



产品说明书 Instruction Manual

EA-PSI 800 R

1000W / 1500W

本图片仅相近于实际产品 / Figure similar to actual product



EA-PSI 880-40R :	21 540 407
EA-PSI 880-60R :	21 540 408
EA-PSI 8360-10R :	21 540 409
EA-PSI 8360-15R :	21 540 410

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安全说明

- 负载线的直径必须符合产品的额定输出电流。
- 请避免给产品带来任何损坏，请勿将金属元件插入通风槽，请勿阻挡通风槽！
- 只有专业技术人员方可执行市电连接。
- 只能选用合适的连线，按照通用安全措施连到市电。
- 请避免直接接触太阳光和湿气。
- 如果未装接口卡，必需盖上插槽盖，以免有人触摸产品内部。

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1. 一般信息

1.1 简介

PSI 800 R系列微处理器控制电源, 专门设计成壁挂式结构, 用风扇冷却。

其功能主要集中于工业用途。意即, 本产品在断电后仍可按最后设定继续工作。

本系列所有型号有固定的电压范围, 以及全电压范围。可在一定限定范围内配置固定的电压范围, 全范围电压不受限, 供应100%的额定电压。

电源输出端有短路保护和过载保护。为保护负载, 本产品还具有过压保护(OVP)。一旦出现过温(OT), 电源输出关闭, 直至温度冷却, 才自动打开。

本产品还配有一模拟接口和默认扩展插卡槽, 它能够通过像USB, RS232或CAN的数字接口进行远程控制和监控。

1.2 目检

收到本产品后, 请检查是否有外观受损痕迹。如有, 请不要操作本产品, 应立即联系您的供应商。

1.3 供应清单

- 1 x 电源供应器
- 1 x 印刷版使用说明书
- 1 x 安装套件

2. 安装

2.1 安装

本产品设计成壁挂式结构。安装时需按空气顺着通风槽流出的方式安装。注意产品的上方和下方应保留一定空间(至少15cm), 以保证足够的冷却。随附的安装套件包含横向或竖向装于产品上的挂条。这些挂条有大到适合5mm螺钎的螺丝孔。

也可见9页图。

2.2 与市电的连接

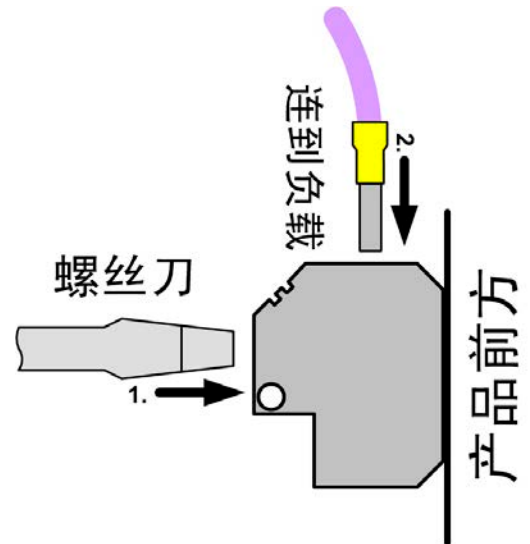
本系列所有型号都具有正向PFC(功率因素校正)和宽范围输入电压。可在90V至264VAC输入电压, 以及45Hz至65Hz频率下工作。

按照前板丝印"Power Input"将电源线连到3位WAGO端子上。仅受训技术人员方可执行。主要在于须选择适当直径的电源线, 以及本产品无电源开关。电源输入端由一装于产品内部的标准5x20mm保险丝保护。

2.3 直流输出端和感测端的连接

直流输出和远程感测输入端位于产品前面, 且相邻, 为同类型端子(卡紧型), 适合安装直径为0.08mm²(28 AWG)至4mm²(12 AWG)的连接线。如果可以, 线尾请套上线套。

连线夹紧步骤:

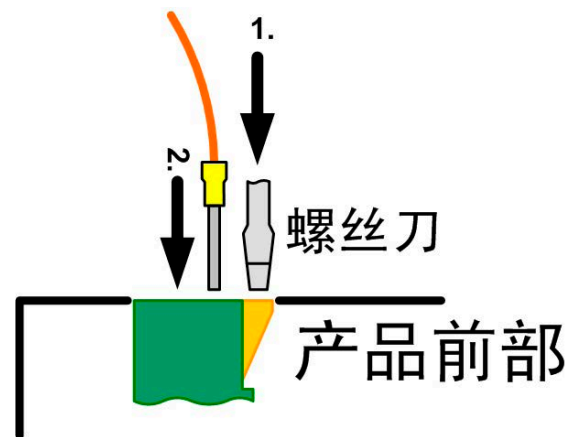


2.4 模拟接口的连接

产品顶部的12针模拟接口也采用按压夹紧型端子。适合安装0.1mm²(26 AWG)至0.5mm²(20 AWG)直径的连接线。如果可以, 线尾请套上线套。

注意! 千万不要将模拟接口的地接到外部控制应用(例如PLC)的负极输出端, 若连接, 控制应用会与电源输出端的负极连通(形成接地回路)。于是负载电流会经过控制引线, 然后损坏产品! 为了避免此情况发生, 需在此“弱”地线上安装一保险丝。

连线夹紧步骤:



3. 功能描述

3.1 一般信息

本电源可预先配置成输出0V输出电压和100%输出电流。

输出电压被控制在可调欠压范围内。

控制面板可用来设定状态，设置产品和调节输出值。而且经内置模拟接口或另外的选择—数字接口卡，能远程控制产品。


3.2 远程感测 (Remote sense)

为补偿负载线上的压降，产品前板还具有—远程感测输入端。按正确极性连线到此，可感测负载的电压。远程感测端可补偿一定量的电压。关于补偿电压值请参考产品技术规格。

不用该感测输入端时，就让它空着，不需连跳线到输出端。

感测连接线的直径非重要条件。


3.3 过压保护 (OVP)

本系列所有型号都有过压保护电路，过压保护值设为额定输出电压的110%。如遇过压错误出现，不论是内部故障或外部原因引起，电源输出会关闭，在显示屏上显示“OV”文本，模拟接口的“ERROR”脚也指示该错误。直至用  按钮确认错误方从显示屏上消失。

OV错误消失后，输出再次打开。

3.4 过温 (OT)

本系列所有型号都有内温监控功能。如遇过热，电源输出暂时关闭，直至冷却后又自动打开。

可在设置菜单下配置OT错误出现后的输出状态。OT错误出现过程中，“auto ON”状态文本指示OT错误消失后输出将打开。OT错误直至用  按钮确认才从显示屏上消失。

该错误状态通过显示屏上的“OT”状态文本，以及模拟接口的“ERROR”引脚指示出来。设置菜单下的“OT disappear = OFF”参数阻止输出状态的恢复。



3.5 电源断电后的输出恢复


电源断电（像用手关闭输入电压一样）后，产品通过恢复输出状态和设定值重建最后输出条件。

当设置菜单下的“Power ON = restore”参数设置断电前输出的最后条件时，“Power ON = OFF”参数则可阻止最后输出状态的恢复。

3.6 欠压监控

可在两个阈值范围内监控欠压状态。每次打开输出且过250ms后就激活该功能。




打开输出后，输出电压位于第一个欠压阈值（“UV warning”）以下，显示器会出现一个警告 。直到用  按钮确认后方消失。这可防止未发现的错误。如果不再有错误出现，且出现的错误已被确认，警告才消除。

如果电压降至第二个欠压阈值（“UV shutdown”）以下，并关闭了输出，则会产生一警告。此时以  和模拟接口的“ERROR”引脚指示出来。

确认报警后输出方可再次打开。

3.7 控制位置

控制位置是指可访问产品的地方。本系列产品有多个控制位置，通过显示屏上的状态文本可显示：

- **local** - 指用户通过  按钮手动激活产品。在该状态下，产品不能远程控制。这用于切断永久远程控制，并在产品上调节一些设定。用 **EXT** 按钮退出local可再次进入远程控制。
- **remote** - 产品经其中—数字接口卡远程控制，且不可进行手动访问。按下  按钮可转换到local，终止remote。
- **extern** - 通过内置模拟接口远程控制产品，且不可执行手动访问。按下  按钮可转换到local，终止extern。

3.8 可配置的电压分布图

本产品还配有数个电压分布图，可预先进行配置，以适用一般应用。最上面的分布图可在全额范围内，即0...100%，设置电压和电流。其它分布图也可配置，但须在一限定电压范围内配置。见下表。所有分布图内还有一个OVP阈值设定值和两个欠压阈值。分布图根据产品的额定输出电压而定。

详见下表。

PSI880-40R, PSI880-60R					
分布图	电压范围				
	1	2	3	4	5
Name	0..80V	12V	24V	36V	48V
U adj max	80.00V	14.40V	28.80V	43.20V	57.60V
U adj min	0.00V	9.60V	19.20V	28.80V	38.40V
U output	88.00V	12.00V	24.00V	36.00V	48.00V
I output	0..Inom	0..Inom	0..Inom	0..Inom	0..Inom
OVP	88.00V	13.20V	26.40V	39.60V	52.80V
UV warning	0.00V	0.00V	0.00V	0.00V	0.00V
UV alarm	0.00V	0.00V	0.00V	0.00V	0.00V

PSI8360-10R, PSI8360-15R						
分布图	电压范围					
	1	2	3	4	5	6
Name	0..360V	24V	48V	60V	110V	220V
U adj max	360.00V	28.80V	57.60V	72.00V	132.00V	264.00V
U adj min	0.00V	19.20V	38.40V	48.00V	88.00V	176.00V
U output	0.00V	24.00V	48.00V	60.00V	110.00V	220.00V
I output	0..Inom	0..Inom	0..Inom	0..Inom	0..Inom	0..Inom
OVP	396.00V	26.40V	52.80V	66.00V	121.00V	242.00V
UV warning	0.00V	0.00V	0.00V	0.00V	0.00V	0.00V
UV alarm	0.00V	0.00V	0.00V	0.00V	0.00V	0.00V

