



**Model 682A01**  
**24 VDC DIN Rail Mount Power Supply**  
**Installation and Operating Manual**

**For assistance with the operation of this product,  
contact PCB Piezotronics, Inc.**

**Toll-free: 800-828-8840**  
**24-hour SensorLine: 716-684-0001**  
**Fax: 716-684-0987**  
**E-mail: [info@pcb.com](mailto:info@pcb.com)**  
**Web: [www.pcb.com](http://www.pcb.com)**





<b>Warranty, Service, Repair, and Return Policies and Instructions</b>
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**The information contained in this document supersedes all similar information that may be found elsewhere in this manual.**

**Total Customer Satisfaction** – PCB Piezotronics guarantees Total Customer Satisfaction. If, at any time, for any reason, you are not completely satisfied with any PCB product, PCB will repair, replace, or exchange it at no charge. You may also choose to have your purchase price refunded in lieu of the repair, replacement, or exchange of the product.

**Service** – Due to the sophisticated nature of the sensors and associated instrumentation provided by PCB Piezotronics, user servicing or repair is not recommended and, if attempted, may void the factory warranty. Routine maintenance, such as the cleaning of electrical connectors, housings, and mounting surfaces with solutions and techniques that will not harm the physical material of construction, is acceptable. Caution should be observed to insure that liquids are not permitted to migrate into devices that are not hermetically sealed. Such devices should only be wiped with a dampened cloth and never submerged or have liquids poured upon them.

**Repair** – In the event that equipment becomes damaged or ceases to operate, arrangements should be made to return the equipment to PCB Piezotronics for repair. User servicing or repair is not recommended and, if attempted, may void the factory warranty.

**Calibration** – Routine calibration of sensors and associated instrumentation is recommended as this helps build confidence in measurement accuracy and acquired data. Equipment calibration cycles are typically established by the users own quality regimen. When in doubt about a calibration cycle, a good “rule of thumb” is to recalibrate on an annual basis. It is also good practice to recalibrate after exposure to any severe temperature extreme, shock, load, or other environmental influence, or prior to any critical test.

PCB Piezotronics maintains an ISO-9001 certified metrology laboratory and offers calibration services, which are accredited by A2LA to ISO/IEC 17025, with full traceability to SI through N.I.S.T. In addition to the normally supplied calibration, special testing is also available, such as: sensitivity at elevated or cryogenic temperatures, phase response, extended high or low frequency response, extended range, leak testing, hydrostatic pressure testing, and others. For information on standard recalibration services or special testing, contact your local PCB Piezotronics distributor, sales representative, or factory customer service representative.

**Returning Equipment** – *Following these procedures will insure that your returned materials are handled in the most expedient manner.* Before

returning any equipment to PCB Piezotronics, contact your local distributor, sales representative, or factory customer service representative to obtain a Return **Warranty, Service, Repair, and Return Policies and Instructions** Materials Authorization (RMA) Number. This RMA number should be clearly marked on the outside of all package(s) and on the packing list(s) accompanying the shipment. A detailed account of the nature of the problem(s) being experienced with the equipment should also be included inside the package(s) containing any returned materials.

A Purchase Order, included with the returned materials, will expedite the turn-around of serviced equipment. It is recommended to include authorization on the Purchase Order for PCB to proceed with any repairs, as long as they do not exceed 50% of the replacement cost of the returned item(s). PCB will provide a price quotation or replacement recommendation for any item whose repair costs would exceed 50% of replacement cost, or any item that is not economically feasible to repair. For routine calibration services, the Purchase Order should include authorization to proceed and return at current pricing, which can be obtained from a factory customer service representative.

**Warranty** – All equipment and repair services provided by PCB Piezotronics, Inc. are covered by a limited warranty against defective material and workmanship for a period of one year from date of original purchase. Contact

PCB for a complete statement of our warranty. Expendable items, such as batteries and mounting hardware, are not covered by warranty. Mechanical damage to equipment due to improper use is not covered by warranty. Electronic circuitry failure caused by the introduction of unregulated or improper excitation power or electrostatic discharge is not covered by warranty.

