ZKC1 系列（Series）

智能型数位式功率调整器

Intelligent Digital Power Regulator

使用说明书

Operating Instruction

上海亚泰仪表有限公司

Shanghai Yatai Instrumentation CO., Ltd

非常感谢您采用亚泰 ZKC1 系列智能型数位式功率调整器，使用前务必详读本使用说明书以防止操作错误！

Thank you very much for choosing Yatai ZKC1 series intelligent digital power regulator, Please read this operating instruction carefully before using it to avoid malfunction!

操作注意事项/Caution When Operating

- 断电后方可清洗仪表/Before cleaning the controller, please ensure that the power is switch off
- 清除显示器上污渍请用软布或棉纸/Please remove stains on the display panel by using a soft cloth only
- 显示器易被划伤，禁止用硬物擦拭或触及/No scrubbing or touching the display panel with any hard object, the display panel can be easily scratched
- 禁止用螺丝刀或书写笔等硬物体操作面板按键，否则会损坏或划伤按键/Do not press any button on the display panel using pointy objects such as ballpoint pen or screw driver, it can easily scratch the panel or damage buttons on the panel

一、产品确认/Product validation

ZKC1 智能型数位式功率调整器是用先进的单片机技术设计而成的，是新一代的用可控硅控制正弦波波形导通大小从而达到控制交流电压输出大小的仪表，并具有以下特点/ZKC1 Intelligent Digital Power Regulator is using advanced single-chip design, it is the new generation regulator providing control solution for power-conversion application by using SCR to control the sine wave:

■ 功能信息/The function of information

- 电源频率 50/60 Hz 自动侦测 Power frequency 50/60 Hz auto-detect
- 可选择零点或相位控制方式 Zero cross control or phase angle control selectable
- 可设定最小或最大输出量限制 High and low output limit settable
- 可设定缓冲启动或脉冲启动时间 Soft start or kick start time settable
- 可选择多种输入方式 Multi-input type optional
- 可选择自动或手动输出 Auto output or manual output selectable
- 多种自动诊断警报功能 Multi automatic diagnostic alarm function

■ 产品选型/Product types choosing

- ZKC1 系列/ZKC1 series —— 单相两线式/Single phase by two wires

型 号 Model	ZKC1-							
	120	220	320	132	232	332	263	363
工 作 电 压 Operating voltage	AC110V	AC220V	AC380V	AC110V	AC220V	AC380V	AC220V	AC380V
额 定 电 流 Rated current	20A max.	20A max.	20A max.	32A max.	32A max.	32A max.	63A max.	63A max.
保 险 丝 Protection fuse	20A	20A	20A	32A	32A	32A	63A	63A
耐 突 波 电 流 Surge current duration	400A	400A	400A	600A	600A	600A	1000A	1000A
最 低 耐 压 Min. block voltage	AC600V	AC600V	AC800V	AC800V	AC800V	AC1200V	AC800V	AC1200V

■ 共同规格/Specification

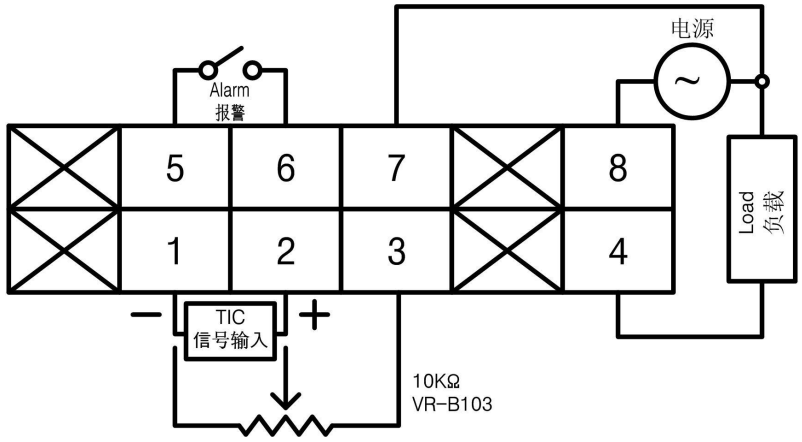
输入方式	Input method	4～20mA/0～20mA/1～5V/0～5V/2～10V/0～10V or VR-10KΩ selectable
控制方式	Control method	Zero cross control or phase angle control selectable
输出控制	Output control	Auto output or manual output selectable
输出范围	Output range	0～100%
输入解析度	Input resolution	0.5%
输出下限	Output low limit	0～100% (L.000～L.100) settable
输出上限	Output high limit	0～199% (H.000～H.199) settable
缓冲启动	Soft start	1～199s (t.001～t.199) settable
使用环境	Operating temp	86～106kPa、0～50℃、45～85%RH
外壳材质	Housing material	ABS

