

智能 UV 电源 使用 说明书

UV Intelligent power operation manual

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一、公司简介

公司成立于 2017 年，坐落于思科城旁，是一家致力于研发、生产和销售高品质智能 UV 电源、LED 电源及其相应配套设备的高科技公司。

公司核心销售团队拥有 20 多年生产销售 UV 电源经验，公司研发团队具有深厚电力电子研发背景。公司秉承数字成就未来，采用模块化柔性设计，可最大限度满足客户定制化需求。

公司愿景：成为 UV 行业领先的系统解决方案公司

公司使命：为客户提供最优 UV 解决方案，帮助客户成功。

公司核心价值观：创新、坦诚、感恩、分享

1 Company Profile

Our company was founded in 2017, located on side of Sike city, which is a manufacturer and trader specialized in research of high quality of UV intelligent power、LED power and matching equipment.

Our core sales team have more than 20 years experiences in UV power, R&D team have profound R&D background in power electronics.

二、产品概述

HYUV 系列是基于我司最新研发的模块化控制平台，针对 UV 固化行业开发的新型高效智能 UV 变频电源；采用 32 位高性能 TI DSP 微处理器，基于先进的前馈+PID 功率控制算法，实现高动态响应，输出功率恒定并无极可调；即使电网电压在一定范围内波动、输出能量依然稳定；能满足各种灯管负载的应用。该系列产品预留丰富外设接口，包括 RS485 通讯接口、多路数字输入/输出接口、模拟量输入/输出接口、双路大功率继电器输出和预留辅助编码器接口，可灵活实现多机组网或 PLC 控制或单机最小系统组网，为客户提供灵活丰富解决方案。

2. Product Introduction

HYUV series is a new high-efficient UV frequency conversion power designed on our latest researched modularized control platform and target on UV curing business, which adopt 32 bits high-performance TI DSP MPU, based on advanced PID feed-forward power control algorithm to realize high dynamic response, can maintain constant output power with stepless. keep stable of output energy even when power grid fluctuated within limits, meet the needs of various applications of loads.

HYUN series reserved rich external peripherals which include RS-485, Multiple digital I/O interface , analog I/O interface , dual high power relay output and reserved auxiliary encoder interface. It can

realize multi-singlechip ,PLC control or singlechip minimum system, provide users with flexible and diverse solutions.

HYUV 系列电源可精确设定输出功率，并动态实现功率闭环可广泛应用于胶印印刷，如烟标包装印刷、彩印包装印刷等大型印刷行业；由于 UV 灯能发出特定波长能量光源，在特殊印刷行业，如网版印刷、平版印刷、凸版印刷、自粘商标、金属铭牌、KT 板、玻璃、陶瓷、电子零件、单面电路板等基材上印制晶体冰花、磨砂、水晶宝石、七彩凸油等特殊效果印刷上广泛应用；由于 UV 灯具有大功率，能集中产生大量热量特点，特别适用于木材表面光亮涂装、纸面上光、塑胶地板、光纤线表面涂装。瞬间干燥、节省时间、生产效率高。能使印件表面达到高光泽，耐磨擦、耐溶剂的效果；同时由于高温高能量光源特性，在电声行业，如微型扬声器、扬声器喇叭、受话器、耳机、耳塞等胶水固化也大量采用。

HYUN series comes delivered with precision setting set for output power and dynamic power closed loop which adopt in large printing factory, such as cigarette packet printing, color packing printing etc. UV light also used in some special printing version since it can emit specific wavelength light, such as screen printing, planographic printing, letterpress printing, autohesion lable, metal nameplate, KT board, glass, ceramic, electrical part, Single-Sided PCBs' printing of ice crystal, frosting, jewel crystal, color letterpress. Beside, since its high power, UV specially suitable for timber surface high gloss, Paper glazing, plastic floor, optical cable surface coating, producing of immense heat concentratedly bring wink-dry, time-save and high efficient, make materials surface high gloss, abrasion and solvent resistance. In addition, high temperature and high energy character also make it adopt widely in Electroacoustic industry for glue curing, like micro speaker, POP-UP SPEAKER, receiver, earphone and earplug.

三、产品特点

- 1、高效节能，相对传统变压器+电容模式，采用动态无级调节技术，最大可节能达 30%
- 2、采用 32 位高性能 DSP，全功能实现数字化控制，可实现单机最小系统组网控制
- 3、采用动态前馈控制+PID 算法控制，实现电源稳定输出
- 4、支持汞灯、各种金属卤素灯，动态调整点灯过程，实现平滑启动
- 5、现场免调试，实现一键式傻瓜操作
- 6、专有控制算法，实现网侧浪涌电压抑制
- 7、具有缺相、过流、过温、欠压和过压等全面保护功能
- 8、包括 1 路模拟量输入口，2 路模拟量输出口、7 路通用数字输入口和 4 路通用输出口
- 9、预留 2 路继电器干触点输出，可用于控制外部大功率风机、快门
- 10、预留辅助编码器接口，可根据流水线动态调整功率输出（选配待开发功能）
- 11、预留外部 K 型热电偶输入节点，可实现产线温度闭环控制（选配待开发功能）

3. Specification

- 1) High efficiency. Comparing to traditional transformer+capacitor, HYUV save max 30% power by adopting dynamic stepless adjustive technology.
- 2) 32 bites DSP, a pure digital control system can realize ingle chip microcomputer minimum system control
- 3) PID feed-forward power control algorithm get stable power supply
- 4)Support mercury camp, metal halid lamps, dynamic regulation lighting on for graceful start.
- 5) Commissioning free on site, Easy One-button operation.
- 6)Proprietary control algorithm to restrain surge voltage on line side
- 7) Posses comprehensive protection function include default phase, overcurrent, over-temperature, undervoltage and overvoltage etc.
- 8)Contain 1 channel of analog input interface, 2 channels of analog output interface, 7 channels of common digital input interface and 4 common output interface.
- 9) Reserve 2 channels of relay dry contact output for controlling of high-power fan and shutter.
- 10) Reserve Auxiliary encoder interface which can adjust output power according assembly line(optional)
- 11) Reserve outside K-thermocouple input node for closed-loop temperature control(optional).
- 12) Reserve Rs-485 interface for multi-single chip or PLC control system