**Contact Information** – International customers should direct all inquiries to their local distributor or sales office. A complete list of distributors and offices can be found at [www.pcb.com](http://www.pcb.com). Customers within the United States may contact their local sales representative or a factory customer service representative. A complete list of sales representatives can be found at [www.pcb.com](http://www.pcb.com). Toll-free telephone numbers for a factory customer service representative, in the division responsible for this product, can be found on the title page at the front of this manual. Our ship to address and general contact numbers are:

PCB Piezotronics, Inc.  
3425 Walden Ave.  
Depew, NY14043 USA  
Toll-free: (800) 828-8840  
24-hour SensorLine<sup>SM</sup>: (716) 684-0001  
Website: [www.pcb.com](http://www.pcb.com)  
E-mail: [info@pcb.com](mailto:info@pcb.com)



PCB工业监视和测量设备 - 中国RoHS2公布表  
 PCB Industrial Monitoring and Measuring Equipment - China RoHS 2 Disclosure Table

部件名称	有害物质					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
住房	○	○	○	○	○	○
PCB板	X	○	○	○	○	○
电气连接器	○	○	○	○	○	○
压电晶体	X	○	○	○	○	○
环氧	○	○	○	○	○	○
铁氟龙	○	○	○	○	○	○
电子	○	○	○	○	○	○
厚膜基板	○	○	X	○	○	○
电线	○	○	○	○	○	○
电缆	X	○	○	○	○	○
塑料	○	○	○	○	○	○
焊接	X	○	○	○	○	○
铜合金/黄铜	X	○	○	○	○	○
本表格依据 SJ/T 11364 的规定编制。						
○：表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 规定的限量要求以下。						
X：表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 规定的限量要求。						
铅是欧洲RoHS指令2011/65/ EU附件三和附件四目前由于允许的豁免。						

CHINA RoHS COMPLIANCE

Component Name	Hazardous Substances					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Chromium VI Compounds (Cr(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	O	O	O	O	O	O
PCB Board	X	O	O	O	O	O
Electrical Connectors	O	O	O	O	O	O
Piezoelectric Crystals	X	O	O	O	O	O
Epoxy	O	O	O	O	O	O
Teflon	O	O	O	O	O	O
Electronics	O	O	O	O	O	O
Thick Film Substrate	O	O	X	O	O	O
Wires	O	O	O	O	O	O
Cables	X	O	O	O	O	O
Plastic	O	O	O	O	O	O
Solder	X	O	O	O	O	O
Copper Alloy/Brass	X	O	O	O	O	O

This table is prepared in accordance with the provisions of SJ/T 11364.

O: Indicates that said hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.

X: Indicates that said hazardous substance contained in at least one of the homogeneous materials for this part is above the limit requirement of GB/T 26572.

Lead is present due to allowed exemption in Annex III or Annex IV of the European RoHS Directive 2011/65/EU.

DOCUMENT NUMBER: 21354

DOCUMENT REVISION: C

ECN: 45605

Model 682A01 24Vdc Primary Switch Mode Power Supply



Operating Guide with Enclosed Warranty Information

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MANUAL NUMBER: 18640  
MANUAL REVISION: B  
ECN NUMBER: 20456

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## **Warranty/Serviceing**

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## Introduction

The Model 682A01 24Vdc Power Supply functions on the principle of the primary switched regulator and complies with the latest technical standard. This all-purpose device can be used in areas from extreme industrial environments to interference-susceptible office and residential areas.

### General Features

- Electronic protection against short circuits and idling
- Wide-range input (AC and DC network without switchover)
- Reliable Isolation (DIMN VDE 0100-410, EN 60 950)
- High mains buffering
- LED function display in the secondary circuit
- Plug connectors
- Redundant circuits possible
- Active Signal Output
- Minimum housing width (22.5mm)
- Rail mounting (EN50022) NS 35



## Specifications

### Input

- **Input Voltage:** ..... 120-240Vac
- **Input Voltage Range:** ..... 85-264Vac/90-350Vdc
- **Frequency:** ..... 45-65Hz
- **Current Inrush at 25°C:** ..... <15A
- **Current Consumption at Nominal Input Voltage:** ..... 0.3/0.5A (230/120Vac)
- **Mains Buffering:** ..... >20/110ms (120/230Vac)
- **Surge Voltage Protection:** ..... Varistor
- **Fuse:** ..... 1.25A/250V