不可编辑

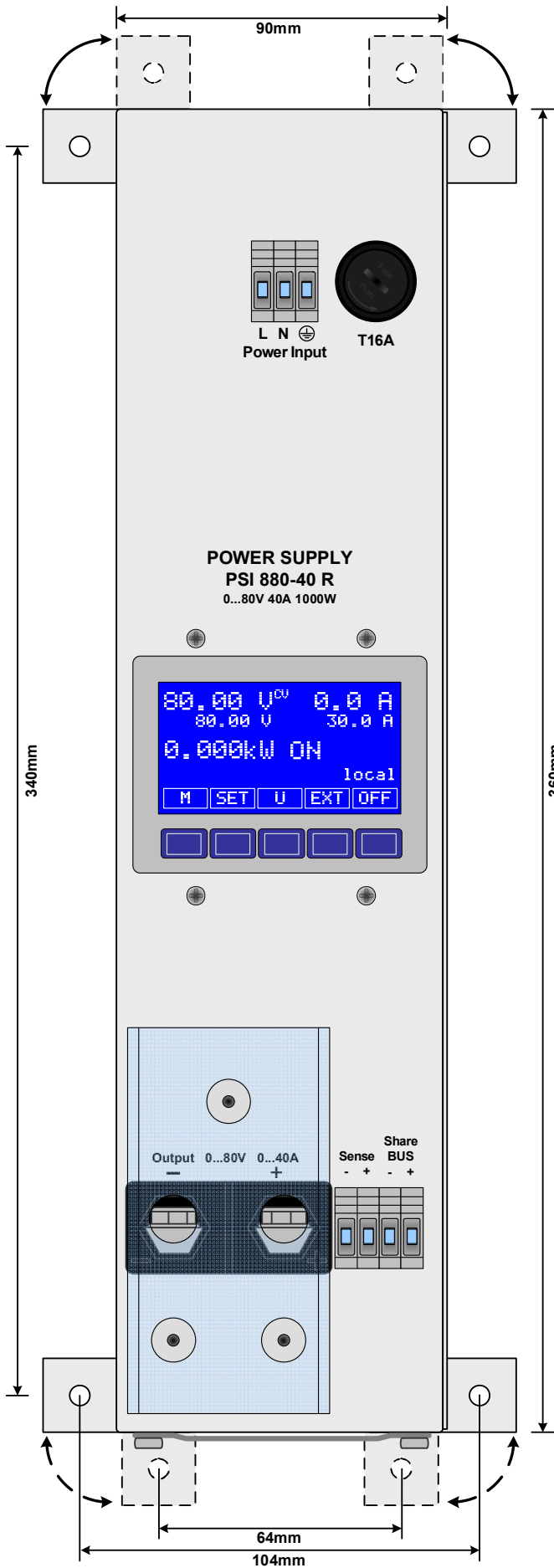
3.9 技术规格

	PSI 880-40R	PSI 8360-10R	PSI 880-60R	PSI 8360-15R
电源输入				
输入电压	90... 264V	90... 264V	90... 264V	90... 264V
输入频率	45... 65Hz	45... 65Hz	45... 65Hz	45... 65Hz
功率因数	>0.99	>0.99	>0.99	>0.99
230V时输入电流	约4.8A	约4.8A	约7.5A	约7.5A
100V时输入电流	约11.4A	约11.4A	约11.4A	约11.4A
输入保险丝	16A	16A	16A	16A
输出 - 电压				
额定电压 U_{Nom}	80V	360V	80V	360V
可调范围	0V... U_{Nom}	0V... U_{Nom}	0V... U_{Nom}	0V... U_{Nom}
精确度*	<0.2%	<0.2%	<0.2%	<0.2%
带载10...90%时的稳定度	<0.05%	<0.05%	<0.05%	<0.05%
±10% ΔU_{IN} 时的稳定度	<0.02%	<0.02%	<0.02%	<0.02%
纹波 (BWL 20MHz)	<10mV _{PP}	<30mV _{PP}	<10mV _{PP}	<30mV _{PP}
带载10-100%的调整	<2ms	<2ms	<2ms	<2ms
远程感测的调整	max. 2V	max. 8V	max. 2V	max. 8V
输出 - 电流				
额定电流	40A	10A	60A	15A
可调范围	0... I_{Nom}	0... I_{Nom}	0... I_{Nom}	0... I_{Nom}
精确度*	<0.2%	<0.2%	<0.2%	<0.2%
带载0...100% ΔU_{OUT} 时的稳定度	<0.15%	<0.15%	<0.15%	<0.15%
±10% ΔU_{IN} 时的稳定度	<0.05%	<0.05%	<0.05%	<0.05%
纹波 (BWL 20MHz)	<100mA _{PP}	<15mA _{PP}	<100mA _{PP}	<15mA _{PP}
输出 - 功率				
额定功率	1000W	1000W	1500W	1500W
$U_{IN} < 150V$ 时的额定功率	1000W	1000W	1000W	1000W
显示器分辨率	0.001kW	0.001kW	0.001kW	0.001kW
调节分辨率	93%	93%	93%	93%
其它				
工作温度	0... 50° C	0... 50° C	0... 50° C	0... 50° C
储存温度	-20... 70° C	-20... 70° C	-20... 70° C	-20... 70° C
相对湿度	<80%	<80%	<80%	<80%
外壳尺寸 (WxHxD)	90x360x240mm	90x360x240mm	90x360x240mm	90x360x240mm
安装后最小尺寸 (WxHxD)	90x400x350mm	90x400x350mm	90x400x350mm	90x400x350mm
重量	6.4kg	6.4kg	6.6kg	6.6kg
产品编号	21540407	21540409	21540408	21540410
绝缘耐压输出对外壳	500V DC			
绝缘耐压输入对输出	4200V DC			
安全标准	EN 60950			
EMC标准	EN 61204, EN 55022 等级 B			
过压等级	2			
保护等级	1			
污染程度	2			
工作高度	<2000m			
模拟编程				
输入范围	0...5V 或 0...10V, 可选			
精确度*	≤ 0.2%			

* 与相应的额定值有关

所有值都为典型值

3.10 产品结构图



注意:

此图显示的是未装数字接口的产品图。若使用模拟或数字接口，需在产品右边留出一定位置安装线。

图1. 前视图

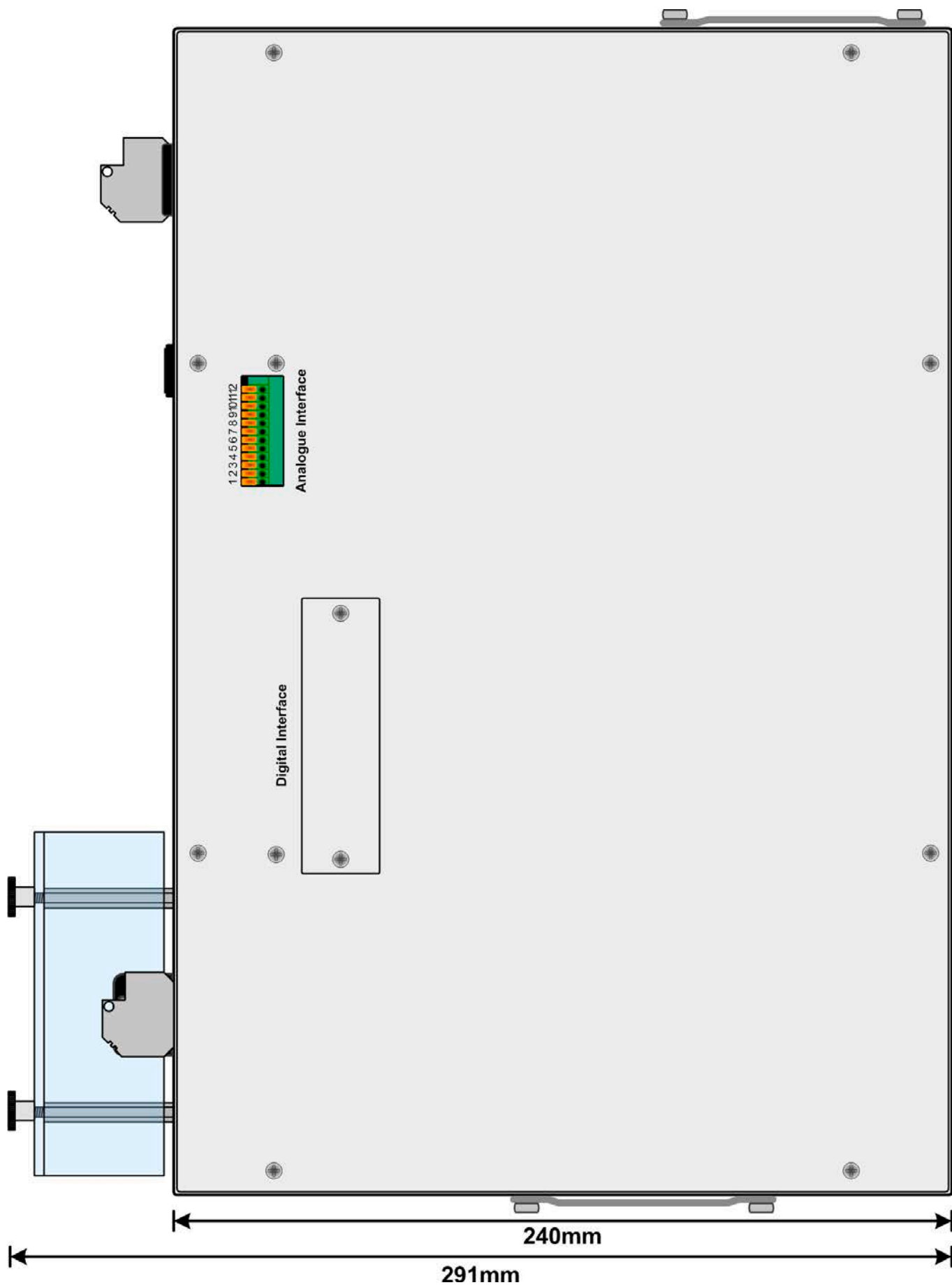
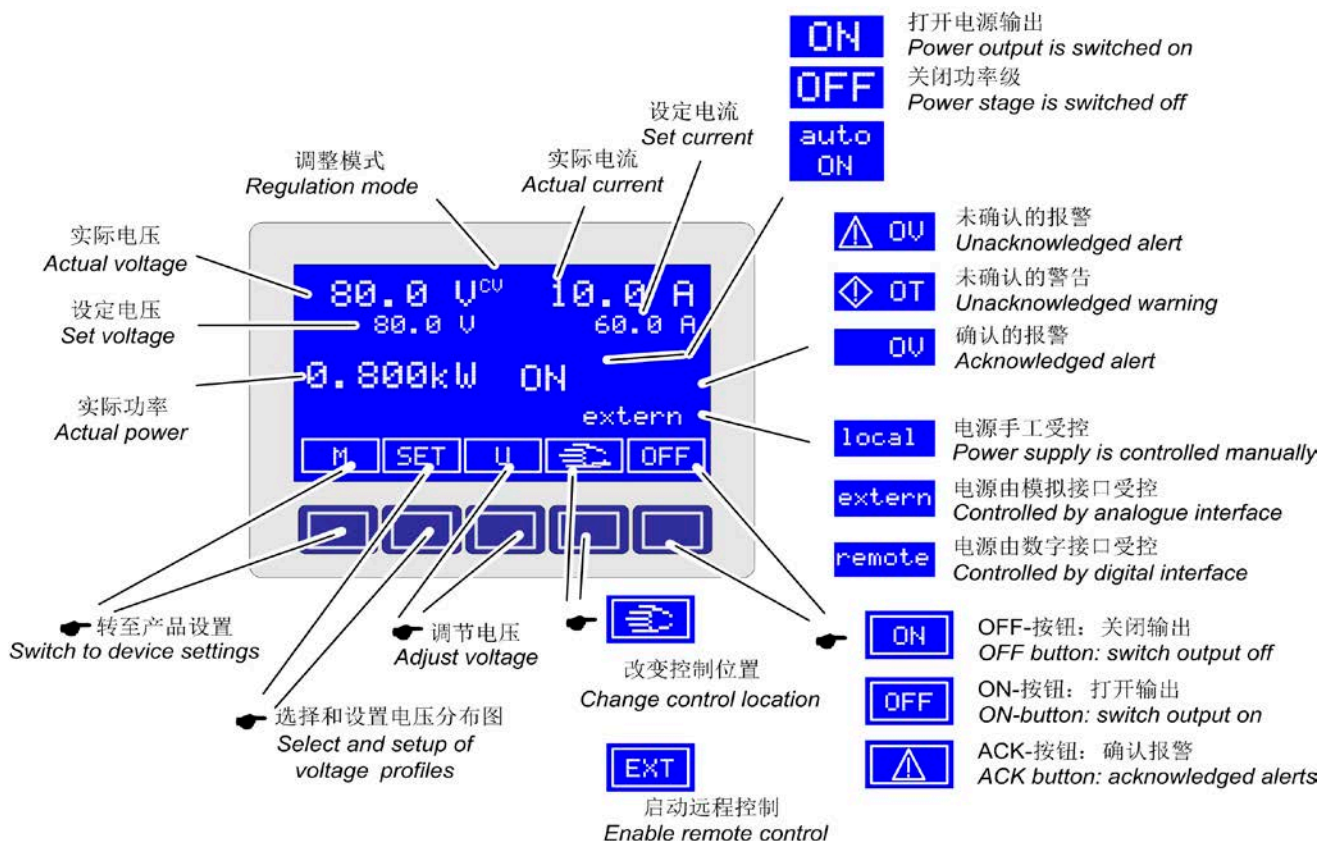


