

Featured measurements

Measurement and Analysis Combinations					
Test point	Sub group	Reading 1	Reading 2	Reading 3	Reading 4
Motor drive input					
Voltage and current					
Phase-phase	V-A-Hz	V ac+dc	A ac+dc	Hz	
	V peak	V peak max	V peak min	V pk-to-pk	Crest factor
	A peak	A peak max	A peak min	A pk-to-pk	Crest factor
Phase-ground	V-A-Hz	V ac+dc	A ac+dc	Hz	
	V peak	V peak max	V peak min	V pk-to-pk	Crest factor
	A peak	A peak max	A peak min	A pk-to-pk	Crest factor
Voltage unbalance	Unbalance	V ac+dc	V ac+dc	V ac+dc	Unbalance
	Peak	V pk-to-pk	V pk-to-pk	V pk-to-pk	
Current unbalance	Unbalance	A ac+dc	A ac+dc	A ac+dc	Unbalance
	Peak	A pk-to-pk	A pk-to-pk	A pk-to-pk	
Motor drive DC bus					
DC		V dc	V pk-to-pk	V peak max	
Ripple		V ac	V pk-to-pk	Hz	
Motor drive output					
Voltage and current (filtered)	V-A-Hz	V PWM	A ac+dc	Hz	V/Hz
	V peak	V peak max	V peak min	V pk-to-pk	Crest factor
	A peak	A peak max	A peak min	A pk-to-pk	Crest factor
Voltage unbalance	Unbalance	V PWM	V PWM	V PWM	Unbalance
	Peak	V pk-to-pk	V pk-to-pk	V pk-to-pk	
Current unbalance	Unbalance	A ac+dc	A ac+dc	A ac+dc	Unbalance
	Peak	A pk-to-pk	A pk-to-pk	A pk-to-pk	
Voltage modulation					
Phase-phase	Zoom 1	V PWM	V pk-to-pk	Hz	V/Hz
	Zoom 2	V peak max	V peak min	Delta V	
	Zoom 3 peak	V peak max	Delta V/s	Risetime peak	Overshoot
	Zoom 3 level	Delta V	Delta V/s	Risetime level	Overshoot
Phase-ground	Zoom 1	V PWM	V pk-to-pk	V peak max	V peak min
	Zoom 2	V Peak max	V peak min	Delta V	Hz
	Zoom 3 peak	V Peak max	Delta V/s	Risetime peak	Overshoot
	Zoom 3 level	Delta V	Delta V/s	Risetime level	Overshoot
Phase-DC +	Zoom 1	V PWM	V pk-to-pk	V Peak max	V peak min
	Zoom 2	V peak max	V peak min	Delta V	Hz
	Zoom 3 peak	V peak max	Delta V/s	Risetime peak	Overshoot
	Zoom 3 level	Delta V	Delta V/s	Risetime level	Overshoot
Phase-DC -	Zoom 1	V PWM	V pk-to-pk	V peak max	V peak min
	Zoom 2	V peak max	V peak min	Delta V	Hz
	Zoom 3 peak	V peak max	Delta V/s	Risetime peak	Overshoot
	Zoom 3 level	Delta V	Delta V/s	Risetime level	Overshoot

Motor input					
Voltage and current (filtered)	V-A-Hz	V PWM	A ac+dc	Hz	V/Hz
	V peak	V peak max	V peak min	V pk-to-pk	Crest factor
	A peak	A peak max	A peak min	A pk-to-pk	Crest factor
Voltage unbalance	Unbalance	V PWM	V PWM	V PWM	Unbalance
	Peak	V pk-to-pk	V pk-to-pk	V pk-to-pk	
Current unbalance	Unbalance	A ac+dc	A ac+dc	A ac+dc	Unbalance
	Peak	A pk-to-pk	A pk-to-pk	A pk-to-pk	
Voltage modulation					
Phase-phase	Zoom 1	V PWM	V pk-to-pk	Hz	V/Hz
	Zoom 2	V peak max	V peak min	Delta V	
	Zoom 3 peak	V peak max	Delta V/s	Risetime peak	Overshoot
	Zoom 3 level	Delta V	Delta V/s	Risetime level	Overshoot
Phase-ground	Zoom 1	V PWM	V pk-to-pk	V peak max	V peak min
	Zoom 2	V peak max	V peak min	Delta V	Hz
	Zoom 3 peak	V peak max	Delta V/s	Risetime peak	Overshoot
	Zoom 3 level	Delta V	Delta V/s	Risetime level	Overshoot
Motor shaft					
Shaft voltage	Events off	V pk-to-pk			
	Events on	Delta V	Rise/fall time	Delta V/s	Events/s
Motor drive input, output and motor input					
Harmonics	Voltage	V ac	V fundamental	Hz fundamental	% THD
	Current	A ac	A fundamental	Hz fundamental	% THD/TDD

