

NORMA 6003/NORMA 6003+/ NORMA 6004/NORMA 6004+

Power Analyzer

Getting Started Manual

PN 5130608

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Introduction

The Fluke NORMA 6003/ NORMA 6003+/ NORMA 6004/NORMA 6004+ Power Analyzers (the Product or Analyzer) are portable high-bandwidth power analyzers. The Product has these optional accessories, the Fluke current clamp 80i-2010s and the high voltage probe U1500s.

The Product provides these benefits:

- Multiple channels for voltage and current.
- Motor Speed and Torque measurements (NORMA 6003+, NORMA 6004+)
- 0.1 % accuracy, 500 kHz bandwidth, 200 kpsps sample rate.
- Electrical isolation between channels to avoid a short circuit.
- Flexible configurations according to the measuring requirements, synchronize 2 Analyzers to configure 6 to 8 channels or split measurements.
- 9.6 cm thickness makes it easy to use in narrow locations.
- 5000 mAh Li-ion battery for approximately 10 hours continuous operation without a power supply.
- CAT III 1000 V, CAT IV 600 V rating
- 100 ms-1 s configurable update rate, 64 GB storage available for continuous recording.
- Main functions: Meter, Scope, Trend, Harmonic, Phasor.
- USB and RS485 interface with open communication protocol.
- Simple UI for better operation experience, suitable for in-field application.
- PC software (Fluke Power Analyzer Software) for online measuring, data downloading, and analysis.

How to Contact Fluke

Fluke Corporation operates worldwide. For local contact information, go to our website: www.fluke.com.

To register your product, or to view, print, or download the latest manual or manual supplement, go to our website: www.fluke.com/productinfo.

Safety

A **Warning** identifies conditions and procedures that are dangerous to the user.

Warning

To prevent possible electrical shock, fire, or personal injury:

- Read all safety information before you use the Product.
- Use the Product only as specified, or the protection supplied by the Product can be compromised.

- Comply with local and national safety codes. Use personal protective equipment (approved rubber gloves, face protection, and flame-resistant clothes) to prevent shock and arc blast injury where hazardous live conductors are exposed.
- Examine the case before you use the Product. Look for cracks or missing plastic. Carefully look at the insulation around the terminals.
- Do not use the Product around explosive gas, vapor, or in damp or wet environments.
- Use Product-approved measurement category (CAT), voltage, and amperage rated accessories (probes, test leads, and adapters) for all measurements.
- Do not use test leads if they are damaged. Examine the test leads for damaged insulation and measure a known voltage.

- Do not use the HOLD function to measure unknown potentials. When HOLD is turned on, the display does not change when a different potential is measured.
- Do not use the Product if it is damaged.
- Do not use the Product if it operates incorrectly.
- The battery door must be closed and locked before you operate the Product.
- Remove all probes, test leads, and accessories before the battery door is opened.
- Do not work alone.
- Use only the external mains power supply included with the Product.
- Do not exceed the Measurement Category (CAT) rating of the lowest rated individual component of a Product, probe, or accessory.
- Do not touch voltages >30 V ac rms, 42 V ac peak, or 60 V dc.
- Do not apply more than the rated voltage, between the terminals or between each terminal and earth ground.
- Measure a known voltage first to make sure that the Product operates correctly.
- Disable the Product if it is damaged.

Symbols

Table 1. Symbols

Symbol	Description	Symbol	Description
	WARNING. RISK OF DANGER.		WARNING. HAZARDOUS VOLTAGE. Risk of electric shock.
	Consult user documentation.		Fuse
	AC (Alternating Current)		DC (Direct Current)
	Double Insulated		Earth
	Application around and removal from uninsulated hazardous live conductors is permitted.	 Li Ion	Battery
	Conforms to European Union directives.	CAT III	Measurement Category III is applicable to test and measuring circuits connected to the distribution part of the building's low-voltage MAINS installation.

Table 1. Symbols (cont.)

Symbol	Description	Symbol	Description
CAT IV	Measurement Category IV is applicable to test and measuring circuits connected at the source of the building's low-voltage MAINS installation.	 Li-ion	This product contains a Lithium-ion battery. Do not mix with solid waste stream. Spent batteries should be disposed of by a qualified recycler or hazardous materials handler per local regulations. Contact your authorized Fluke Service Center for recycling information.
	This product complies with the WEEE Directive and its marking requirements. The affixed label indicates that you must not discard this electrical/electronic product in domestic household waste. Do not dispose of this product as unsorted municipal waste. For information about take-back and recycling programs available in your country, see the Fluke website.		