四、选型指南 Catalog

2000 系列智能电源型号与技术数据

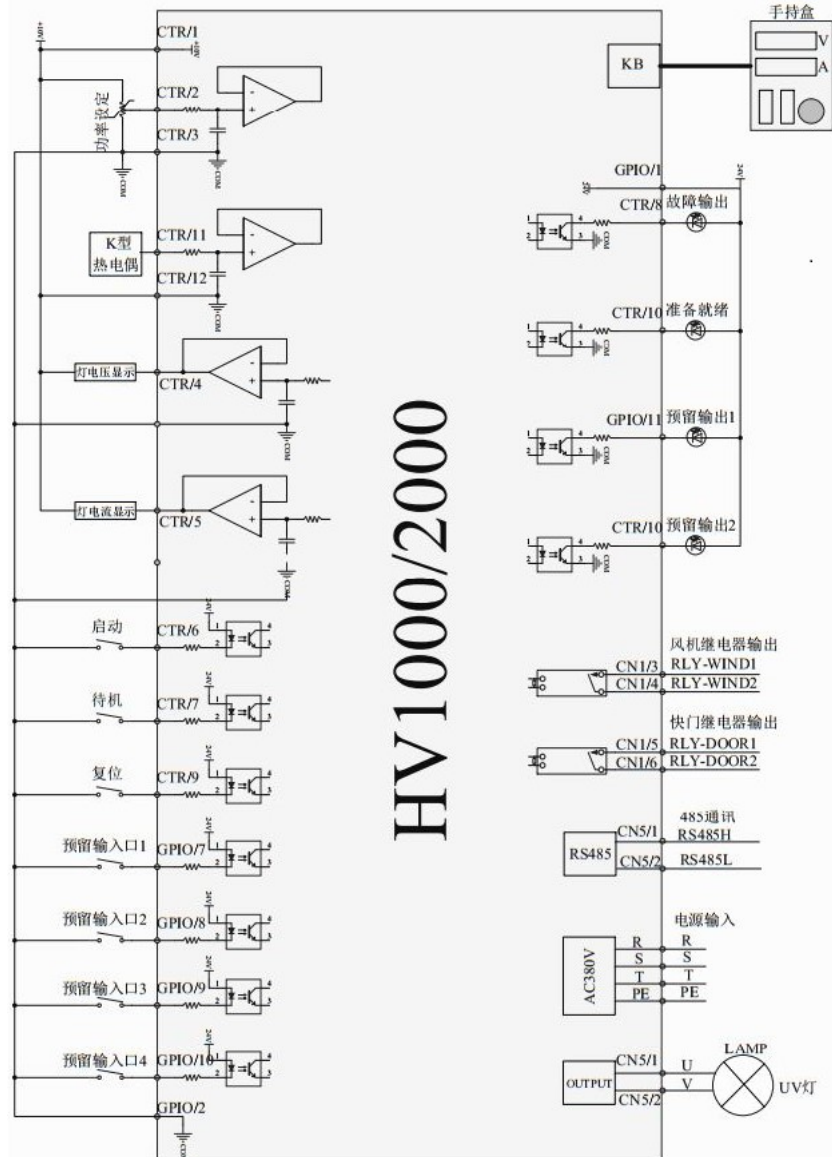
序号	产品型号	输出功率 kW	输出电压 V	备注
1	HV2000-4T030	3	300~~650	
2	HV2000-4T060	6	300~~950	
3	HV2000-4T080	8	800~~1150	
4	HV2000-4T010	10	800~~1450	
5	HV2000-4T012	12	1200~~1700	
6	HV2000-4T016	16	1450~~1900	
7	HV2000-4T018	18	1600~~2000	
8	HV2000-4T021	21	1600~~2100	
9	HV2000-4T025	25	1700~~2100	

4. Catalogs

2000 Series Intelligent Power Model and Technical Data

No.	Model	Output Power(kW)	Output Voltage(V)	Remark
1	HV2000-4T030	3	300~~650	
2	HV2000-4T060	6	300~~950	
3	HV2000-4T080	8	800~~1150	
4	HV2000-4T010	10	800~~1450	
5	HV2000-4T012	12	1200~~1700	
6	HV2000-4T016	16	1450~~1900	
7	HV2000-4T018	18	1600~~2000	
8	HV2000-4T021	21	1600~~2100	
9	HV2000-4T025	25	1700~~2100	

5 Wiring Diagram



六、技术数据

HV1000/2000 产品技术指标及规格

功能单元	规格项目	参数
输入	输入电源	4T#系列：三相 AC380V 50/60Hz 3T#系列：三相 AC220V 50/60Hz 2T#系列：单相 AC220V 50/60Hz
	输入电压范围	根据机型确定
输出	输出电压/电流	根据机型确定
	输出频率	16kHz
控制方式		矢量控制
控制特性	功率设定分辨率	0.1kW
	电流限制	通过 PC 上位机或手持盒或 PLC 设定
	浪涌抑制功能	通过专用算法控制，对网侧输入浪涌电压抑制，实现灯端稳定输出
典型功能	待机功能	当设备间歇式，设定待机功耗，用于节能场合
	开机误启动检测	上电检测运行状态开关，防止误操作运行
	工作时间记录	可实现运行中灯管工作时间读取
	运行功能	外部干触点控制电源启停，适用于并网 PLC 控制
	RS485 通讯	标准配置 RS485 通讯协议接口，运行、停止命令；参数设置修改；机器状态读取
	同步控制（选配）	通过监控产线速度，智能动态调整 UV 电源输出功率，实现最优功率配置
控制输入/输出端口	数字输入	7 路光耦隔离输入
	数字输出	4 路光耦隔离输出（每路输出≤30mA）
	继电器控制输出	2 路继电器输出（每路输出≤800mA）
	模拟量输入	1 路模拟量输入（0~+10V 电压输入）
	模拟量输出	2 路模拟量输出（0~+20V 电压输出）
保护功能		过压、欠压、过流、过载、UV 电源过热、缺相等
显示功能		标配：八段码 LED 显示；选配：LCD 液晶显示屏显示
环境	效率	97%
	安装方式	壁挂式
	防护等级	IP20
	冷却方式	风冷
	使用场所	室内，不受阳光直射，无尘埃、腐蚀性气体、可燃性气体、油雾、水蒸汽、滴水或盐分等
	海拔高度	低于 2000 米（2000 米以上降额使用，每升高 100 米降额 1%）
	环境温度（℃）	-20℃~+55℃（不结冰）（环境温度高于 55℃时降额使用）
	湿度	小于 90%RH，无水珠凝结
	大气压力（KPa）	80kPa~110kPa
	储存温度	-40℃~+70℃