■ **适用范围信息/Scope of application**

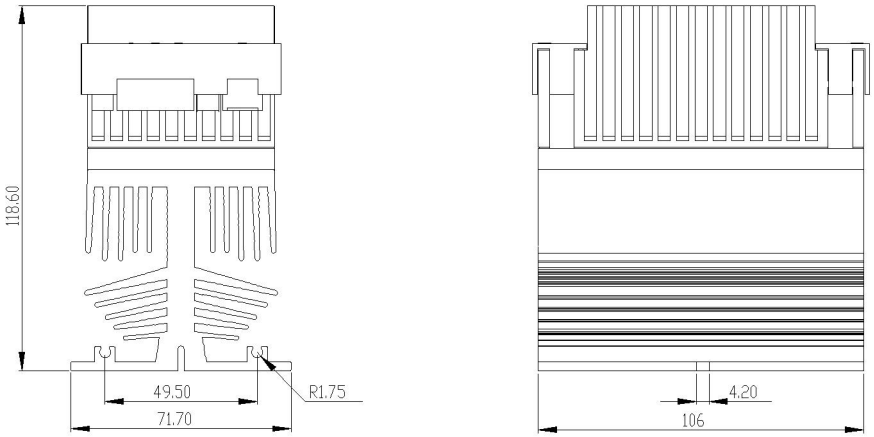
- 本产品可与连续 PID 输出的温度控制仪表配合使用，达到高精度温度控制功能，也可单独用于高精度的电压控制等/This product can be used together with temperature controllers with Continuous PID output in order to achieve high accuracy of temperature control. It can also be used alone to achieve accurate voltage control
- 本产品可广泛应用于陶瓷、冶金、热处理、化工、电炉、窑炉等高精度温度控制，是传统的 ZK-1、NZK-1 可控硅调压器的更新换代产品/This product can be used widely in high accuracy temperature control of ceramic, metallurgy, heat treatment, chemical engineering , electric stove and kilns etc, it is the new generation regulator replacement for the traditional ZK-1、NZK-1 SCR regulators
- 请参照上述定制信息确认送达产品是否和您选定的型号和功能完全一致/Please check carefully with the information provided above to confirm the product delivered to you is the same model and function you order

二、接线图和外形尺寸图/Connection diagram and outline dimension

1、接线图/Connection diagram



2、外形尺寸图/Outline dimension



三、菜单设定/Menu setting

1、功能设定/Function setting

状态/Status	显示代码/Display code	说明/Description
运转状态 Running status Press SET & ▽ Key 3 sec	A.100	1、A:自动输出量/Auto output volume 2、M:手动输出量/Manual output volume
锁住设定 Setting of lock Press SET Key	LCK.0	1、Lck.0:全锁定/All lock 2、Lck.1:仅参数可设定/Only data settable 3、Lck.2:可设定/Unlock
输出选择 Selection of output Press SET Key	OUt.A	1、Out.A:自动输出量/Auto output volume 2、Out.M:手动输出量/Manual output volume
输入选择 Selection of input Press SET Key	Int.3	1、Int.0: 4～20mA 2、Int.1: 0～20mA 3、Int.2: 1～5V 4、Int.3: 0～5V 5、Int.4: 2～10V 6、Int.5: 0～10V 7、Int.6: 10KΩ可变电位器/10KΩ Variable resistance
控制方式选择 Selection of control method Press SET Key	CON.1	1、Con.0:零点控制/Zero cross control 2、Con.1:相位控制/Phase control
启动方式选择 Selection of start method Press SET Key	Str.0	1、Str.0:缓冲启动/Soft start 2、Str.1:脉冲启动/Kick start
报警输出状态选择 Setting of alarm status Press SET Key	ALn.0	1、Alm.0:报警输出常开/Alarm output normal open(NO) 2、Alm.1:报警输出常闭/Alarm output normal close(NC)

