

Other features

- **Output power:** 4kVA, 7.5kVA, 10kVA, 15kVA and 20kVA.
- **Single-phase power supply voltage:** 208VAC, 220VAC, 230VAC, 240VAC, 277VAC +10% - 5%. The regulators are designed to work with the input voltage down up to -10%, but providing derated performances.
- **Frequency:** 50 or 60 Hz \pm 7,5%.
- **Maximum output current to the series circuit:** 6.6A, adjustable through step from 1.8A. The output current values are accurately regulated within the FAA limits, considering the following operating conditions which can be happened contemporary too:
 - * any load from short circuit to full rated load
 - * any input voltage within -5% + 10 % of the rated input voltage, at the rated frequency;
 - * any of the hereabove described environmental conditions
 - * maximum 30% of the secondary windings of the isolating transformers open-circuited, considering a load not less than 50% of the rated one.
- **Efficiency:** not less than 0.90, at rated input voltage with unity power factor load.
- **Power factor:** not less than 0.99, with input voltage between -5% and +10% of the nominal value, at rated current (6.6A), with load between 30% and 100% of the nominal unity power factor one.
- **Total Harmonic Distortion:** THD input and output current: <5%, with resistive load between 10% and 100% of the nominal (with THD input voltage <3% and PWM controlled power transistors module operating).
- **Remote control voltage:** 24, 48 or 60 VDC, internal or external; 120 VAC external.
- **Protection degree:** IP 21.

EQUIPMENT DESCRIPTION

The unit is assembled into a metal box consisting of a structural frame, a set of side and top panels screwed to the frame, and two front crates, one mounting all the CCR control/monitoring withdrawable PCBs and the other the electromechanical equipment. The side

and top panels can be removed, by unscrewing the relevant fixing screws, for complete inspection of the inside components. The quick inspection of the LV equipment and control section can be easily carried out by removing the relevant crate.

The CCR is equipped with a main circuit breaker, rated according to the its power, to protect the power supply line and to surely cut out the power supply to the regulator .

The PCBs support keyboards, displays and signalling leds.

The finishing is made by phospatating and baked electrostatic epoxy powder coating, colour RAL 7032.

The assembly is equipped with four lifting eyebolts. The lower side of the unit is suitably shaped, to allow the handling by means of a fork truck too.

The cable entrance is provided through the bottom of the unit.

One grounding bolt, complete with washers and nuts, is outside provided in the right rear side of the unit (close to the bottom). Inside the unit (always in the rear side, close to the bottom) a grounding bar allows the grounding of all the unit metallic parts through screws, washers and nuts.

The identification label, including electrical and manufacturing data and standard conformity, are mounted on the front side of the regulator.

Warning labels are placed outside and inside the unit.

Dimensions (CCRs up to 15 kVA): 500 mm wide, 770 mm deep, 1570 mm high. **(CCRs rated 20 kVA):** 620 mm wide, 920 mm deep, 1670 mm high.

THEORY OF OPERATION

(1) Input circuit: consists of an input filter for EMC compatibility, a two-pole circuit breaker and a single-pole load contactor.

(2) Power supply filter: consists of a two-phase inductance and capacitor(s) and filters the harmonics generated by the power module.

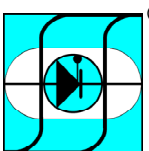
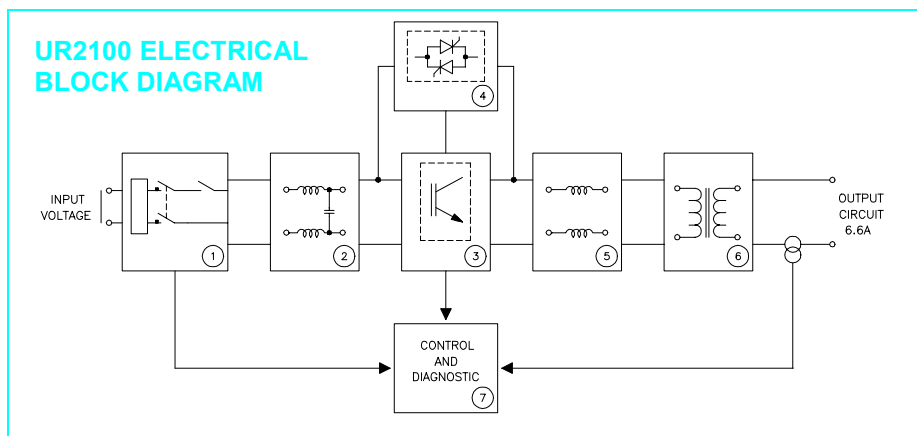
(3) Normally operating PWM (Pulse Wave Modulation) power module: consists of a suitable circuitry topology, including power diodes and IGBT with measuring sensors, provided with PWM control. The width of the pulse is modulated to follow the theoretical 50 Hz sinewave, as fixed by the control system (set point). The frequency of the carrier pulse is 7.5 kHz and the modulating sinewave has a line frequency. This block is not present on UR2200 regulators.

(4) Stand-by power module: consists of two power thyristors, mounted in antiparallel, which are triggered according to the reference control signal (set point). This module is automatically inserted in case of main power module failure or in case of failure of the fans, provided for its forced ventilation. This block is not present on UR2000 regulators.

(5) Output filter: consists of an inductance, which filters the 7.5 kHz frequency of the carrier and practically allows the passage of the fundamental harmonic only.

(6) Power transformer: increases the output voltage and isolates the constant current regulator from the series circuit.

(7) Control and diagnostic circuit: this circuit, based on DSP technology, constantly monitors the input voltage and current, the output current of the power module, the load voltage and current, to grant the correct operation of the unit. The internal loop assures the maximum bandwidth to provide a very fast response to any instantaneous changes at the CCR output (from full load to short circuit conditions).



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