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功能单元	规格项目	参数
	安装方向	为了保证 UV 电源的制冷效果，请务必纵向安装

6. Technical Data

HV1000/2000series Technical Specification

Units	Items	Specification
Input	Input power	4t# series: 3-phase ac380v 50/60hz 3t#series: 3-phase ac220v 50/60hz 2t# series: 1-phase ac220v 50/60hz
	Input voltage range	According to model
Output	Output voltage/current	According to model
	Output frequency	16khz
Control mode		Vector control
Control characteristics	Power resolution setting	0.1kw
	Current limitation	Setting by upper pc/handheld box/plc
	Surge suppression	Through proprietary control algorithm to restrain surge voltage on line side to make sure stable output of lamp
Typical functions	Standby	Setting standby power consumption when in intermittent status for energy efficiency occasion.
	Error start inspection	Checking running status switch when power on to avoid misoperation
	Time book	Reading working hours of tube
	Fahrfunktion	External power control with dry contact , which suitable for grid-connected plc control system
	Rs485 communication	Standard rs485 interface , running 、 stop command ; parameters setting modification; pc status reading
	Synchronous control (optional)	Intelligent dynamic adjustment of uv power supply to reach optimal power configuration through monitoring production line speed
I/o port	Digital input	7 opto-couplers isolation input
	Digital output	4 opto-couplers isolation output(each output≤30ma)
	Relay control output	2 relay output(each ≤800ma)
	Analog input	1 analog input (0~+10v voltage input)
	Analog output	2 analog output (0~+20v voltage output)
Protection		Default phase, undervoltage, overvoltage, overcurrent, overload, power source overheating etc.
Display		Led screen (optional: lcd screen)
Environment	Efficiency	97%
	Installation	Wall-mounted
	Protection degree	Ip20
	Cooling method	Air cooling
	Location	Indoor, no direct sunshine, no dust, corrosive gas, flammable gas, oil mist, water vapor, drip or salinity

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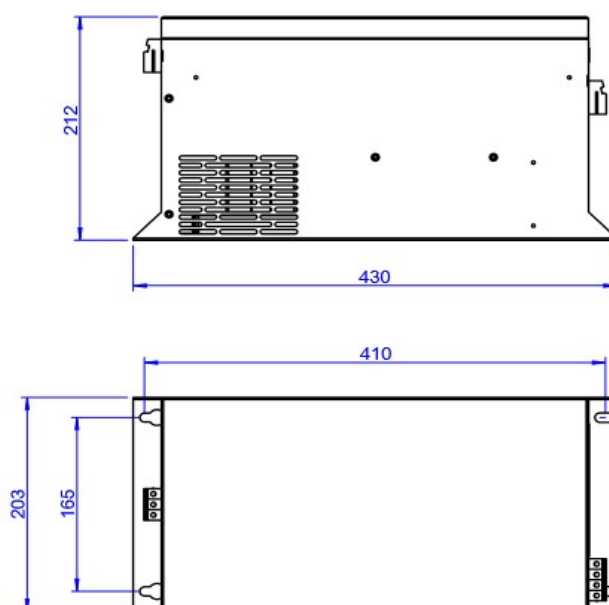
Units	Items	Specification
	Altitude	Under 2000m, (derated use when over 2000m, 1% derate for every 100m rising 米以上降额使用, 每升高 100 米降额 1%)
	Ambient temperature (°C)	-20°C ~ +55°C (no frozen) (derated use when over 55°C)
	Humidity	Less than 90%rh, no water droplets
	Atmospheric pressure (kpa)	80kpa ~ 110kpa
	Storage temperature	-40°C ~ +70°C
	Installation direction	Pls make sure installed vertically to ensure refrigerating effect of uv power.

7 Outline Dimensions

Table 7--1

No.	Model	Length (mm)	Width (mm)	Height (mm)	Mounting holes length (mm)	Mounting holes width (mm)
1	HV2000-4T030	430	203	212	410	165
2	HV2000-4T060	430	203	212	410	165
3	HV2000-4T100	470	203	225	450	165
4	HV2000-4T120	535	203	258	515	165
5	HV2000-4T160	555	222	258	540	165
6	HV2000-4T180	555	222	258	540	165
7	HV2000-4T250	600	268	258	580	210

HV2000-4T060 Model outline dimensions



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8、Interfaces and Wiring



HV1000/2000 series interfaces as below:

Table 8-1 HV1000/2000 Interface Summary

Description	Specification	Type
R/S/T/PE	Mains input	Screw fasten terminal
OUT U V	UV OUTPUT terminal	Screw fasten terminal

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I/O	Common digital I/O terminal	Green European connector
PLC	PLC control terminal	Green European connector
HMI	Hand box terminal	RJ45
RS485	RS485 interface	Green European connector

8.1 Main Power Terminals Function

Main power terminals include AC input terminal RST and light output terminal UV, show as below:

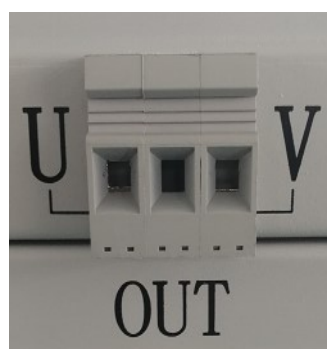


Table 8-2 Main Power Terminals

Category	Definition	Description	Remarks
4T:3-phase 380V input	R	R-phase input	Power input
3T: 3-phase AC220V input	S	S-phase input	
2T:1-phase AC220V input	T	T-phase input	
Earthing	PE	Earthing	Earth wire
300V~~2300V output	U	300V~~2300V output	Connect UVlight
	-		
	V		

NOTE:

1. Start connection after 10 minutes of outage
2. Pls make sure digital power PE terminal was already grounding
3. Do not install Power Factor Correction Controller and surge absorber.

