

Customer: ROMAN MELNYK TEST ACCOUNT
35 VANTAGE POINT DRIVE
ROCHESTER, NY 14624



ANAB AC-2489

PO Number: ABC123

Certificate/SO Number: 1-FY5AR-160-1 Revision 2

Manufacturer: Fluke Corporation
Model Number: 87 V
Description: Multimeter, Digital
Serial Number: ABC123
ID: 54321

As-Found: In Tolerance, Pass Acceptance
As-Left: In Tolerance, Pass Acceptance

Issue Date: Mar 10, 2021
Calibration Date: Mar 16, 2021
Due Date: Mar 16, 2022

Calibrated To: Manufacturer Specification
Calibration Procedure: 1-AC08977-28

Transcat Calibration Laboratories have been audited and found in compliance with ISO/IEC 17025:2017. Accredited calibrations performed within the Lab's Scope of Accreditation are indicated by the presence of the Accrediting Body's Logo and Certificate Number. Any measurements on an accredited calibration not covered by that Lab's Scope of Accreditation are listed in the notes section of the certificate. SCC, NRC, CLAS or ANAB do not guarantee the accuracy of an individual calibration by accredited laboratories.

Transcat calibrations, as applicable, are performed in compliance with the requirements of the Transcat Quality Manual QAC-P01-000, the customer's Purchase Order and/or Quality Agreement requirements, ISO 9001:2015, ANSI/NCSL Z540.1-1994 (R2002) or NQA-1, as applicable. Complete records of work performed are maintained by Transcat and are available for inspection. Laboratory standards used in the performance of this calibration are listed on this certificate.

Transcat documents the traceability of measurements to the SI units through the National Institute of Standards and Technology (NIST), or the National Research Council of Canada (NRC), or other national measurement institutes (NMI) that are signatories to the CIPM Mutual Recognition Arrangement, or accepted fundamental and/or natural physical constants, or by the use of specified methods, consensus standards or ratio type measurements. Documentation supporting traceability information is available for review upon written request at a Transcat facility. The measured quantity and the measurement uncertainty are required for further dissemination of traceability.

Uncertainties are reported with a coverage factor $k=2$, providing a level of confidence of approximately 95%. All calibrations have been performed using processes having a TUR of 4:1 or better (3:1 for mass calibrations), unless otherwise noted. The Test Uncertainty Ratio (TUR) is calculated in accordance with NCSL International RP-18. For mass calibrations: Conventional mass referenced to 8.0 g/cm³.

The results in this report relate only to the item calibrated or tested. Recorded calibration data is valid at the time of calibration within the stated uncertainties at the environmental conditions noted. The determination of compliance to the specification is specific to the model/serial no./ID no. referenced above based on the tolerances shown; these tolerances are either the original equipment manufacturers (OEM's) warranted specifications or the client's requested specifications. This certificate may not be reproduced except in full, without the written approval of Transcat. Additional information, if applicable may be included on separate report(s).

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As Found/As Left Data

Description	Setpoints	Accuracy	Low Limit	High Limit	As Found / As Left	O O T	Cal Process Uncertainty (k=2; ±)	Measurement Uncertainty (k=2; ±)	Units	TUR
AC Volts Measure										
600 mV Range	330.0mVrms	±(0.7% Rdg + 4 LSD)	327.3	332.7	329.5 mVrms		8.6e-002	1.7e-001	mVrms	31.5 : 1
		Acceptance Limits:	327.4	332.6						
	60Hz									
	600.0mVrms	±(2% Rdg + 20 LSD)	586.0	614.0	602.4 mVrms		1.4e-001	2.0e-001	mVrms	100.0 : 1
		Acceptance Limits:	586.1	613.9						
	13kHz									
6 V Range	3.300Vrms	±(0.7% Rdg + 2 LSD)	3.275	3.325	3.295 Vrms		8.6e-004	1.7e-003	Vrms	29.2 : 1
		Acceptance Limits:	3.276	3.324						
	60Hz									
	3.300Vrms	±(2% Rdg + 20 LSD)	3.214	3.386	3.287 Vrms		1.1e-003	1.8e-003	Vrms	79.3 : 1
		Acceptance Limits:	3.215	3.385						
	20kHz									
60 V Range	33.00Vrms	±(0.7% Rdg + 2 LSD)	32.75	33.25	32.96 Vrms		6.5e-003	1.5e-002	Vrms	38.5 : 1
		Acceptance Limits:	32.76	33.24						
	60Hz									
	33.00Vrms	±(2% Rdg + 20 LSD)	32.14	33.86	32.87 Vrms		1.1e-002	1.8e-002	Vrms	77.3 : 1
		Acceptance Limits:	32.15	33.85						
	20kHz									
600 V Range	330.0Vrms	±(0.7% Rdg + 2 LSD)	327.5	332.5	329.6 Vrms		8.5e-002	1.5e-001	Vrms	29.4 : 1
		Acceptance Limits:	327.6	332.4						
	60Hz									
	330.0Vrms	±(2% Rdg + 4 LSD)	323.0	337.0	329.8 Vrms		7.2e-002	1.4e-001	Vrms	96.8 : 1
		Acceptance Limits:	323.1	336.9						
	2.5kHz									
1000 V Range	500Vrms	±(0.7% Rdg + 2 LSD)	494	506	500 Vrms		1.2e-001	1.2e+000	Vrms	48.0 : 1