Product Familiarization

Check the contents of the soft case for completeness. If something in the soft case is damaged or missing, contact your distributor or the nearest sales or service office. See [Table 2](#) for a list of included accessories and [Table 3](#) for optional accessories.

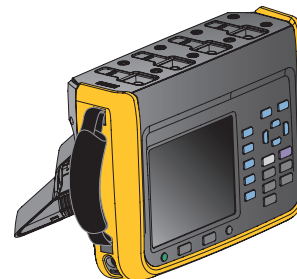
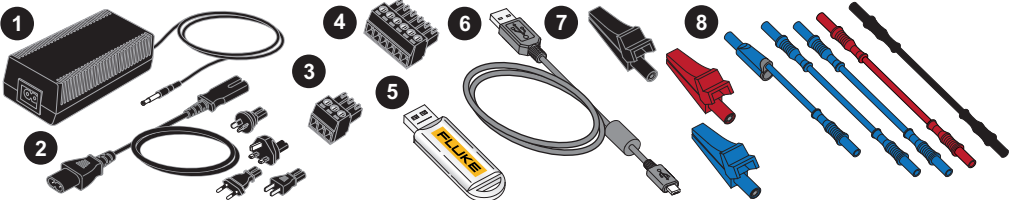


Figure 1. The Product

Table 2. Accessories



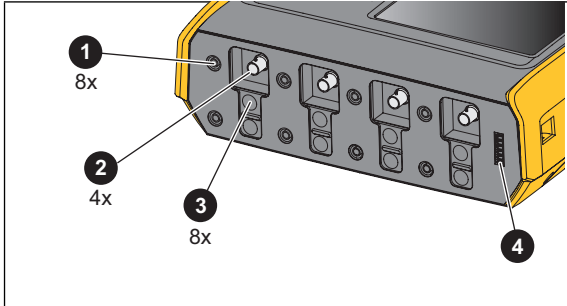
Item	Accessory	Part Number	Item	Accessory	Part Number
1	Power Supply Adapter (CAT IV 600 V)	4829014	7	4 Channel Model Test Lead Set for NORMA 6004/6004+:	5098494
2	Power line cord (for China)	4894155		0.18 m cables: (8) blue	
	Power line cord (for international)	4894137		1.5 m cables:	
	Mains Adapter set (for international)	4894143		(4) black, (4) red (4) blue	
3	485 / synchrony adapter (3.81 mm, black, 3 pin)	5094687	8	Alligator clips:	5098502
4	Speed / torque adapter (3.81 mm, black, 6 pin) NORMA 6003+, NORMA 6004+	5094693		(4) black, (4) red (4) blue	
5	USB Flash Drive for PC SW	4739818		3 Channel Model Test Lead Set for NORMA 6003/6003+:	
6	USB (mini B) cable	5126257		0.18 m cables: (6) blue	5101220
				1.5 m cables:	
				(3) black, (3) red (3) blue	
				Alligator clips:	
				(3) black, (3) red (3) blue	
				Soft case (not shown)	

Table 3. Optional Accessories

Accessory	Part Number
Test Lead Set (single channel): 1.5 m cables: (1) red, (1) black, (2) blue	5098516
Extra battery Fluke BP 291	3894688
Alligator Clip Set (single channel): (1) red, (1) black, (2) blue	5098525
U1500s (high voltage probe)	5098906
80i-2010s (current clamp)	5098880
⚠ 11 A Fuse	803293

Back Panel

Table 4. Back Panel

	
❶	Voltage Ports
❷	External Current Sensor Ports
❸	Current Ports
❹	Motor Speed/Torque Ports (NORMA 6003+/ NORMA 6004+)

Product Connections

Fluke provides a safety test lead kit set configured to prevent a phase-to-phase or phase-to-neutral short circuit. See 8 in Table 2. Use the stackable

connector on the Product side only. Do not use test leads with dual stackable connectors.

