators represents the best trade-off 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 with DSP* and CAN* network, associated to fully experienced AUGIER's solutions for power electrotechnic and electrical parts and components.

DIAM 4100 : Technical Characteristics

GENERAL PRESENTATION

Each DIAM4100 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 the lastest digital technologies; it is fixed at the front panel of the device. This front sheet supports the user interface delivering any useful information, and allowing all local or distant 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 at the rear in the upper part, and can be acceded removing the roof top or the back panel.

- The **High voltage compartment** is located at the lower part of the device, and includes components connected to the lighting loop, as the power transformer, lightning arrestors, load tapping and load terminals. It can be acceded opening the front panel of the CCR. A door contact switches the CCR off when opening the compartment, in order to avoid contact hazard with high voltage electrical parts.

MECHANICAL FEATURES

- Protection : IP 21. (other available on request).
- Dimensions (all powers and voltages) :

  H 1380 mm, W 500 mm, D 700 mm.

  with integrated circuit selector : H 1580mm, W 500mm, D 700mm.
- Axle track and wheelbase (if casters option): 355 x 610 mm.
- Use : temperature : -20°C (FAA style : -40°C to +55°C) to +55°C, humidity max. : 95%.
- Natural air cooling .
- Accessibility: In order to open front and back panels.
  Distance min. between back and wall > 20 cm.

DIAM 4100 : Technical Characteristics

PROTECTIONS

- Lightning arrestors on outputs or input (option)
- Input circuit breaker instead of fuse (option)
- Overcurrent, Open circuit,
- Under/Over input voltage.

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.

An USB front socket allows the connection of a laptop computer, for a parameter setting possible without live voltage.

ELECTRICAL FEATURES

- Supply: Single-phase 208 to 480 Vac ±10% (IEC type) or −5/+10% (FAA type).
- Frequency : 50/60Hz ±7.5%
- Output rated current : 6,6 A (20 A on request)
- Output rated power : from 1 kVA up to 30 kVA
- Power factor : FAA type : > 90% (2.5 to 10kW CCRs) or > 95% (15 to 30kW CCRs).

  IEC type : > 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: ± 10% (IEC) or −5/+10% (FAA) – Frequency: ± 7.5%, Load from 0 to 100%
- Remote control : Tension from 20V to 60V DC, or dry contacts, or serial single or double network.
- Back indication: Static dry contacts (IEC type), or relay contacts (FAA), or serial network
- Black current : preferred value 1.5 or 1.8 A

DIAM 4100 : Display and Menus

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 :
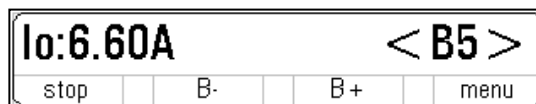- "Output current Io" – "brightness state Bx"
- "Output current Io" – "Output power Po"
- "Output current Io" – "Output voltage Uo"

DISPLAY EXAMPLES AND KEYS DEFINITION :

- "Stop" mode:

```
Io:0.00A                STOP
 stop  |  local  |  auto  |  menu
```
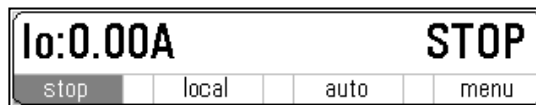
- "Local" mode : (B5 level). Press B+ or B- to increase / decrease the brightness :

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

- "Remote control" mode (B4 level):

```
Io:5.20A              < B4 >
 stop  |  local  |  auto  |  menu
```
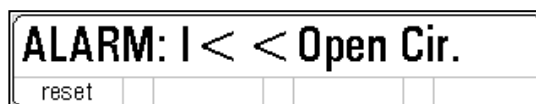
ALARMS AND WARNINGS

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, the fault shall be fixed first and then the alarm acknowledged, by pressing the "reset" key.

```
ALARM: I < < Open Cir.
 reset  |      |      |
```

- Example : Earth Fault warning; in order to see what is the exact resistance value of the leakage (from 0 to 10 Mohms), go in the "monitoring" menu.

```
Warning: :EFD Level1
 stop  |  local  |  auto  |  menu
```

MONITORING

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

```
        Monitoring
 esc  |   ←   |   →   |   OK
```

DIAM 4100 : Display and Menus

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, from 208 to 480 Vac
- Rated power, in kVA, from 1 to 30 kVA
- Brightness steps, from 1 to 8.
- Type : FAA or IEC

OPTION MENU

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

- Parameter access: *No*

  A change from *No* to *Yes* allows the modification of all parameters of the DIAM4100, 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 preferably set according to the current standard, but can be individually changed.