图 2. 带模拟和数字接口的产品右视图

4. 操作

4.1 控制和显示面板



4.1.1 面板显示器布局

显示和控制面板被分为设定值、实际值、输出状态、产品状态、按钮分配和按钮这些区域。

按钮分配条可根据用户选择交互变换，并通过按钮下方的指定文本或符号指示出来。

显示器的左上半区显示大写的输出电压相关值。直接在相关设定值的下方。当输出关闭时，实际电压值旁的“CV”指示恒压操作。

显示器的右上半区显示大写的输出电流相关值。直接在相关设定值的下方。当输出关闭时，实际电流值旁的“CC”指示恒流操作。

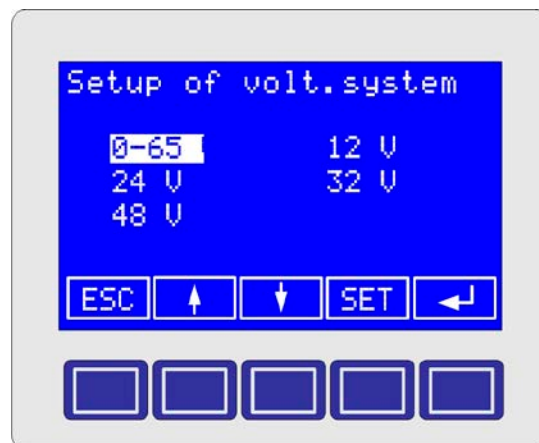
电压值区域的下方是实际功率。但无可调功率设定值。

输出状态、其它状态（报警，警告）和控制位置（见章节3.7）显示于右下区。

4.2 电压分布图的选择

注意：只有当输出=关闭时方可转换电压分布图。

通过主显示屏上的 **SET** 按钮可进入电压分布图选择菜单。



只有第一个电压分布图（这儿为：0...65V）才提供输出值全额范围的调节。

其它分布图允许调节，但是只能在某特定范围内（见第7页表格）调节电压。用 **↑** **↓** 按钮选择需要的分布图，然后用 **←** 按钮提交。显示器返回正常界面，而输出值变为分布图下调节的数值。

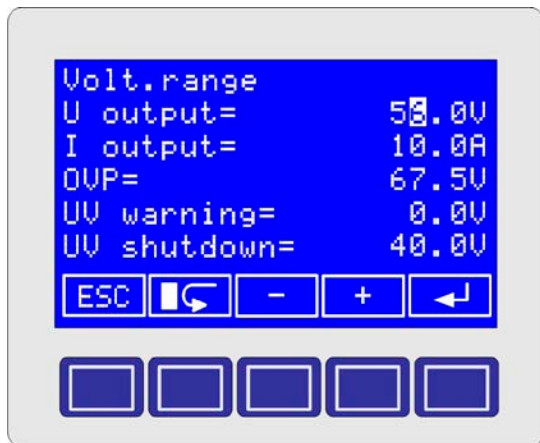
若按下 **SET** 按钮，则打开选定的分布图进行调节。

4.3 编辑电压分布图

用 **↑** **↓** 按钮选定即将调节的参数。推动 **SET** 按钮，选定的参数变为可调，按下 **←** 按钮可提交或用 **ESC** 按钮终止操作（数值未提交出去）。

更改参数

使用 **SET** 按钮后，可对选定参数在其限制范围内进行调节。



若选定了一个需调节的参数，用 **+** 和 **-** 按钮增加或减少当前带标记的小数位（光标所在位），用 **←** 按钮可移动光标位置。

ESC 按钮终止调节，并回到前菜单。

为提交菜单下的已调节值，必须用 **←** 按钮。

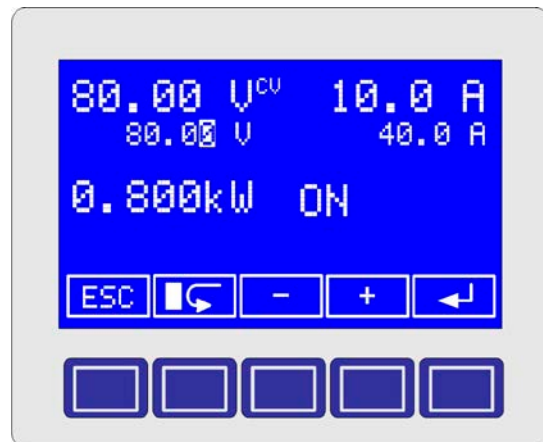
4.4 调节设定电流

在正输出电流的设定值不能直接调节，但可针对每个电压配置文档分开定义。可见“4.3 编辑电压分布图”。

4.5 直接对电压的调整

在主显示器下，也可通过 **U** 按钮直接进入输出电压的调节。它跳入当前选定的电压分布图，选择电压后可调节。

提交或终止调节如上述“4.3 编辑电压分布图”方式一样执行。



4.6 设置菜单

用 **M** 按钮进入设置菜单。菜单结构和默认设置在下页图中有详述。

注意：设定的修改仅可当输出=管不时方可执行。

4.6.1 “General settings”菜单项

„General Settings“项可使用户在电源已打开的条件下配置电源输出，过温错误时的输出动作和LCD背光显示。

电源打开后的输出状态

Power ON (默认: *restore*)

如果在产品打开后或电源断电之前已将**Power ON** 设为*restore*，则再次打开输出。另外的选项**Power ON = OFF**，则在每次启动产品后保持输出为关闭状态。

OT-过温关闭后的输出状态

OT disappear (默认: *auto ON*)

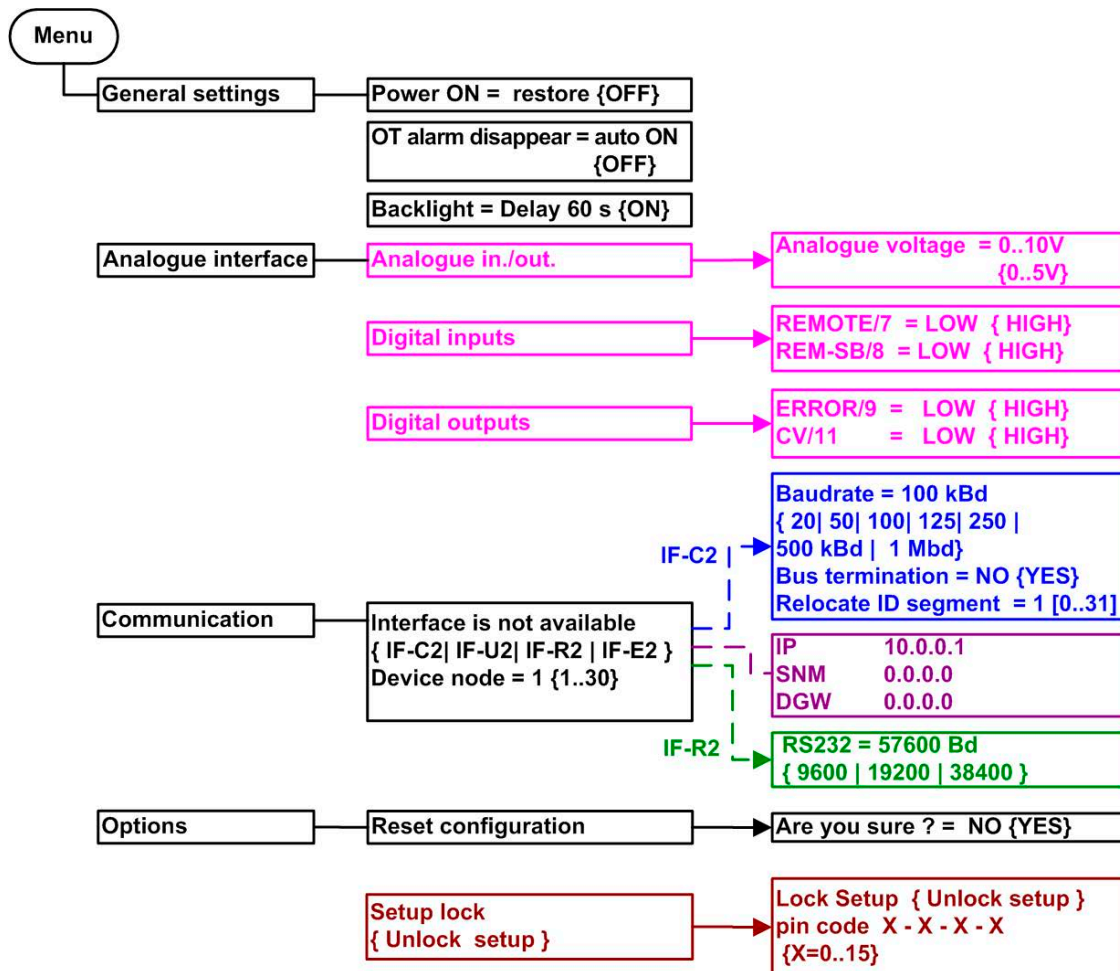
若设为*auto ON*，则在过温错误出现并消失后自动打开输出。若设为*OFF*，那么输出一直关闭，只能手动打开。

*注意：过问关断输出为以报警状态，且必须由用户按下 **▲** 按钮确认该报警。*

显示器亮度

Backlight (默认: *Delay 60s*)

若选了**Backlight = Delay 60s**，背光一般情况下是灭的，只有在每次按下按键60s后才亮。要永久亮背光，可选择**Backlight = ON**。



4.6.2 “Analogue interface” 菜单项

该选项配置模拟接口。模拟输入和输出脚可在普通0..5V和0..10V控制电压范围下工作。0..5V的分辨率和精确度只有0..10V的一半。

Analogue in./out. (默认: 0..10V)

若选了 **Analogue voltage = 0..10V**，不管是选定哪个电压分布图，模拟输入和输出脚接受对应0..10V的0...100%额定值。

Analogue voltage = 0..5V选项也对应地工作。若选择0..5V，>5V的电压会被剪切到100%额定值。

注意：只有当电压配置文档1被选定时模拟远程控制才工作。否则会产生一EXT报警。

Digital inputs (默认: LOW)

可选择低态动作或高态动作的数字输入脚。

如果是 **LOW**，输出脚在低输入电平下执行其指定功能。详情请见模拟接口的技术规格表。

如果是 **HIGH**，输出脚在高输入电平下动作。

Digital outputs (默认: LOW)