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AC Volts Measure										
		Acceptance Limits:	494	506						
	60Hz									
	1000Vrms	±(1% Rdg + 4 LSD)	986	1014	1002 Vrms		2.4e-001	1.2e+000	Vrms	57.8 : 1
		Acceptance Limits:	986	1014						
	1kHz									
Frequency Measure										
600 mV Range	99.95kHz	±(0.005% Rdg + 1 LSD)	99.94	99.96	99.95 kHz		1.9e-004	1.2e-002	kHz	51.3 : 1
		Acceptance Limits:	99.94	99.96						
	150mVrms									
	199.50kHz	±(0.005% Rdg + 1 LSD)	199.48	199.52	199.50 kHz		3.9e-004	1.2e-002	kHz	51.5 : 1
		Acceptance Limits:	199.48	199.52						
	150mVrms									
6 V Range - Sensitivity	99.95kHz	±(0.005% Rdg + 1 LSD)	99.94	99.96	99.95 kHz		1.9e-004	1.2e-002	kHz	51.3 : 1
		Acceptance Limits:	99.94	99.96						
	0.7Vrms									
60 V Range - Sensitivity	99.95kHz	±(0.005% Rdg + 1 LSD)	99.94	99.96	99.95 kHz		1.9e-004	1.2e-002	kHz	51.3 : 1
		Acceptance Limits:	99.94	99.96						
	7Vrms									
6 V Range - Trigger Level	1000.0Hz	±(0.005% Rdg + 1 LSD)	999.8	1000.2	1000.0 Hz		2.0e-003	1.2e-001	Hz	100.0 : 1
		Acceptance Limits:	999.8	1000.2						
	3.4Vp-p									
Duty Cycle										
Duty Cycle - 6 V DC Range	1kHz	±(0.3 %)	49.7	50.3	50.0 %		9.8e-005	1.2e-001	%	100.0 : 1
		Acceptance Limits:	49.7	50.3						
	5Vp-p									

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DC Volts Measure										
6 V Range	3.300V	±(0.05% Rdg + 1 LSD)	3.297	3.303	3.300 V		5.0e-005	1.2e-003	V	59.5 : 1
		Acceptance Limits:	3.297	3.303						
60 V Range	33.00V	±(0.05% Rdg + 1 LSD)	32.97	33.03	33.00 V		6.3e-004	1.2e-002	V	47.8 : 1
		Acceptance Limits:	32.97	33.03						
600 V Range	330.0V	±(0.05% Rdg + 1 LSD)	329.7	330.3	330.0 V		6.0e-003	1.2e-001	V	50.1 : 1
		Acceptance Limits:	329.7	330.3						
1000 V Range	1000V	±(0.05% Rdg + 1 LSD)	998	1002	1000 V		1.6e-002	1.2e+000	V	100.0 : 1
		Acceptance Limits:	998	1002						
600 mV Range	33.0mV	±(0.1% Rdg + 1 LSD)	32.9	33.1	33.0 mV		1.3e-003	1.2e-001	mV	76.7 : 1
		Acceptance Limits:	32.9	33.1						
	330.0mV	±(0.1% Rdg + 1 LSD)	329.6	330.4	330.0 mV		4.6e-003	1.2e-001	mV	86.8 : 1
		Acceptance Limits:	329.6	330.4						