Specifications

Measurement Function	Specification
DC voltage (V dc)	
Maximum voltage with 10:1 or 100:1 probe	1000 V
Maximum resolution with 10:1 or 100:1 probe (voltage to ground)	1mV / 10mV
Full scale reading	999 counts
Accuracy at 4 s to 10 us/div	± (1.5 % + 6 counts)
True-rms voltage (V ac or V ac + dc) (with DC coupling selected)	
Maximum voltage with 10:1 or 100:1 probe (voltage to ground)	1000 V
Maximum resolution with 10:1 or 100:1 probe	1 mv / 10 mV
Full scale reading	999 counts
DC to 60 Hz	± (1.5 % + 10 counts)
60 Hz to 20 kHz	± (2.5 % + 15 counts)
20 kHz to 1 MHz	± (5 % + 20 counts)
1 MHz to 25 MHz	± (10 % + 20 counts)
PWM voltage (V pwm)	
Purpose	To measure on pulse width modulated signals, like motor drive inverter outputs
Principle	Readings show the effective voltage based on the average value of samples over a whole number of periods of the fundamental frequency
Accuracy	As Vac+dc for sinewave signals
Peak voltage (V peak)	
Modes	Max peak, min peak, or pk-to-pk
Maximum voltage with 10:1 or 100:1 probe (voltage to ground)	1000 V
Maximum resolution with 10:1 or 100:1 probe	10 mV
Accuracy	
Max peak, min peak	± 0.2 division
Pk-to-pk	± 0.4 division
Full scale reading	800 counts

Current (AMP) with current clamp	
Ranges	Same as V ac, Vac+dc or V peak
Scale Factors	0.1 mV/A, 1 mV/A, 10 mV/A, 20 mV/A, 50mV/A, 100 mV/A, 200 mV/A, 400 mV/A
Accuracy	Same as Vac, Vac+dc or V peak (add current clamp accuracy)
Frequency (Hz)	
Range	1.000 Hz to 500 MHz
Full scale reading	9999 counts
Accuracy	± (0.5 % + 2 counts)
Voltage/Herz ratio (V/Hz)	
Purpose	To show the measured V PWM value (see V PWM) divided by the fundamental frequency on variable ac motor speed drives
Accuracy	% Vrms + % Hz
Voltage unbalance drive input	
Purpose	To show the highest percentage difference of one of the phase vs average of the 3 true-rms voltages
Accuracy	Indicative percentage based on Vac+dc values
Voltage unbalance drive output and motor input	
Purpose	To show the highest percentage difference of one of the phase vs average of the 3 PWM voltages
Accuracy	Indicative percentage based on V PWM values
Current unbalance drive input	
Purpose	To show the highest percentage difference of one of the phase vs average of the 3 AC current values
Accuracy	Indicative percentage based on Aac+dc values
Current unbalance drive output and motor input	
Purpose	To show the highest percentage difference of one of the phase vs average of the 3 AC current values
Accuracy	Indicative percentage based on A ac values
Rise and fall time	
Readings	Voltage difference (dV), time difference (dt), voltage vs time difference (dV/dt), overshoot
Accuracy	As oscilloscope accuracy
Harmonics and spectrum	
Harmonics	DC to 51st
Spectrum ranges	1..9 kHz, 9-150 kHz (20 MHz filter on), up to 500 MHz (voltage modulation)
Shaft voltage	
Events / second	Indicative percentage based on rise and fall time (Impulse discharges) measurements
Report data capture	
Number of screens	Typical 50 screens can be saved in reports (depends on compression ratio)
Transfer to PC	Using 32 GB or smaller 2 GB USB stick or mini-USB to USB cable or WiFi link and FlukeView™ 2 for ScopeMeter®
Probe settings	
Voltage Probe	1:1, 10:1, 100:1, 1000:1, 20:1, 200:1
Current Clamp	0.1 mV/A, 1 mV/A, 10 mV/A, 20 mV/A, 50 mV/A, 100 mV/A, 200 mV/A, 400 mV/A
Shaft Voltage Probe	1:1, 10:1, 100:1

Safety	
General	IEC 61010-1: Pollution Degree 2
Measurement	Measurement IEC 61010-2-030: CAT IV 600 V / CAT III 1000 V
Maximum voltage between any Terminal and Earth Ground	1000 V
Max. input voltages	Via VPS410-II or VPS421 1000 V CAT III / 600 V CAT IV
BNC Input	A, B, C, D directly 300 V CAT IV
Max. Floating Voltage, test tool or test tool with VPS410-II / VPS421 voltage probe	From any terminal to earth ground 1000 V CAT III / 600 V CAT IV Between any terminal 1000 V CAT III / 600 V CAT IV
Working voltage between probe tip and probe reference lead	VPS410-II: 1000 V VPS421: 2000 V

Ordering information

MDA-550-III

Motor drive analyzer, 4 channel, 500 MHz

Includes

1x BP 291 li-ion battery pack, 1x BC190 charger/power adapter, 3x VPS421 100:1 high voltage probes with alligator clips, 1x VPS410-II-R 10:1 500MHz voltage probe, 3x i400s ac current clamp, 1x SVS-500 shaft voltage set (3x brush, probe holder, two-piece extension rod and magnetic base), large size, protective carrying case with rollers (C437-II), FlukeView-2 PC software (full version) and WiFi dongle

Additional accessories

SVS-500 set of 3x brushes, probe holder, two-piece extension rod and magnetic base

SB-500 set of 3x replacement brushes

*In addition, Fluke 190 series III ScopeMeter™ Test Tools accessories are also supported by the MDA-550

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Printed in U.S.A. 7/2021 210765-6011207-en

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