2、参数设定/Data setting

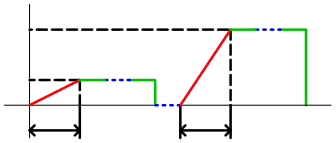
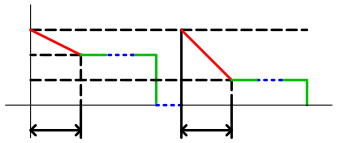
状态/Status	显示代码/Display code	说明/Description
运 转 状 态 Running status	A.100	1、A:自动输出量/Auto output volume 2、M:手动输出量/Manual output volume
Press SET Key 3 sec 最 小 输 出 量 设 定 Setting of minimum output	L.000	1、范围/Range:0～100 2、最小输出量设定/Minimum output volume setting
Press SET Key 最 大 输 出 量 设 定 Setting of maximum output	H.100	1、范围/Range:0～199 2、最大输出量设定/Maximum output volume setting
Press SET Key 可 控 硅 小 输 出 切 除 TRIACS small output resection	d.010	1、范围/Range:0～50 2、可控硅小输出切除/TRIACS small output resection
Press SET Key 缓冲/脉冲 启动 时间设定 Setting of soft/kick start time	t.010	1、范围/Range:1～199 2、缓冲启动时间/Time of soft start 或/or 脉冲启动时间/Time of kick start
Press SET Key 输 入 偏 差 修 正 Setting of Input offset	F.000	1、范围/Range:-99～99 2、输入偏差修正/Setting of Input offset
Press SET Key		

3、手动输出设定/Setting of manual output

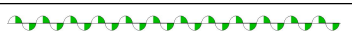
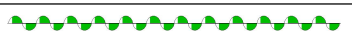
手动输出状态/Manual output status	说明/Description
n.050	1、在手动输出状态中，按 △ 或 ▽ 键 1 秒可改变手动输出量/On the manual output status,Press △ or ▽ key one second to change the manual output vomlune 2、按 SET 键完成手动输出量设定/Press SET to finish setting

四、菜单参数详解/Menu parameter details

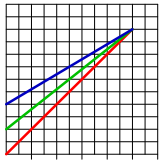
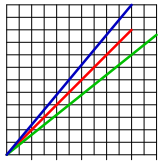
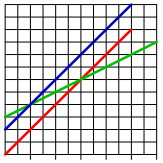
1、启动方式说明/Start mode description

缓冲启动/Soft start	脉冲启动/Kick start	说明/Description
		

2、控制方式说明/Illustration of control method

控制方法/Control method		相位控制/Phase angle control	零点控制/Zero cross control
输 出 量 /Output volume	10%		
	25%		
	50%		
	75%		
特性/Feature		1、适用于控制电感性或变阻性负载 例如：红外线加热器、变压器负载、纯金属或碳硅发热体/Suited to control the inductive load or The variable resistance load For example:IR、Pure metal heater、Silicone carbonate heater or Transformer 2、功率因素小于 1/The power factor cosΘ ＜ 1 3、较高谐波干扰/Higher harmonic noise	1、适用于控制定阻性负载或电容性负载 例如：合金类发热体或电容器负载/Suited to control the constant resistance load or The capacity load For example:Alloy heater or Capacitor 2、功率因素等于 1/The power factor CosΘ ＝ 1 3、较低谐波干扰/Lower harmonic noise

3、输出量限制设定/Output limit Setting

注意/Note：

1、Un：输出量/Output volume

2、设定范围/Setting range：下限设定/Low limit = 0～100%，上限设定/High limit = 0～199%

3、输出量下限 + 上限设定适用于高辐射热加热器，如：红外线加热器/Low + high limit setting is suited to control the radial heating heater, such as: IR lamp

五、故障排除/Trouble shooting

报警/Alarm	说明/Description	检查/Checking
FBEr	保险丝烧毁/Fuse break	请检查保险丝是否烧毁/Please check power supply
OHEr	散热器过热超过 120℃/Over heat 120℃	请改善散热条件/Please improve cooling condition

