

# ACB-3000

## Redundancy Static Transfer Switch

### GENERAL FEATURES:

Sine wave output voltage by-pass for dual input lines.

Switching period less than < 2 ms

Two models for 120V<sub>ac</sub> and 230V<sub>ac</sub>, 50Hz.

High current converter up to 13A or 21 A, depending on the model.

Designed according to EN50155:2017

Fire and smoke: EN45545-2:2013  
+A1:2015

Safety according to norm IEC 62368-1  
CAN BUS to control status



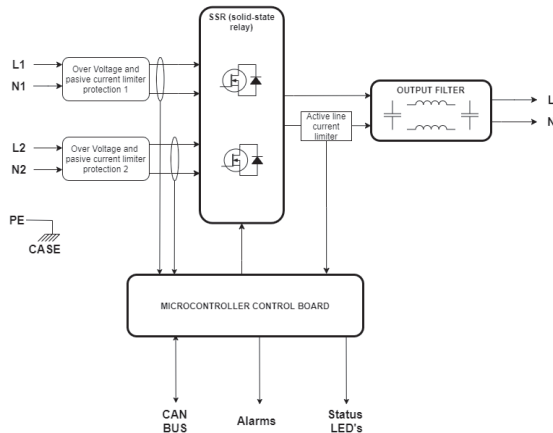


MODEL	9431			9576*		
Premium models ODS-XXXX	750-230	1500-230	3000-230	750-120	1500-120	3000-120
<b>DUAL AC INPUTS</b>						
Nominal AC input voltage	230 V <sub>ac</sub>			120 V <sub>ac</sub>		
Minimum/Maximum AC input voltage	±10% of nominal					
Efficiency	>99%					
<b>OUTPUT</b>						
Output voltage	230 V <sub>ac</sub> (same as input)			120 V <sub>ac</sub> (same as input)		
Voltage tolerance	≤ ±10 % of nominal					
Load regulation	-2 V					
Line regulation	V <sub>input</sub> - 2 V					
Nominal AC output current	13 A <sub>rms</sub>			21 A <sub>rms</sub>		
Maximum peak input current	22 A <sub>pk</sub>			32 A <sub>pk</sub>		
<b>DC AUXILIAR (not necessary)</b>						
Nominal DC input voltage	15 – 139 V <sub>dc</sub>					
<b>ENVIRONMENTAL</b>						
Storage temperature	-40 ... 85 °C					
Operating temperature: Full load	-40 ... 55 °C (EN50155 OT2)					
Operating temperature: 70 % load	-40 ... 70 °C (EN50155 OT4)					
Operating temperature: 50 % load	-40 ... 85 °C (EN50155 OT6)					
Cooling	Natural convection					
Operating altitude	2000m at full load, 2500m at 90% of load					
Maximum Relative humidity	95 % with no condensation					
Shock and vibration	EN61373:2011 Category 1 class B body mounted					
Service life	> 20 years					
MTBF	> 1000000 h @ 40 °C according to IEC61709					
<b>EMC</b>						
Emission	EN50121-4					
Immunity	EN50121-4					
<b>SAFETY</b>						
Safety according to norm	IEC 62368-1					
Dielectric strength Input-Output / Earth	1500 V <sub>ac</sub> 50 Hz					
Dielectric strength DC input / Earth	1500 V <sub>ac</sub> 50 Hz					
Protection Degree	IP40					
Pollution degree	PD2					
Overvoltage category	OV2					
Fire and smoke	EN45545-2:2013 +A1:2015					
<b>MECHANICAL</b>						
Dimensions	78,34 x 60 x 200 mm					
Weight	1,2 kg					
<b>CONTROL</b>						
Switching response in case of failure	< 2 ms					
Input Line 1 OK	Green					
Input line 2 OK	Green					
Output OK	Green					
Failure of the system	Red					
Status	Can Bus					
<b>PROTECTIONS</b>						
Against output overloads and short-circuits	Current limiting by fuse and active protection of overcurrent with push-in button for system restart after 3 overcurrent situations.					
Failure in line 1	Solid state relay 1 closed if line 1 is OK and opened if it isn't					
Failure in line 2	Solid state relay 2 closed if line 2 is OK and opened if it isn't					
Failure in system	Solid state relay 3 closed if all the system is OK and opened if it isn't					

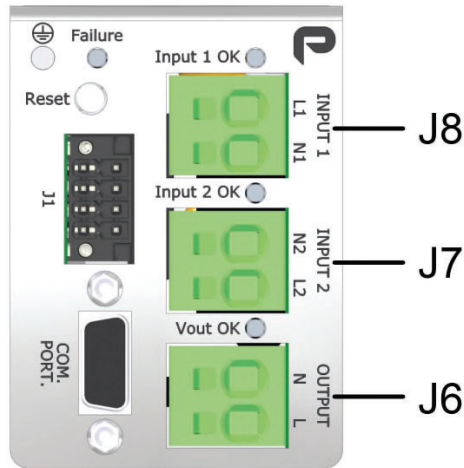
\*Design available on request and subject to MOQ.