可选择低态动作或高态动作的数字输出脚。

根据所选电平，输出脚报告其指定功能。即：通过转到 **GND LOW** 设置或高电位 **HIGH** 设置。详情请见模拟接口。

4.6.3 “Communication” 菜单项

如果产品配有数字接口卡，可用该菜单配置通讯设置。在另外一份接口卡用户指南中有详细解释。

4.6.4 “Options” 菜单项

该菜单项可将产品重设为默认设置，以及用pin码锁定控制面板。

Reset configuration

若选择 **YES** 为“Are you sure?”确认提示的回答，所有可编辑参数都重设为默认值。若选 **NO**，则所有设定保持不变。


配置重设后，必须再次提交所选电压分布的“U output”值。


Lock setup

用箭头按钮输入4位数的PIN码，则锁定控制面板，解锁按钮除外。这四个数可以是0 - 15，于是形成 $16^4 = 65536$ 个组合。解锁方法与锁定方法一样，再次输入PIN码即可。如果PIN码丢失，只有执行“Reset configuration”操作才可再次操作产品。见上面所述。

提醒，配置重设将使所有设置重置为默认值！

4.7 报警

本产品会通过  符号，缩写，以及模拟接口的输出引脚ERROR，在显示器上指示出不同的报警。

用户必须使用  按钮确认这些报警信息。有些报警信息(OT, OVP) 会关闭输出，但是确认报警后可在此打开。

有一例外就是OT报警，如果在 „General settings“ 菜单下 „OT disappear“ 选项已设为 „auto ON“，产品冷却将自动打开输出。

4.7.1 报警类型

OT - 因过热而过温关断

OVP - 因内部或外部原因而过压关断

EXT - 远程控制错误

提示:

- 如果出现OT或OVP输出被关闭，不管产品位于手动还是远程控制模式。
- EXT报警指示当2-5或2-6电压配置文档被选定时，用户尝试通过模拟接口转换到远程控制。要转换到模拟远程控制，需先用 **SET** 按钮选择电压配置文档1。也可参考4.2章节。

5. 远程控制

5.1 数字远程控制

可供用户选择的还有数字接口卡（USB, RS232或CAN），用它可完全远程控制和监控产品。关于其功能和技术规格详情请见接口卡的用户手册。

利用CAN，可将多台电源联网。

5.2 模拟远程控制

根据所选控制电压范围（见章节“4.6 设置菜单”），通过0...10V或0...5V控制电压，将控制输出电压和电流的设定值赋予设定值输入脚VSEL和CSEL。

根据所选控制电压范围（见章节“4.6 设置菜单”），通过0...10V或0...5V控制电压，将实际输出电压和电流作为监控电压传给输出脚VMON和CMON。

远程控制产品前，须用引脚7“Remote”将产品转至远程控制。且需输入两个值。若只调节其中一个，另一个要绑定到VREF脚，以便始终为100%值。

用模拟接口远程控制以“extern”状态文本显示于显示屏上。

注意：7和8输入引脚不能实现电晶体-电晶体逻辑兼容。故在无其它工具的帮助下，不可由PLC(可编程控制器)数字输入端直接控制。

5.2.1 模拟接口各引脚分布和技术规格

引脚	名称	类型 ¹	描述	电平	电器参数
1	VSEL	AI	设定值: 电压	0... 10V对应0... 100%的 U_{nom}	精确度 <0.5%, $U_{Max} = 12V$, 输入阻抗 >100k
2	CSEL	AI	设定值: 电流	0... 10V对应0... 100%的 I_{nom}	
3	VREF	AO	参考电压	10V / 5V	$I_{Max} = 10mA$ 时, 精确度<0.1%, 对AGND有短路保护
4	VMON	AO	实际值: 电流	0... 10V对应0... 100%的 U_{nom}	$I_{Max} = +2mA$ 时精确度为0.2%, 对AGND有短路保护
5	CMON	AO	实际值: 电压	0... 10V对应0... 100%的 I_{nom}	
6	AGND		模拟信号地		VSEL, CSEL, CMON, VMON, VREF 用
7	Remote	DI	激活外部控制	外部 = Low ($U_{Low} < 1V$) 内部 = High ($U_{High} > 4V$)	$U_{Max} = 0...15V$; $I_{Max} = -3mA$, 5V时
8	Rem_SB	DI	功率输出开/关	关 = Low ($U_{Low} < 1V$), 开 = High ($U_{High} > 4V$)	
9	Error	DO	UV 警告 UV 关断 过压-OVP	Low = 无错误 ($U_{Low} < 1V$), High = 出错 ($U_{High} > 4V$)	$U_{Max} = 15V$, $I_{Max} = -10mA$; 准集电极上拉至 V_{cc} ⁽²⁾
10	DGND		数字信号地		作控制和消息信号
11	CV	DO	电压控制操作 电流控制操作	Low = 电压受控 ($U_{Low} < 1V$) High = 电流受控 ($U_{High} > 4V$)	$U_{Max} = 15V$, $I_{Max} = -10mA$; 准集电极上拉至 V_{cc} ⁽²⁾
12	+VCC	AO	辅助电压	12... 16V	$I_{Max} = 24mA$, 对AGND有短路保护

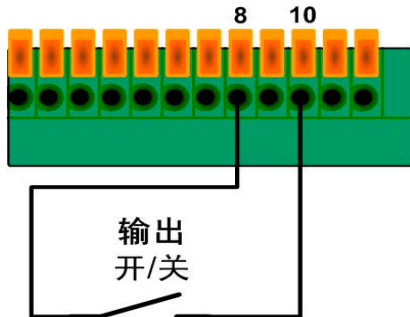
¹⁾ AI = 模拟输入脚, AO = 模拟输出脚, DO = 数字输出脚

²⁾ 12V...15V

5.2.2 模拟接口应用举例

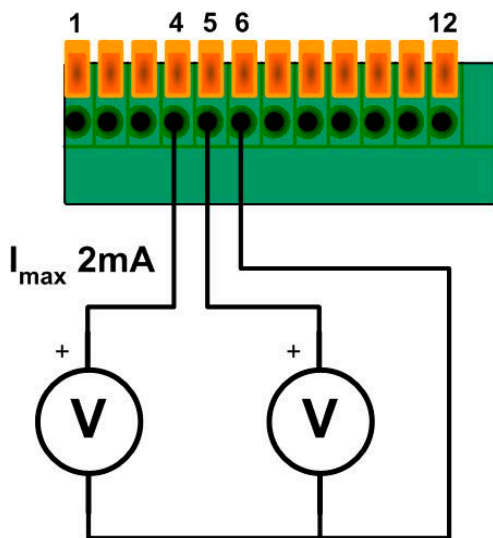
注意：连接模拟接口的引脚时，建议使用如下直径的连线：0,1mm²（AWG26）至0,5mm²（AWG20）。

远程打开/关闭输出



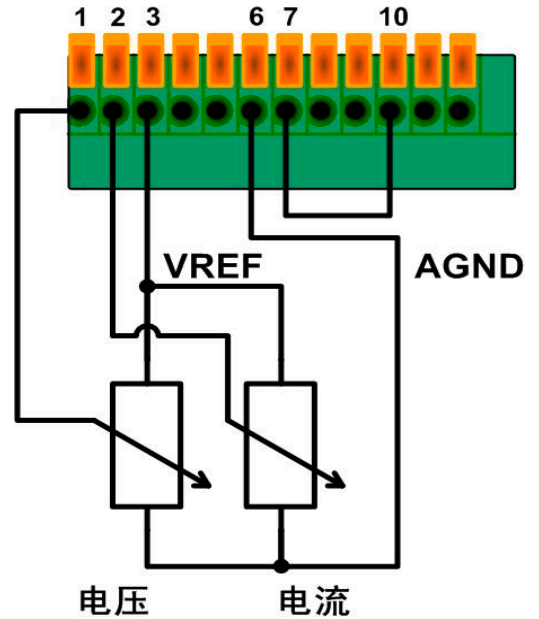
该输入脚在未激活远程控制时关闭电源输出，除非控制模式设为 *local*（也可见章节3.7）。在此状态下，该引脚可被当作一个中断器，可阻止直流输出通过面板上的ON/OFF按钮被再次打开。如果输入脚配置成 *LOW*（也可见章节4.6.2），只有打开触点或释放开关才能再次打开电源输出。
经模拟接口的远程操作模式下，该引脚仅能定义直流输出的状态。

监控电压和电流



根据设置菜单下电压范围的选项，模拟监控输出脚输出0...5V或0...10V电压，对应额定值的0...100%。
参考脚为模拟地（AGND）。

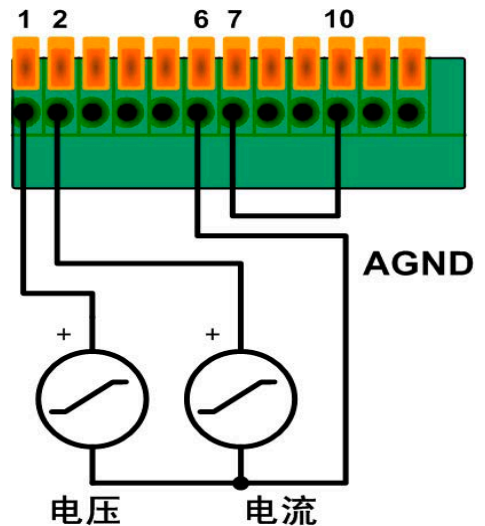
设定值1



这个例子显示如何用参考电压（VREF）和设定值输入脚上的电位器来控制设定值。

电位器阻值应为10kOhm或更高。

设定值2



这个例子显示如何通过外部电压源控制电压和电流。

注意！严禁连接>12V的电压至这些输入脚！

根据设置下的电压范围选项，>10V或>5V的设定值会被限定为100%额定值。

6. 其它应用

6.1 串联

可将多台同型号产品串联在一起，但要遵守下列规则：

- 无主-从操作
- 模拟接口的地**不准**相互连接。这也适用于模拟接口的所有其它信号地。如果需要远程控制，可使用隔离放大器，并联控制所有产品。
- 任何承受负载电流的导体直径必须符合该产品最大的额定输出电流。
- 任何产品的负极直流输出对地（PE）电压不能超过300V。

6.2 并联

注意！只有同型号（输出电压和电流相同）产品方可进行这个操作。

当多台产品并联连接时，共享总线操作可使负载电流分配均衡。

并联时需进行这样的连接：将所有产品的(+)直流输出端相互连接，所有(-)直流输出端相互连接。所有产品的Share Bus端子的(+)与(-)引脚也要并联。

重点：在该操作模式下，带**最低**输出电压之产品控制和定义整个并联连接的输出电压。意思是，系统内任何一台产品都可能执行该任务。因此建议挑选一台产品用于控制整个系统，同时其它产品的设定电压、电流和功率设为所需最大值。于是所有产品都只显示各自的实际数值，并没有系统实际值的总和。

注意：若出现过热（OT）或过温（OVP）类似错误，整个系统会却断输出电压。

若要远程控制整个系统，只要经其模拟或数字接口控制主机即可。读取实际值时，电压显示值将代表整个系统的电压，但是显示电流仅为主机的输出电流。为了获得精确的读取值，可将并联下的产品数量与实际电流相乘（仅当所有产品输出相同额定电流时适用）或者分开读取每一台产品的电流。

7. 其它

7.1 其它附件和选项功能

本系列产品可供下列附件：

a) 数字接口卡

还可供配USB，RS232或CAN用可插拔式数字接口卡。每款型号都有一接口卡插槽。

7.2 固件更新

只有当产品出现错误行为或者应用新功能时才需进行产品固件更新。

要更新一台产品固件，需要用到某一数字接口卡，新的固件文档，称作“更新工具”的Windows软件。

下列这些接口卡才能用于固件更新：

- IF-U2 (USB)
- IF-R2 (RS232)

如果手上没有一张上述接口卡，则不可更新。请立即联系您的产品销售方寻求解决方案。产品对应的更新工具和固件文档可从产品制造商网站获取，或者发邮件索取。更新工具将会指导用户整个半自动更新过程。

About

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Safety instructions

- The cross section of the load leads has to match the nominal current of the device!
- Avoid any damage to the device, do not insert metal parts through the slots, do not obstruct the slots!
- Mains connection must only be done by trained technical personnel!
- Mains connection only with appropriate leads and under adherence of common safety measures!
- Avoid direct sunlight and humidity!
- Always attach the slot cover if the interface card is NOT equipped, in order to prevent someone to reach into the device!