Table 5. 3-Phase Connections

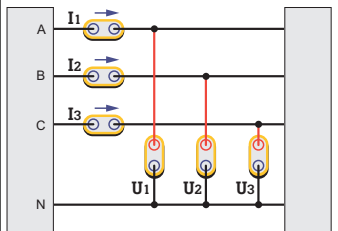
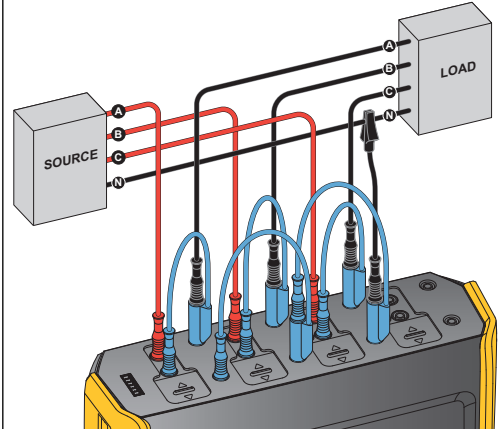
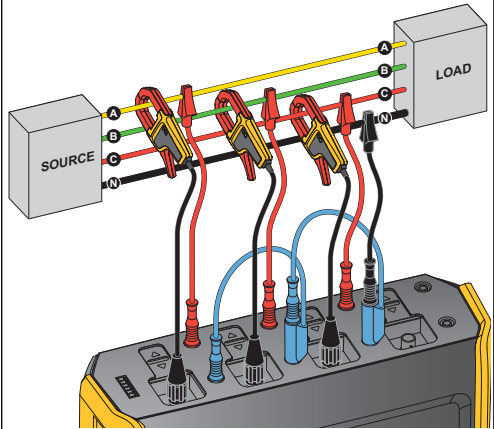
3-phase / 4-wire (3P4W3M)	Internal Shunt	External Current Sensor
Source Load 		

Table 5. 3-Phase Connections (cont.)

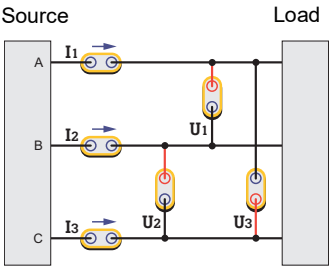
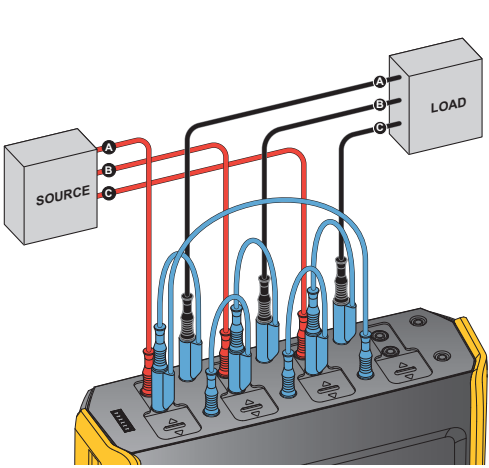
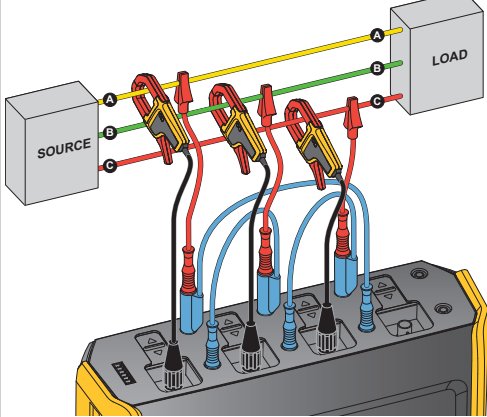
3-phase / 3-wire (3P3W3M)	Internal Shunt	External Current Sensor
Source Load 		

Table 5. 3-Phase Connections (cont.)

