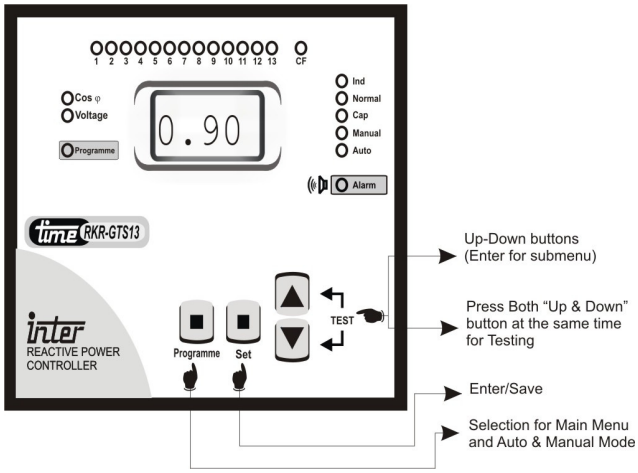
RKR-GTSXX
Reactive Power Controllers

1. INTRODUCTION

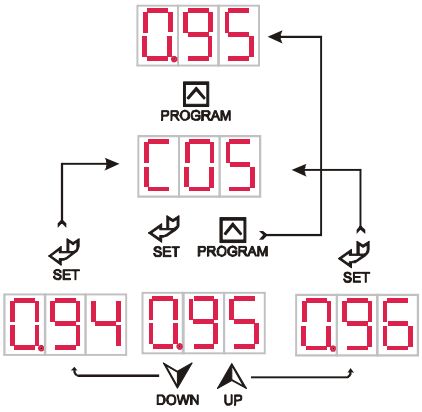
Reactive Power Compansation is as of "Reactive Power being required for the inductive loads in the A.C systems is supplied by different techniques/methods." The most common method is well-arranged capacitor groups accompanied by one Reactive Power Controller which measures cos φ value; switches on and off capacitor groups according to required capacitor power, in a central compansation system. RKR-GTS are microprocessor-based Power Factor Controllers (regulators) with LED screen for Hi-technological control of capacitor banks at 5-7-13 control contacts.

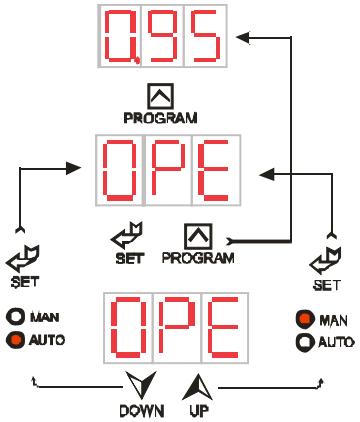


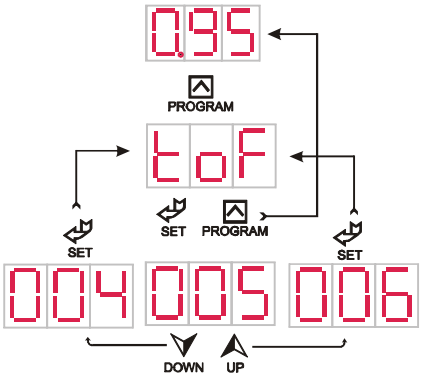
2. MAIN FUNCTIONS

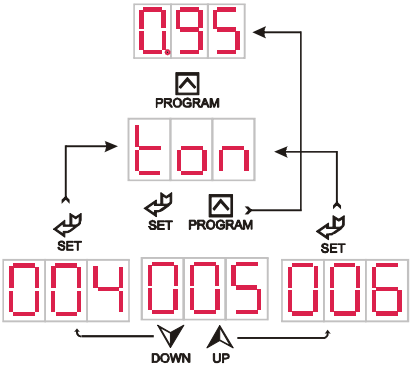
- 7 Segment LED Display.
- Automatic & Manual operations.
- Capacitor power measuring.
- Auto c/k adjustment.
- Auto polarisation (current flow direction).
- Over voltage protection via alarm output.
- Adjustable capacitor switching on/off time.
- Display of voltage & cos φ values.
- Faults indications via LEDs in case of alarm occurance.
- Fixed capacitor group output options from 1 step to 5; 7; 13 steps with nonrequired sequencing and adjustment features.
- Direct capacitor switching on/off upon system requirement aimed for serial compensation.

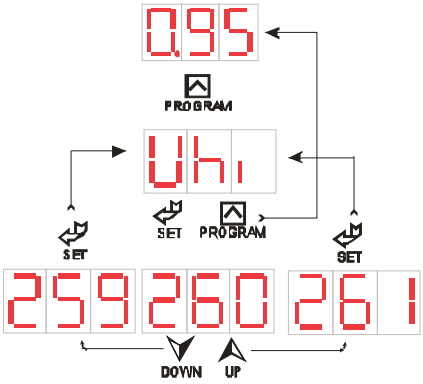
3. DISPLAY SCREEN VIEW











4. PROGRAMMING

There are 5 menus available for programming of the device via the use of 4 buttons.
Cos : Target cosφ; adjustable range from 0.80-1.00.
Ton : Capacitor on delay switching: adjustable from 1-120 sec.
Toff : Capacitor off delay switching: adjustable from 1-120 sec.
Uhl : Over voltage protection limit; 240-300VAC adjustable.
Ope : Operation mode; auto/manual.

