plating electronic GmbH - Marie-Curie-Str. 6 - D-79211 Denzlingen - Germany
Tel.: +49 (0)7666 / 9009-0 - Fax.: +49 (0) 7666 / 9009-44 e-mail: info@plating.de

Documentation type:	Operating manual	Last modification:	
Author:	J. Schumann		
Last modification by:	Dietgard Mayer-Eckardt	Print date: 2015-02-09	Comment:
Last saving date:	2015-02-09		

Operating manual for

SIFCO PROCESS® CLASSIC POWER PACKs

Read this operating manual completely before installation.

Not following installation and operation procedures will void the warranty. It also could result in serious injury or death.

sifcoasc

List of Contents:

Available sizes of the CLASSIC series:

RECTIFIER CLASSIC type:	Casing	Item No.
SP-C 15-20-115-1	pe1020	90115201
SP-C 15-20-230-1	pe1020	90115203
SP-C 30-20-115-1	pe1020	90130201
SP-C 30-20-230-1	pe1020	90130203
SP-C 60-20-115-1	pe1060	90160201
SP-C 60-20-230-1	pe1060	90160203

Encoding key:

	DC-Current		DC-Voltage		Supply voltage-phases
SP-C	15	-	20	-	115-1

1 EU Declaration of Conformity

Conformity declaration of the European community corresponding to the EMV-guidelines 2004/108/EG about the electromagnetic compatibility and the low-voltage guidelines 2006/95/EG.

We

Manufacturer:	plating electronic GmbH
Ust.-Id Nr.:	DE 141938869
Addressee:	Marie-Curie-Straße 6 79211 Denzlingen / Deutschland

declare our product:

Installation:	electroplating DC power supply type SIFCO PROCESS® CLASSIC POWER PACK air cooled, with integrated pole changer with total counter
Supply.	single phase
Serial No.:	see rating plate

on which the declaration is related to, is corresponding to the following standards resp. normative documents:

DIN EN 61000-6-2: 2005 (German Language Version)
Corrigendum to DIN EN 61000-6-2 (VDE0839-6-2): 2006;
German version CENELEC-Cor.: 2005 to EN 61000-6-2: 2005.
DIN EN 61000-6-2 Corrigendum 1: 2011; VDE0839-2 Corrigendum 1: 2011
Electromagnetic compatibility (EMC) Part 6-2: Generic standards -
Immunity for industrial environments (IEC 61000-6-2:2005)
DIN EN 61000-6-4: 2011; VDE 0839-6-4: 2011
German version: Electromagnetic compatibility (EMC) part 6-4: Generic standards -
Emission standard for industrial environments (IEC 61000-6-4: 2006 + A1: 2010)
German version EN 61000-6-4: 2007 + A1: 2011
DIN EN 55011: 2011; VDE 0875-11: 2011
(German version) Class A, Group 1
German version: Industrial, scientific and medical equipment -
Radio-frequency disturbance characteristics –
Limits and methods of measurement (IEC/CISPR 11: 2009, modified)
+ A1: 2010); German version EN 55011: 2009 + A1: 2010
DIN EN 50178: 1998 (VDE 0160: 1998)
Electronic equipment for use in power installations
German version EN 50178: 1997

RoHS-conform to guideline 2011/65/EU per June 8th 2011

Denzlingen, 30.05.2014

place / date

Karl Rieder (Managing director)

2 General security information

2.1 Class-A device

This device is defined as a **class-A**-device.

Warning: This device is provided to be used only in industrial environment! In other environments, a sufficient electromagnetic tolerance could not be assured without additional installation measures.

2.2 Security

This DC power supply was delivered after a thorough function- and safety-check. Only qualified staff shall connect the device and put it into operation. Service and maintenance is only to be performed by qualified personnel.

Unauthorized modification or repairing is life endangering. Observe all instructions of the manufacturer; else, the warranty for DC power supplies and accessories will expire.

Parts carrying a life-endangering voltage potential are installed inside the casing. These are marked with warning labels.

Any manipulation of the electrical parts is life endangering and, by doing so, including improper operation, cancels the guarantee.

Attention!

Do not operate any DC power supply with one or more loose cable connectors!