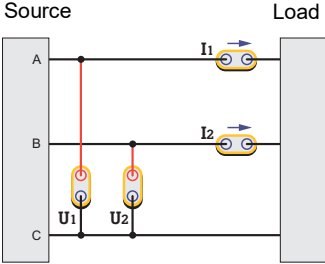
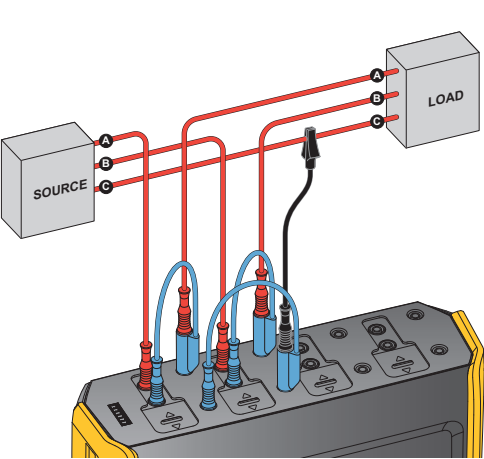
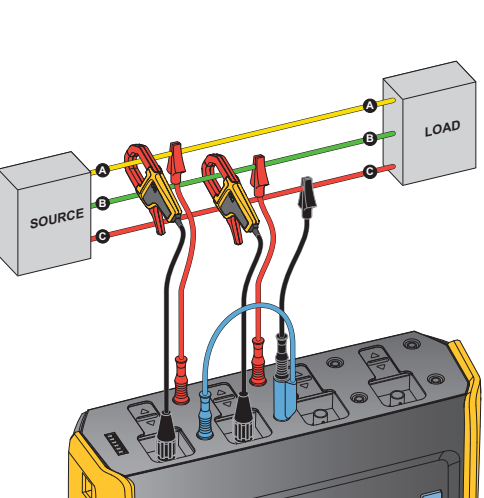
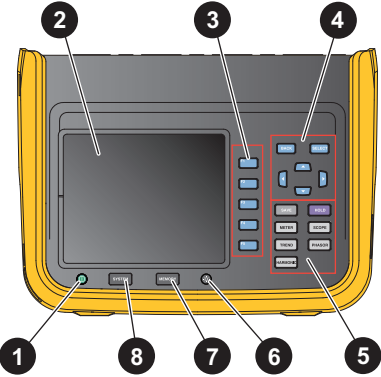
3-phase / 3-wire (3P3W2M)	Internal Shunt	External Current Sensor
Source Load 		

Table 6. Controls

	1	Power Button ⓘ	Turn on/off the Analyzer
	2	Screen	LCD screen
	3	Function Keys	Select from the on-screen options
	4	Controls ⏪ ⏩ ⏴ ⏵	BACK - Go to previous screen SELECT - Accept the selection Directional keys to move the cursor.
	5	Interface Keys	HOLD - Hold or release current screen SAVE - Save data, configuration, or screen shot. Function keys METER / SCOPE / TREND / PHASOR / HARMONIC
	6	⚙	Backlight (single press) Screen shot (hold for 2 seconds)
	7	MEMORY	View/Manage data in SD card
	8	SYSTEM	Instrument information, instrument settings, communication settings, and calibration settings

Maintenance

Before each use, inspect the Analyzer. Look for cracks or missing portions of the housing and output cable insulating cover and for loose or weakened components.

Warning

To prevent electric shock:

- **Use only specified replacement parts.**
- **Have an approved technician repair the Product.**
- **Do not perform any service procedures unless you are qualified to do so.**
- **Read the *Safety* information at the beginning of this manual before proceeding.**

Cleaning and Storage

Periodically wipe the case with a damp cloth and mild detergent. Do not use abrasives or solvents.

If the Analyzer is not used for long time periods (>60 days), remove the battery and store the battery separately.

Product Disposal

Dispose of the Product in a professional and environmentally sound manner:

- Delete personal data on the Product before disposal.
- Remove batteries that are not integrated into the electrical system before disposal and dispose of batteries separately.
- If this Product has an integral battery, put the entire Product in the electrical waste.

Battery

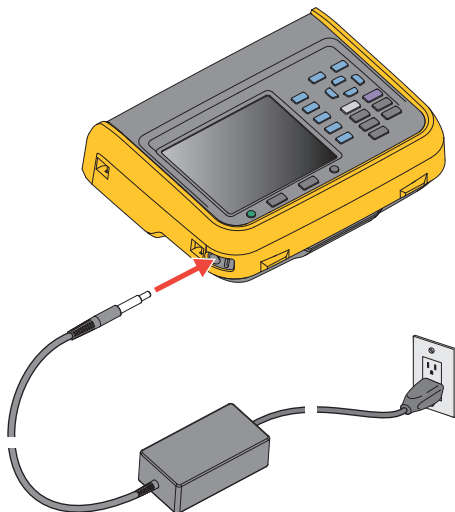


Figure 2. Charge the Battery

⚠⚠ Warning

To prevent electrical shock, remove all probes, test leads, and accessories before the battery door is opened.