8.2 通用数字量输入/输出端子

HV1000 系列预留了 2 路继电器输出和 2 路数字量输入；

HV2000 系列预留了 2 路继电器输出、4 路数字量输入和 2 路数字量输出；

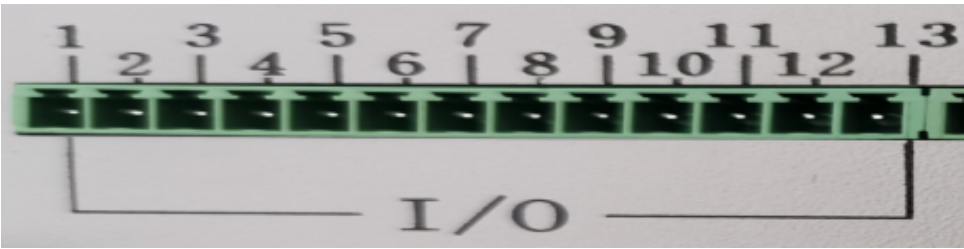
端子类型见下图：其中左边为 pin1。

8.2 Common Digital I/O Terminals

HV1000 series reserve 2 channels of relay dry contact output and 2 channels of digital inputs.

HV2000 series reserve 2 channels of relay dry contact output, 4 channels of digital input and 2 channels of digital outputs.

terminals type show as below, left side is pin1.



Terminals details show as below:

Table 8-3 Common Digital I/O Terminals

Pin	Description	Remark
1	+24vpower output	
2	0v(com.)	
3	Fan control relay normally open contact1 (isolation contact)	
4	Fan control relay normally open contact2 (isolation contact)	
5	Tp output normally open contact 1 (isolation contact)	
6	Tp output normally open contact 2 (isolation contact)	
7	Reserve	
8	Reserve	
9	Photoelectric switch input (and com)	Only hv 2000series
10	External troubleshooting input (active low)	
11	Reserve	
12	Reserve	
13	Reserve	

Schematic diagrams show as below:

Table 8-4 Common digital I/O terminal schematic diagrams

No.	Type	Circuit diagram	Remark
1	Relay output		

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2	Digital input Source input		Hv1000 series reserve 2 interface, di1/2
3	Digital output source output		Hv2000series exclusive

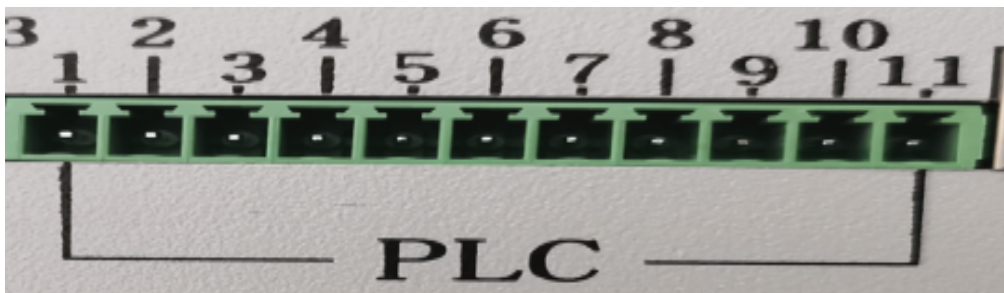
8.3 CONTROL TERMINAL

该端子主要用于控制数字电源运行，并对外输出电源本身状态，可很方便通过外围电路或 PLC 快速实现对数字电源正常使用。

端子类型见下图：其中左边为 pin1。

8.3 Control Terminals

These terminals used for digital power operation controlling, and power state output, digital operation can be conveniently controlled through peripheral circuit and PLC



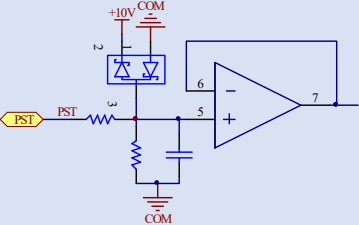
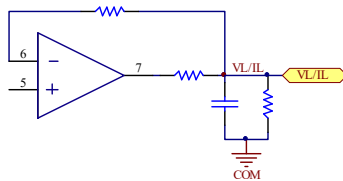
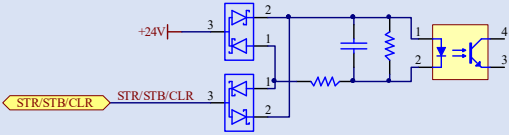
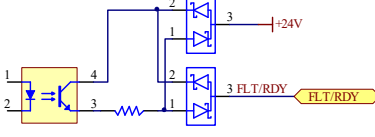
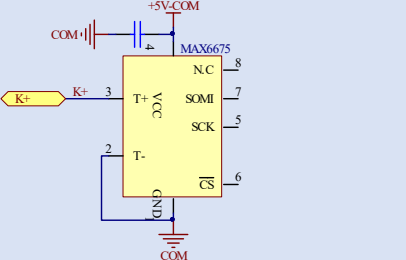
terminals details show as below:

Table 8-5 Main Power Wiring Terminals

Pin	Description	Remark
1	+10v (analog voltage input reference point)	
2	Power analog voltage input terminal (0-10v)	
3	Com	
4	Current feedback (analog voltage available, 1a=0.5v)	
5	Com	
6	Power on input(link to com)	
7	Standby signal input(link to com)	
8	Reserve	
9	Reserve	
10	Reserve	
11	Reserve	Hv2000 series exclusive

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Table 8-6 Control Terminals Diagrams

No.	Type	Circuit diagram	Remark
1	Analog input		
2	Analog output		
3	Digital input Source input		
4	Digital output Source output		
5	K-thermocouple input		Hv2000series exclusive

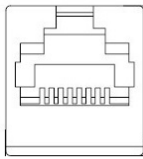
8.4 Handheld box interface

该接口用于调试专用手持盒连接电缆接口。其中 HV1000 系列为传统式手持盒；HV2000 为 LCD 屏调试手持盒。接口采用 RJ45 标准网口，示意图如下：

8.4 Handheld Box Interface

This interface used for commissioning of dedicated ZSSY interface, HV1000 is traditional style, HV2000 is LCD style. The interface adopt RJ45 standard interface as follow:

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8.5 RS485 Communication Interface

RS485 interface adopt green European terminals as below, left is pin1.