Cos
Press program button on main menu. **Cos** is selected via the use of "Up-Down" buttons and then "SET" button is pressed to display the last set value. Program LED will start blinking. The required set value is entered via the use of "Up-Down" buttons. Press "SET" to save. Use program button to exit.

Ton
Press program button on main menu. **Ton** is selected via the use "Up-Down" buttons and then "SET" button is pressed to display the last set value. Program LED will start blinking. The required set value is entered via the use of "Up-Down" buttons. Press "SET" to save. Use program button to exit.

Toff
Press program button on main menu. **Toff** is selected via the use of "Up-Down" buttons and then "SET" button is pressed to display the last set value. Program LED will start blinking. The required set value is entered via the use of "Up-Down" buttons. Press "SET" to save. Use program button to exit.

Uhl
Press program button on main menu. **Uhl** is selected via the use of "Up-Down" buttons and then "SET" button is pressed to display the last set value. Program LED will start blinking. The required set value is entered via the use of "Up-Down" buttons. Press "SET" to save. Use program button to exit.

Ope
Press program button on main menu. **Ope** (auto/manual) is selected via the use of "Up-Down" buttons and then "SET" button is pressed to select. Program LED will start blinking. The required operation mode is selected via the use of "Up-Down" buttons. Press "SET" to save. Use program button to exit.

5. CAPACITOR POWERS

Test mode must be applied to the device after the required parameters selected correctly. At the end of the test process the device will show detected capacitors by blinking LEDs of capacitors.

6. OPERATION

6.1.TEST
The defines or corrects the "Current Flow Direction" during the test mode. Followingly, all capacitor steps are swiched on and off one by one for computing capacitor power.

6.2.CONTACT TEST
It is assigned to test output contacts of the device when "No Current" status only is observed. Press "SET" button for 5 (five) sec. to shift into "Contact Test Mode" for testing while "No Current" text is displayed on the screen. Once this mode's activated, device will switch on and off all the contact one by one starting from first step to last. An auto-stop is to be performed after testing of the last step completed. Device shall not perform a measuring or changing of the formerly recorded datas while "Contact Test Mode" status is activated.

6.3.CAPACITOR SWITCHING (ON/OFF)
Device is functionally allocated with very complex capacitor measurement and power determination algorithm. Capacitor switching on on and off is performed in accordance with the previously determined total reactive power and the measured capacitors power at the end of "ton toff" periods. Device effectively detects where and which of the capacitor is connected because of the required compansation is reached very fastly. Capacitor connection is not depend on any particular switching order. Switching on and off times are determined by ton and toff times respectively. User should need to perform a new test whenever any change in capacitors groups or in their order is in subject.

a) **Stepping LED is off permanent;** no capacitor connected to this stage and shall not be switched on.
b) **Stepping LED blinks;** capacitor group connected to the stage, but not yet activated. Upon requirement, it may be switched on.
c) **Stepping LED is on permanent;** capacitor is connected and active.

7. ALARMS

7.1.Over Voltage Alarm

If the voltage of line exceeds the value determined by Uov for 4 seconds, device will switch off all the capacitors in a way to protect against possible damages. While the device is in alarm the voltage will blink on the screen and then the alarm output will be switched on. Alarm LED also will be on. If the voltage drops 10V below of Uov for 4 seconds device will go out of alarm status and will continue the operation normally.

7.2.Under Conpersation Alarm

If the device switches on all capacitors while cos φ value is still under the adjusted target cos φ value for 3 minutes, the alarm signal will be produced. Alarm relay and LED will be switched on and followingly, the flashing "IND" text will be displayed. Returning back to the normal operation will switch the alarm off. Note that the alarm is activated only in automatic mode.

7.3.Over Compensation Alarm

If device switches off all capacitors while cos φ value is still higher than of the settarget cos φ value for 3 minutes the alarm signal will be produced. Alarm relay and LED will be switched on and followingly, the flashing "CAP" text will be displayed. Returning back to the normal operation will switch the alarm off. Note that the alarm is activated only in automatic mode.

8. TECHNICAL SPECIFICATIONS

Operating Voltage (Un)	220VAC ±20%
Operating Range	(0.8-1.2)xUn
Operating Frequency	50/60 Hz
Current Transformer Ratio	……/5A
Line Current Range	0.02A-5.5A
Current Transformer Direction (Polarization)	Automatic
C/k Adjustment	Automatic
Stage Number	UP TO 5; 7; 13 + Fıxed Group, Automatic
Output Contact	250V/3A AC
Alarm Output	250V/5A AC
Cooling Fan Output	250V/5A AC
Display	3x7 Segmend Led Display
Operating Temperature	-25°C… + 65°C
Plastic Material	Nonflammable Synthetic Plastic as per UL-94, Class VO
Dimensions	144mmx144mm (DIN 43 700)
Mounting Depth	90mm Max.
Protection Class	Terminals IP 20, Housing IP 54
Weight	**RKR-5GTS:** 1000 gr., **RKR-7GTS:** 1015 gr., **RKR-13GTS:** 1080 gr.