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1. General

1.1 Introduction

The microprocessor controlled power supplies of the PSI 800 R series are designed for wall mount and work with fan cooling.

The functionality focuses industrial power supply. It means, the device will continue its work with the last settings after a blackout.

All models feature fixed voltage ranges, as well a full voltage range. The fixed voltage ranges are configurable within certain limits, the full voltage range is not limited and offers 100% of all nominal values.

The power output is short-circuit-proof and overload-proof. For protection of the loads, the devices also feature an overvoltage protection (OVP). At an overtemperature (OT) event, the power output will be switched off until the unit has cooled down and automatically switch on again.

The devices are equipped with an analogue interface and an extension card slot by default, that enables remote control and monitoring by digital interfaces like USB, RS232 or CAN.

1.2 Visual check

After receipt, the unit has to be checked for signs of physical damage. If any damage is found, the unit may not be operated. Also contact your dealer immediately.

1.3 Scope of delivery

- 1 x Power supply unit
- 1 x Printed user manual
- 1 x Mounting kit

2. Installation

2.1 Mounting

The device is designed for wall mount. It is required to mount it in a way that allows unimpeded air flow through the ventilation slots. Take care for plenty of space (at least 15cm) below and above the device in order to ensure proper cooling. The included mounting kit contains strips that can be attached to the device in vertical or horizontal position. These strips have drill holes for screws with up to 5mm thread.

Also see drawing on page 23.

2.2 Mains connection

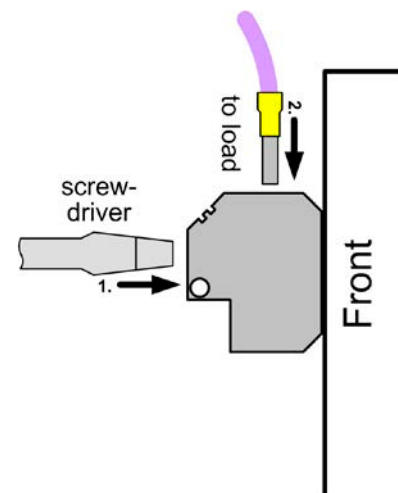
All models are equipped with an active PFC (power factor correction) and a wide range input. It can be operated at AC input voltages from 90V to 264V and mains frequencies of 45Hz up to 65Hz.

The connection is done at the 3pole WAGO connector „Power Input“ on the front and according to the print. It must only be carried out by trained technical personnel. Main focus lies on an appropriate cross section of the mains lead, as well as the fact that the device does not feature a power switch. The mains input is fused by a standard 5x20mm fuse which is located in the fuse holder next to the unit clamp.

2.3 DC output connection

The DC output and the remote sense inputs are located on the front of the device next to each other and are of same type (press & clamp). Cable cross section goes from 0.08mm² (28 AWG) to 4mm² (12 AWG). If possible, use cable end sleeves.

Clamping procedure:

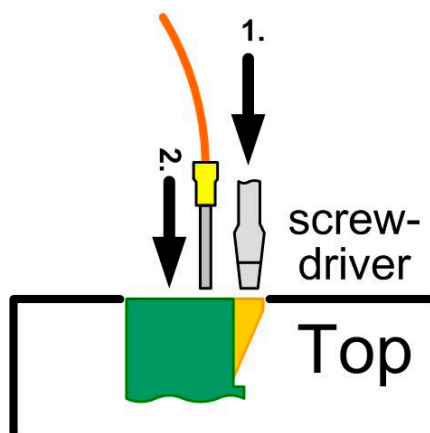


2.4 Analog interface connection

The 12 pole analog interface on the top side is of type press & clamp. It is eligible for cable cross sections of 0.1mm² (26 AWG) to 0.5mm² (20 AWG). If possible, use cable end sleeves.

Attention! Never connect grounds of the analogue interface to minus (negative) output of an external control application (PLC, for example), if that control application is already connected to the negative power supply output (ground loop). Load current might flow over the control leads and damage the device! In order to avoid this a fuse can be integrated in the „weak“ ground line.

Clamping procedure:



3. Functional description

3.1 General

The power supply is pre-configured 0 output voltage and 100% output current.

The output voltage is supervised for adjustable undervoltage thresholds.

The control panel is used to set conditions, set up the device and to adjust output values. Alternatively, the device can be remotely controlled via the internal, analogue interface or an option, digital interface card.


3.2 Remote sense

In order to compensate voltage drops along the load leads, the device features remote sense inputs on the front. Here the sensed voltage from the load is connected with correct polarity. Remote sense can compensate up to a certain level. Refer to the technical specifications about that level.

When not using the sense inputs, they just remain open. It is not required to bridge them to the output.

The cross section of the sense leads is non-critical.


3.3 Overvoltage protection (OVP)

All models feature an overvoltage protection circuit which is set 110% of the nominal output voltage. In case of an overvoltage condition, whether caused by an internal defect or by external reasons, the power output is switched off and the error is indicated by the a status text „OV“ in the display and also by pin „ERROR“ of the analogue interface. The error indication remains in the display until acknowledged by button .

After the OV condition is gone, the output can be switched on again.

3.4 Overtemperature (OT)

All models also feature an internal temperature supervision. In case of overheating, the power output will be temporarily switched off until the device has cooled down.

The state of the output after an OT error can be configured in the setup. During an OT condition a status text „*auto ON*“ indicates that the output will be on after the OT condition is gone. The error indication remains in the display until it is acknowledged by the button .

The condition is indicated by the status text „OT“ in the display and by pin „ERROR“ of the analogue interface. The output state restoration can be deactivated in the setup menu by the parameter „*OT disappear = OFF*“.



3.5 Output restoration after blackout


After a mains blackout (same as switching the input voltage off by hand), the device will reconstruct the last condition by restoring output state and set values.

The output state restoration can be deactivated in the setup menu by the parameter „*Power ON = OFF*“, while „*Power ON = restore*“ will set the output to the last condition before the blackout.

3.6 Undervoltage supervision

The supervision of an undervoltage condition is done with two thresholds. It will be activated after 250ms and every time the output is switched on.

In case the output voltage is below the 1st undervoltage threshold („*UV warning*“) after the output has been switched on, the display will indicate a warning . The warning remains in the display until acknowledged by the button . This prevents unseen errors. The warning is removed if no error is persistent anymore and after it has been acknowledged.

The 2nd undervoltage threshold („*UV shutdown*“) will generate an alarm if the output voltage falls below and switch off the output. This is indicated by  and on the „ERROR“ pin of the analogue interface.





The output can be switched on again, after the alarm has been acknowledged.

3.7 Configurable voltage profiles

The device feature several voltage profiles that are pre-configured for common applications. The top-most profile allows to set voltage and current within the full nominal values, i.e. from 0...100%. The other profile are configurable, but within a limited voltage range. See the tables below. In all profiles there is also a set value for the OVP threshold and both undervoltage thresholds. The profile depend on the nominal output voltage of the device.

3.8 Control locations

Control locations are places from where the device is accessed. With this series, there are several control locations which are indicated by status texts in the display:

- **local** - is manually activated by the user with button . In this situation the device can not be controlled remotely. This can be useful to intercept during a permanent remote control and adjust some settings on the device. After enabling remote control again by leaving *local* with button , remote control is not activated automatically.
- **remote** - the unit is remotely controlled by one of the digital interface cards and manual access is not possible. Pressing button  changes to *local* and aborts *remote*.
- **extern** - the unit is remotely controlled by the internal analogue interface and manual access is not possible. Pressing button  changes to *local* and aborts *extern*.

PSI880-40R, PSI880-60R					
	Voltage ranges				
Profile	1	2	3	4	5
Name	0..80V	12V	24V	36V	48V
U adj max	80.00V	14.40V	28.80V	43.20V	57.60V
U adj min	0.00V	9.60V	19.20V	28.80V	38.40V
U output	88.00V	12.00V	24.00V	36.00V	48.00V
I output	0.. Inom	0.. Inom	0.. Inom	0.. Inom	0.. Inom
OVP	88.00V	13.20V	26.40V	39.60V	52.80V
UV warning	0.00V	0.00V	0.00V	0.00V	0.00V
UV alarm	0.00V	0.00V	0.00V	0.00V	0.00V

PSI8360-10R, PSI8360-15R

PSI8360-10R, PSI8360-15R						
	Voltage ranges					
Profile	1	2	3	4	5	6
Name	0..360V	24V	48V	60V	110V	220V
U adj max	360.00V	28.80V	57.60V	72.00V	132.00V	264.00V
U adj min	0.00V	19.20V	38.40V	48.00V	88.00V	176.00V
U output	0.00V	24.00V	48.00V	60.00V	110.00V	220.00V
I output	0.. Inom	0.. Inom	0.. Inom	0.. Inom	0.. Inom	0.. Inom
OVP	396.00V	26.40V	52.80V	66.00V	121.00V	242.00V
UV warning	0.00V	0.00V	0.00V	0.00V	0.00V	0.00V
UV alarm	0.00V	0.00V	0.00V	0.00V	0.00V	0.00V

