AC LOAD BENCH 15kVA (MOET)

PERFORMANCES

- Power 15 kVA on two ranges 130V and 260V
- Loaded network insulation relay
- Current regulation
- Accuracy 0.4%
- 130 ARMS at 115VRMS / 65 ARMS at 230 VRMS
- Wide bandwidth (2kHz full scale)
- Signal to Noise Ratio > 70 dB
- External Trigger
- Calibration by software
- Phase lock over a period

CE 🔲 *IEEE488.2*

APPLICATIONS

- Load emulation
- Network Qualification
- Tests according to ABD100.1.8 / MIL-STD-704 / AIR2021
- Integrated power analyzer (acquisition option)
- Nonlinear loads
- Generation of harmonics

DESCRIPTION

- This linear technology load bench is suitable for many laboratory and test applications. Its excellent characteristics of accuracy, bandwidth, low distortion and immunity to the network make it appreciated for emulation applications of any type of load, qualification of avionic networks and measurement of impact on any type of current.
- The linear technology allows its use at full power for a power factor between -0.8 and -1.
- The load bench is in the form of a standard bench of width 800 mm, depth 800 mm and height 38 U (2010 mm).
- Its input connections are in the form of power bases with keying.
- Remote control using an IEEE488.2 link, optional Ethernet, allows easy integration into an automatic test system.

COMMERCIAL REFERENCE

- **PA-15000-L/130A-230V**

  - **Option "PA-ACQ" :** adding a power analyzer
  - **Option "PA-ETH" :** remote control on Ethernet
  - **Option "PA-SR" :** custom voltage ranges

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FEATURES

<table>
<tr><td rowspan="38">INPUTS</td><td>Main features</td><td>Range 130V</td><td>Range 260V</td></tr>
<tr><td>Input type</td><td>Direct (without transformer)</td><td>Through a transformer</td></tr>
<tr><td>Current shape</td><td colspan="2">AC, AC + harmonics</td></tr>
<tr><td>Voltage and current (1)</td><td>Range 130V</td><td>Range 260V</td></tr>
<tr><td>Nominal power</td><td colspan="2">15 000 VA</td></tr>
<tr><td>Voltage AC (2) et (3)</td><td>70-130 VRMS</td><td>140-260 VRMS</td></tr>
<tr><td>Permanent Current AC</td><td>0-130 ARMS</td><td>0-65 ARMS</td></tr>
<tr><td>Current accuracy</td><td></td><td></td></tr>
<tr><td>Typical</td><td colspan="2">0,1% of nominal current of the range
+ 0,1% of the programmed current value</td></tr>
<tr><td>Max</td><td colspan="2">0,5% of nominal current of the range</td></tr>
<tr><td>Current distortion at full power</td><td></td><td></td></tr>
<tr><td>Max</td><td colspan="2">< 0,7% à 400 Hz</td></tr>
<tr><td>Current regulation for mains variation of + 6% -10%</td><td></td><td></td></tr>
<tr><td>Max</td><td colspan="2">< 0,2%</td></tr>
<tr><td>Residual noise</td><td></td><td></td></tr>
<tr><td>Signal / Noise Ratio</td><td colspan="2">> 70 dB</td></tr>
<tr><td>Bandwidth</td><td></td><td></td></tr>
<tr><td>Fundamental</td><td colspan="2">300 – 2000 Hz</td></tr>
<tr><td>Small signals (at -3 dB)</td><td colspan="2">20 kHz</td></tr>
<tr><td>Harmonics generation</td><td colspan="2">Up to 150 kHz</td></tr>
<tr><td>Full-scale variation time with square pilot signal</td><td></td><td></td></tr>
<tr><td>Rise time 10% / 90%</td><td colspan="2">< 20 µs</td></tr>
<tr><td>Fall time 10% / 90%</td><td colspan="2">< 20 µs</td></tr>
<tr><td>Synchronization with loaded network</td><td></td><td></td></tr>
<tr><td>Duration required</td><td colspan="2">1 period</td></tr>
<tr><td>Frequency variation of the network</td><td colspan="2">Up to 200 Hz/s (4)</td></tr>
<tr><td>Variation regarding temperature</td><td></td><td></td></tr>
<tr><td>Typical</td><td colspan="2">50 ppm/°C</td></tr>
<tr><td>Max</td><td colspan="2">100 ppm/°C</td></tr>
<tr><td>Stability after 15 minutes de operation</td><td></td><td></td></tr>
<tr><td>Max</td><td colspan="2">< 5.10⁻⁴ of nominal current</td></tr>
<tr><td>Isolation output to case</td><td></td><td></td></tr>
<tr><td>Measurement at 500 VDC</td><td colspan="2">> 100 MΩ</td></tr>
</table>