9. SAFETY & WARNING INSTRUCTIONS

- Turn off power during connection/wiring.
- Check correct mains voltage/wiring terminal.
- Installation shall only be performed by qualified personnel.
- Do not use any solvent or alike for cleaning.

10. CONNECTION DIAGRAM

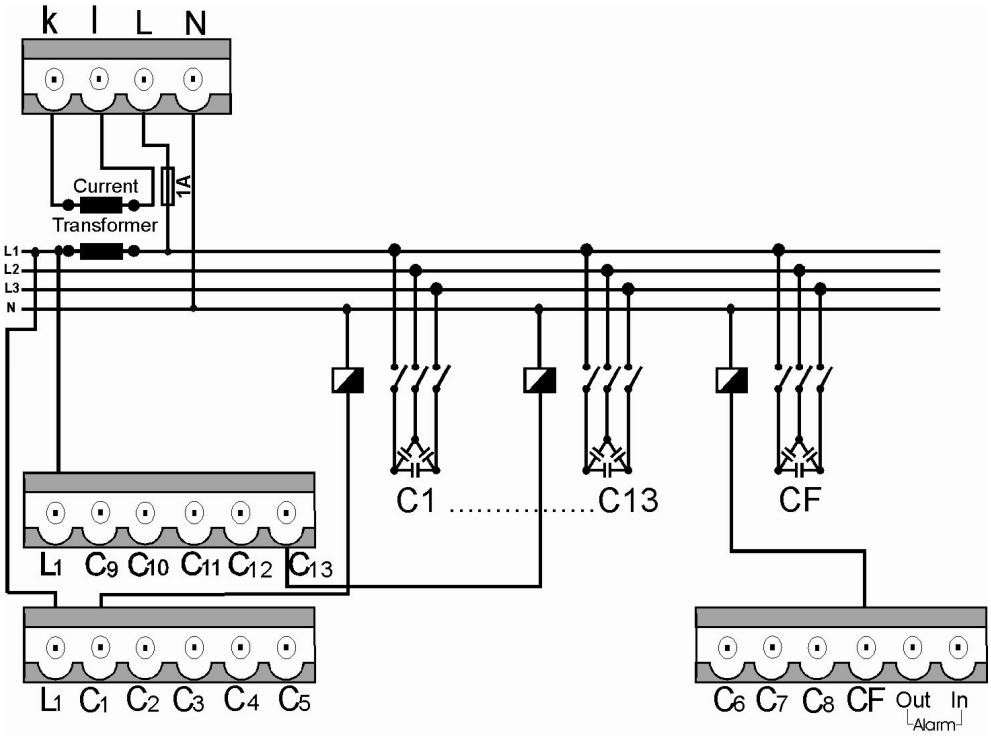
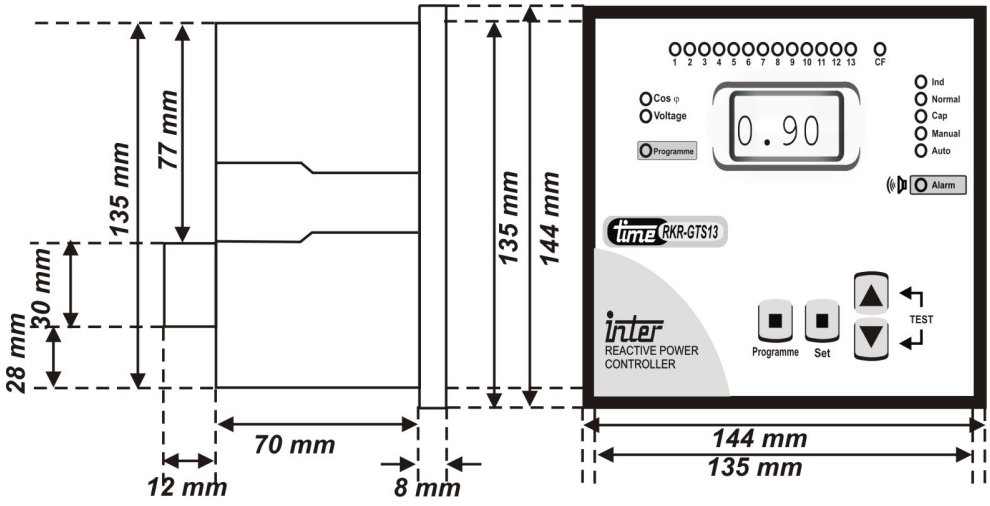


Figure-1 Connection Diagram

11. MECHANICAL DIMENSIONS



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