not editable

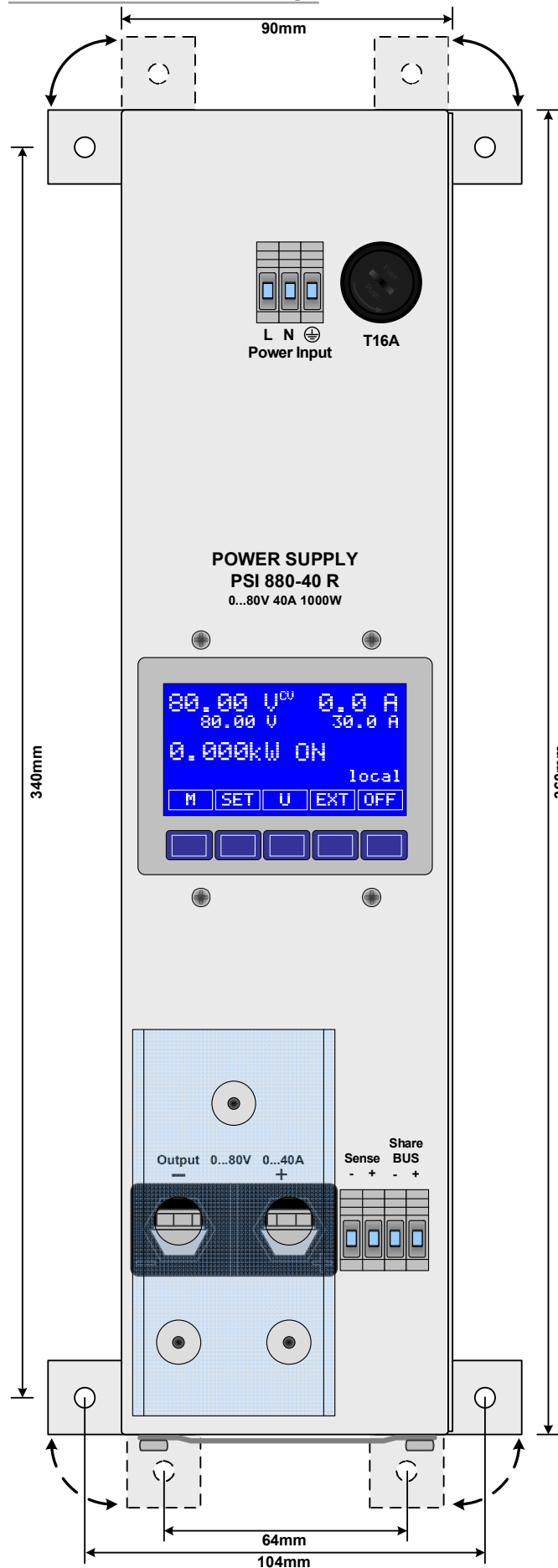
3.9 Technical specifications

	PSI 880-40R	PSI 8360-10R	PSI 880-60R	PSI 8360-15R
Mains input				
Input voltage	90...264V	90...264V	90...264V	90...264V
Frequency	45...65Hz	45...65Hz	45...65Hz	45...65Hz
Power factor correction	>0.99	>0.99	>0.99	>0.99
Input current at 230V and full load	approx. 4.8A	approx. 4.8A	approx. 7.5A	approx. 7.5A
Input current at 100V and full load	approx. 11.4A	approx. 11.4A	approx. 11.4A	approx. 11.4A
Fuse	16A	16A	16A	16A
Output - Voltage				
Nominal voltage U_{Nom}	80V	360V	80V	360V
Adjustable range	0V... U_{Nom}	0V... U_{Nom}	0V... U_{Nom}	0V... U_{Nom}
Accuracy*	<0.2%	<0.2%	<0.2%	<0.2%
Stability at 10-90% load	<0.05%	<0.05%	<0.05%	<0.05%
Stability at $\pm 10\% \Delta U_{in}$	<0.02%	<0.02%	<0.02%	<0.02%
Ripple (BWL 20MHz)	<10mV _{PP} <5mV _{RMS}	<30mV _{PP} <12mV _{RMS}	<10mV _{PP} <5mV _{RMS}	<30mV _{PP} <12mV _{RMS}
Regulation 10-100% load	<2ms	<2ms	<2ms	<2ms
Regulation Remote sense	max. 2V	max. 8V	max. 2V	max. 8V
Output - Current				
Nominal current	40A	10A	60A	15A
Adjustable range	0... I_{Nom}	0... I_{Nom}	0... I_{Nom}	0... I_{Nom}
Accuracy*	<0.2%	<0.2%	<0.2%	<0.2%
Stability at 0-100% ΔU_{out}	<0.15%	<0.15%	<0.15%	<0.15%
Stability at $\pm 10\% \Delta U_{in}$	<0.05%	<0.05%	<0.05%	<0.05%
Ripple (BWL 20MHz)	<100mA _{PP}	<15mA _{PP}	<100mA _{PP}	<15mA _{PP}
Output - Power				
Nominal power	1000W	1000W	1500W	1500W
Nominal power at $U_{in} < 150V$	1000W	1000W	1000W	1000W
Resolution of display	0.001kW	0.001kW	0.001kW	0.001kW
Efficiency	93%	93%	93%	93%
Miscellaneous				
Operation temperature	0...50°C	0...50°C	0...50°C	0...50°C
Storage temperature	-20...70°C	-20...70°C	-20...70°C	-20...70°C
Humidity	<80%	<80%	<80%	<80%
Dimensions of enclosure (WxHxD)	90x360x240mm	90x360x240mm	90x360x240mm	90x360x240mm
Dimensions of installation (WxHxD), min.	90x400x350mm	90x400x350mm	90x400x350mm	90x400x350mm
Weight	6.4kg	6.4kg	6.6kg	6.6kg
Article No.	21540407	21540409	21540408	21540410
Isolation output to enclosure	500V DC			
Isolation input to output	4200V DC			
Safety	EN 60950			
EMC standards	EN 61204, EN 55022 Class B			
Overvoltage category	Class II			
Protection class	Class I			
Pollution degree	2			
Operational altitude	<2000m			
Analogue programming				
Input range	0...5V oder 0...10V, umschaltbar			
Accuracy	<0.2%			

* Related to the corresponding nominal value

All values are typical values

3.10 Mechanical drawings



Note:

The figure shows a unit without digital interface equipped. When using the analogue or digital interface, it is required to leave some space next to right side of the unit, for the cables.

Figure 1. Front

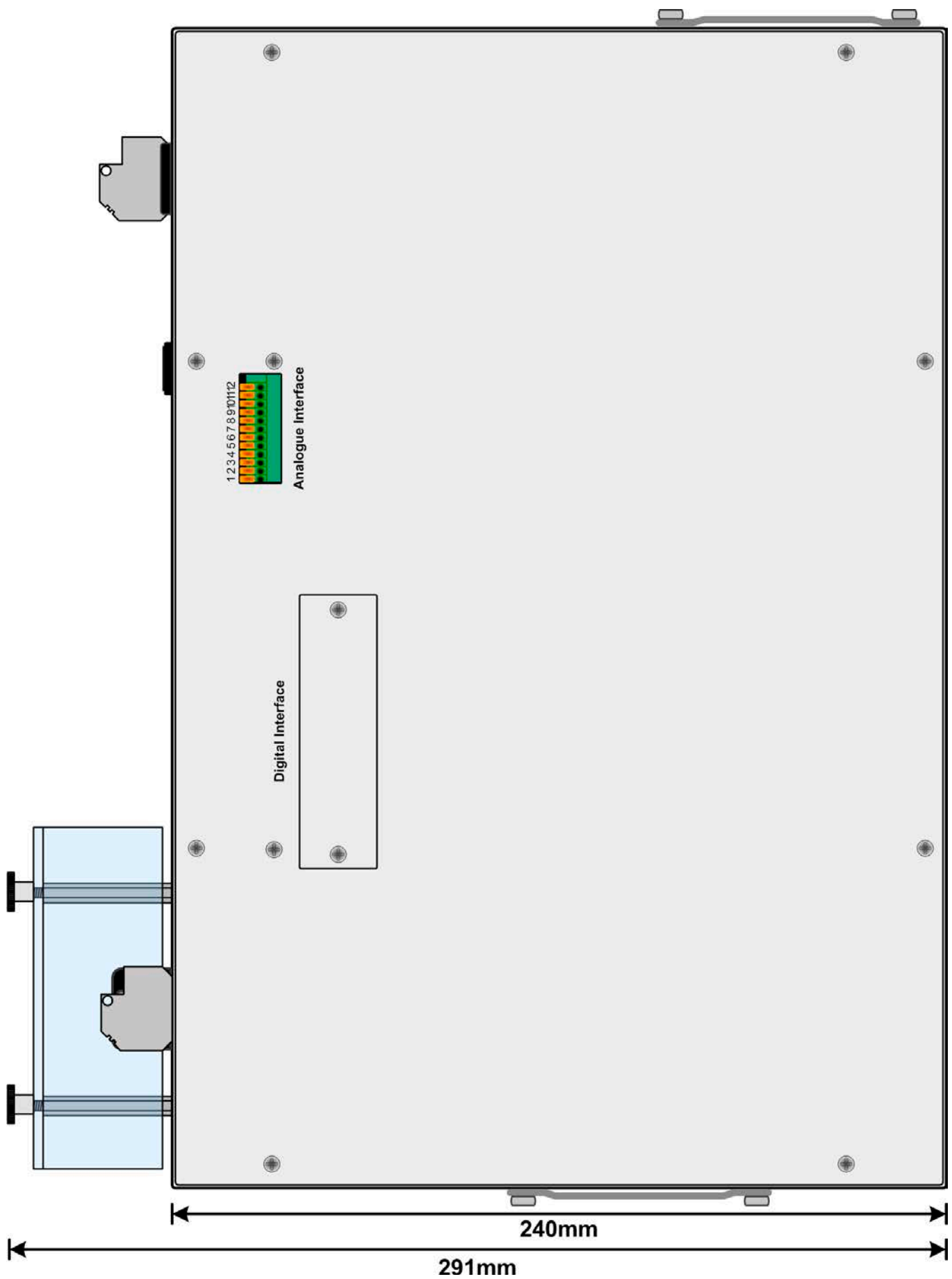
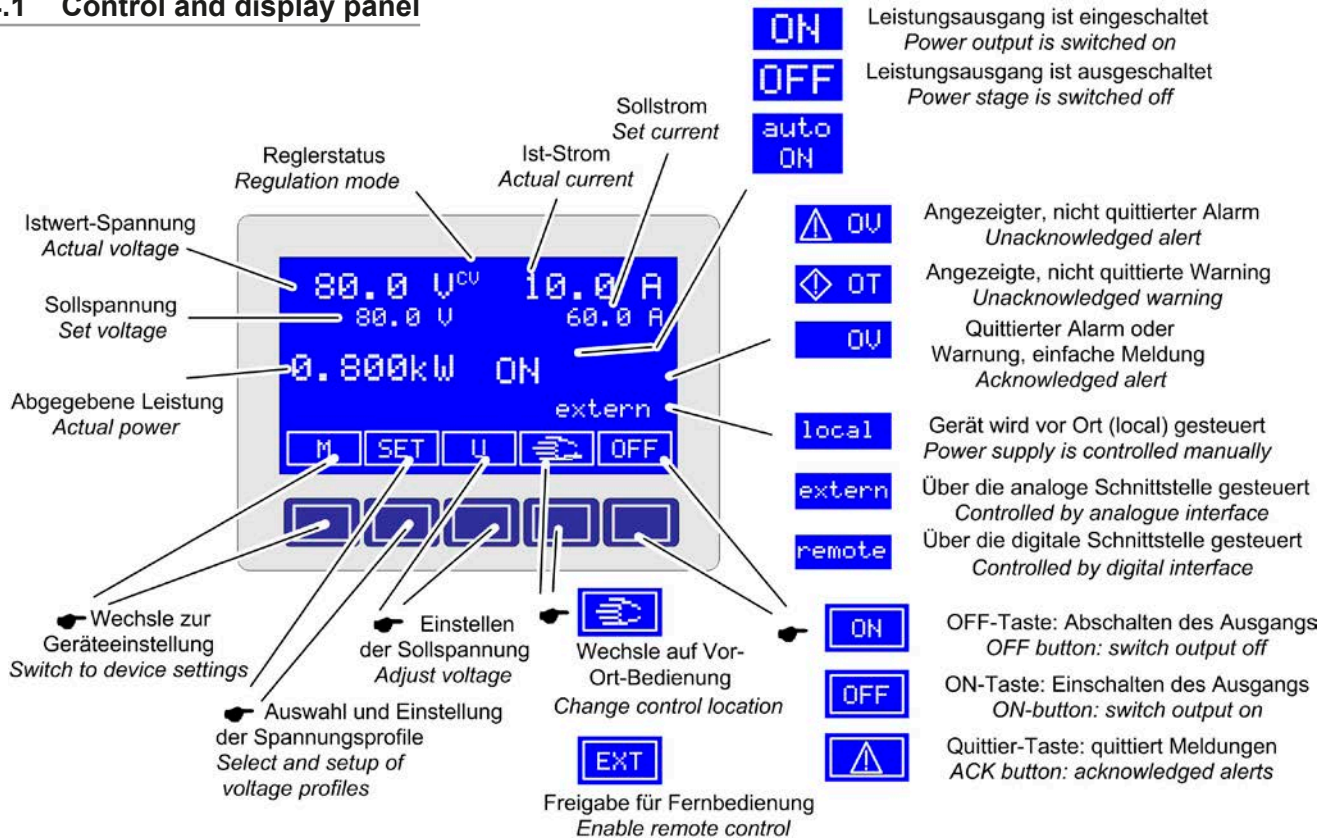


Figure 2. Side view from the right, with analogue and dig..interface

4. Operation

4.1 Control and display panel



4.1.1 Layout of the display

The display is separated into areas for set values, actual values, the output state, device status and the button assignments.