### Output

- **Nominal Voltage/Current:** ..... 24Vdc/1.0A
- **Tolerances:** .....  $\pm 3\%$
- **Adjustment Range:** ..... Fixed Voltage
- **Switching On After Applying Mains Voltage:** ..... 0.5s(230Vac) / <1s(120Vac)
- **Internal Surge Voltage Protection:** ..... 35Vdc  $\pm 5\%$
- **Function Display:** ..... LED
- **Parallel Switching:** ..... only for the construction of redundant systems.
- **System Deviation with change of load 10-90%:** ..... <1%/<3% (Static/Dynamic)
- **Power Down Time 10-90%:** ..... <150ms
- **Residual Ripple/Peak Switching Voltage:** ..... <100mVpp
- **Maximum Power Loss:** ..... 0.9/4.52W (No Load/Load)
- **DC OK (Active):** ..... 24Vdc/20mA



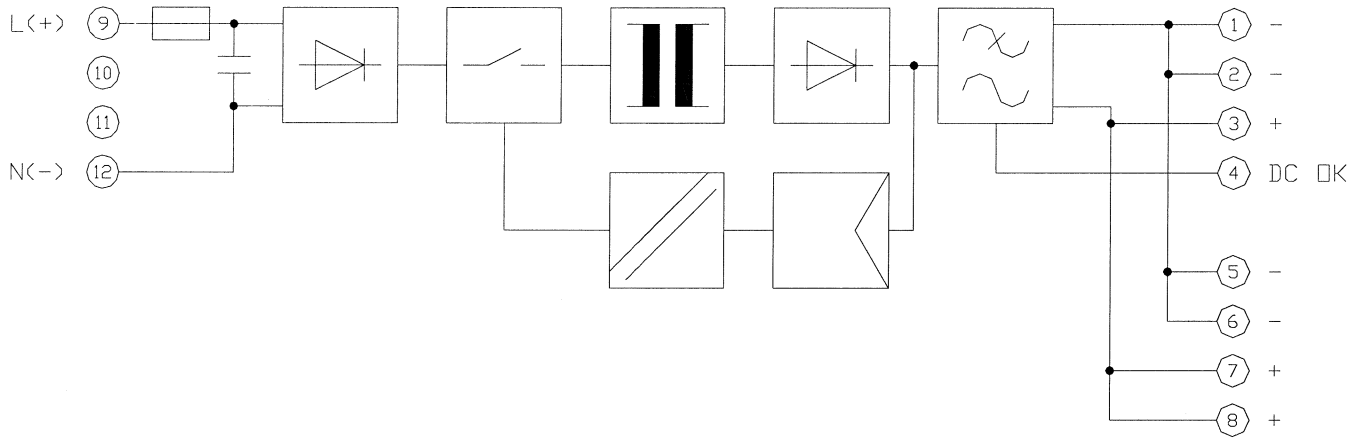
### **Environmental**

- **Operating Temperature:** ..... -25°C to +70°C
- **Storage Temperature:** ..... -40°C to +85°C
- **Humidity, non-condensing:** ..... 95% at 25°C
- **Vibration in acc. with IEC 68-2-6:** ..... 15Hz-150Hz, 2.5mm or 2.3g
- **Shock in acc. with IEC 68-2-27:** ..... 30g for 18ms in 3 directions
- **Contamination in acc. with EN 50178:** ..... 2

### **General**

- **Isolation Voltage:** ..... 3kV
- **Installation Position:** ..... On horizontal mounting rail NS 35 according to EN 50022
- **Mounting:** ..... can be mounted in rows – vertical spacing >10cm, horizontal without spacing
- **Conductor Cross Section:** ..... 0.2-2.5mm<sup>2</sup>, AWG 14-24 Rigid/Flexible
- **Protection Type:** ..... IP 20
- **Protection Class:** ..... II
- **MTBF:** ..... >500,000h acc. to IEC 1709 (SN29500)
- **Efficiency:** ..... >80%
- **Weight:** ..... approx. 0.21kg
- **Approx. dimensions (WxHxD):** ..... (22.5x99x114.5)mm

**Block Diagram**



## Connection and Operating Instructions



### **DANGER!**

- Never work on live equipment!
- When the device is opened, a dangerous voltage may remain at the electrolytic capacitors for up to 2 minutes after shutdown!



