UC Series

Universal Process Controller

User Manual

ABUS TECHNOLOGIES INC.

WARNING

- This manual should be passed on to the end user.
- The contents of this manual are subject to change without prior notice.
- All rights reserved.
- ABUS gives no warranty of any kind with regard to this manual, including, but not limited to, fitness for a particular purpose.
- If any question arises or errors are found, or if any information is missing from this manual, please inform your supplier or inform at info@abustek.com.
- The specifications mentioned in this manual are limited to those for the standard type under the specified model number break-down and do not necessarily apply for customized instruments.
- Please note that changes in the specifications, construction, or component parts of the instrument may not immediately be reflected in this manual at the time of change.
- If the customer or any third party is harmed by the use of this product, ABUS assumes no responsibility for any such harm owing to any defects in the product which were not predictable, or for any indirect damages.

Although Warning hazards are related to personal injury, and Caution hazards are associated with equipment or property damage, it must be understood that operation of damaged equipment could, under certain operational conditions, result in degraded process system performance leading to personal injury or death. Therefore, comply fully with all Warning and Caution notices.

Information in this manual is intended only to assist our customers in the efficient operation of our equipment. Use of this manual for any other purpose is specifically prohibited and its contents are not to be reproduced in full or part without prior approval of Technical Communications Department, ABUS Technologies

HEALTH AND SAFETY

To ensure that our products are safe and without risk to health, the following points must be noted:

1. The relevant sections of these instructions must be read carefully before proceeding.
2. Warning labels on containers and packages must be observed.
3. Installation, operation, maintenance and servicing must only be carried out by suitably trained personnel and in accordance with the information given. Any deviation from these instructions will transfer the complete liability to the user.
4. Normal safety precautions must be taken to avoid the possibility of an accident occurring when operating in conditions of high pressure and/or temperature.
5. Chemicals must be stored away from heat, protected from temperature extremes and powders kept dry. Normal safe handling procedures must be used.
6. When disposing of chemicals ensure that no two chemicals are mixed.

Safety advice concerning the use of the equipment described in this manual or any relevant hazard data sheets (where applicable) may be obtained from the Company address on the back cover, together with servicing and spares information.

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1. INTRODUCTION

UC508 economy is a Microprocessor based Digital Process Controller, which can be applied in high-precision measurement and control of temperature, pressure, discharge, liquid level and humidity etc... A four-digit LCD dual display shows measured value and set-value for all programming parameters. Instrument configuration is achieved from the front panel keyboard, without any hardware change. The user should read this manual thoroughly before using the instrument. It must be handled with care and should be used accordingly for best results.

2. PRESENTATION

2.1 Features

1. Input signal: *Thermocouple, RTD, direct voltage, current* programmed from the front panel.
2. Outputs can be set on-off control or PID control with configurable direct/reverse action modes.
3. The input uses digital correction system; there is nonlinear correction form of communal used thermocouple and resistance thermometer detector.
4. Control output modes hold out relay contact switch, solid-state relay driving voltage, and single-phase thyristor zero-crossing trigger signal etc.
5. Comprehensive self-detection and protection. In case of error, it provides automatic repair or prompt message and closes the output.

2.2 Technical Parameters

Input Signals: Refer to table 6.1 *Input Signal*
Intrinsic error: ± 0.5% FS ± 1 digit
Sampling period: <0.3s
Working power supply: 220V 10%/50~60Hz, power consumption<5W.

Control modes (freely changeable with keypad)**:**

- On-off control (configurable direct/reverse action and differential gap)
- PID control (configurable direct/reverse action, manual or automatic of PID parameters)

Alarm modes (freely changeable with keypad)**:**

- One way of programmable alarm output is provided with a number of alarm modes including higher limit, lower limit (Relay output).
- In addition, the alarm feature can also be temporarily disabled when applying the power.