⚠⚠ Warning

To prevent possible electrical shock, fire, or personal injury, charge the battery when the low battery indicator shows to prevent incorrect measurements.

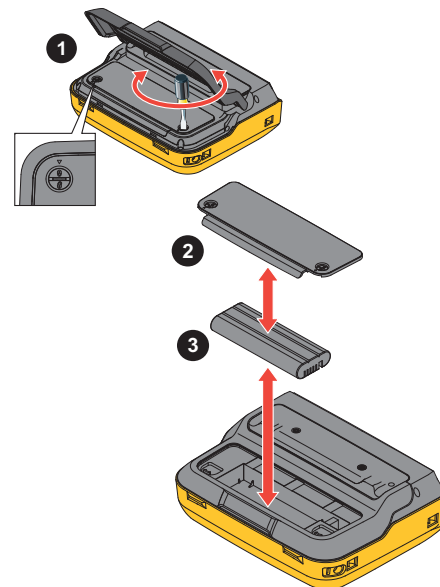


Figure 3. Battery Installation

Fuse Replacement

⚠ ⚠ Warning

To prevent electrical shock, remove all probes, test leads, and accessories before the fuse door is opened.

To change the fuses:

1. Turn off the power, disconnect the power cord, and disconnect all test leads.
2. Open the tilt stand and using a Phillips screwdriver, remove the screws on the fuse door, and then remove the door.
3. For each fuse, gently use a flat-bladed screwdriver to pry open the clip and remove the fuse.
4. Replace the fuse.
5. Close the battery door.
6. Replace the screws.

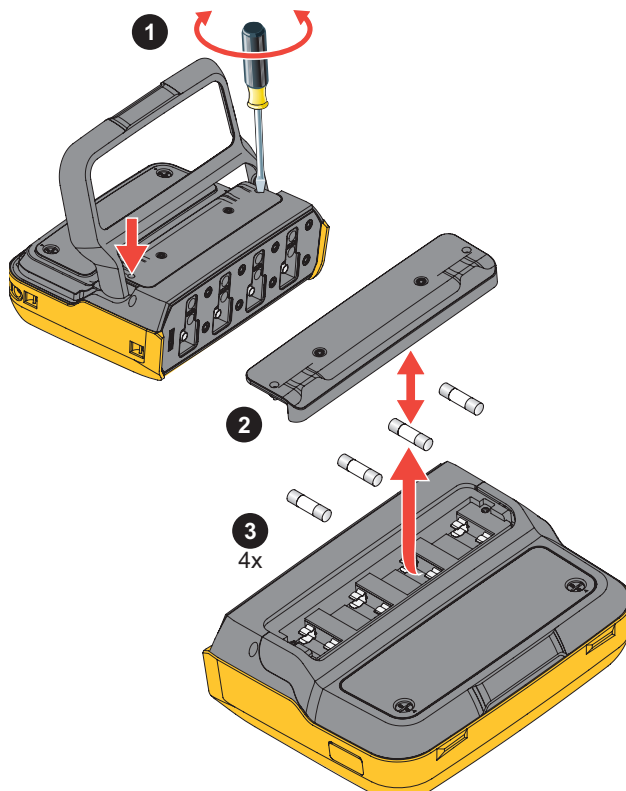


Figure 4. Fuse Replacement

Specifications

Maximum voltage between any Terminal and Earth Ground	1000 V
Size (HxWxL).....	298 mm x 215 mm x 96 mm
Weight.....	3.5 kg
Display	5.7 in TFT LCD 640x480
Operating Temperature ...	0 °C to 40 °C (with battery adapter) -10 °C to + 50 °C (battery only)
Storage Temperature.....	-30 °C to 60 °C (without battery) -20 °C to 60 °C (with battery)
Operating Humidity	Non-condensing (<10 °C) ≤90 % RH (at 10 °C to 30 °C) ≤75 % RH (at 30 °C to 40 °C) ≤45 % RH (at 40 °C to 50 °C)
Operating Altitude	2000 m
Storage Altitude	12 000 m
Ingress Protection.....	IEC 60529: IP50 (Terminals Connected)
Battery	
Type.....	Li-ion Fluke BP 291, 10.8 V/5000 mAh, 54 Wh IEC 62133 UN 38.3
Battery life.....	10 hours (Typical)
Safety	
General.....	IEC 61010-1: Pollution Degree 2
Measurement.....	IEC 61010-2-030 CAT IV 600, CAT III 1000 V

Electromagnetic Compatibility (EMC)

International.....	IEC 61326-1: Industrial Electromagnetic Environment; IEC 61326-2-2 CISPR 11: Group 1, Class A
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Group 1: Equipment has intentionally generated and/or uses conductively-coupled radio frequency energy that is necessary for the internal function of the equipment itself.