### **CAUTION!**

- A specialist in accordance with the requirements of EN 60950 must perform the installation.
- For vertical installations we recommend a minimum spacing of 10cm between other modules and this power supply to insure sufficient convection.
- No minimum spacing is required for horizontal mounting.
- The mains feed line must have an appropriate fixing or strain relief outside the device.
- The supply-side installation and the connection via screw terminal blocks must be done in a way that ensures protection against electric shock.

### **Rail Mounting**

The power supply unit can be snapped onto all mounting rails in accordance with EN 50022-35

### **Cable Connection**

This device is equipped with plug connectors. This easy to assemble connection method allows devices to be exchanged easily and the electrical connection to be visibly isolated.

#### **Connecting Cables:**

Cable cross sections from 0.2 - 2.5mm<sup>2</sup> rigid (solid)/flexible (stranded)

AWG 14-24

Copper rated for an operating temperature of 75°C/170°F

#### **For reliable and touch-proof contacts:**

Strip off 7mm of insulation from the connection wire ends.

#### **Input:**

The 120-240Vac connection is made by the screw connections L(+) and N(-) on the plug connector. Do not exceed a torque of 0.05Nm. The Power LED on the front of the device signalizes that the device is functioning.

#### **Output:**

The 24Vdc connection is made by the screw connections + and - (torque 0.5Nm) on the plug connection.

**Protection:**

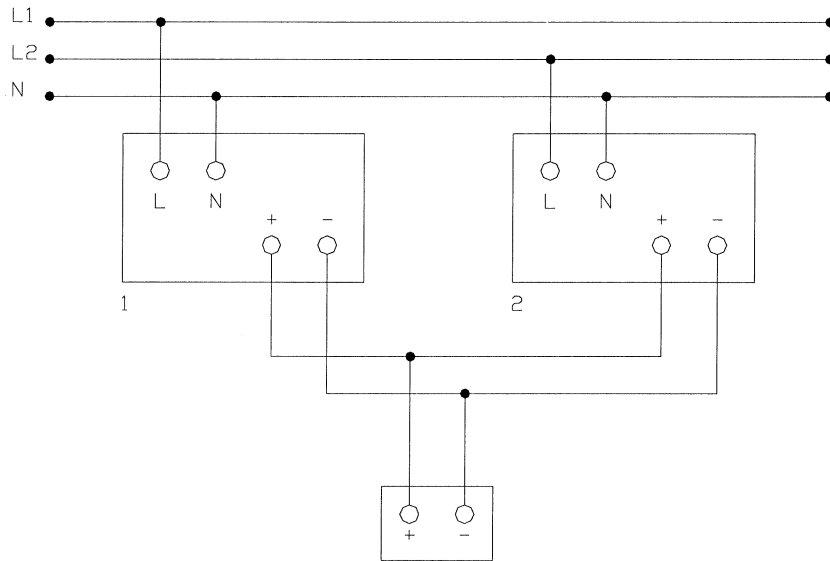
The device must be installed in accordance with the specifications of EN 60950. It must be possible to switch off the device using a suitable disconnecting device outside the power supply. For example, primary side line protection could be used.

**In the case of DC applications, it is necessary to connect in series an adequate fuse.**

On the secondary side, the device is electronically protected against short circuits and idling. In the event of an error, the output voltage is limited to maximum 35V ±5%.

**Redundancy Mode:**

This device can be switched in parallel for redundancy operation. If a fault occurs in the primary circuit of No.1, the device No.2 automatically takes control of the entire power supply without interruption and vice versa.



## Characteristics

**Thermal Behavior:**

The device supplies the rated current of 1.0A with an ambient temperature up to 60°C.