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Resistance 2 Wire Comp Measure										
600 Ohm Range	330.0Ohm	±(0.2% Rdg + 2 LSD)	329.1	330.9	330.1 Ohm		2.4e-002	1.4e-001	Ohm	36.8 : 1
		Acceptance Limits:	329.1	330.9						
6 kOhm Range	3.300kOhm	±(0.2% Rdg + 1 LSD)	3.292	3.308	3.300 kOhm		2.4e-004	1.4e-003	kOhm	32.7 : 1
		Acceptance Limits:	3.292	3.308						
60 kOhm Range	33.00kOhm	±(0.2% Rdg + 1 LSD)	32.92	33.08	33.02 kOhm		2.4e-003	1.4e-002	kOhm	32.7 : 1
		Acceptance Limits:	32.92	33.08						
600 kOhm Range	330.0kOhm	±(0.6% Rdg + 1 LSD)	327.9	332.1	330.3 kOhm		2.6e-002	1.4e-001	kOhm	81.9 : 1
		Acceptance Limits:	327.9	332.1						
6 MOhm Range	3.300MOhm	±(0.6% Rdg + 1 LSD)	3.279	3.321	3.303 MOhm		5.4e-004	1.4e-003	MOhm	39.2 : 1
		Acceptance Limits:	3.280	3.321						
50 MOhm Range	30.00MOhm	±(1% Rdg + 3 LSD)	29.67	30.33	30.09 MOhm		7.9e-003	1.5e-002	MOhm	41.6 : 1
		Acceptance Limits:	29.68	30.32						
60 nS Range (Open)	0.00MOhm	±(1% Rdg + 30 LSD)	-0.30	0.30	-0.05 nS		0.0e+000	1.2e-002	nS	4 : 1
		Acceptance Limits:	-0.30	0.30						
60 nS Range	100MOhm	±(1% Rdg + 30 LSD)	9.60	10.40	9.93 nS		4.6e-003	1.3e-002	nS	87.2 : 1
		Acceptance Limits:	9.60	10.40						
Diode Test										
Diode Test	3.000V	±(2% Rdg + 1 LSD)	2.939	3.061	3.000 V		2.9e-005	1.2e-003	V	100.0 : 1
		Acceptance Limits:	2.939	3.061						
A AC Measure										
6 A Range	3.000A	±(1% Rdg + 2 LSD)	2.968	3.032	2.999 A		3.0e-003	3.4e-003	A	10.7 : 1
		Acceptance Limits:	2.971	3.029						
	60Hz									

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A DC Measure										
6 A Range	3.000A	±(0.2% Rdg + 4 LSD)	2.990	3.010	3.001 A		1.9e-003	2.3e-003	A	5.2 : 1
		Acceptance Limits:	2.992	3.008						
10 A Range	10.00A	±(0.2% Rdg + 2 LSD)	9.96	10.04	10.00 A		5.5e-003	1.3e-002	A	7.3 : 1
		Acceptance Limits:	9.97	10.03						
mA AC Measure										
60 mA Range	33.00mA	±(1% Rdg + 2 LSD)	32.65	33.35	32.97 mA		2.7e-002	3.2e-002	mA	13.0 : 1
		Acceptance Limits:	32.68	33.32						
	60Hz									
400 mA Range	330.0mA	±(1% Rdg + 2 LSD)	326.5	333.5	330.0 mA		2.1e-001	2.6e-001	mA	16.7 : 1
		Acceptance Limits:	326.7	333.3						
	60Hz									
mA DC Measure										
60 mA Range	33.00mA	±(0.2% Rdg + 4 LSD)	32.89	33.11	33.00 mA		4.5e-003	1.4e-002	mA	24.6 : 1
		Acceptance Limits:	32.89	33.11						
400 mA Range	330.0mA	±(0.2% Rdg + 2 LSD)	329.1	330.9	329.9 mA		8.2e-002	1.6e-001	mA	10.9 : 1
		Acceptance Limits:	329.2	330.8						
µA AC Measure										
600 µA Range	330.0µA	±(1% Rdg + 2 LSD)	326.5	333.5	329.9 µA		3.8e-001	4.0e-001	µA	9.3 : 1
		Acceptance Limits:	326.9	333.1						
	60Hz									
6000 µA Range	3300µA	±(1% Rdg + 2 LSD)	3265	3335	3299 µA		2.8e+000	3.3e+000	µA	12.7 : 1
		Acceptance Limits:	3268	3332						
	60Hz									

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µA DC Measure										
600 µA Range	330.0µA	±(0.2% Rdg + 4 LSD)	328.9	331.1	330.0 µA		6.7e-002	1.6e-001	µA	16.4 : 1
		Acceptance Limits:	329.0	331.0						
6000 µA Range	3300µA	±(0.2% Rdg + 2 LSD)	3291	3309	3300 µA		5.1e-001	1.4e+000	µA	17.5 : 1
		Acceptance Limits:	3292	3308						
Capacitance Measure										
10 nF Range	0.26nF	≥ (0.21 nF) ; ≤ (0.31 nF)	0.21	0.31	0.26 nF		0.0e+000	1.2e-002	nF	4 : 1
		Acceptance Limits:	0.21	0.31						
100 nF Range	5.0nF	±(1% Rdg + 2 LSD)	4.7	5.3	5.0 nF		1.6e-002	1.3e-001	nF	18.3 : 1
		Acceptance Limits:	4.7	5.3						
100 µF Range	9.5µF	±(1% Rdg + 2 LSD)	9.2	9.8	9.5 µF		2.5e-002	1.3e-001	µF	11.8 : 1
		Acceptance Limits:	9.2	9.8						
Low Pass Filter										
Low Pass Filter - 1000 V Range	400Vrms	-(6% Rdg + 4 LSD) ; +(1% Rdg + 4 LSD)	372	408	381 Vrms		1.0e-001	1.2e+000	Vrms	100.0 : 1
		Acceptance Limits:	372	408						
	400Hz									
(Not spec'd - Approx 226 to 340Vrms)	400Vrms				289 Vrms		7.2e-002	1.2e+000	Vrms	4 : 1
	800Hz									
Low Pass Filter @ 800Hz										
Filter follows an expected roll-off curve.			P	P	P					