## BLOCKS DIAGRAM



## CONNECTIONS

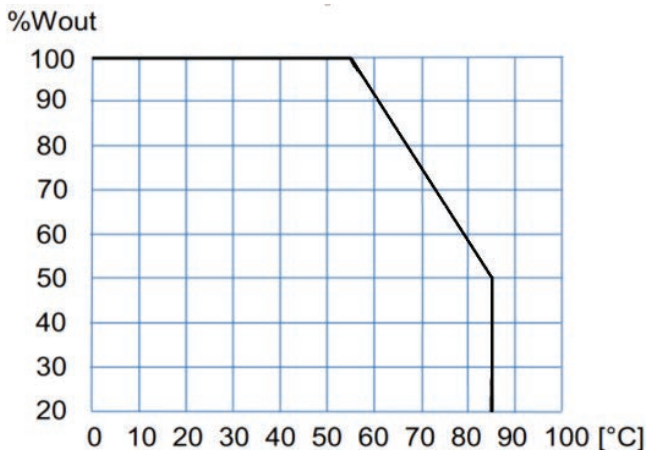


Note 1: maximum spring terminals cross section cable 6mm<sup>2</sup>

Note 2: J1 recommended male connector Phoenix Contact 1790124

Note 3: maximum nut torque in M4 earth connection 1.9 Nm

## POWER DERATING vs AMBIENT TEMP.



## DESCRIPTION

The ACB-3000 is a current transfer switch converter which has 2 main AC voltage input lines and is capable of switch between them and give an output in case of failure in one of their input lines.

Supplied by the Premium families ODS-750, ODS-1500 and ODS-3000 the unit is designed to give extra protection against failure in one of the input lines for mainly auxiliary loads in Railways.

In case of failure the equipment has control LEDs and solid-state relays which will change their state.

The device is protected against overload and short-circuits by means of a current limiting circuit. After a detection of overcurrent, the failure LED will be on and there will be no output. When 3 overcurrent situations have been produced, the ACB will stop supplying the output until the 'Reset' button is pressed.

In normal operation, the input that is supplying the output will have its LED blinking. If the other input is correctly supplied, its LED will be on. If the output is active, the LED will blink indicating correct function.

	Function
<b>J8 (Pin 1)</b>	Neutral 1 Input
<b>J8 (Pin 2)</b>	Line 1 input
<b>J7 (Pin 1)</b>	Line 2 input (priority)
<b>J7 (Pin 2)</b>	Neutral 2 input (priority)
<b>J6 (Pin 1)</b>	Line output
<b>J6 (Pin 2)</b>	Neutral output
<b>Push-in button</b>	Restart of the system in case of 3 overcurrent situation.
<b>J1 (Pin 7,8)</b>	Relay of failure in system
<b>J1 (Pin 5,6)</b>	Relay of failure in line 2
<b>J1 (Pin 4,3)</b>	Relay of failure in line 1
<b>J1 (Pin 2,1)</b>	+Vbat, -Vbat auxiliar
<b>J4 (SubD9)</b>	CAN-BUS communications



### CAN Communication port

It is possible to monitor the unit via DSUB9 connector with CAN protocol.