Table 8-7 RS485 Interface Definitions

Pin	Definition	Description	Remark
1	H	Rs485 +input	
2	L	Rs485 - input	

九、通讯协议

HV1000/2000 系列电源采用标准 MODBUS 协议，支持 03(H) 读取多个保持寄存器和 06(H) 写入单个寄存器两个功能码。物理层采用标准的 RS485 接口。

本协议适用于 HV1000/2000 系列数字电源与应用设备及附件间的通讯。

9. Communication Protocol

HV1000/2000 series adopt standard MODBUS protocol, which has 2 function code, 03(H) that read Multiple Holding Register and 06(H) Preset Single Register. Physical layers use standard RS485 interface.

The protocol is the same with communication between HV1000/2000 series power and application apparatus and accessories.

9.1 协议概述

应用协议层：

物理接口层：RS485 (458 配置：波特率 9600，8 位数据位，无效验，1 位停止。)

特殊规定：本应用中对数据帧的起始条件追加约束规定：各数据帧的起始间隔时间大于 3.5 个字节传输周期（标准），但最小间隔时间不得小于 0.5ms。

应用数据单元 ADU 数据格式如下表：

表 9-1 HV1000/2000 系列 ADU 定义

应用数据单元 ADU							
地址	功能代码	数据 1			数据 N	CRC 低位	CRC 高位
协议数据单元 PDU							

注：

- 1、数据格式采用 MODBUS-RTU 标准格式，其中地址和功能代码各占一个字节（1BYTE），16 位（2BYTE）数据中，高位在前，低位在后。
- 2、每帧数据（ADU）最大容量为 256 字节（256BYTE），包括地址位和 CRC 校验位。

9.1 Protocol Introduction

Application protocol: MODBUS-RTU

Physical Interface: RS485 (485: bps9600, 8 data bits, none, 1 stop)

NOTE: The application add constraint qualification to initial condition of data frames : the initial interval time between data frames must over 3.5 bytes transmission cycle (standard) ,while minimum interval time also over 0.5ms.

Application Data Unit ADU data format as below:

Table 9-1 ADU Definition of HV1000/2000series

Adu							
Address	Function code	Data 1			Data n	Crc low order	Crc high order
Protocol data unit pdu							

NOTE:1. It adopt MODBUS-RTU as standard data format, address and Function code occupy 1 byte respectively, MSB first in 2 bytes data,

2. Each ADU full capacity is 256 bytes, which include address bit and CRC check bit

协议数据单元 ADU 数据格式如下表:

Table 9-2 HV1000/2000 系列 PDU 定义

协议数据单元 PDU	
80H+功能代码	异常代码 (01~~08)

在 PDU 数据区中, 除功能代码占一个字节外, 各数据占用的字节数具有以下规律:

- 1、外设对数字电源查询或写入以字 2BYTE 为单位;
- 2、数字电源对外设查询或写入以字节 1BYTE 为单位;
- 3、子功能代码以字 2BYTE 为单位;
- 4、异常应答以字节 1BYTE 为单位。

2) Protocol data unit PDU data format as below:

Table 9-2 PDU Definition of HV1000/2000 Series

Pdu	
80h+function code	Exception code (01~~08)

Despite function code consume 1 byte, each data byte consumption follow below rules:

- 1 Peripherals request query or write in digital power in 2 bytes.
- 2 Digital power query or write in peripherals in 1 byte.
- 3 Subfunction code in 2 bytes.
- 4 Exception response in 1 byte

9.2 协议操作

本协议包括外设和数字电源间查询 (03H) 和写入 (06H) 操作。为方便理解, 现规范如下:

查询 (功能码 03H): 外设对数字电源进行查询, 以字 2BYTE 为单位, 且数字电源对外设应答以字节 1BYTE 为单位;

写入 (功能码 06H): 外设对数字电源进行写入, 以字 2BYTE 为单位, 且数字电源对外设应答以字节 1BYTE 为单位;

9.2 Protocol Operation

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The protocol includes query (03H) and write (06H) between Peripherals and digital powers. To facilitate understanding, take regulation as follow:

Query(function code 03H): peripherals query digital power in 2 bytes, and digital power response in 1 byte.

Write (function code 06H): peripherals write in digital power in 2 bytes, and digital power response in 1 byte.

9.2.1 查询操作

外设请求查询数字电源命令格式:

功能码	1 BYTE	03H
起始地址	2 BYTE	0~FFH
寄存器数 N	2 BYTE	1~7DH (1~125)

数字电源应答外设查询结果格式:

功能码	1 BYTE	03H
字节数	1 BYTE	2*N (N 是读取数字电源寄存器数量)
寄存器数值	N*2 BYTE	N: 外设查询寄存器数量

9.2.1 Query Operation

Peripherals request query command format

Function code	1 byte	03h
Initial address	2 bytes	0~ffh
Registers value n	2 bytes	1~7dh (1~125)

Digital power response query result format

Function code	1 byte	03h
Number of bytes	1 byte	2*n (n: number of readings of digital power registers)
Registers value	N*2 byte	N: number of enquiry registers by peripherals

9.2.2 写入操作

外设请求写入数字电源命令格式:

功能码	1 BYTE	06H
寄存器地址	2 BYTE	0~0FFFFH
寄存器数值	2 BYTE	0~0FFFFH

数字电源应答外设写入结果格式:

功能码	1 BYTE	03H
-----	--------	-----

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字节数	1 BYTE	2*N (N 是读取数字电源寄存器数量)
寄存器数值	N*2 BYTE	N: 外设查询寄存器数量

9.2.2 Write Operation

Peripherals request to write to digital power command format

Function code	1 byte	06h
Registers address	2 bytes	0~0ffffh
Registers value	2 bytes	0~0ffffh

Digital power response written query result format

Function code	1 byte	03h
Number of bytes	1 byte	2*n (n: number of readings of digital power registers)
Registers value	N*2 byte	N: number of enquiry registers by peripherals

9.2.3 通讯异常报警信息

当外设检测到数字电源返回信息的地址正确，功能码正确，但数据不符合 MODBUS-RTU 要求时，会回复地址位 8000H 的错误代码。

异常代码	
代码	故障说明
01	地址不合法
02	CRC 校验错误
03	参数不合法
04	当前状态下命令无效
05	只读参数，拒绝写入
06	只写参数，拒绝读取
07	无权限
08	未知错误

9.2.3 Abnormal Communication Alarm Information

When peripherals found correct address and function code but incorrect data format from MODBUS-RTU by digital powers' returning, will reply error code 8000H of address bit.

Abnormal Code	
code	Trouble shooting
01	Illegal address
02	CRC error
03	Illegal parameter
04	Invalid command in current state
05	Read-only, writes rejected
06	Writes only, read rejected
07	No permission

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9.2.4 通信参数的地址定义

9.2.4.1 数字电源参数地址分布 06(H) 支持的寄存器

寄存器定义	寄存器地址空间 (十六进制)	单位	备注
操作命令	1000 (H)		0: 关机 1: 开机
功率设定	1001 (H)	%	输出功率设定值 (额定功率的百分比)
待机命令	1002 (H)		0: 正常模式 1: 待机模式
灯管运行时间	111C (H)	小时	灯管运行的时间, 写 0 可清除
故障信息	D007 (H) 或 D008 (H) D00A (H)		返回值为 0 表示无故障

9.2.4 Address Definition of Communications Parameters

9.2.4.1 Address Distributing Of Digital Power Parameters

Supported Registers Of 06(H)

Register Definition	Register Address Space (HEX)	Unit	Remark
operating command	1000(H)		0: ON 1: OFF
Power setting	1001(H)	%	Output Power set value (rated power percentage)
Standby command	1002(H)		0: run 1: standby
Tube running time	111C(H)	h	Tube running time, write 0 to clear
Failure information	D007(H)orD008(H) D00A(H)		Return 0 means no fault

9.2.4.1.2 数字电源状态监控一览表 03(H) 支持的寄存器

NO.	项目	单位	地址	备注
	数字电源当前输出功率	kW	D000H	通讯 10 倍量化
	数字电源当前输出电流	A	D001H	通讯 10 倍量化
	数字电源当前输出电压	V	D002H	
	NTC1 温度	℃	D003H	通讯加 50℃ 偏置
	热电偶温度	℃	D004H	通讯加 50℃ 偏置
	NTC2 温度	℃	D005H	通讯加 50℃ 偏置

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	运行状态		D006H	0: 停机 1: 激发 2: 预热 3: 运行 4: 待机 5: 故障
	故障状态 1		D007H	
	故障状态 2		D008H	
	功率设定	%	D009H	
	故障状态 3		D00AH	
	灯管运行时间	h	D011H	

9.2.4.1.2 Digital Power Monitoring List --Supported Registers Of 03(H)

No.	Description	Unit	Address	Remark
	Digital power output power	kW	D000H	communication 10 times Quantization
	Digital power output current	A	D001H	communication 10 times Quantization
	Digital power output voltage	V	D002H	
	NTC1 temperature	℃	D003H	50℃ more offset for communication
	thermocouple temperature	℃	D004H	50℃ more offset for communication
	NTC2 temperature	℃	D005H	50℃ more offset for communication
	Running status		D006H	0: stop 1: arouse 2: preheat 3: run 4: standby 5: fault
	Malfunction 1		D007H	
	Malfunction 2		D008H	
	Power setting	%	D009H	Output Power set value (rated power percentage)
	Malfunction 3		D00AH	
	Tube running time	H	D011H	Tube running time, write 0 to clear

9.2.4.1.3 数字电源故障定义览表

NO.	故障定义-故障状态 1 D007 (H)	
	故障定义	位

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	模块 ID 错误	Bit0
	输入欠压	Bit1
	AC 继电器未闭合	Bit2
	缺相	Bit3
	预留	Bit4
	IGBT 过温	Bit5
	输出软件过流	Bit6
	预留	Bit7
	散热器过热	Bit8
	存储器故障	Bit9
	锁死	Bit10
	预留	Bit11
	硬件故障	Bit12
	预留	Bit13
	开机键位置故障	Bit14
	生产信息未写入	Bit15
NO.	故障定义-故障状态 2 D008 (H)	
	故障定义	位
	预留	Bit0
	BUCK 自检错误	Bit1
	预锁	Bit2
	自检未完成	Bit3
	BUCK 过流	Bit4
	预留	Bit5
	预留	Bit6
	预留	Bit7
	预留	Bit8
	预留	Bit9
	预留	Bit10
	预留	Bit11
	预留	Bit12
	预留	Bit13
	预留	Bit14
	预留	Bit15
NO.	故障定义-故障状态 3 D00A (H)	
	故障定义	位
	功率异常	Bit0
	灯管故障	Bit1

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	灯管灭灯	Bit2
	预留	Bit3
	预留	Bit4
	预留	Bit5
	预留	Bit6
	预留	Bit7
	预留	Bit8
	预留	Bit9
	预留	Bit10
	预留	Bit11
	预留	Bit12
	预留	Bit13
	预留	Bit14
	预留	Bit15