Note (1): the power is permanent for a power factor between -1 (180° phase shift between current and voltage) and -0,8 (143° phase shift between current and voltage)

Note (2): other voltage ranges on request (PA-SR option)

Note (3): "overvoltage" and "undervoltage" devices are integrated into this load:
Range 130V:
Operation only in range 70 VRMS – 130 VRMS
Range 260V:
Operation only in range 140 VRMS – 260 VRMS
Outside these ranges, the load bench is safe and does not disconnect any current.

Note (4): the continuity of the synchronization with the input network voltage is guaranteed for a frequency variation of this network less than or equal to 200 Hz / s.

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FEATURES

POWER SUPPLY		
Mains network		
	Number of phases	3 Phases + Earth without Neutral
	Tension entre phases	400 VRMS -10% +6%
	Frequency	47 - 63 Hz
Input current at full load power		
	Max	40 ARMS
	Overcurrent protection	Thermal breaker
	Differential protection	Differential breaker 30mA
	Inrush current	Limited by resistors
Dielectric strength mains input versus output connected to case		
	Measurement at 1500 VRMS / 50Hz	Current < 1 mA

MECANICHAL AND ENVIRONMENTAL		
Dimensions and weight		
	Width	800 mm
	Height	2010 mm (38U)
	Depth	800 mm
	Weight	400 kg
Temperature and humidity		
	Storage temperature	-10°C à +85°C
	Operating temperature	+0°C à +50°C
	Relative humidity	10% - 90% non-condensing
Marking		
	Marking	CE
	Protection level	IP30
Protections		
	Against overvoltage	See Note (3) page 2
	Against undervoltage	
	Against overheat	Power input switch off (1)

1) A temperature sensor is installed on each power element. It switches off the load in case of overheat. The load must be re-activated by a local control or an external control.

OPTIONS

OPTION « PA-ACQ »
The addition of an "ACQ2" board allows the acquisition and analysis of the voltage and current at the input of this load. This option is described in the data sheet "FT-Card ACQ-EN-V1".

OPTION « PA-ETH »
Remote control of this load is carried out via an IEEE488.2 link.
This option is the replacement of this link over a TCP-IP over Ethernet network.

OPTION « PA-SR »
If different voltages are required, this option allows you to specify new input voltage ranges for this load.