If during operation one or more plugs are pulled out of the boards inside the modules, electronic parts and the power unit could be destroyed!

This DC power supply was constructed in consideration of the threat analysis and the relevant safety regulations. Further, all relevant technical specifications are respected. Therefore, this technology is state-of-the-art and guarantees a maximum of safety and functionality.

The safety and functionality can only be kept if the all relevant arrangements are done.

The operator of the installation is responsible for the adherence of safety rules.

The operator has to ensure that

- the DC power supply is only to be used for the application released by the manufacturer

Active loads such as batteries or generators must never be connected to the DC generator (danger of destruction)!

- the installation is only to be put into operation if it is in an accurate condition and all safety devices are checked regularly.
- all requested individual protective equipment for operator and maintenance personnel is available and is be used.
- The operating manual must be available at the operating place. The operating manual must be complete and in a good condition.
- Mounting, repairing, electrical installation, adjusting and maintenance are only to be done by qualified personnel!

Security advice:

The DC-power-supplies of the SIFCO PROCESS® CLASSIC POWER PACK series are designed as desktop units.

The DC power supplies are only to be operated in the permissible ranges of current, voltage, environmental temperature and atmospheric humidity according to the rating plate and the operating manual.

The devices are only to be used in plating systems. The use of the device for other applications must be released by the manufacturer.

Note:

If there is a current leakage towards the ground (PE), this may cause disturbance inside the DC power supply. This could be the case if DC potentials of the rectifiers are connected to GND. If a disconnecting of the internal PE-wiring is necessary, the user has to take precautions, according to the regulations of the land the device is used in, to assure that there is no danger for persons.

The safety precautions must be done according to all local and federal regulations.

2.3 Installation of the DC power supply modules

While mounting the module and the DC connectors, observe especially the following:

- Don‘t tighten screws with a lever, don’t bent any rails or panels.
- The device must be operated as desktop unit.
- If mounting the device near the plating tanks is necessary, one has to make sure that it is protected against chemical vapor, dust and dropping particles.
- Ensure an unhindered airflow at the air input and air output.
- Observe the installation instructions of the electrical installation.

2.4 Operation conditions

Plating DC power supplies are not to be operated in an explosive environment. Ensure a sufficient airflow to avoid an internal overheating.

The cooling air must be free from any chemical contamination and free from particles, steam and dust.

The unit must be protected from dropping particles, dripping water and spalsh water.

If contaminated air is getting into the device, the electronic components could be damaged.

3 General description

The DC-power supply type SIFCO PROCESS® CLASSIC POWER PACK is a sophisticated switch mode type rectifier, designed for the electroplating applications. It is designed as a desktop unit.

The digital LED display guarantees an easily readable index of current and voltage values.

The electronic regulation guarantees the correctness of the output parameters during the operation, even with variable loads.

Over temperature protection

The device is temperature protected.

For devices with cooling fan:
In case of rising interior temperature, first the fan speed increases.

If the interior temperature is exceeding the limit, the device decreases the output current automatically and, after a cooling phase, increases it.

Attention!

Automatic restart after cooling down!

Do not run the power supply at higher environmental temperatures than 40°C!

3.1 Switch mode technology

This device was designed as switch mode type DC power supply. The advantages of the switch mode technology are:

- very compact design
- maximum regulation accuracy
- very low ripple
- high efficiency and power factor >95%

3.2 Intended purpose

Device for industrial application

According to the norms

DIN EN 61000-3-12 (VDE 0838-12):2012-06
EN 61000-3-12:2011

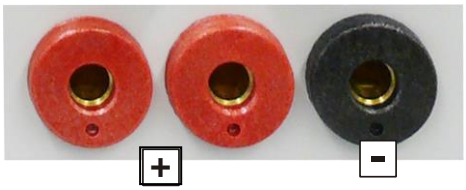
this device is only to be used for industrial applications. Offering and selling the device to the general public is not provided.

This device was designed to be used for electroplating processes in plating systems only.

All other use must be clarified with the technical support of the manufacturer. Otherwise, the installation or other connected devices could be damaged.

4 DC connection

Connect the DC output of the DC power supply to the load.