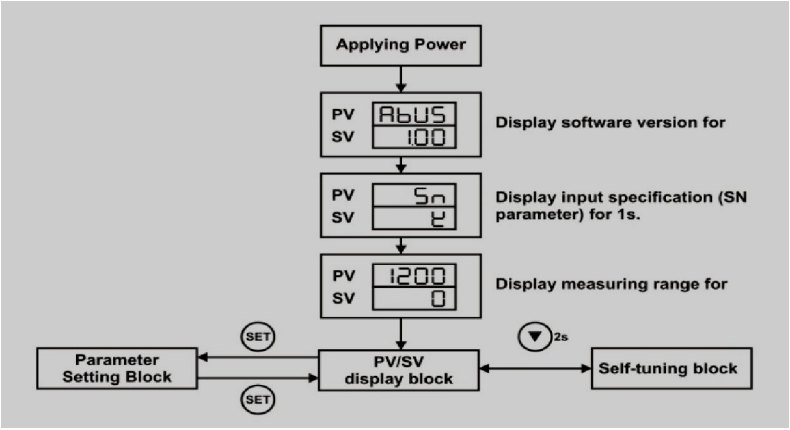
Output specifications:

- Output module of relay contact switch: Normally open (absorbed by varistor), 30VDC/2A, 240VAC/2A.
- Output module of solid-state relay (SSR) driving voltage: 12VDC/25mA.
- Output module of single-phase thyristor zero-crossing trigger signal: 100~380VAC/50~60Hz, capable of triggering
- 5-500A TRIAC or 2 SCRs in inverse parallel connection or thyristor power module.

Operating Environment:

Recommended Temperature: 0~50
Relative Humidity: ≤ 85%RH

2.3 Display Status



3. DIMENSIONS

PANEL DIMENSION CODE	PANEL DIMENSION		CASE DIMENSION			HOLE CUTOUT DIMENSION	
	W	H	W	H	D	W	H
A	96	96	91	91	100	92	92
D	72	72	67	67	100	68	68
E	48	96	44	90	100	45	92
F	96	48	90	44	100	92	45
G	48	48	44	44	100	45	45

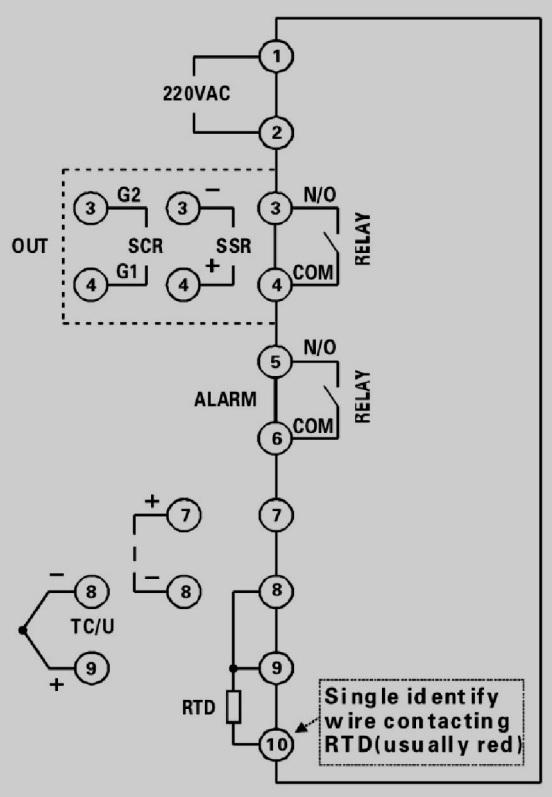
4. ORDERING DETAILS

TYPE							DESCRIPTION
Product	UC508						UC Series Process Controller
Dimensions		A					96 x 96 mm
		D					72 x 72 mm
		E					48 x 96 mm
		F					96 x 48 mm
		G					48 x 48 mm
Control Output			2				Relay contact switch output.
			4				Solid-state relay driving voltage output.
			6				SCR Single-phase thyristor
Alarm Output				0			None
				1			1-Alarm.
Input type					0		Universal (Refer table 6.1)
RS#485 Communication						0	No communication
						1	With RS485 Modbus RTU Protocol.