六、安全注意事项/Safety notice

警 告/Warning	潜在危险，如果操作失当可能导致死亡或严重伤害/Potentially hazardous situation, if mishandling, may result in death or serious injury

1、请确认「输入方式」与本控制器「输入选择」是否相符？接线是否正确？否则可能导致本控制器失控
Please confirm the input type and connection method with this controller, if not, it may result in malfunction

2、带电运行中，请勿触碰本控制器任何接线端子以避免触电
Please do not touch any terminal of this controller while power supply is supplied,if do, it may result in electronic shock

3、更换保险丝前，请务必关闭电源系统以避免触电
「Power supply system」must to be shut down before replace the fuse,if not,it may result in electronic shock

4、负载电流请勿超过额定电流，以避免保险丝或本控制器烧毁
Please rated the load current within the specified value,if not,it may result to burn up this controller or fuse

5、请务必锁紧端子螺丝，扭力需超过 100kg-cm，否则可能导致本控制器或保险丝烧毁
Please tighten the screw terminal over 100kg-cm,if not,it may result to burn up this controller or fuse

6、本控制器烧毁后可能是短路或失控状态，请加装独立警报系统以确保安全，否则可能造成严重意外事故
If this controller is burned up,it may be in short circuit condition or malfunction,please settle an independent alarm system to ensure safety protection,if not,it may result in a serious accident

七、安装注意事项及可控硅小知识/Installation and SCR tips

■ **安装注意事项/Caution when installing**

- 仪表应在推荐的工作环境下使用
  The installation and usage of the equipment should be done under the suggested working conditions
- 模拟量输入值不要超过仪表的输入信号范围
  Analogy input could not exceed the input signal range of the regulator
- 严谨猛力撞击仪表
  Do not expose the regulator to any vibration or shock directly
- 电源电压不要超过工作电压±10%范围
  Power supply could not exceed 10% of the working voltage

■ **可控硅小知识/SCR tips**

- 断态、反向重复峰值电压：一般取负载电压有效值的三倍以上，例如：AC220V 供电的负载，可控硅的峰值电压应大于 AC800V；AC380V 供电的负载，可控硅的峰值电压应大于 AC1200V
  Peak repetitive off state voltage and peak repetitive reverse voltage: Normally use a value more than three times of the effective value of the load voltage, for example: for load voltage with AC220V, SCR peak voltage should be more than AC800V; for lad voltage with AC380V, SCR peak voltage should be more than AC1200V

- 门极触发电流：一般选择 60～150mA 之间，门极触发电流太小，容易引起可控硅误触发；门极触发电流太大，容易引起可控硅输出小电流时出现打不开现象
  Gate trigger current: Normally choose between 60～150mA. If the gate trigger current is under the value, the SCR can be mis-triggered easily. If the gate trigger current is over the value, SCR output current can not be opened

- 门极触发电压：一般应小于 2V
  Gate trigger voltage: < 2V

- 通态峰值电压：通态峰值电压越小越好，通态峰值电压越小则发热量越低即可控硅损耗越小
  Peak forward on-state voltage: the lower the peak forward on-state voltage value the better as lower value of the peak forward on-state voltage means less heat and less loss

八、维护和保存/Service and maintenance

- 仪表自开票之日起十八个月内，因制造质量发生故障由本厂负责全面保修，因使用不当而造成损坏的则本厂酌情收取修理成本费，本厂仪表终身维修
  This equipment is under warranty for 18 months since the day of purchase (the warranty only stands if the problem is caused by the malfunction due to manufacturing). Any repairment for damages caused by improper use of the equipment will be charged. The equipment is provided with lifetime maintenance and repair on cost

- 仪表应在包装齐全的情况下存放在干燥通风、无腐蚀性气体的场合
  Please keep the controller in a dry place with air and NO corrosive gas

上海亚泰仪表有限公司
销售部地址：上海市四川北路1851号8楼
电话：021-51053127 51053128 传真：51053123
Email：yatai@yatai.sh.cn 网址：http://www.yatai.sh.cn
生产基地：上海市宝山区振园路128号
技术咨询：021-36160962