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INTERNAL CONSTITUTION
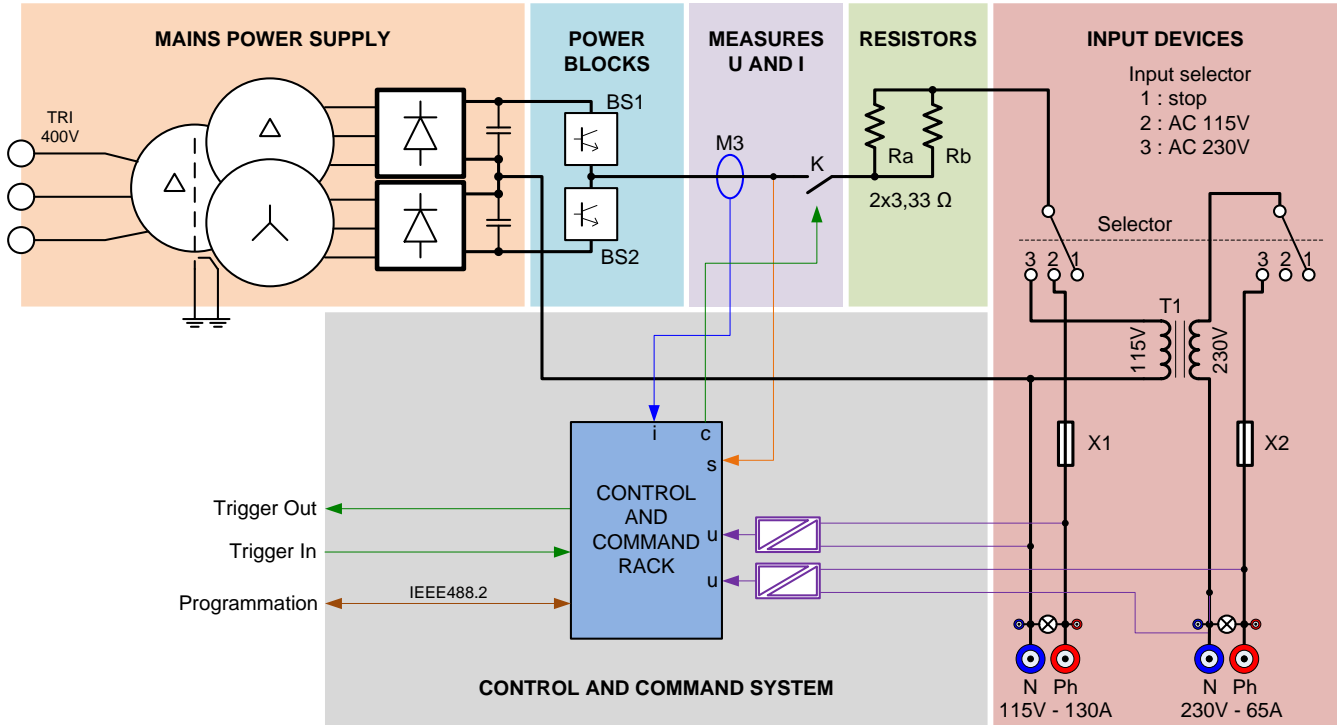
The selector switch "S1" selects the desired voltage range, 130VRMS or 260 VRMS.

The trigger input "Trigger In" allows synchronization between the load bench and another test device.

The "Trigger Out" output is used to synchronize other equipment to the load bench.

The control rack receives the readbacks of the voltages of the AC inputs via isolated measuring channels. A fast Phase Locked Loop (PLL) ensures synchronization between the bench and the network to be loaded for a maximum duration of one period.

REMOTE CONTROL USING OPS SOFTWARE SUITE

The OPS software suite, developed by Power +, allows easy control of equipment.

The OPS1 software allows generation of specific waveforms.

The "SPC" library allows customizing periodic current waveforms with precise harmonic content. The amplitude and phase of each harmonic, from rank 2 to rank 500 can be programmed with a resolution of 1% and 1 °.

