Advanced Test Equipment Rentals

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IEC Flicker Impedance

M6204 IEC Flicker Impedance

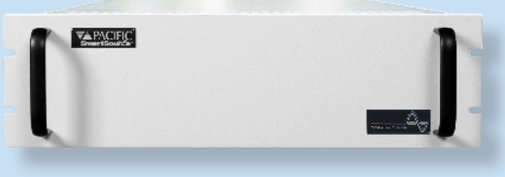
12KVA
Three Phase
16 Arms/Phase
IEC 60725 Compliant

Standard Features:

- Three Phase Flicker Impedance Network
  Supports both single and three phase flicker testing of UUT's up to 16Arms per phase
- Z_{ref} Impedances Values per IEC 60725
  Line Impedance: 0.24 Ω+ 0.15 j Ω
  Neutral Impedance: 0.16 Ω + 0.10j Ω
- Compatible with 360AMXT and 3120AMXT AC Source Models
  IEC Impedance is matched to AC Source Output impedance for exact IEC 60725 matching
- High Qualify Impedance Components Used
  Low Thermal Drift and Forced Air Cooling while under Load Ensures Constant Flicker Impedance during Long Flicker Test Runs
- Dual Connectors on Rear Panel
  Multiple Terminal Blocks Provided for Power, Voltage Sense and Power Analyzer Connections Simplifies Connections
- Standard 19" Rack Mount Enclosure
  Fits easily on Lab Bench, on top of the AC Power Source used or in an Instrument Cabinet

Standards Supported:

- IEC 61000-3-3 / EN 61000-3-3
- IEC 61000-4-13 / EN 61000-4-13
- IEC 61000-4-27/ EN 61000-4-27
- IEC 60725



IEC Flicker Impedance

The M6204 unit provides the requisite lumped impedance between the AC Power Source and the Unit Under Test (UUT) used to test for flicker compliance to IEC 61000-3-3. Designed to meet IEC 60725 - Consideration of reference impedances and public supply network impedances for use in determining the disturbance characteristics of electrical equipment having a rated current ≤75 A per phase – the M6204 simulates the typical public utility impedance characteristics found in most European countries in order to provide a common flicker measurement reference.

Three Phase and Single Phase UUT Testing

A separate impedance network in the Neutral leg ensures full compliance to IEC 61000-3-3 and IEC 60725 even under imbalanced three phase load conditions. The same three phase Impedance network is also fully capable of supporting single phase Flicker test. In this case, the Phase A impedance and Neutral impedance combine together to provide the required Z_{ref} = 0.40 Ω + 0.25 j Ω single phase impedance.

Full 16 Arms per Phase Capable

The use of high quality components with low thermal drift and high saturation resistance ensures a stable impedance network throughout the entire flicker test duration – typically two hours. This is augmented by efficient yet quiet forced air cooling. Testing to the full 16 Arms per phase as required for products that fall under the IEC 61000-3-3 Flicker Standard is fully supported by this lumped impedance with ample margin for temporary overload conditions.

AC Source Matched

The M6204 impedance is factory calibrated and matched to the AMX AC Power Source Model it is used with. This ensures that the combination of AC Source Output Impedance and Lumped Impedance adds up to the requisite IEC 60725 Impedance values. This prevents unwanted system level errors that can occur when the IEC Flicker Impedance is sourced from a different vendor as the AC Power Source.

The Leader in AC Power Technology

An early pioneer in the development solid-state power conversion equipment, Pacific Power Source continues to develop, manufacture, and market both linear and high-performance PWM AC Power Sources. Pacific's reputation as a market and technology leader is best demonstrated by its continuing investments in both research and development and world-wide customer support. With corporate owned offices in the United States, Germany, the United Kingdom, and China, local personalized support is always available.

