技術資料

Fluke NORMA 5000 高精度功率分析儀表

主要功能

Fluke Norma 5000功率檢測分析儀/功率計: Fluke Norma 5000 六相功率分析儀提供了市場同類產品中最高的頻寬，是變頻器和照明設備開發的最佳測試和分析工具。

- 用戶可選的平均時間 — 15 ms～3600 s，適合於動態測量。
- 功率檢測分析儀/功率計簡單的使用者介面確保操作簡單、直觀。
- 標準配置允許使用者精確指定適合其特定應用的相應功能。
- 同時並行採集所有相，精確顯示所有相上在某一精確時間點的動態事件。
- 功率檢測儀/功率計所有的輸入是電隔離的，避免各種應用中的短路。
- 高達 40 次的電壓、電路和功率諧波 。
- FFT 分析、向量圖、記錄儀功能，以及數位示波器（DSO）模式。
- 功率檢測分析儀/功率計4 MB 板載記憶體（可擴展至 128 MB），用於儲存測量值。
- 快速、方便地連接到 PC – RS232 和 USB 為標配。可選 IEEE488、Ethernet 或 USB2.0。
- PI1過程介面，可通過外部感測器測量扭矩和速率。含4路模擬輸出，可方便地用於馬達和驅動應用。
- 341 kHz 或 1 MHz 取樣速率，可進行詳盡的信號分析
- 直流～3 MHz/10 MHz 頻寬，可靠的測量準確度。
- 包括 Fluke NormaView PC 軟體，可用來下載資料、分析和編寫報告。

產品概述: Fluke NORMA 5000 高精度功率分析儀表

福祿克

Norma功率計|功率分析儀：電力電子測試和開發領域可靠的高準確度測量工具

結構緊湊的 Fluke Norma 系列功率檢測分析儀/功率計提供了最新的測量技術來幫助從事馬達、逆變器、照明、電源、變壓器和汽車零件開發和測試的工程師，使其產品生產率更高。

Fluke Norma 系列功率檢測分析儀/功率計採用了擁有專利的高頻寬架構，能夠精度測量單相或三相電流和電壓、諧波分析、快速傅裡葉變換（FFT）分析，以及計算功率和其它計算值。

Fluke Norma 5000 六相功率檢測分析儀/功率計具有無可比擬的性價比，無論是現場使用，還是作為實驗室或試驗臺上的臺式儀器，都非常方便、可靠。

應用：

- 電動馬達和逆變驅動系統功率檢測分析–功率計通過詳盡地頻譜分析和動態扭矩計算，可準確測量由逆變器引起的開關損耗，並且能夠全面評估高頻下的扭矩瞬態和諧波。
- 逆變器驅動系統功率檢測分析–功率計可同時測量相同事件視窗內所有的電氣和機械功率參數，使用戶能夠觀察一個部件對另一部件的影響，或其對整個系統的影響。
- 照明系統功率檢測分析 - 功率計獨有的高達 10 MHz 的頻寬，以及高達 1 MHz 的高取樣速率，可詳盡分析整流器輸出信號。獨有的分流器技術能夠在非常高的頻率下進行功率檢測。同時，測量輸入和輸出功率的功能提供了整流器損耗計算能力。

- 變壓器功率檢測分析–功率計同步測量6相功率，即使在非常小的功率因數下，亦可以計算出高準確度大功率變壓器的效率和損耗，還能夠同步測量多相變壓器線圈的電阻。
- 汽車功率檢測分析–功率計同步測量電氣輸入和機械輸出，能夠提供關於個體零件以及整個驅動系統的效率和損耗的資料。

規格: Fluke NORMA 5000 高精度功率分析儀表

General Specifications

Number of Phases	Fluke Norma 4000:	1 to 3
	Fluke Norma 5000:	3, 4 or 6
Weight	Fluke Norma 4000:	Approx. 5 kg (11 lb.)
	Fluke Norma 5000:	Approx. 7 kg (15 lb.)
Size	Fluke Norma 4000:	150 mm x 237 mm x 315 mm (5.9 in x 9.3 in x 12.4 in)
	Fluke Norma 5000:	150 mm x 447 mm x 315 mm (5.9 in x 17.6 in x 12.4 in)

On-board Printer	Fluke Norma 4000: No Fluke Norma 5000: Yes (optional)
Display	Color, 5.7 “ / 144 mm - 320 x 240 pixel User-selectable background lighting and contrast.
Bandwidth	dc to 3MHz or dc to 10MHz depending on input module
Basic Accuracy	0.2%, 0.1% or 0.03% depending on input modules
Sampling Rate	0.33 MHz or 1 MHz depending on input modules
Voltage Input Range	0.3 V to 1000 V
Current Input Range (direct, not via shunt)	0.03 mA to 20 A depending on input module
Memory for Configurations	4 MB
Memory for Settings	0.5 MB
Fast Fourier Transformation (FFT)	To the 40th harmonic
RS232/USB Interface	Standard
PI1 Process interface (8 analog/impulse inputs and 4 analog outputs)	Optional
IEEE 488.2/GPIB interface (1 MBit/s Ethernet / 10 MBit/s or 100 MBit/s)	Optional
Fluke NormaView PC software (for data download, analysis & report writing)	Standard

Basic Functions

Fast Fourier Transformation (FFT)	Calculation of harmonics with graphical representation. Up to 3 bar graphs are displayed at the same time. Measured values: U, I, P per phase Order: 1st to 40th harmonics, maximum half sample frequency
Digital Oscilloscope (DSO)	Simultaneous display of up to 3 measured values on sample level. Quick view of curve form and distortion.
Integration function (energy)	Simultaneous display of up to 6 configurable numeric values. Start/Stop conditions and positive negative direction available.
Vector Display	Vector display of HO1 up to 6 signals. For easy testing of the right connection of the instrument and quick overview of the phase angle of each signal.
Recorder	Display of average values over time for trend determination.