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Peak MIN/MAX										
MAX - 6 VDC Range	6Vp-p	±(0.103 V)	3.897	4.103	4.025 V		5.6e-004	1.4e-003	V	100.0 : 1
		Acceptance Limits:	3.898	4.102						
	2kHz									
MIN	6Vp-p	±(0.102 V)	-2.102	-1.898	-2.009 V		2.8e-004	1.3e-003	V	100.0 : 1
		Acceptance Limits:	-2.102	-1.898						
	2kHz									
Temperature Measure										
Type K (ITS90)	0.0°C	±(1% Rdg + 10 LSD)	-1.0	1.0	0.1 °C		0.0e+000	1.2e-001	°C	4 : 1
		Acceptance Limits:	-1.0	1.0						
	100.0°C	±(1% Rdg + 10 LSD)	98.0	102.0	100.1 °C		1.6e-001	2.0e-001	°C	12.5 : 1
		Acceptance Limits:	98.2	101.8						
Function Check										
Backlight Comes On			P	P	P					
Backlight Intensifies			P	P	P					
Backlight Off			P	P	P					

Field not applicable.

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Traceable Standards

Asset	Manufacturer	Model Number	Description	Cal Date	Due Date	Traceability Number	Use
5312	Fluke Corporation	5520A	Multifunction Calibrator	27-Aug-20	27-Aug-21	5-&5312-38-2	AF/AL

The use of the standard is defined as: AF - used for as-found readings, AL - used for as-left readings.

Environmental Data

Temperature	Relative Humidity	Temp / RH Asset
71.40°F /21.89°C	53.00%	3133A

Decision Rule

This instrument meets the requirements of ANSI/NCSS Z540.3:2006. Calibration Uncertainties are considered in the determination of compliance to the Acceptance Limits. A guardband value was calculated using Z540.3 Method 5 and used to reduce each Tolerance Limit to determine the Acceptance Limits. Reported values that are less than or equal to the Tolerance Limits are considered In-tolerance; values that are greater than the Tolerance Limits are identified as Out-of-Tolerance. Reported values that are less than or equal to the Acceptance Limits (Pass Acceptance) are considered Acceptable; values greater than the Acceptance Limits (Fail Acceptance) contain risk greater than 2% PFA and do not meet Z540.3 requirements. Statements of conformity are binary.

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Legend

Topic	Description
Accuracy	UUT specification that establishes expected tolerances and a time limit (calibration interval) over which the instrument is expected to hold these tolerances
As Found	Initial measurement results
As Left	Measurement results after adjustment and/or repair
Blank Data Field	Test is not applicable for the UUT
Cal Process Uncertainty (CPU)	The uncertainty of calibration process for the reported measurement result
Calibration Date	Indicates the date that the calibration was completed
Cover Factor (k)	A measure of uncertainty that defines an interval about the measurement result
Due Date	Indicates the end of the calibration cycle as requested by the customer
Issue Date	Indicates the date that the calibration has passed the Data Review Process and was signed by an authorized signatory or the date that a revision to the original certificate has been issued
Low / High Limits	Establishes UUT acceptable performance limits for the test measurement
Measurement Uncertainty	The dispersion of the values attributed to a measured quantity
OOT	Out of Tolerance
Setpoints	Measurement target values
Traceability	Unbroken chain of comparisons relating an instrument's measurements to a known standard(s)
Traceability Number	Unique identifier(s) used to document traceability of calibration standards
TUR	Test Uncertainty Ratio, ratio of the tolerance or specification of the test measurement in relation to the uncertainty in measurement results
UUT	Unit Under test

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Calibrated At:
35 Vantage Point Dr
Rochester, NY 14624

Facility Responsible:
35 Vantage Point Dr
Rochester, NY 14624
800-828-1470

Calibrated By:
 **Electronically Signed By:**
Kevin Kita

Reviewed By:
 **Electronically Signed By:**
Jared Payne for

Unit Barcode: 
273A0001034

Kevin Kita Mar 16, 2021
Calibration Technician 11:50:35 -04:00

Kevin OGrady Mar 16, 2021
Lab Manager 11:53:00 -04:00

Date Received: November 09, 2020
Service Level : R10
Revised On: Revised on March 16, 2021