PACIFIC POWER SOURCE
THE POWER OF EXPERTISE

FREQUENCY CONVERSION | AEROSPACE | R & D | MILITARY | MANUFACTURING | CUSTOM

Applications

Flicker Testing

The M6204 IEC Flicker Impedance provides the required lumped impedance to create a Flicker test system consisting of a Programmable AC Power Source, an IEC compliant Flicker Meter or Power Analyzer with Flicker measurement mode and the required lumped impedance between the AC Source and the UUT. The IEC Flicker standard is based on analyzing voltage fluctuations caused by changes in UUT load current working against a reference impedance (Z_{ref}). Z_{ref} was chosen to simulate the typical public utility impedance found in Europe. An incorrect or out of tolerance Flicker Impedance can lead to significant errors in Flicker measurement results.

Requirements for the IEC Flicker Impedance when testing UUT's with Currents up to 75 Arms per phase are covered by IEC Standard 60725, currently at revision 3.0. For UUT's with phase currents of 16 Arms per phase or less (either single or three phase UUT's), the required Z_{ref} is defined as a combination of resistive and inductive components with the following nominal values:

Phase Impedances: $Z_L = 0.24 + j0.15\ \Omega$ each phase

Neutral Impedance: $Z_N = 0.16 + j0.10\ \Omega$

For single phase applications, the Phase A and Neutral impedance combine to provide the required single phase Z_{ref} of $Z = 0.40 + j0.25\ \Omega$ so the same M6204 Impedance can be used for either single or three phase Flicker testing.

Other IEC Test Standards

The same IEC Flicker impedance is also called out to be used during other IEC Tests. Examples of some of these IEC Test Standards are shown in the table below.

IEC Reference	Descritption
IEC 61000-4-13	Harmonics and Inter Harmonics Immunity Test
IEC 61000-4-27	Unbalance, immunity test for equipment with input current not exceeding 16 A per phase

The M6204 Impedance is compatible with these IEC 61000-4 Immunity test standards.

Benefits

High Quality

- The M6204 IEC Flicker Impedance is constructed of high quality resistive and inductive components sized to handle load currents up to 16Arms with ease. Proper heat sinking and forced airflow ensure stable operation over a wide temperature range, even under full load conditions that can persist for many hours. The same impedance module can be used for either Single phase or Three phase UUT Flicker testing without the need to rewire or re-configure.

Lumped Impedance

- Compared to "synthesized or electronic" impedance solutions as employed by some manufacturers, the M6204 provides the required separate Neutral Impedance which is not available on AC Sources with synthesized impedance. This ensures accurate Flicker measurement results under all circumstances, including unbalanced three phase load conditions caused by the UUT.
- Furthermore, synthesized impedance circuits often have a limited frequency range and may closely approximate the required impedance at 50Hz but will not accurately simulate the effect of higher current harmonic frequency components present in UUT current for non-linear loads. A lumped impedance like the M6204 does not have such a frequency dependency and will correctly respond to current harmonics.

AC Source Matching

- Since most AC Power Sources have a non-zero output impedance, adding the lumped impedance to an AC Source will have a cumulative effect resulting in an overall combined output impedance to the UUT that will exceed the actual Z_{ref} value. This will result in overstated Flicker measurement results that may lead to an UUT not passing Flicker test where it otherwise would have.
- By obtaining both the AC Power Source and the IEC Flicker Impedance from the same manufacturer, you can be sure both are matched. This means the lumped impedance as well as the AC Source output impedance is adjusted to ensure the combined impedance is within Z_{ref} tolerances.