The button assignment strip changes interactively according to the user's selection and is indicated by text or symbols which are dedicated to the buttons beneath.

The upper left half of the display shows output voltage relevant values in big font. Directly beneath is the related set value. While the output is off, the text „CV“ right next to the voltage actual value indicates constant voltage operation.

The upper right half of the display shows output current relevant values in big font. Directly beneath is the related set value. While the output is off, the text „CC“ right next to the current actual value indicates constant current operation.

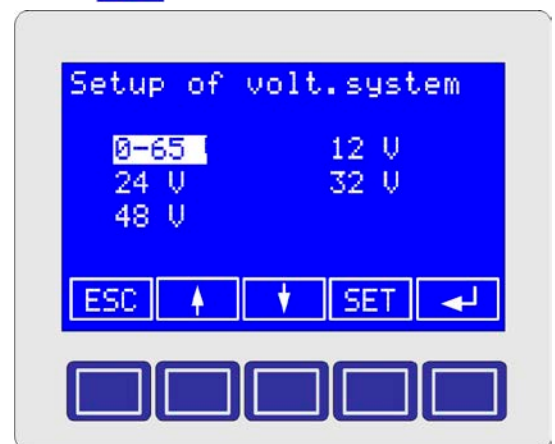
Beneath the voltage value area the actual output power is indicated. There is no adjustable power set value.

The output state, status (alarms, warnings) and the control location (see section 3.7) are indicated in the lower right area of the display.

4.2 Selecting a voltage profile

Note: Switching voltage profiles is only possible during output = off.

The voltage profile selection menu is accessed by the button **SET** in the main display.



Only the first voltage profile (here: 0..65V) offers full output value adjustment.

The other profiles allow adjustment, but for the voltage only within certain limit (see tables on page 21). The **↑ ↓** buttons are used to select the desired profile, which is then submitted with the **←** button. The display will return to normal and the output values are changed to the ones as adjusted in the profile.

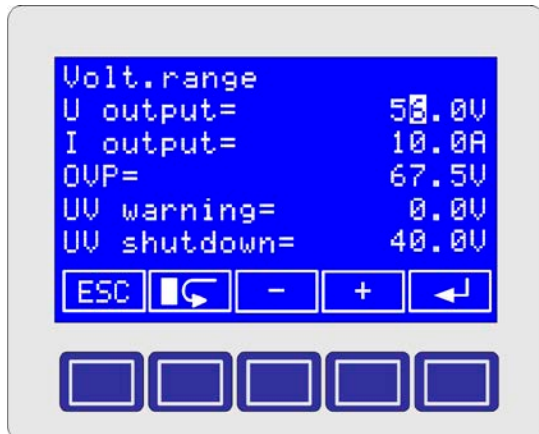
If button **SET** is pushed instead, the selected profile is opened for adjustment.

4.3 Editing a voltage profile

The parameter that is going to be adjusted is selected by the **↑** **↓** buttons. By pushing **SET** the selected parameter becomes adjustable and is submitted with the **↵** button or discarded with **ESC**.

Changing parameters

After using the **SET** button, the selected parameter can be adjusted within its limits.



If a parameter is selected for adjustment, the **+** and **-** buttons are used to increase or decrease the currently marked decimal place (cursor), while the **↵** button moves the cursor position.

The **ESC** button aborts the adjustment and returns to the previous menu.

In order to submit the values in the menu, the **↵ button has to be used.**

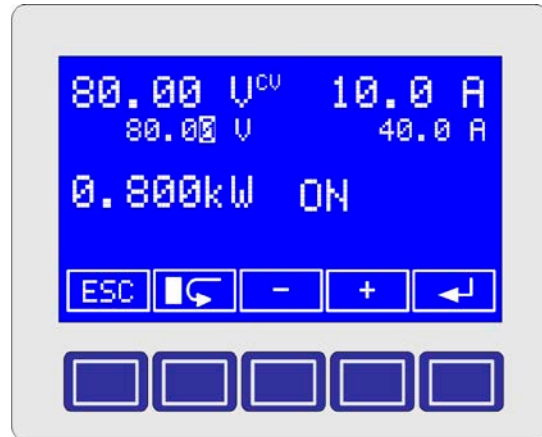
4.4 Adjusting the set value for current

The set value for the output current can not be directly adjusted, but a separate setting can be defined for every voltage profile. See section "4.3 Editing a voltage profile".

4.5 Direct voltage adjustment

From the main display, the output voltage can also be directly accessed for adjustment by the **U** button. It jumps into the currently selected voltage profile and selects the voltage for adjustment.

Submission or abortion of the adjustment is done the same way as described above in "4.3 Editing a voltage profile".



4.6 The setup menu

The setup menu is accessed with the button **M**. The menu structure and default settings are depicted in the figure on the next page.

Note: modification of settings only possible during output = off.

4.6.1 Menu item „General settings“

The item „*General Settings*“ configures the power output state after mains returns, the behaviour of the power output at overtemperature and the LCD backlight.

Output state after mains switch-on

Power ON (Default: *restore*)

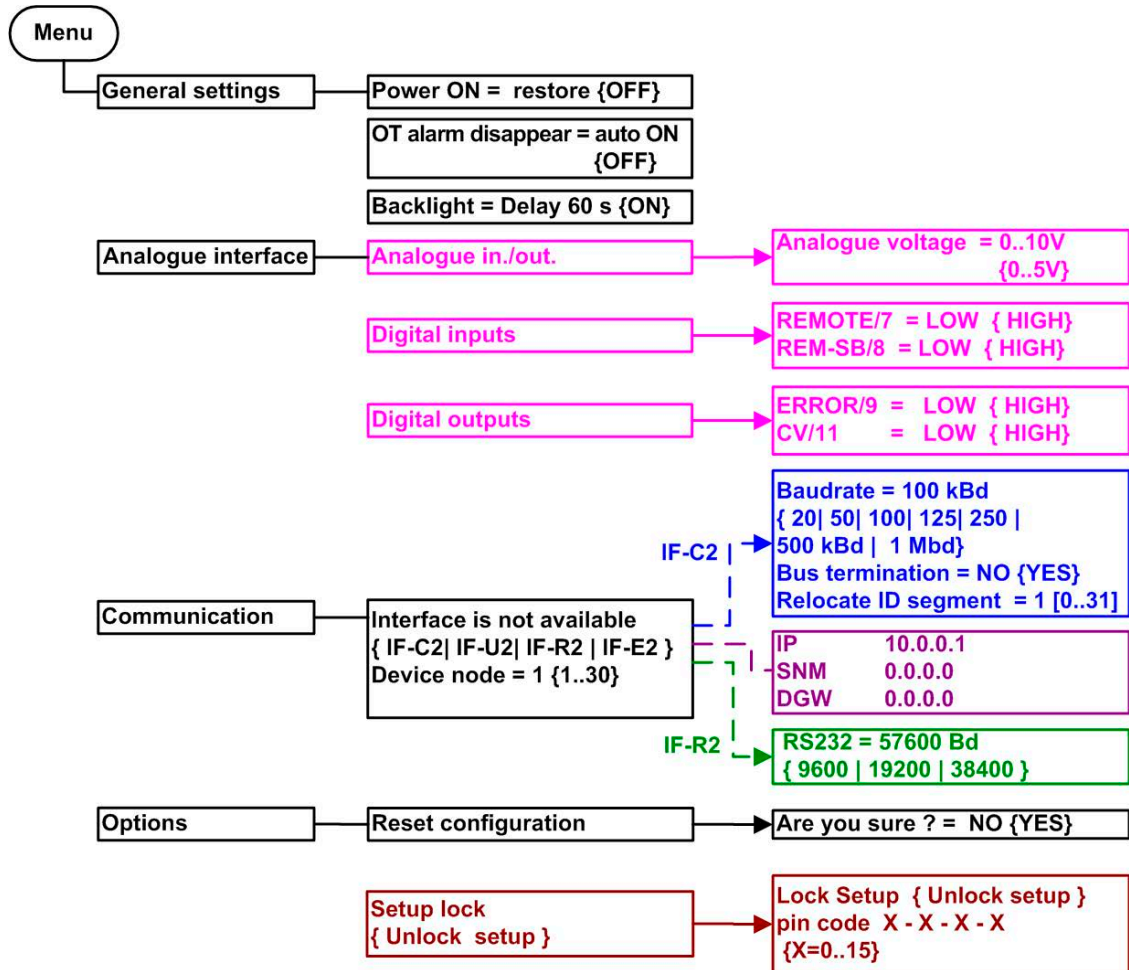
The output is restored to the condition it had the last time the device was switched off, if **Power ON** is set to *restore*. The other option, **Power ON = OFF** leaves the output off after every start.

Output state after OT shut-off

OT disappear (Default: *auto ON*)

If set to *auto ON*, the output will automatically switch on again after an overtemperature condition has occurred and is gone again. With setting **OFF**, the output will remain off and has to be switched on manually.

*Note: overtemperature shutdown of the output is an alarm condition and the alarm has to be acknowledged by the user by pressing the **⚠** button.*



Display illumination

Backlight (Default: *Delay 60s*)

If *Backlight = Delay 60s* is set, the backlight is generally off and will be switched on for 60s after every push of a button. For permanent backlight select option *Backlight = ON*.

4.6.2 Menu item „Analogue interface“

This configures the built-in analogue interface. The analogue inputs and outputs can work with the common 0...5V and 0...10V control voltage ranges. In the range 0...5V the resolution and accuracy are halved.

Analogue in./out. (Default: *0...10V*)

If *Analogue voltage = 0...10V* is selected, the analogue inputs and outputs will accept 0...10V for 0...100% nominal values. With 0...10V range selected, voltages >10V are clipped to 100%.

The selection *Analogue voltage = 0...5V* will work accordingly. With 0...5V range selected, voltages >5V are clipped to 100%.

Note: analog remote control is only possible with voltage profile 1 selected. Otherwise, an alarm EXT is generated.

Note: analog remote control is only possible with voltage profile 1 selected. Otherwise, the device will signalise alarm EXT.

Digital inputs (Default: *LOW*)

The digital inputs can be selected to be low-active or high-active.

If set to *LOW* the input will execute its defined function at low input level. See the technical specifications table of the analogue interface for details.

If set to *HIGH*, the input will react to input level high.

Digital outputs (Default: *LOW*)

The digital outputs can be selected to be low-active or high-active.

The outputs will signalise their defined function with the selected output level, i.e. by switching to GND at *LOW* or to high potential at *HIGH*. See the technical specifications table of the analogue interface for details.

4.6.3 Menu item „Communication“

In case the device is equipped with a digital interface card, this menu entry is used to configure communication settings. A detailed description of those settings can be found in the external user guide of the interface card.

4.6.4 Menu item „Options“

This menu page provides a possibility to reset the device to default settings and to lock the control panel with a pin code.