9.2.4.1.3 Digital Power Fault Definition List

No.	Fault Definition-Description 1 D007 (H)	
	Fault Definition	Bit
	module ID error	Bit0
	Under voltage protect	Bit1
	AC relay unclosed	Bit2
	Phase Loss	Bit3
	Reserved	Bit4
	IGBT overtemperature	Bit5
	Output software Overcurrent	Bit6
	Reserved	Bit7
	radiator overheat	Bit8
	memory fault	Bit9
	deadlock	Bit10
	Reserved	Bit11
	Hardware fault	Bit12
	Reserved	Bit13
	power button location fault	Bit14
	production information unwritten	Bit15
No.	Fault Definition-Description2 D008 (H)	
	Fault Definition	Bit

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	Reserved	Bit0
	BUCK Checksum Error	Bit1
	pre-locking	Bit2
	Self-checking unfinish	Bit3
	BUCK overcurrent	Bit4
	Reserve	Bit5
	Reserve	Bit6
	Reserve	Bit7
	Reserve	Bit8
	Reserve	Bit9
	Reserve	Bit10
	Reserve	Bit11
	Reserve	Bit12
	Reserve	Bit13
	Reserve	Bit14
	Reserve	Bit15
No.	Fault Definition-Description 3 D00a (H)	
	Fault Definition	Bit
	Output power abnormal	Bit0
	tube fault	Bit1
	Tube lighting-off	Bit2
	Reserve	Bit3
	Reserve	Bit4
	Reserve	Bit5
	Reserve	Bit6
	Reserve	Bit7
	Reserve	Bit8
	Reserve	Bit9
	Reserve	Bit10
	Reserve	Bit11
	Reserve	Bit12
	Reserve	Bit13
	Reserve	Bit14
	Reserve	Bit15

十、手操盒 HMI 操作说明

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10.1 电源配置 LCD 液晶屏手操盒 HMI

手操盒 HMI 界面如图：

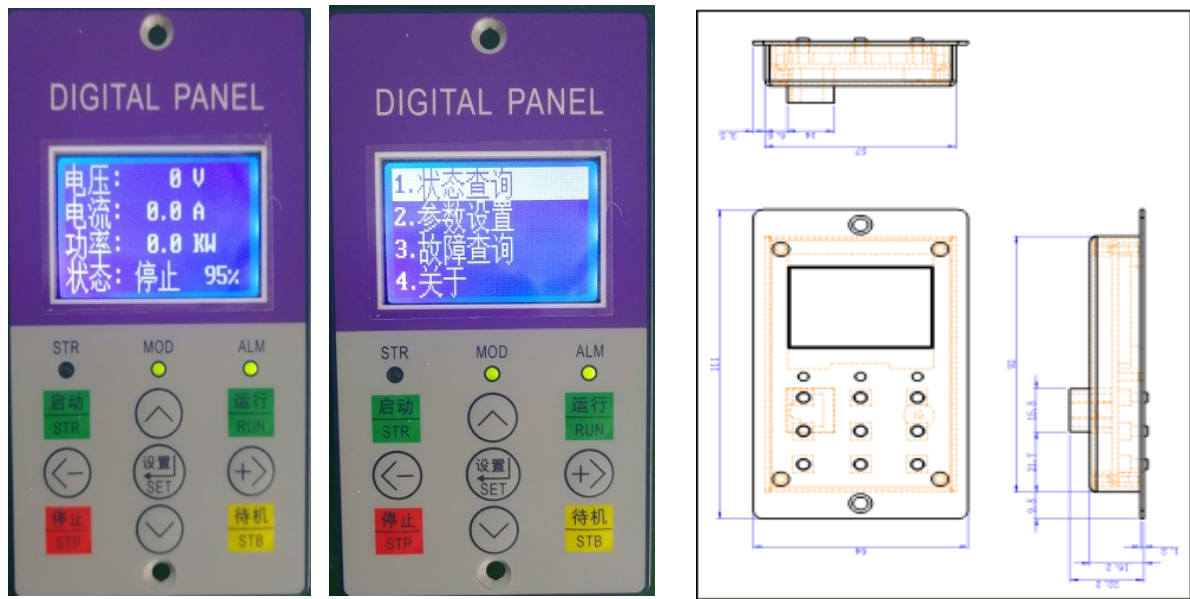


表 10-1LCD 屏信息说明

NO	名称	说明	备注
1	状态查询	进入后可查询当前电源工作状态，包括灯电流/电压/运行功率等信息。	
2	参数设置	进入后设置电源各种运行参数，包括灯电流/电压/运行功率/灯管类型/485 地址等参数。	建议客户仅需设置灯管类型，和 485 地址，
3	故障查询	进入后可查询当前电源故障状态。	
4	关于	进入可查询电源出厂的相关信息。	

Table 10-1 LCD Screen Information Description

No	Definition	Description	Remark
1	Status enquiry	Check power working state, include current/voltage/power etc.	
2	Parameters setting	Set working parameters include current//voltage/power/tube type/485 address etc.	It is suggested to set tube type and 485 address only
3	troubleshooting	Check power fault state	
4	about	Check factory version	

10.2 运行状态灯

表 10-2 运行状态灯说明

名称	说明	显示情况		状态说明	备注
		状态	颜色		

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STR	运行状态指示灯	灭		电源处于关机状态	
		亮	绿色	电源处于正常点灯运行状态	
MOD	运行模式指示灯	灭		电源处于关机状态	
		亮	绿色	电源处于正常点灯运行状态	
			黄色	电源处于待机状态	
STA	故障状态指示灯	灭		电源处于关机状态	
		亮	绿色	电源处于正常点灯运行状态	
			红色	电源处于故障状态	

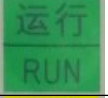
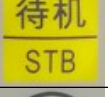
10.2 Running Status Lamp

Table 10-2 Running Status Lamp Description

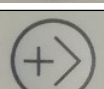
Definition	Description	Situation		Status	Remark
		Status	Color		
STR	Status lamp	off		off	
		on	green	running	
MOD	Mode lamp	off		off	
		on	green	running	
			yellow	standby	
STA	Fault lamp	off		off	
		on	green	running	
			red	fault	