Example of current waveform creation:
- ➢ Harmonic of rank 10 = 10%
- ➢ Harmonic of rank 20 = 10%
- ➢ Harmonic of rank 30 = 10%
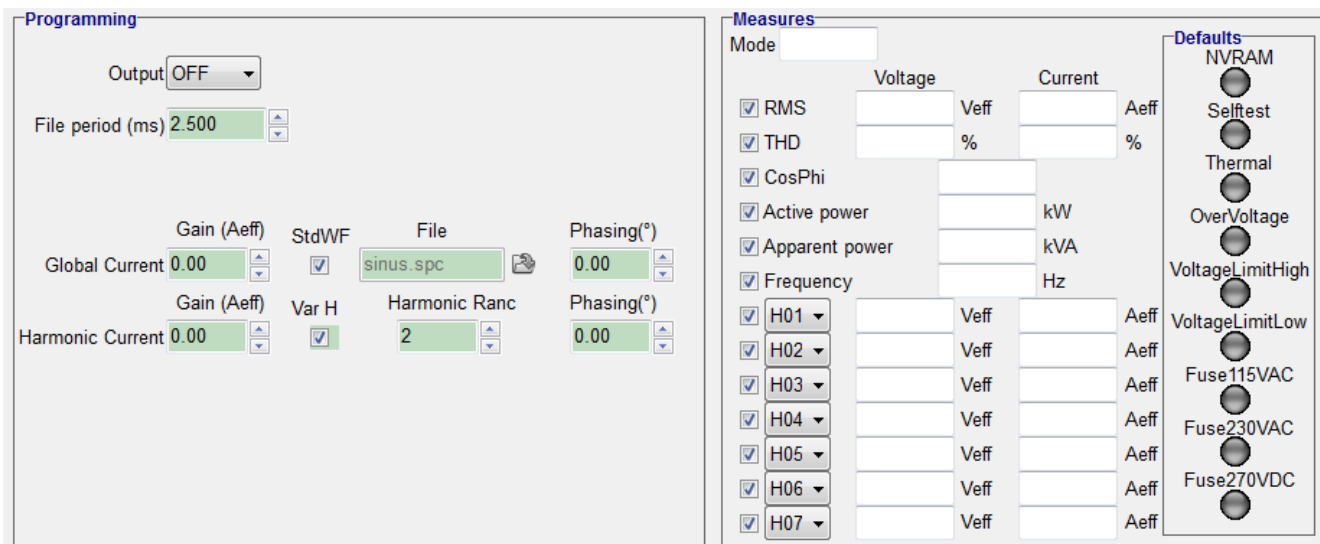
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The OPS3 software communicates with the load bench using an IEEE488-2 link.

The OPS3 software allows to send simple commands (ON / OFF, maximum current).

It allows reading and displaying the status of the bench as well as the voltage and current measurements made by the power analyzer:
 ➢ RMS values,
  ➢ Total harmonic distortion,
  ➢ Power factor,
  ➢ Power,
  ➢ Frequency,
  ➢ Amplitude of the harmonics of the voltage and current from rank 1 to rank 32.

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CONTINUOUS OPERATION

These diagrams express the relationship between current and voltage for a power factor of -1, -0.7 and -0.5. Hatched areas are the non-operating zones due to the "undervoltage" and "overvoltage" protections.

Permanent operation is allowed "below curves". The limitations are due to the heating limit of the power transistors.