RAM data memory	Storing of sample and average values; setting of start and stop conditions. From the RAM approximately 4 MB are available for the storage of measured values.
Configuration	Set up the analyzer to measure and display data in the format required.

Ambient Conditions

Working Temperature Range	5 °C to 35 °C (41 °F to 95 °F)
Storage Temperature Range	-20 °C to 50 °C (-4 °F to 122 °F)
Housing Material	Fluke Norma Power Analyzers are extremely compact and equipped with a solid metal case to meet stringent EMC requirements.
Climatic Class	KYG DIN 40040, max. 85 % relative humidity, non-condensing.
Power supply	85 V ac to 264 V ac, 50 Hz to 60 Hz, dc 100 to 260 V, ca. 40 VA European plug with switch. Binding post for current available on some models.
Measuring Inputs	Safety sockets 4 mm, 2 for each input. External shunt connection over BNC socket.
Operation	Membrane keyboard with cursor – function keys and direct functions.
Connections	Rear panel of the 3-phase Analyzer

Measured Values

Non-gapping calculation of averaged values for each phase. In three phase system additionally calculation of total power and averaging of V and I of the three phases. The fundamental H01 will be calculated in synchronous mode also for these values.
Urms effective value, Urm rectified mean, Um mean value
Up-, Up+, Upp peak values
Ucf crest factor Ucf, Uff form factor
Ufc fundamental content
Uthd distortion factor DIN, IEC
Irms effective value, Irm rectified mean, Im mean value
Ip-, Ip+, Ipp peak values
Icf crest factor Icf, Iff form factor
Ifc fundamental content
Ithd distortion factor DIN, IEC
P active power [W]
Q reactive power [Var]
S apparent power [VA]
ë, cos. phase angular
Integral function for active power P, reactive power Q, apparent power S, voltage (Um) and current (Im),
Number of digits 4 or 5 dependent on measured value.

Frequency and Synchronization

Range	DC and 0.2 Hz to sample rate
Accuracy	±0.01 % of measured value (reading)
	· Channels which can be selected: all U/I or external input. · One of three low pass filter with different frequencies can be switched into the signal. · The frequency is always visible on the top of the screen. · The BNC synchronization socket on backside of the instrument can be used either as input or output. · The input signals can be measured up to the sample rate of the power phase. The maximum level must not be higher then 50V. · The output signal is a pulsed 5Volts TTL signal (frequency depends on the measured synch frequency).

Configuration Memory

	Up to 15 user configurations can be saved into a permanent memory and reloaded later on. Changes that were not saved are lost after switching off the instrument.

Interface

	RS232 interface for upload of firmware and data exchange with the PC. A printer can be connected over an external converter.
Options	IEEE 488.2 / 1 MBit/s Ethernet / 10 MBit/s or 100 Mbit/s

Standards and Safety

Electrical Safety	EN 61010-1 / 2nd Edition 1000 V CAT II (600V CAT III) Degree of pollution 2, safety Class I EN 61558 for transformer EN 61010-2-031/032 for accessories
Maximum inputs	For voltage inputs Measurement range 1000 Veff, 2 kVpeak For current inputs Measurement range 10 Aeff, 20 Apeak
Test voltage	Net input: case (protective conductor): 1.5 KV AC Net connection: Measurement input: 5.4 kV AC Measurement inputs: Case: 3.3 kV AC Measurement input: input: 5.4 kV
Electromagnetic susceptibility	Emission: IEC 61326-1, EN 50081-1, EN 55011 Class B Immunity: IEC 61326-1 / Annex A (industrial sector), EN 50082-1

功率模組

Fluke Norma 4000功率檢測分析儀/功率計可安裝多達3個功率模組，Fluke Norma 5000功率檢測分析儀/功率計可安裝多達6個功率模組。使用者可根據其應用類型，從各種各樣可選的功率模組選擇適合其應用的功率模組。技術指標會根據所選功率模組而有所不同。

每個插入式功率模組包括1路電壓和1路電流測量通道。每個單元有一個測量通道可用。然而，每個單元僅可使用一種類型的通道。

功率模組概述

功率模組通道

PP42	準確度:	0.2% (0.1% 讀數 + 0.1 % 量程)
	電流量程:	20 A
	取樣速率:	341 kHz
	頻寬:	3 MHz
PP50	準確度:	0.1% (0.05% 讀數 + 0.05 % 量程)
	電流量程:	10 A
	取樣速率:	1 MHz
	頻寬:	10 MHz
PP54	準確度:	0.1% (0.05% 讀數 + 0.05 % 量程)
	電流量程:	10 A
	取樣速率:	341 kHz
	頻寬:	3 MHz
PP64	準確度:	0.03% (0.02% 讀數 + 0.01% 量程)
	電流量程:	10 A
	取樣速率:	341 kHz
	頻寬:	3 MHz

機型

Fluke Norma 5000

High Precision Power Analyzer

Includes:

- Power supply cable
- 5.7“ / 144 mm color display
- Internal printer
- RS232/USB interface for data download
- Space for six power-phases and options
- Fluke NormaView PC software
- User’ s manual
- Test certificate
- Calibration values

Fluke. *保持您的世界運作不懈。*

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