LOAD ADAPTATION

The output transformer is equipped with an epoxy plate including adjustment taps in order to adapt the rated output power of the CCR to the load. Moving 2 brass straps allows steps of 12.5%. Parameters of that position are then automatically memorized by the CCR, without other operation.
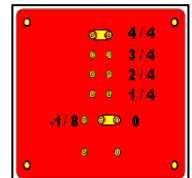
CUT-OUT AND EARTHING PLATE

In option, the CCR can be equipped with an earthing cut-out plate using 2 jumpers which allows to make all maintenance and measurement operations on the loop, without unscrewing any load or earth connections.

- "Normal" position: When the two 3 pins jumpers are in that position, the CCR supplies normally the load.

- "Safety" position: When the two jumpers are in that position, load and CCR are disconnected, short-circuited and grounded.
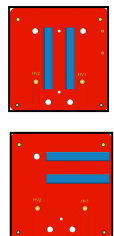
Note: other cut-out options are available (for more information, contact us).

Constant Current Regulator - DIAM 4100

ORDERING INFORMATION

The DIAM4100 regulator is identified by a serial ordering code which indicates its type and particularity. If needed, add all useful precision and options.

<u>Example</u> : D41-IEC-1-5-50-15-400-B21-530 = DIAM4100 compliant to IEC, 6.6A, 5 brightness, 50Hz, 15kVA, 400Vac, with a multiwire interface (dry contacts) „Jbus serial network, lightning arrestors on output terminals, Circuit breaker, EFD and LFD.

D	4	1	-	I	E	C	-	1	-	5	-	5	0	-	1	5	-	4	0	0	-	B	2	1	-	5	3	0

Series	D41 : DIAM 4100
Type	IEC : IEC type 828 : L-828 FAA Type (options as described in L828 advisory are included) 829 : L-829 FAA Type (options as described in L829 advisory are included) AXX : AENA compliance (A29 = AENA PPT2-1995; A04 = AENA PPT2 / 04 / 04 / 2004
Class	1 : Class 1 (ouput current 6.6A) 2 : Class 2 (output current 20A)
Style	3 : Style 1 (Class 1: 4.8A; 5.5A; 6.6A) 5 : Style 2 : (Class 1: 2.8A; 3.4A; 4.1A; 5.2A; 6.6A, or Class 2: 8.5A; 10.3A; 12.4A; 15.8A; 20A) A : 5 brightness, AENA values 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	05 : 5 kVA	15 : 15 kVA	30 : 30 kVA
02 : 2.5 kVA	07 : 7.5 kVA	20 : 20 kVA	
04 : 4 kVA	10 : 10 kVA	25 : 25 kVA	

Supply XXX : Input voltage : 208, 220, 230, 240, 277, 380, 400, 415 or 480 Vca –5% + 10% (FAA) or +-10% (IEC)

Control

0XX : No multiwire interface	00X : No multiwire interface	XX0 : No communication network
AXX : Internal source Remote Control	A1X or B1X : Negative common monitoring (IEC interface board)	XX1 : 1 x JBus RS485 port
BXX : External 20 to 60 Vdc Rem Control	A2X or B2X : free common monitoring (FAA interface board, dry contacts)	XX2 : 2 x JBus RS485 ports
CXX : AENA Terminal Block	C2X	XX3 : 1 x lonwork port
DXX : Cylindrical sockets (SOURIAU)	D2X	XX4 : 1 x Ethernet port
GXX : Internal 120 Vac remote control	G2X	XX5 : 1 x JBus and 1 x Ethernet port
HXX : External 120 Vac remote control	H2X	XX6 : 2 x ethernet ports
(Only one letter must be selected)	(Only one letter and number must be selected)	(Only one letter must be selected)

Regular Options

0XX : No extra protection options	X0X : No extra monitoring options	XX0 : No extra options
1XX : Lighting arrestors (outputs)	X1X : Earth fault detector (EFD)	XX1 : Cut-out / earthing jumpers
2XX : Lighting arrestors (inputs)	X2X : Lamp failure detector (LFD)	XX2 : Casters (unidirectional)
4XX : Circuit breaker	X4X : Time meters (each brightness)	XX4 : ECB included
(Final number : add all needed weights)	(Final number : add needed weights)	(Final number : add needed weights)

If FAA type CCR, options as described in according advisory included)

Other Options : Complementary codes to add : BI (2 omni-directional caster with lock), CSx (circuit selesctor x-ways)
Or specify : (FAA cut-out, IP other than IP 21).