Ratings

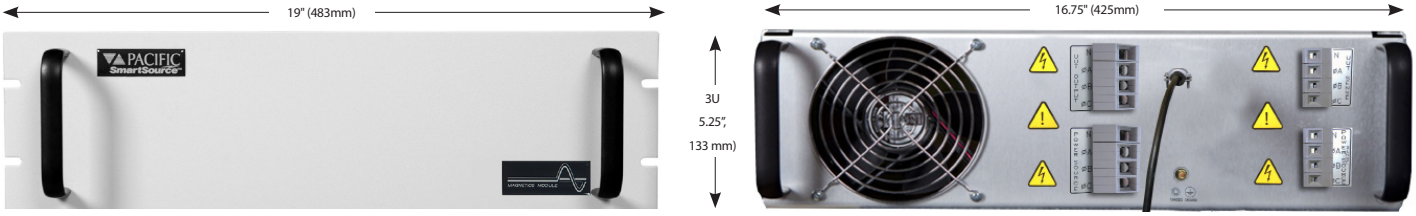
M6204

IEC Impedance			
Parameter	Specification	Unit	Conditions
Resistive			
Phase A	0.24	Ω	
Phase B	0.24	Ω	
Phase C	0.24	Ω	
Neutral	0.16	Ω	
Accuracy	± 0.002	Ω	Internal Calibration
Inductive			
Phase A	0.15j	Ω	
Phase B	0.15j	Ω	
Phase C	0.15j	Ω	
Neutral	0.10j	Ω	
Accuracy	< 2%		
Voltage			
Max.	300.0	Vrms	
Current			
Max.	16.0	Arms	
Power			
Max.	4000	VA / W	Per Phase
Terminals	No of Terminal Positions	Designator	
AC Input - Power Source	3 Phase + Neutral	Terminal Block -1	Rear Panel, Connect to AC Source Output Recommended Wire Size: 6 AWG
AC Output - UUT	3 Phase + Neutral	Terminal Block -3	Rear Panel, Connect to UUT AC Input Recommended Wire Size: 6 AWG
AC Voltage Sense	3 Phase + Neutral	Terminal Block -2	Rear Panel, Connect to AC Source External Voltage Sense Recommended Wire Size: 20 AWG
AC Output - UUT Sense	3 Phase + Neutral	Terminal Block -4	Connects to Flicker Meter or Power Analyzer Inputs Recommended Wire Size: 20 AWG
Cooling Fan Power	Cable Harness	J20A/P20A	Interface Cable to AC Source Included
Ground	Screw Stud	GND	Chassis Ground Required

Input Power Requirments

DC Input			
Parameter	Specification	Unit	Conditions
Fan			
Voltage (nominal)	24	Vdc	DC Power provided by AC Power Source through included P20A/J20A Interface cable.
Current @ 24 Vdc	0.28	Adc	
Fan	Axial		Dual Ball bearing
Size	120	mm	

[1] If a NON Pacific Power Source AC Power Source model is used with the M6204, an external 24Vdc supply capable of supplying 280 mAdc @ 24Vdc is required to operate the Fan.



M6204 IEC Flicker Impedance front and rear views

General/Environmental

Ambient Temperature	Operating: 0° - 50° C Storage: -20 ° - 80° C

Mechanical Specifications

Chassis	Type	19" Rack Width	3U Rack Mount
Chassis (W x H x D)	16.75" x 5.25" x 23.5" 425 x 133 x 597 mm		
	Width including Rack Ears: 19" / 483 mm Depth		
Cabinet Mount	Rack Slide Mounting Holes on Side of Chassis or L Bracket support required		
Cooling	Fan Cooled, Single 120mm dual ball bearing fan, 24Vdc, 0.28Adc rated.		
Front Panel Controls	None		
Rear Panel Connections	Terminal Blocks		
		Power	TBM6204-1 / TBM6204-3
		Voltage Sense	TBM6204-2 / TBM6204-4
	Cable		J20A / P20A

Ordering Information

Model	Description	Requirements
☐ M6204	☐ 3 Phase, 12KVA, IEC Lumped Impedance Network	☐ Use with Programmable AC Power Source. Pacific Power Source Recommends AMX Series Linear Models for Harmonics and Flicker test systems.

Available Models

M6204

Order Example

M6204
- 3 Phase, 12KVA, IEC Lumped Impedance Network

Typical Delivery Items

Ship Kit:
- User Manual

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