Permanent operation range 130V
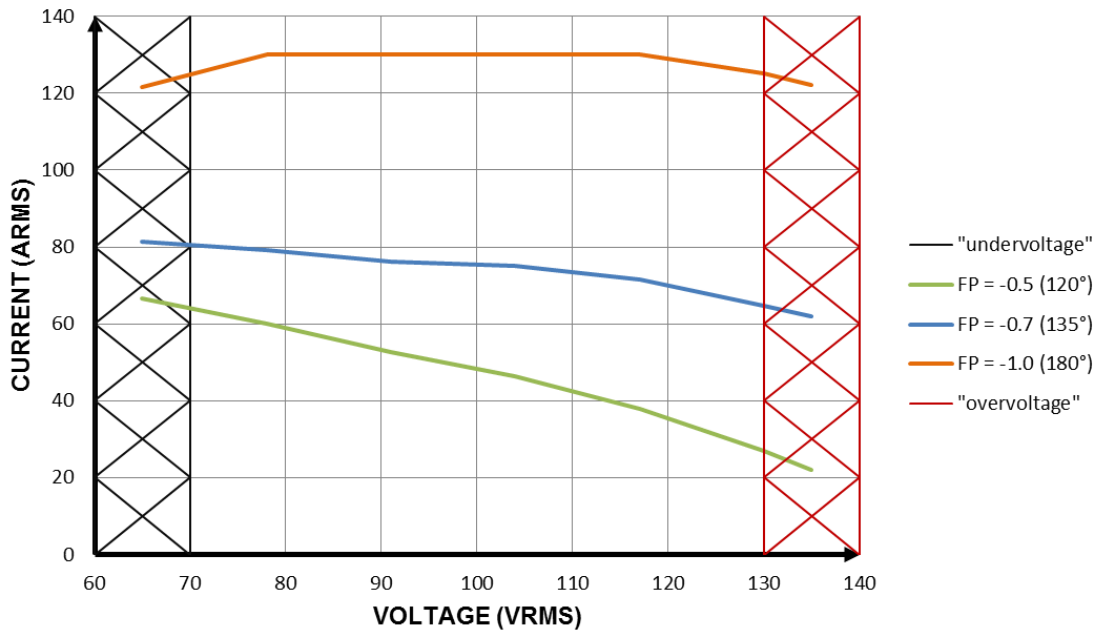

Permanent operation range 260V
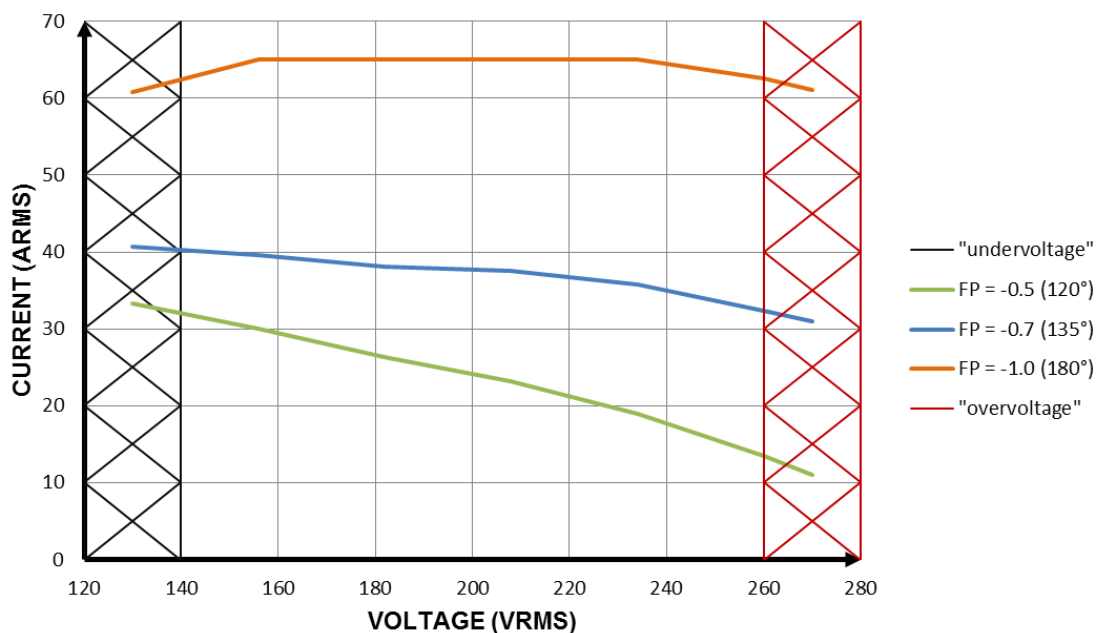
CONSTITUTION OF A THREE PHASES SYSTEM

It is possible to control several load benches simultaneously associated with a supervision system.

The monitoring system, which can be integrated into the PC, ensures timing by managing the trigger inputs and outputs.

The OPS3 software installed on the PC configures each load bench: current, waveform ...