**Active Signal Output:**

The 24Vdc (high) signal is between the “DC OK” and “-“ connection terminal blocks and can be loaded with 20mA maximum. The signal output will drop to 0V (low) when the output voltage has fallen below 21.5Vdc.

The DC OK signal is isolated from the power output. This provides correct signaling in redundant applications.

## **Warning 1 – ESD sensitivity**

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*The power supply/signal conditioner should not be opened by anyone other than qualified service personnel.* This product is intended for use by qualified personnel who recognize shock hazards and are familiar with the safety precautions required to avoid injury.

## **Warning 2 – ESD sensitivity**

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This equipment is designed with user safety in mind; however, the protection provided by the equipment may be impaired if the equipment is used in a manner not specified by PCB Piezotronics, Inc.

## **Caution 1 – ESD sensitivity**

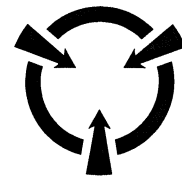
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**Cables can kill your equipment.** High voltage electrostatic discharge (ESD) can damage electrical devices. Similar to a capacitor, a cable can hold a charge caused by triboelectric transfer, such as that which occurs in the following:

- *Laying on and moving across a rug,*
- *Any movement through air,*
- *The action of rolling out a cable, and/or*
- *Contact with a non-grounded person.*

### **The PCB solution for product safety:**

- *Connect the cables only with the AC power off.*
- *Temporarily “short” the end of the cable before attaching it to any signal input or output.*



**CAUTION**  
ELECTROSTATIC  
DISCHARGE SENSITIVE

## **Caution 2 – ESD sensitivity**

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**ESD considerations should be made prior to performing any internal adjustments on the equipment.** Any piece of electronic equipment is vulnerable to ESD when opened for adjustments. Internal adjustments should therefore be done ONLY at an ESD-safe work area. Many products have ESD protection, but the level of protection may be exceeded by extremely high voltage.

## **Warranty**

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IMI instrumentation is warranted against defective material and workmanship for 1 year unless otherwise expressly specified. Damage to instruments caused by incorrect power or misapplication, is not covered by warranty. *If there are any questions regarding power, intended application, or general usage, please consult with your local sales contact or distributor.* Batteries and other expendable hardware items are not covered by warranty.

## **Service**

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Because of the sophisticated nature of IMI instrumentation, field repair is typically **NOT** recommended and may void any warranty. If factory service is required, return the instrumentation according to the "Return Procedure" stated below. *A repair and/or replacement quotation will be provided prior to servicing at no charge.* Before returning the unit, please consult a factory IMI applications engineer concerning the situation as certain problems can often be corrected with simple on-site procedures.

## **Return procedure**

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*To expedite returned instrumentation, contact a factory IMI applications engineer for a RETURN MATERIAL AUTHORIZATION (RMA) NUMBER. Please have information available such as model and serial number. Also, to insure efficient service, provide a written description of the symptoms and problems with the equipment to a local sales representative or distributor, or contact IMI if none are located in your area.*

Customers outside the U.S. should consult their local IMI distributor for information on returning equipment. For exceptions, please contact the International Sales department at IMI to request shipping instructions and an RMA. For assistance, please call (716) 684-0003, or fax us at (716) 684-3823. You may also receive assistance via e-mail at [imi@pcb.com](mailto:imi@pcb.com) or visit our web site at [www.pcb.com](http://www.pcb.com).



## Customer Service

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IMI, a division of PCB Piezotronics, guarantees **Total Customer Satisfaction**. If, at any time, for any reason, you are not completely satisfied with any IMI product, IMI will repair, replace, or exchange it at no charge. You may also choose, within the warranty period, to have your purchase price refunded.

IMI offers to all customers, at no charge, 24-hour phone support. This service makes product or application support available to our customers, day or night, seven days a week. When unforeseen problems or emergency situations arise, call the **IMI Hot Line at (716) 684-0003**, and an application specialist will assist you.