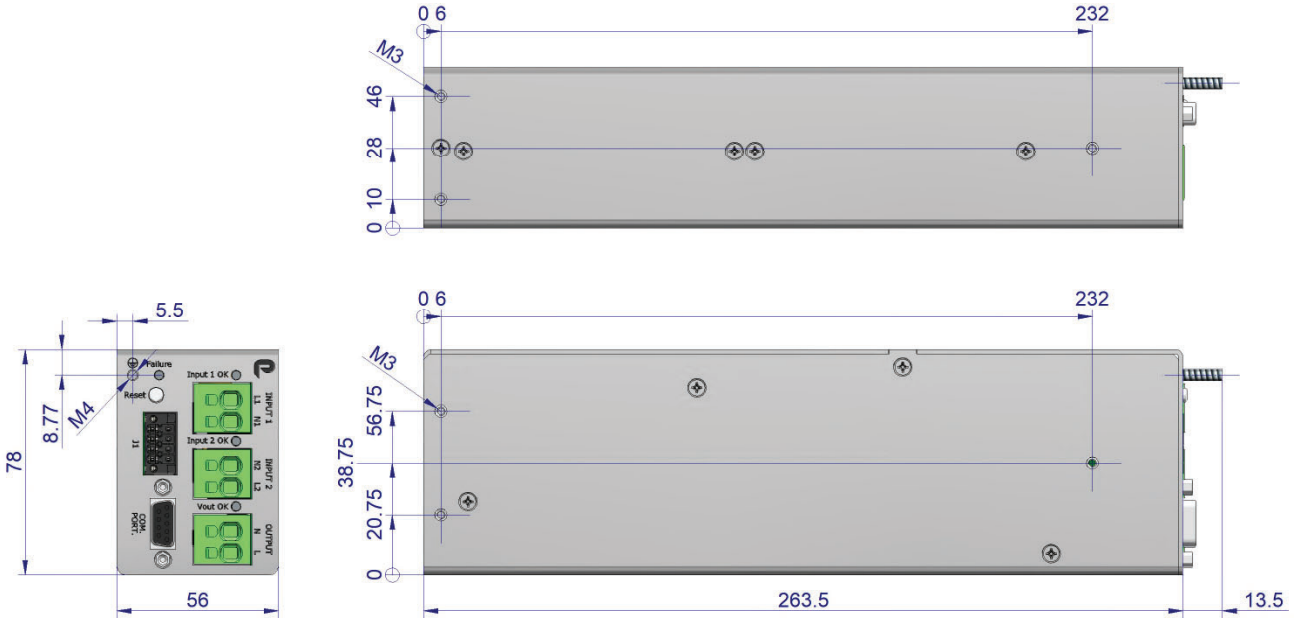
**Protocol configuration:** By default, CANopen devices start without CANopen Node-ID (0xFF) and baudrate of 250 kbit. Node ID must be set to communicate with the device.

Standardized Device Profile Area					
Index	Subindex	Name	Type	Attribute	Notes
6001	00	Active line	UINT8	ro	
6002	00	State	UINT8	ro	
6003	00	Number of failures	UINT8	ro	
6100	01	Input voltage RMS 1	UINT32	ro	
6100	02	Input voltage RMS	UINT32	ro	
6101	01	Input current RMS 1	UINT32	ro	
6101	02	Input current RMS	UINT32	ro	
6102	01	Input frequency 1	UINT32	ro	
6102	02	Input frequency 2	UINT32	ro	
6103	01	Input state 1	UINT8	ro	
6103	02	Input state 2	UINT8	ro	
6200	00	Output voltage RMS	UINT32	ro	
6201	00	Output current RMS	UINT32	ro	
6202	00	Output freq	UINT32	ro	
6300	00	Number of startups	UINT32	ro	
6301	00	Number of hours ON	UINT32	ro	

Communication Profile Area					
Index	Subindex	Name	Type	Attribute	Notes
1001	00	Error register	UINT8	ro	
1003	00	Number of errors	DYNAMIC_TABLE	rw	
1003	01	Error messages	DYNAMIC_TABLE	ro	
1008	00	Manufacturer device name	ARRAY	ro	
100A	00	Manufacturer software version	ARRAY	ro	
1017	00	Producer Heartbeat time	UINT16	rw	
1029	00	Error behavior object	UINT8	-	
1018	01	vendor_ID	UINT32	ro	
1018	02	Product Code	UINT32	ro	
1018	03	Revision Number	UINT32	ro	
1018	04	Serial Number	UINT32	ro	



## DIMENSIONS



Lateral fixing holes 6 x M3 (screw torque < 1.6 Nm). Maximum screw deep 5 mm.  
Earth screw M4 (nut torque < 2.5 Nm)

## ACCESSORIES (pending)



## EU, UKCA DECLARATION OF CONFORMITY

The undersigned, representing the following:

Manufacturer: PREMIUM, S. A.,  
Address: C/ Dolors Aleu 19-21, 08908 L'Hospitalet de Llobregat, SPAIN

herewith declares that the product:

Type: AC/AC bypass  
Model: **ACB-3000- 9431 - 9576**

is in conformity with the provisions of the following EU directive(s):

2014/35/EU SI 2016 No 1101	Low voltage / The electrical equipment (safety) regulations
2014/30/EU SI 2016 No 1091	EMC / Electromagnetic compatibility regulations
2015/863/EU SI 2012 No. 3032	RoHS / Restriction of the use of certain hazardous substances in electrical and electronic equipment

and that standards and/or technical specifications referenced below have been applied:

EN 60950-1: 2005	Safety. Information technology equipment
EN 62368-1: 2014	Safety. Audio/video, information and communication technology equipment
EN 61000-6-3: 2007	Generic emission standard
EN 61000-6-2: 2005	Generic immunity standard
EN 50155: 2017*	Railway applications. Electronic equipment used on rolling stock material
EN 50121-3-2: 2016*	Railway applications. EMC Rolling stock equipment

\* See annexe

CE marking year: **2020**; UKCA marking year: **2021**

### Notes:

For the fulfillment of this declaration the product must be used only for the aim that has been conceived, considering the limitations established in the instructions manual or datasheet.

L'Hospitalet de Llobregat, 31-05-2021



Miguel Angel Fernandez  
Chief Research & Development Officer

PREMIUM S.A. is an ISO9001 and ISO14001  
certified company by Bureau Veritas



## ANNEXE

Applicable values for the different sections of the norm EN50155: 2017																																																																								
4.3.1	Working altitude	Up to 2000m																																																																						
4.3.2	Ambient temperature	Class OT1 (-25 to 55°C): load < 100% Class OT3 (-25 to 70°C): load < 62.5% Class OT5 (-25 to 85°C): load < 25%																																																																						
4.3.3	Switch-on extended operating temp.	Class ST1																																																																						
4.3.4	Rapid temperature variations	Class H1																																																																						
4.3.5	Shocks and vibrations	According EN61373:2010 Category 1 class B																																																																						
4.3.6	EMC Electromagnetic Compatibility EN50121-3-2:2015	<table border="1"> <thead> <tr> <th>Test</th> <th>Norm</th> <th>Port</th> <th>Frequency</th> <th>Limits</th> </tr> </thead> <tbody> <tr> <td rowspan="3">Radiated emissions</td> <td rowspan="3">IEC55016</td> <td rowspan="3">Case</td> <td>30MHz...230MHz</td> <td>40dB(µV/m) Qpk at 10m</td> </tr> <tr> <td>230MHz...1GHz</td> <td>47dB(µV/m) Qpk at 10m</td> </tr> <tr> <td>1...3GHz</td> <td>Do not apply</td> </tr> <tr> <td></td> <td></td> <td></td> <td>3...6GHz</td> <td>Internal freq. &lt; 108MHz</td> </tr> <tr> <td rowspan="2">Conducted emissions</td> <td rowspan="2">IEC55016</td> <td rowspan="2">Output</td> <td>150kHz...500kHz</td> <td>99dB(µV) Qpk</td> </tr> <tr> <td>500kHz...30MHz</td> <td>93dB(µV) Qpk</td> </tr> </tbody> </table>	Test	Norm	Port	Frequency	Limits	Radiated emissions	IEC55016	Case	30MHz...230MHz	40dB(µV/m) Qpk at 10m	230MHz...1GHz	47dB(µV/m) Qpk at 10m	1...3GHz	Do not apply				3...6GHz	Internal freq. < 108MHz	Conducted emissions	IEC55016	Output	150kHz...500kHz	99dB(µV) Qpk	500kHz...30MHz	93dB(µV) Qpk																																												
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4.3.7	Relative humidity	Up to 95%																																																																						
5.1.1.2	DC power supply range	From 0.70 to 1.25 Un continuous																																																																						
5.1.1.3	Temporary DC power supply fluctuation	From 0.60 to 1.40 Un 0.1s From 1.25 to 1.40 Un 1s without damage																																																																						
5.1.1.4	Interruptions of voltage supply	S1																																																																						
5.1.1.6	Input ripple factor	10% peak to peak with a DC Ripple Factor of 5 %																																																																						
5.1.3	Supply change-over	0,6 Un duration 100 ms (without interruptions). Performance criterion A																																																																						
7.2.7	Input reverse polarity protection	By serial diode in the input																																																																						
10.7	Protective coating for PCB assemblies	Class PC2																																																																						
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