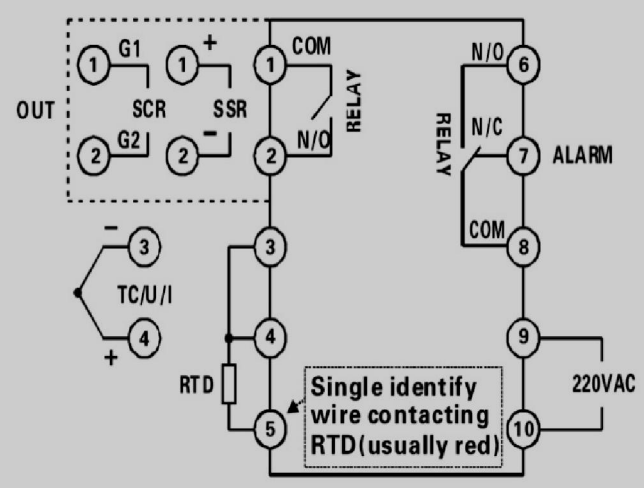
Example: UC508 > G > 2 > 1 > 0 > 1

5. CONNECTIONS

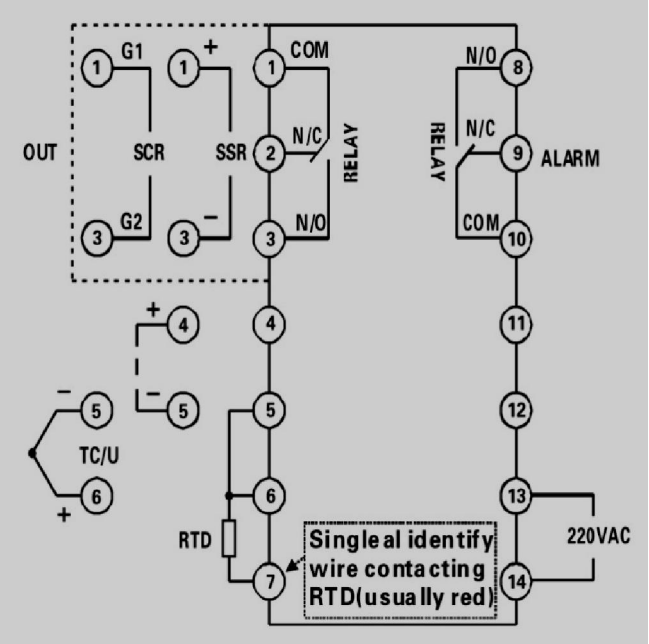
Wiring Diagram of UC Series -A.E.F



Wiring Diagram of UC Series-G



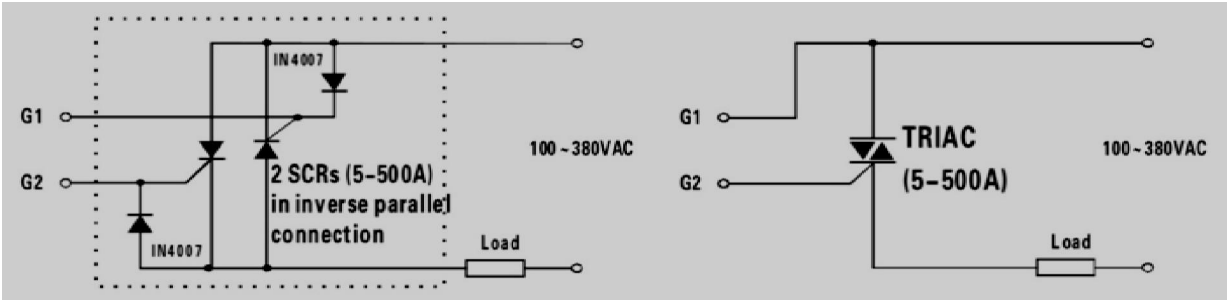
Wiring Diagram of UC Series-D



Description of symbols in the wiring diagram

SYMBOLS	DESCRIPTION
OUT	Alarm Outlet
ALARM	Control Outlet
RELAY	Relay contact switch Output
SSR	Solid-state relay driving Voltage Output.
SCR	Thyristor zero-crossing trigger signal Output
I	Direct current Input
TC/U	Thermocouple / Direct Voltage Input
RTD	RTD Input