10.3 功能键一共 9 个按键，功能说明

表 10-3 功能键说明

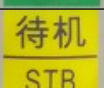
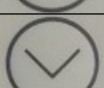
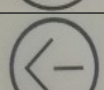
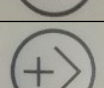
NO	符号	名称	功能说明	备注
1		启动/点灯按钮	按下该按钮电源开始点灯	
2		停机/灭灯按钮	按下该按钮电源停止工作	
3		正常运行按钮	该按钮使电源从待机状态切换到正常工作状态	
4		待机状态按钮	该按钮使电源从正常工作状态切换到低能耗待机状态	
5		模式/确定功能按钮	按下该按钮表示进入功能选择模式或者在参数设置时表示设置完成确认退出	
6		上翻/增加功能按钮	菜单上翻页面或者在参数设置是表示数值增加功能	

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7		下翻/减少功能按钮	菜单下翻页面或者在参数设置是表示数值减少功能	
8		左移/返回功能按钮	返回上一层目录或者参数设置是表示左移位功能；主页面下面每按一次功能减少 1%(最少 20%)	
9		右移功能按钮	参数设置是表示右移位功能；主页面下面每按一次功能增加 1%(最大 100%)	

10.3 Function Button (Totally 9) Introduction

Table 10-3 Function Button Introduction

NO.	Symbol	Definition	Description	Remark
1		Start/lighting on	Press to start the power	
2		Stop/lighting-off	Press to stop the power	
3		running	Press to switch the power from standby to running	
4		Standby	Press to switch the power from running to standby	
5		Mode/ENTER	Press to enter function selection mode/complete setting and confirming	
6		Turn on/increase	Turning up / increase value when parameters setting.	
7		Turn down/decrease	Turning down /decrease value in parameters setting	
8		Left shift / back	Back to previous level / left shift in parameters setting, 1% decrease for each press (20% max)	
9		Right shift	Right shift in parameters setting, 1% increase for each press (100% max)	

十一、手操盒设置参数 ZSSY setting parameter

一. 状态查询（是读出内部参数）status Enquiry:

D-01 输出电压（0V）

D-02 输出电流（0.0A）

D-03 输出功率（0.0KW）

D-04 散热器温度（0℃）

D-05 热电偶温度（0℃）

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D-06 整流电压 (0V)
D-07 BUCK 电压 (0V)
D-08 占空比 (0.0%)
D-09 485 地址 (1)
D-10 灯管类型 (汞灯)
D-11 控制方式 (功率控制)
D-12 锁状态 (未锁死) (无效)
D-13 带锁计时 (0)
D-14 灯管计时 (0)
D-15 灯管总计时 (0)

二. 参数设置 parameter setting

P1.01 控制源 1 RS485. 0 模拟量。	P1.01 Locus of control 1: RS485. 0 analog
P1.02 485 地址 1---127	P1.02 485 address 1—127
P1.03 最大功率 3KW---30KW	P1.03 max power 3KW---30KW
P1.04 待机功率 一般在 30%	P1.04 standby power: normally 30%
P1.05 运行功率 0%---100%	P1.05 service rating 0%---100%
P1.06 开风机延时 单位 (秒 S)	fan start delay: (s)
P1.07 关风机延时 单位 (分 M)	fan close delay:
P1.08 光电检测 0 否 1 是	photoelectric detection: 0No 1Yes
P1.09 超时时间 单位 (秒 S)	overtime (s)
P1.10 灯管类型 0 稼灯 1 汞灯	Tube type: 0 Gallium lamp 1 mercury lamp
P1.11 稼灯管压 (1400V)	Gallium lamp voltage: (1400V)
P1.12 解锁 锁状态: 无效 (密码: 00000)	unlock lock status: invalid(password:00000)
P1.13 清除时间 (0)	cleanout time (0)
P1.14 加锁 0: 是 1: 否。	Lock: 0yes 1No
P1.15 语言 0: 英文 1: 中文。	Language: 0 English 1 Chinese
P1.16 蜂鸣器使能 0: 否 1: 是。	Buzzer : 0No 1Yes

三. 故障查询 troubleshooting

1 故障查询-1/1 (有故障就以中文表示出来)
Troubleshooting-1/1(Chineseexpression when out of order)

四. 关于 About

1.产品型号: product model:
2.电源软件版本。Power Software version
3.键盘软件版本。Keyboard software version
4.生产日期。Production date
5.序列号。(五位数) serial number(5 digit):

11. Handheld Box Setting Parameters

1 Status Enquiry (Read Internal Parameters)

D-01 output voltage (0V)
D-02 output current (0.0A)

D-03 output power (0.0KW)
D-04 radiator temperature (0℃)
D-05 thermocouple temperature (0℃)
D-06 rectified voltage (0V)
D-07 BUCK voltage (0V)
D-08 duty ratio (0.0%)
D-09 485 address (1)
D-10 tube type (mercury lamp)
D-11 control mode (power control)
D-12 lock state (unlock) (invalid)
D-13 lock time (0)
D-14 tube time (0)
D-15 tube total time (0)

2 Parameter Setting

P1.01 Locus of control 1: RS485. 0 analog
P1.02 485 address 1—127
P1.03 max power 3KW---30KW
P1.04 standby power: normally 30%
P1.05 service rating 0%---100%
P1.06 fan start delay: (s)
P1.07 fan close delay(min):
P1.08 photoelectric detection: 0No 1Yes
P1.09 overtime (s)
P1.10 Tube type: 0 Gallium lamp 1 mercury lamp
P1.11 Gallium lamp voltage: (1400V)
P1.12 unlock lock status: invalid(password:00000)
P1.13 cleanout time (0)
P1.14 Lock: 0yes 1No
P1.15 Language: 0 English 1 Chinese
P1.16 Buzzer : 0 No 1Yes

3 Troubleshooting

1) Troubleshooting-1/1(Chinese expression when failure)

4 About

- 1) product model:
- 2).Power Software version
- 3). Keyboard software version
- 4). Production date
- 5). serial number(5 digits):