The two PLUS connectors have the same potential.

Check for right polarity and proper contact.

Look for the

DIN VDE 0298-4 : 2013-06

admitted cable cross section and the correct polarity.

Attention:

The connection of active loads as batteries or DC-machines to the DC output would cause damages to the unit!

Please check:

Do not wire the power supply cable and the DC cables into a roll or bind the supply cable and the DC cables together with other wires. Otherwise, overheating is possible.

5 Mains supply

Supply voltage: 115V or 230V AC (see rating plate of the individual device) +/-10% 50-60cps, single phase

Phase current: see “Technical data”

Use the pre-installed mains cable with safety plug.

Mains cable specification:

The mains cable must be selected corresponding to the following regulations:

DIN VDE 0298-4 / 2013-06

Use equivalent regulations that are valid for the country the device is used in.

Provide for an allowable external fuse admitted to

DIN VDE 0636-2 / 2014-09 / DIN EN 60269-2

Check for the correct environmental temperature (max. 40°C).

Please check:

Make sure that the supply cable could be directly connected to your main supply.

Avoid the use of cable extensions and multiple power sockets.

Do not wire the power supply or the DC cables into a roll or bind the supply and the DC cables together with other wires. Otherwise, overheating is possible.

6 Control elements in the front

Type pe1020:

Type pe1060:

1 = Main switch
2 = ON / OFF keys
3 = Rotary switch of pole changer
4 = Current potentiometer, 10-turn
5 = Voltage potentiometer, 10-turn
6 = DC output
7 = Total counter pe6010
8 = Digital displays
9 = Key for current preset (I-preset)

7 Back plane

Type pe1020:

Type 1060:

1 = Power supply cable

2 = Fuse

3 = Heat sink (fan, cooling air outlet, only in type pe1060)

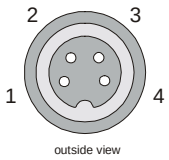
4 = Air grid (only in type pe1020)

5 = Shunt connector (not available in type pe1060): 60mV at $I_{nom.}$

(1 = +Ushunt 2 +3 = Shield 4 = -Ushunt)

In pe1060: The cooling air inlet is located in the bottom of the device

7.1 Shunt-connector



Pin	Signal
1	+ Ushunt (GND)
2	shield
3	shield
4	- Ushunt (0 … -60mV for 0A … $I_{nom.}$)

8 Operate

To operate in standard mode or with special features, use the potentiometers and the buttons and rotary switch in the front of the device.

Set mains connection and switch main switch on. Displays light up.

By using the keys pads, you are able to select two modes:

8.1 OFF

In this position, there is no power on the DC-output. The display is on, the preset function is available.

8.2 ON

In the mode „ON“, the DC output is enabled, the device is in function with the potentiometers. The output values of voltage and current can be adjusted infinitely.

Note:

If one potentiometer, the voltage or current one, is set to „zero“, the output of the rectifier is blocked.

8.3 Preset function (pre-selection)

When working at a chemical process you work either on constant current mode or on constant voltage mode. Therefore, either the voltage or the current value does not reach the selected value. To display the set values press the “PRESET” button.

Therefore, you are able to do the current and voltage setting even without load or with variable load at the DC-output. The preset function is also available if the “Off” key is pressed. While the button is pressed, you can choose a new setting by turning the potentiometers. The DC-output is not disabled by this presetting procedure.

8.4 Digital displays

The digital displays show the actual output values (current and voltage).

8.5 Potentiometers for current and voltage setting

With these potentiometers, the output parameters (current and voltage) can be set from zero to 102% of the nominal values.

Attention:
The adjustments can influence each other mutually (see description for current and voltage constant regulation below).

Attention:
If one of the potentiometers is set to „0“, the DC-output is blocked!

8.6 Constant current regulation (CC)

If a constant current is needed, follow these terms:

First, move the output voltage to the highest admitted level for your process by using the voltage potentiometer.

Now use the current potentiometer to adjust your tank current.

The actual values will be displayed on the meters for voltage and current.

8.7 Constant voltage regulation (CV)

If a constant voltage is needed, follow these terms:

First, move the output current to the highest admitted level for your process by using the current potentiometer.