Wiring diagram of thyristor trigger output

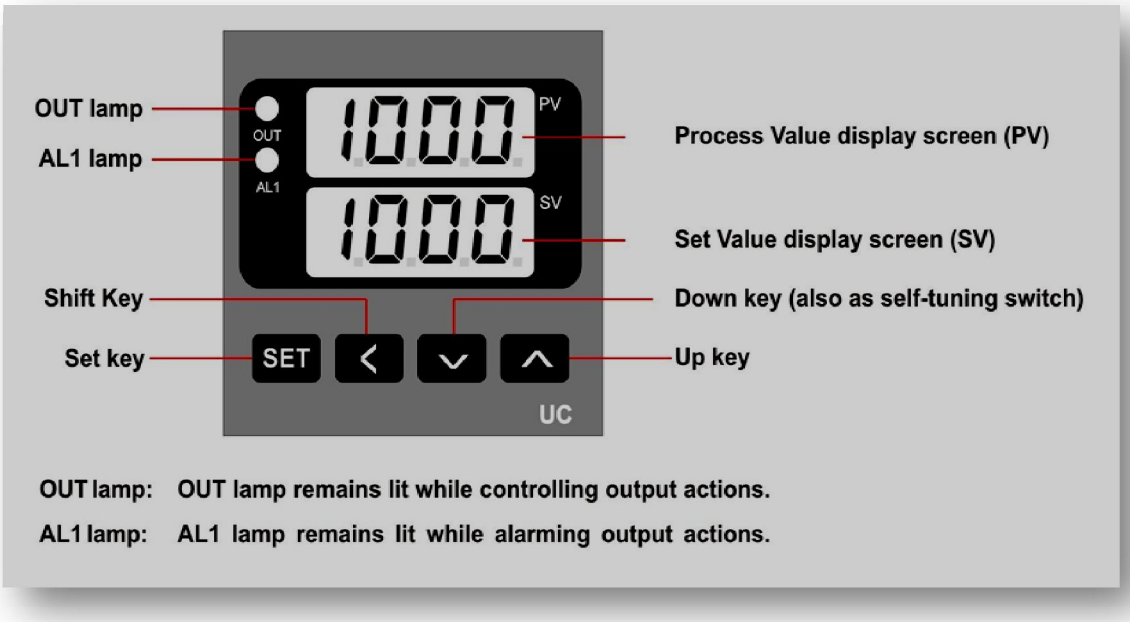


6. INSTALLATION

6.1 Input Signal

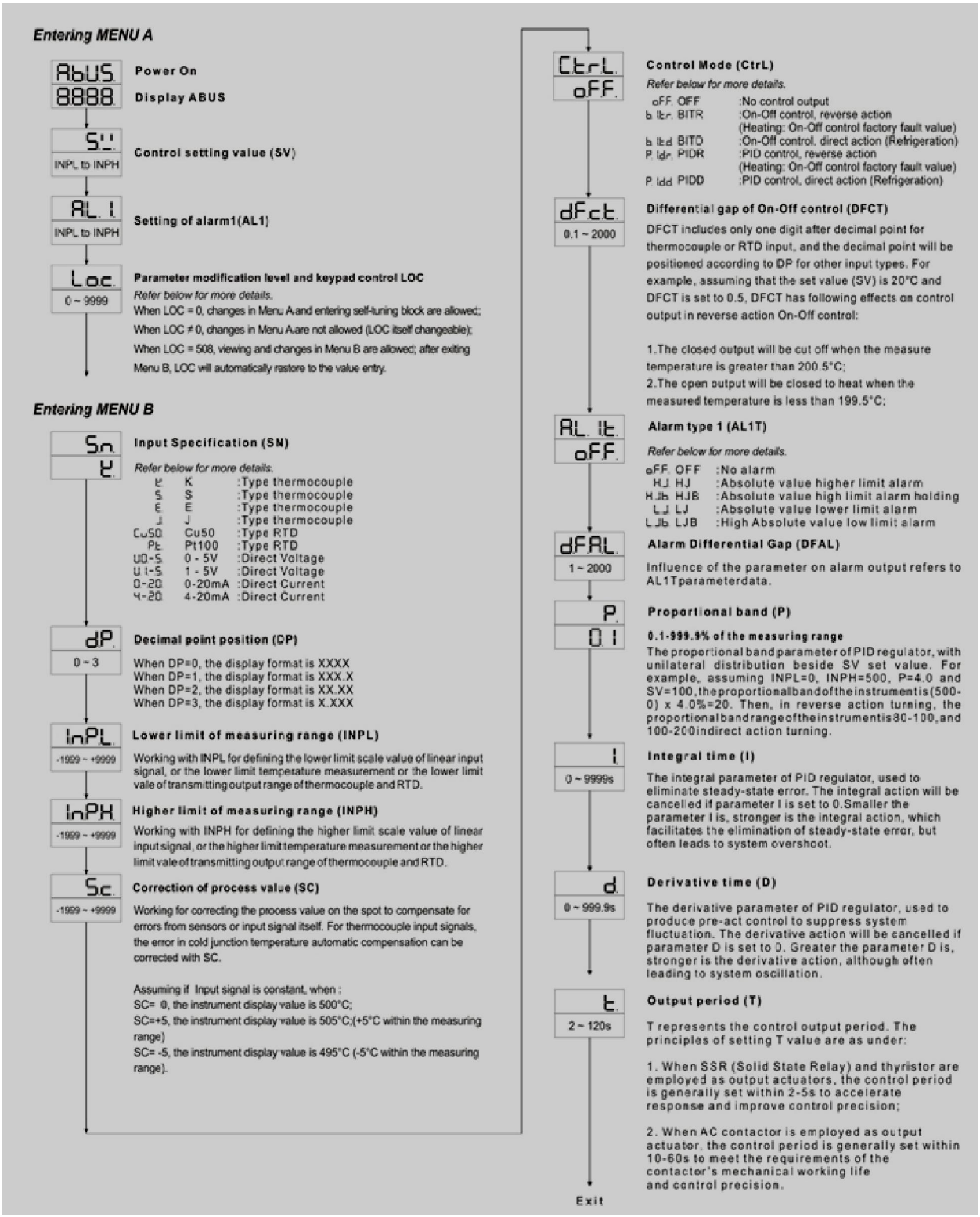
INPUT TYPE	CODE	MEASURING RANGE
Thermocouple (TC)	K	-50°C ~ +1350°C
	S	-50°C ~ +1750°C
	E	-50°C ~ +800°C
	J	-50°C ~ +1000°C
Resistance Thermometer Detector (RTD)	Cu50	-50°C ~ +150°C
	Pt100	-200°C ~ +850°C
Direct voltage (V)	0-5V	Customized range within -1999 ~ +9999
	1-5V	
Direct Current (I)	0-20mA	
	4-20mA	