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*ICP® is a registered trademark of PCB Piezotronics, Incorporated,  
which uniquely identifies PCB sensors that incorporate built-in microelectronics.*



Model Number 682A01	<b>24 VDC DIN RAIL MOUNT POWER SUPPLY</b>	Revision: B ECN #: 45402
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	<u>ENGLISH</u>	<u>SI</u>
<b>Performance</b>		
MTBF	>500000h	>500000h
Efficiency	>85%	>85%
<b>Control Interface</b>		
Display	LED	LED
<b>Environmental</b>		
Temperature Range(Operating)	-13 to +158 °F	-25 to +70 °C
Temperature Range(Storage)	-40 to +185 °F	-40 to +85 °C
Humidity Range(Non-Condensing)	<95 %	<95 %
<b>Electrical</b>		
Power Required	85-264 VAC / 90-350 VDC	85-264 VAC / 90-350 VDC
Output Voltage	24 VDC	24 VDC
Output Current	1.3 Amps	1.3 Amps
Input Frequency	45 to 65 Hz	45 to 65 Hz
Inrush Current(@ 25 deg C)	<15A	<15A
Current Consumption(230/120 VAC)	0.3/0.5A	0.3/0.5A
Fuse	1.25A/250V	1.25A/250V
Mains Buffering	>20/110ms (120/230 VAC)	>20/110ms (120/230 VAC)
Surge Voltage Protection	Varistor	Varistor
10-90% Load Tolerance	+/- 3%	+/- 3%
Turn On Delay	<0.5/1s (230/120 VAC)	<0.5/1s (230/120 VAC)
Turn Off Delay	<150ms	<150ms
Internal Surge Voltage Protection	35 VDC +/- 5%	35 VDC +/- 5%
Parallel Switching	Redundant Systems Only	Redundant Systems Only
Ripple Voltage	<20mV pp	<20mV pp
Maximum Power Loss	0.9/4.5W (No Load/Load)	0.9/4.5W (No Load/Load)
DC OK (Active)	24V / 20mA	24V / 20mA
Insulation Voltage	3kV	3kV
<b>Physical</b>		
Size (Height x Width x Depth)	3.90 in x 0.89 in x 4.24 in	99 mm x 22.5 mm x 107 mm
Weight	7.1 oz	0.2 kg
Conductor Cross Section	AWG 14-24	0.2-2.5mm <sup>2</sup>
Vibration(10Hz-150Hz)	2g	0.15mm
Shock(3 directions for 18 ms)	30g	30g

**OPTIONAL VERSIONS**

Optional versions have identical specifications and accessories as listed for the standard model except where noted below. More than one option may be used.

**NOTES:**

[1]This device is in compliance with the EMC guideline 89/336/EEC and the low voltage guideline 73/23/EEC

[2]This device must be installed in accordance with the specifications of EN60950. It must be possible to switch off the device using a suitable disconnecting device outside the power supply. For example, primary side line protection could be used.

[3]In the case of DC applications it is necessary to connect in series an adequate fuse

[4]See appropriate Declaration of Conformance for details

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Entered: LK	Engineer: gs	Sales: MC	Approved: BAM	Spec Number:
Date: 6/6/2016	Date: 6/6/2016	Date: 6/6/2016	Date: 6/6/2016	18194



*All specifications are at room temperature unless otherwise specified.  
In the interest of constant product improvement, we reserve the right to change specifications without notice.*



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Fax: 716-684-0987  
E-Mail: info@pcb.com