Now use the voltage potentiometer to adjust your tank voltage.

The actual values will be displayed on the meters for voltage and current.

8.8 Protection against overheating

The device is temperature protected.

For devices with cooling fan:
In case of rising interior temperature, first the fan speed increases.

If the interior temperature is exceeding the limit, the device decreases the output current automatically and, after a cooling phase, increases it.

Do not use the device at higher environmental temperature (max. 40°C)!

Attention:

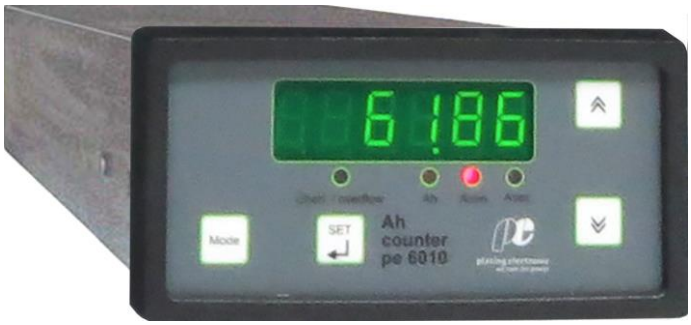
Auto-re-start after cooling down!

9 Manual pole changer

In the front panel of the rectifier, there is a big rotary switch with three positions:

- **position 0** = there is no DC-output power at the DC-terminals
- **position F =** pole changer is set to forward current, + to +, - to -
- **position R** = pole changer is set to reverse, the DC-output polarity is changed, - to + and + to –

10 Total counter pe 6010



10.1 General description pe6010

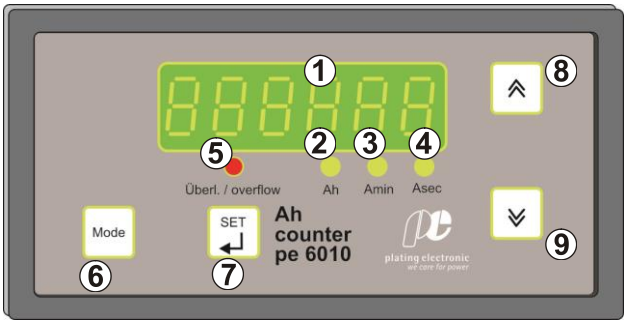
The module pe6010 is a microprocessor controlled Ah - meter with switchable measuring ranges Ampere hours, Ampere minutes and Ampere seconds (also: gram-Gold, weight I and III, and gram-Silver).

It allows the measurement of the number of Ampere-hours from a defined start time. All control elements are placed on the front of the unit. A good readable digital display shows the actual number of ampere-hours. The device can be programmed by push-button switches.

The actual operating mode is displayed by clear visible light emitting diodes (LED).

At the rear, you find the terminals for the current signals and the mains supply. The housing is designed for the installation in front panels.

10.2 Control elements placed at front panel



1 = Digital display for Ah, Amin or Asec

2 = LED for range „Ampere-hours (Ah)“

3 = LED for range „Ampere-minutes (Amin)“

4 = LED for range „Ampere-seconds (Asec)“

5 = LED for “overflow“ indication

6 = Push-button-switch for operating modes (Mode)

7 = Push-button-switch for saving the entries (SET)

8 = Push-button-switch for step-up the range and preset value (Up)

9 = Push-button-switch for step-down the range and preset value (Down)

10.3 Programming and operation

Range setting:

Actuate key „Mode“ for approx. 3 seconds. The LED for the actual range begins to flash.

The range can be selected by the keys “Up” or “Down”. Save the range selection by actuating the “Enter” key. The display is then reset to “000000”.

Operation:

All half second the display values are updated. The range is displayed by one of the LED “Ah”, “Amin”, “Asec”.

In the case of an overflow of the display, the counting will be continued from “000000”. The overflow is displayed by flashing of the range-LED. Additional the LED “overflow” is flashing.

Reset of the digital display:

The digital display can be reset by pressing the key “Enter” for 5 seconds.

10.4 Configuration

10.4.1 Current range configuration

- Switch mains supply off
- Press UP- and DOWN buttons at once and switch the power supply ON.