6.2 Panel



7. CONFIGURATION

7.1 Configuration Process



7.2 Key Operation Instruction

The instrument will automatically enter PV/SV display block 3.5s after applying power. The PV screen and the SV screen will display process value and set value respectively.

Parameter setting block: Under PV/SV display block, the instrument will enter parameter setting block by pressing down SET key for 2s. The PV screen displays parameter name and the SV screen displays parameter value, the last figure of which will flash. Edit parameter value with ◄, ▼, ▲ keys. Then press SET key to confirm the change and switch to the next parameter name, or press down SET key for 2s to confirm the change and return to PV/SV display block. The instrument will return to PV/SV display block if there is no key action for 60s, in this case, the last change to the parameter will be cancelled.

Self-tuning block (only available when LOC=0 and the instrument are under PID control mode)**:** Under PV/SV display block, the instrument will enter self-tuning block by pressing down key for 2s. The PV screen displays the process value, and the SV screen displays a flashing -AT- at interval of 0.5s (during the process, the instrument can enter and exit parameter setting block and output display block with no effect on self-tuning. But the self-tuning prompt will disappear). On completion of self-tuning, the PID parameters of the instrument will be automatically changed and saved and the instrument will return to PV/SV display block automatically. Press down ▼ key for 2s when -AT- on the SV screen stops flashing to exit the self-tuning block during self-tuning process.

8. MAINTENANCE

Metrological verification should be conducted annually for the instrument. If the instrument goes beyond error limit, which often results from a damper environment, dust or corrosive gas, the inner part of the instrument should be cleaned and dried. In case the accuracy can not be restored by cleaning and drying, the instrument should be sent back as default product to the factory for troubleshooting.

9. SAFETY PRECAUTIONS

1. The unit should be powered for 15 minutes before use.
2. Use in ambient temperature of 0-60˚C.
3. Avoid vibrations, shock, excessive dust, corrosive chemical materials or gaseous environment.
4. Input wire should not be too long. If measured signal have to be far away from the unit, please use 2-core shielded cable.
5. Use this instrument in the scope of its specifications, otherwise fire or malfunctions may result.
6. Contact of the instrument, with organic solvents or oils should be avoided.
7. Do not turn on the power supply until all of the wiring is completed. Otherwise electrical shock, fire or malfunction may result.
8. Do not disassemble, repair or modify the instrument.
9. All connections should be tightened properly.
10. Power supply should be constant, should not be fluctuating.

10. WARRANTY

ABUS provides the original purchaser of this instrument a one (1) year warranty against defects in material and workmanship under the following terms:

- The one year warranty begins on the day of shipment as stated on the sales bill.
- During the warranty period all costs of material and labor will be free of charge provided that the instrument does not show any evidence of misuse.
- For maintenance, return the instrument with a copy of the sales bill to our factory.
- All transportation and insurance costs should be covered by the owner of the equipment.
- Should any sign of electrical or mechanical shock, abuse, bad handling or misuse be evident the warranty voids and maintenance costs will be charged.