Example of a set of three load banks constituting a three-phase load system.
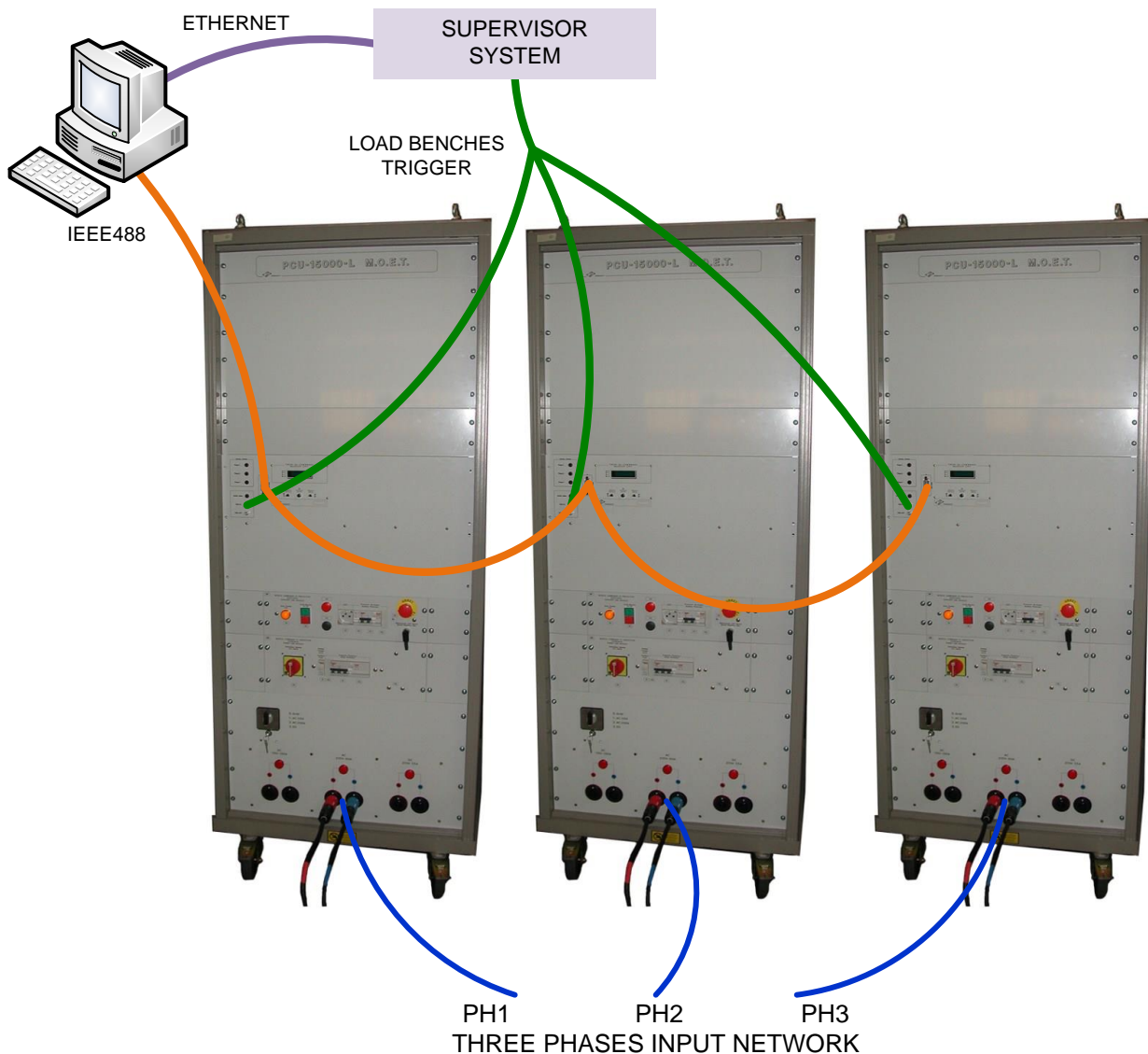
Specification subject to change without notice.