The display will show:

"UP_ _ _ 0"

Confirm with "Enter"

The current setting is following now in this menu.

This procedure is just necessary after the installation of the counter in a DC power supply unit, or if the current type was changed.

The function matches the measurement input of the counter to the nominal current of the rectifier.

The display shows now **C_0100** (C means CURRENT)

Set the 4-digit display to the nominal current (A) of rectifier following the next steps:

- Set the flashing left digit using the “Up” or “Down” button.

- Press the “Enter” key to read in the desired value. Then the next digit begins to flash.

- Repeat the steps until all digits are programmed.

When all digits are entered, the unit jumps to the preset counter mode and the according LED lights up.

Examples:

Rectifier nominal current:	15A	Display :	C_0015
	100A		C_0100
	1000A		C_1000

Manufacturer presetting (if no other agreement): 60mV at 100A

11 Technical data

Device type:		SIFCO PROCESS® CLASSIC POWER PACK
Function:		DC power supply
Mains voltage:		according to individual rating plate
Neutral:		yes
Phase current:		according to individual rating plate
Advised cable cross section for mains cable:		according to DIN VDE 0298-4 / 2013-06
DC-output voltage:		according to individual rating plate
DC-output current:		according to individual rating plate
Advised cable cross section for DC cable:		according to DIN VDE 0298-4 / 2013-06
Ripple: 1060 type 1020 type		< 1% of nominal voltage at 300cps < 0.5% of nominal voltage at 300cps
Regulation inaccuracy: 1060 type 1020 type		< 1% < 0.5%
Cyclic duration factor:		100 %
Environmental temperature:		0 to +40°C
Noise suppression:		according to EN 55011 curve A
Internal fuse:		according to individual rating plate
Protection grade:		IP21
Cooling:		Air, by heat sink
Cooling air consumption:		---
Weight:		approx.11kg (1020 type), approx. 29kg (1060 type)
Dimensions: 1060 type 1020 type		482 x 134 x 520 (W x H x D) 365 x 190 x 300 (W x H x D) (heat sink and switches not included)
Casing (color):		black

Other features:

* automatic turn off at under- and over voltage with defined start level
* protection against short circuit and open circuit
* over temperature protected
* power factor > 85% (switch mode technology)

12 Service and maintenance

The device is extensively maintenance-free.

It is recommended to perform the following maintenance tasks at regular intervals:

- Clean the fans and blow away dirt with compressed air (use only oil- and water free compressed air!)
- Check the fans (function and unusual noises)
- Blowing out of dirt with compressed air (only use filtrated compressed air that is free from oil and water)
- Check and possibly retightening of electrical connections
- Cleaning of the contact surfaces of the DC connections
- Visual check of the casing (protecting grade still kept?)
- Visual check of all accessible electrical connections within the device
- Check up all connections done by the customer

The maintenance intervals are to be defined by the customer and / or operator. The intervals are depending on the environmental conditions and operation cycles.

Do not clean the units with strong cleaning agents. Adjustment and maintenance work should only be done under strict safety precautions, especially if the work must be done while the device is switched on. Inside the unit, there are no controls to be used during operation.

This device was manufactured under high quality standards and has passed several function and safety tests during the production process. If there should be any trouble however, please contact the manufacturer.

13 Spare parts list

On request

14 Warranty and Repair Information

This unit has a two-year manufacturer's warranty, subject to the terms and conditions of the manufacturer.

Warranty/Service Locations:

North America, Canada, South America

Hendor PE, Inc.
55 Concourse Way
Greer, SC 29650
Phone (864) 879-0888
Fax (864)879-4237
Email Werner@hendor-pe.com

Europe
Plating Electronic GmbH
Marie Curie Str. 6
D-79211 Denzlingen, Germany
Phone +49 (0) 7666 / 9009-0
Fax +49 (0) 7666 / 9009-44
Email martha.drayer@plating.de

Asia
Solidheat Industries, PTE Ltd.
Block 9005, Tampines Street 9
#02-266 Industrial Park A
528839 Singapore
Phone 65-6784-7591
Fax 65-6784-7590
Email kelvinsoh@solidheat.com.sg