Reset configuration


If **YES** is selected at the confirmation prompt „Are you sure?“, all editable parameters are reset to their default values. With **NO**, all settings remain unaltered.


After a configuration reset, the value „U output“ of the selected voltage profiles has to be submitted once again.

Lock setup

After entering a 4 digit PIN code with the arrow buttons, the control panel is locked, except the unlock button. The four numbers can be 0 - 15, which results in 65536 combinations. Unlocking is done the same way, by entering the PIN code again. If the PIN code is lost, the lock can only be removed by doing a „Reset configuration“. See above.

4.7 Alarms

The device will indicate different alarms in the display using the symbol  and an abbreviation, as well as the output pin ERROR on the analogue interface.

Those alarms have to be acknowledged by the user with button . Some alarms (**OT**, **OVP**) will switch off the output, which can be switched on again after acknowledgement.

The only exception is the OT alarm, where the output can automatically switch on again after the device has cooled down, if in menu „General settings“ the option „OT disappear“ was set to „auto ON“.

4.7.1 Alarm types

OT - Overtemperature shutdown due to overheating

OVP - Overvoltage shutdown due to internal or external cause

EXT - Remote control error

Notes:

- If **OT** or **OVP** occurs, the output is switched off, no matter if manual or remote control was active
- The alarm **EXT** shows that an attempt was made to switch to remote control by analogue interface while one of the voltage profiles 2-5 resp. 2-6 was selected. In order to switch to analogue remote control, first select voltage profile 1 via **SET** button. Also see section 4.2.

5. Remote control

5.1 By remote interface

With the optionally available, digital interface cards (USB, RS232, Ethernet or CAN) the device can be completely remotely controlled and monitored. For details of features and technical specifications see the user manual of the interface cards. With CAN, multiple power supplies can be networked.

5.2 By analogue interface

Set values that control output voltage and current can be given to set value inputs VSEL and CSEL with control voltages of 0...10V or 0...5V, depending on the selected control voltage range (see section „4.6 The setup menu“).

The actual output values of voltage and current are put out as monitoring voltages to outputs VMON and CMON with 0...10V or 0...5V, depending on the selected control voltage range (see section „4.6 The setup menu“).

Before controlling the device remotely it has to be switched to remote control by pin 7 „Remote“. Both values must be given. If only one of both is going to be adjusted, the other one can be tied to VREF in order to be 100%.

Remote control by analog interface is indicated in the display with the status text „extern“.

Note: the digital inputs are not CMOS compatible. In order to pull those down to GND, a low-resistive contact or switch like from a relay or transistor etc. is required. Digital outputs of a PLC or similar may not suffice here. Consult the technical documentation of your controlling hardware.

5.2.1 Pin assignment and technical specifications of the analogue interface

Pin	Name	Typ ¹	Description	Level	Electrical specifications
1	VSEL	AI	Set value: voltage	0...10V correspond to 0...100% U_{Nom}	Accuracy 0.2%, $U_{Max} = 12V$ Input impedance >100k
2	CSEL	AI	Set value: current	0...10V correspond to 0...100% I_{Nom}	
3	VREF	AO	Reference voltage	10V / 5V	Accuracy < 0.1% bei $I_{Max} = 10mA$ Short-circuit-proof against AGND
4	VMON	AO	Actual value: voltage	0...10V correspond to 0...100% von U_{Nom}	Accuracy < 0.2% bei $I_{Max} = +2mA$ Short-circuit-proof against AGND
5	CMON	AO	Actual value: current	0...10V correspond to 0...100% von I_{Nom}	
6	AGND		Reference for analogue signals		For VSEL, CSEL, CMON, VMON, VREF
7	Remote	DI	Activate external controls	External = Low ($U_{Low} < 1V$), Internal = High ($U_{High} > 4V$)	$U_{Max} = 0...15V$ $I_{Max} = -3mA$ bei 15V
8	Rem_SB	DI	Power output on/off	Off = Low ($U_{Low} < 1V$) On = High ($U_{High} > 4V$)	
9	Error	DO	Various errors like OVP, OT	Low = No error ($U_{Low} < 1V$) High = Error ($U_{High} > 4V$)	$U_{Max} = 15V$, $I_{Max} = -10mA$ Quasi open collector with pull-up to V_{cc} ²
10	DGND		Reference for digital signals		For control and condition signals
11	CV	DO	Regulation mode	Low = Voltage controlled ($U_{Low} < 1V$) High = Current controlled ($U_{High} > 4V$)	$U_{Max} = 15V$, $I_{Max} = -10mA$ Quasi open collector with pull-up to V_{cc} ²
12	+VCC	AO	Auxiliary voltage	12...16V	$I_{Max} = 24mA$ Short-circuit-proof against DGND

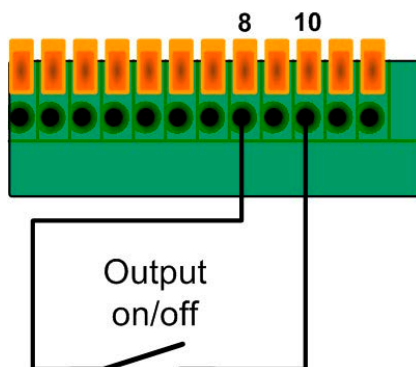
¹⁾ AI = Analogue input, AO = Analogue output, DO = digital output

²⁾ 12V...15V

5.2.2 Examples for the analogue interface

Note: recommended cross section when wiring the clamp pins of the analogue interface: 0,1mm² (AWG26) to 0,5mm² (AWG20).

Remotely switching output on / off



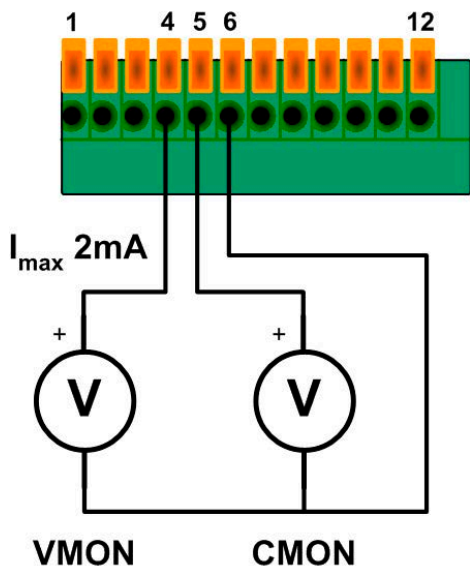
This input can be used to switch **off** the power output even without activated remote control, except the control location was set to *local* (also see section 3.8). If the input is configured to *LOW* (see section 4.6.2), then the power output can only be switched on again by opening the contact or releasing the switch.

In this situation the pin acts as a disabler, preventing the DC output from being switched on again, which would have to be done with ON/OFF button on the panel. If the input is configured to *LOW* (see section 4.6.2), then the power output can only be switched on again by opening the contact or releasing the switch.

During normal remote control via analog interface, this pin solely defines the state of the DC output.

The contact/switch on pin 8 overrides button „ON“.

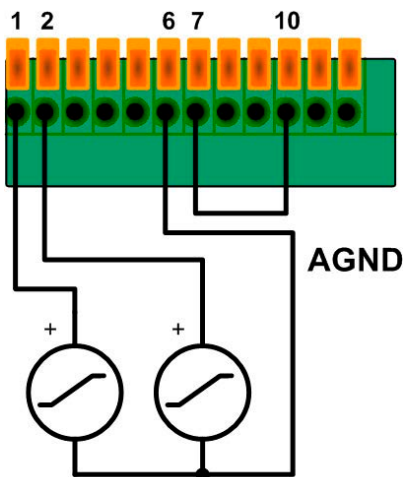
Monitoring voltage and current



The analogue monitoring outputs put out 0...5V or 0...10V, depending on the voltage range selection in the setup, which each corresponding to 0...100% of the nominal values.

Reference is analogue ground (AGND).

Set values 2

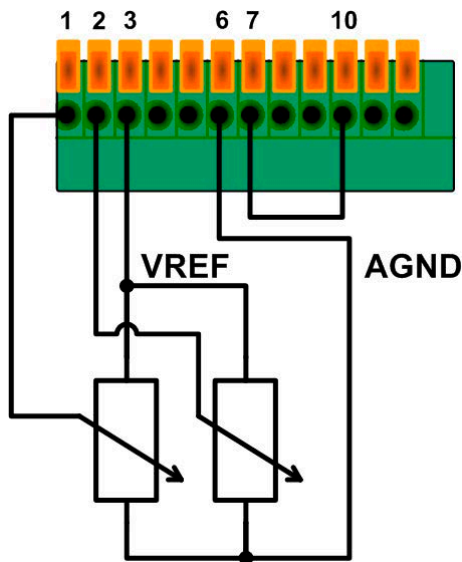


The example shows how to control voltage and current by means of external voltage sources.

Attention! Never connect voltages >12V to these inputs!

Set values >10V or >5V, depending on the voltage range selection in the setup, are clipped to 100% nominal value.

Set values 1



The example shows how the set values can be controlled using the reference voltage (VREF) and potentiometers on the set value inputs.

The potentiometer should be 10kOhm each or higher.

6. Other applications

6.1 Series connection

It is possible to connect multiple units of the same type to a series connection if these rules are followed:

- No master-slave operation
- The grounds of the analogue interfaces **MUST NOT** be connected to each other. This also applies for any other signal on the analogue interfaces. If remote control is required, it can be done using galvanic isolation amplifiers and by controlling all units in parallel.
- Any load current leading conductor must be dimensioned for the maximum output current of the unit with the highest nominal output current.
- No negative DC output pole of any device may have a potential >300V against earth (PE).

6.2 Parallel connection

Attention! Only units of the same type (voltage and current) must be used for this operation mode.

Share bus operation is used to gain a symmetric load current distribution when running multiple units in parallel connection.

Following connections are required: connect all (+) DC outputs of the units to each other and all (-) DC outputs to each other. Pins (+) and (-) of terminal **Share Bus** of all units are also connected in parallel.

Important: in this operation mode, the unit with the **lowest** output voltage controls and defines the output voltage of the whole parallel connection. It means, any unit of the system could be in charge. Thus it recommended to pick one unit that is used to control the whole system, while the set value of voltage, current and power for the remaining units are set to the required maximum. All units displays their own actual values, there will be no totals formation of the system's actual values.

Note: in case of an error like overheating (OT) or overvoltage (OVP), the whole system will shut down the output voltage.

In order to control the whole system remotely, it is sufficient to control the master via its analogue or digital interface. When reading actual values, the voltage monitor value will represent the overall system voltage, but the current monitor only the output current of the master. In order to get accurate readings, either the actual current is multiplied by the number of units in the parallel connection (only applicable if all have the same nominal output current) or all units will have to be read separately.

7. Miscellaneous

7.1 Accessories and options

Following accessories are optionally available:

a) Digital interface cards

Pluggable and retrofittable, digital interface cards for USB, RS232 or CAN are available. There is one interface card slot available with every model.

7.2 Firmware update

A firmware update of the device should only be done if the device shows erroneous behaviour or if new features have been implemented.

In order to update a device, it requires a certain digital interface card, a new firmware file and a Windows software called „Update tool“.

These interfaces are qualified to be used for a firmware update:

- IF-U2 (USB)
- IF-R2 (RS232)

In case none of the above interface types is at hand, the device can not be updated. Please contact your dealer for a solution. The update tool and the particular firmware file for your device are obtainable from the website of the device manufacturer, or are mailed upon request. The update tool will guide the user through the semi-automatic update process.



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