Class A: Equipment is suitable for use in all establishments other than domestic and those directly connected to a low-voltage power supply network that supplies buildings used for domestic purposes. There may be potential difficulties in ensuring electromagnetic compatibility in other environments due to conducted and radiated disturbances.

Caution: This equipment is not intended for use in residential environments and may not provide adequate protection to radio reception in such environments.

Emissions that exceed the levels required by CISPR 11 can occur when the equipment is connected to a test object.

Korea (KCC).....	Class A Equipment (Industrial Broadcasting & Communication Equipment)
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Class A: Equipment meets requirements for industrial electromagnetic wave equipment and the seller or user should take notice of it. This equipment is intended for use in business environments and not to be used in homes.

USA (FCC)	47 CFR 15 subpart B. This product is considered an exempt device per clause 15.103.
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Electrical Specifications

Modules

NORMA 6003	3 Voltage + 3 Current
NORMA 6003+	3 Voltage + 3 Current + 1 Motor
NORMA 6004	4 Voltage + 4 Current
NORMA 6004+	4 Voltage + 4 Current + 1 Motor
Sample Rate	200 ksp/s
Data Update Rate	100 ms, 200 ms 500 ms, 1 s

Voltage

Range	10 V, 100 V, 1000 V
Crest Factor	CF $\leq$ 2
Maximum voltage	10 % over load
Input Impedance	2 M Ω / 10 pF (Typical)
Temperature	
Coefficient	0.05 x (Spec)/k
Sample Rate	200 ksp/s
Bandwidth	1000 V range: 500 kHz 100 V range: 200 kHz 10 V range: 100 kHz

Accuracy - Accuracy (% reading + % range)

Range	DC	AC	
		10 Hz to 1 kHz	10 kHz
1000 V	0.1 + 0.1	0.1 + 0.1	5 + 0.5
100 V	0.1 + 0.1	0.1 + 0.1	5 + 0.5
10 V	0.1 + 0.2	0.1 + 0.2	5 + 0.5

Current

Shunt

Range	0.1 A, 1 A, 10 A
Crest Factor	CF $\leq$ 2
Maximum current	10 % over load
Input Impedance	0.025 Ω (Typical)

BNC

Range	0.1 V, 1 V, 10 V
Crest Factor	CF $\leq$ 2
Maximum voltage	10 % over load
Input Impedance	100 k Ω / 100 pF
Temperature	
Coefficient	0.05 x (Spec)/k
Sample Rate	200 ksp/s
Bandwidth	10 A range: 500 kHz, 1 A range: 200 kHz, 0.1 A range: 100 kHz, 10 V range: 500 kHz, 1 V range: 200 kHz, 0.1 V range: 100 kHz

Accuracy - Accuracy (% reading + % range)

Range	DC	AC	
		10 Hz to 1 kHz	10 kHz
10 A	0.1 + 0.2	0.1 + 0.1	5 + 1
1 A	0.1 + 0.5	0.1 + 0.2	5 + 1
0.1 A	0.1 + 2	0.1 + 1	5 + 1
10 V	0.1 + 0.1	0.1 + 0.1	5 + 1
1 V	0.1 + 0.2	0.1 + 0.1	5 + 1
0.1 V	0.1 + 1	0.1 + 0.5	5 + 1

Motor (NORMA 6003+, NORMA 6004+)

Voltage Range ± 10 V dc, 10 % overload

Voltage Channels2

Input Impedance1.1 M Ω (Typical)

Temperature

Coefficient.....0.05 Inherent uncertainty/K

Sample Rate200 ksps

Accuracy at dc0.1 % reading + 0.1 % range

Pulse Channels.....3

Pulse logic

high threshold2 V (Typical)

Pulse logic

low threshold.....0.8 V (Typical)

Maximum pulse

frequency100 kHz

Frequency Domain Measurement

Frequency Accuracy0.05 % range + 0.05 % reading

Harmonics.....100 order, up to 6 kHz