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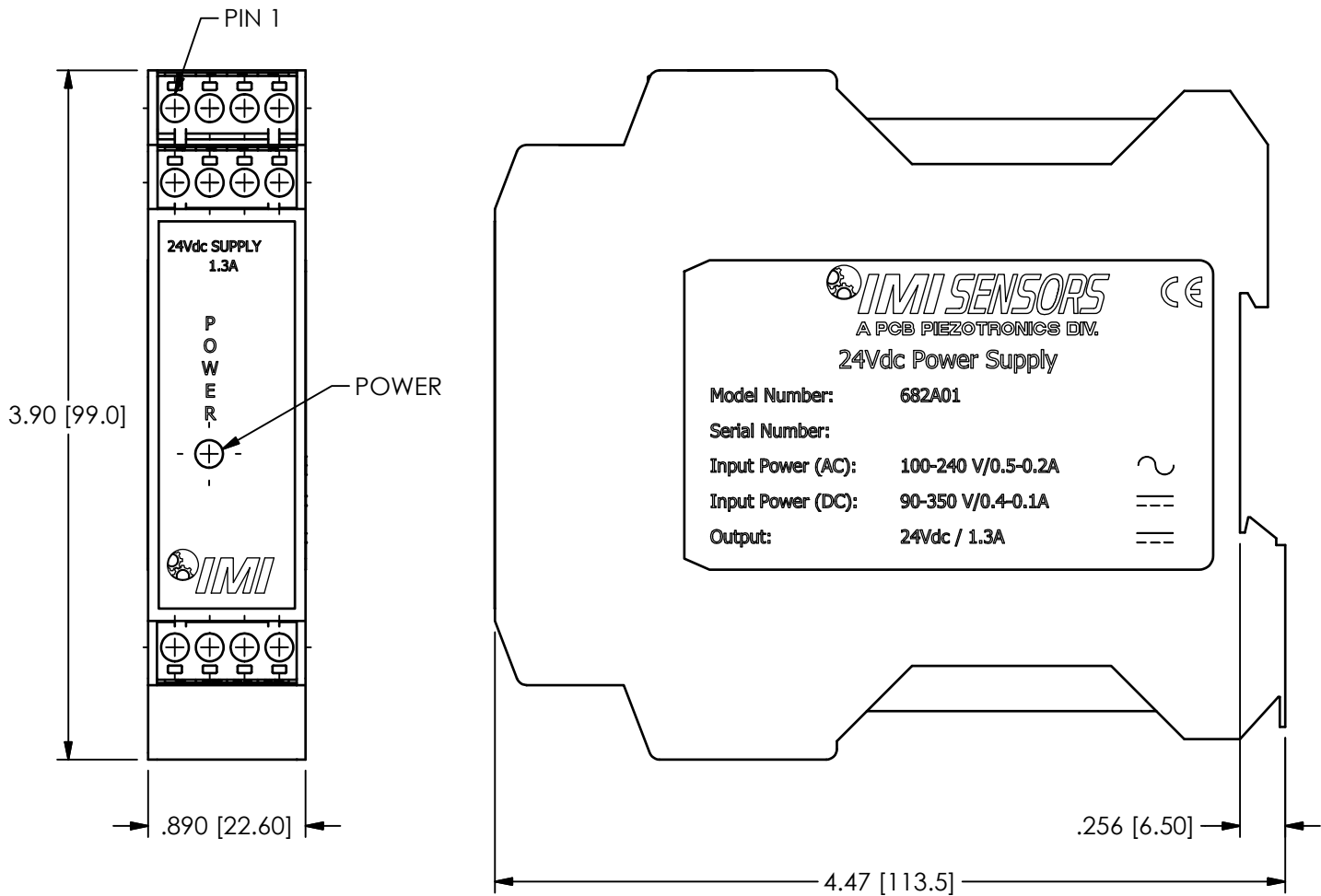
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REVISIONS		
REV	DESCRIPTION	DIN
C	UPDATED POWER SPECS	45402

18276

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UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:		DRAWN		CHECKED		ENGINEER		 3425 WALDEN AVE. DEPEW, NY 14043 (716) 684-0001 E-MAIL: sales@pcb.com	
DIMENSIONS IN INCHES	DIMENSIONS IN MILLIMETERS [ IN BRACKETS ]	JDM	6/9/16	ECB	6/9/16	GGG	6/9/16		
DECIMALS XX ±.03 XXX ±.010	DECIMALS X ± 0.8 XX ± 0.25	TITLE OUTLINE DRAWING MODEL 682A01 24Vdc DIN RAIL POWER SUPPLY						CODE IDENT. NO.	DWG. NO.
ANGLES ± 2 DEGREES	ANGLES ± 2 DEGREES							52681	18276
FILLETS AND RADII .003 - .005	FILLETS AND RADII 0.07 - 0.13	SCALE: FULL		SHEET 1 OF 1					

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