

**CERTIFICATE OF CALIBRATION**  
**Preliminary**

**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/cm<sup>3</sup>.

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	PCS	TUR
<b>AC Volts Measure</b>											
600 mV Range	330.0mVrms 60Hz	±( 0.7% Rdg + 4 LSD)	327.3	332.7	329.5 mVrms		8.6e-002	1.7e-001	mVrms	100.0	31.5 : 1
	600.0mVrms 13kHz	±( 2% Rdg + 20 LSD)	586.0	614.0	602.4 mVrms		1.4e-001	2.0e-001	mVrms	100.0	100.0 : 1
6 V Range	3.300Vrms 60Hz	±( 0.7% Rdg + 2 LSD)	3.275	3.325	3.295 Vrms		8.6e-004	1.7e-003	Vrms	100.0	29.2 : 1
	3.300Vrms 20kHz	±( 2% Rdg + 20 LSD)	3.214	3.386	3.287 Vrms		1.1e-003	1.8e-003	Vrms	100.0	79.3 : 1
60 V Range	33.00Vrms 60Hz	±( 0.7% Rdg + 2 LSD)	32.75	33.25	32.96 Vrms		6.5e-003	1.5e-002	Vrms	100.0	38.5 : 1
	33.00Vrms 20kHz	±( 2% Rdg + 20 LSD)	32.14	33.86	32.87 Vrms		1.1e-002	1.8e-002	Vrms	100.0	77.3 : 1
600 V Range	330.0Vrms 60Hz	±( 0.7% Rdg + 2 LSD)	327.5	332.5	329.6 Vrms		8.5e-002	1.5e-001	Vrms	100.0	29.4 : 1
	330.0Vrms 2.5kHz	±( 2% Rdg + 4 LSD)	323.0	337.0	329.8 Vrms		7.2e-002	1.4e-001	Vrms	100.0	96.8 : 1
1000 V Range	500Vrms 60Hz	±( 0.7% Rdg + 2 LSD)	494	506	500 Vrms		1.2e-001	1.2e+000	Vrms	100.0	48.0 : 1
	1000Vrms 1kHz	±( 1% Rdg + 4 LSD)	986	1014	1002 Vrms		2.4e-001	1.2e+000	Vrms	100.0	57.8 : 1

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<b>Frequency Measure</b>											
600 mV Range	99.95kHz	±( 0.005% Rdg + 1 LSD)	99.94	99.96	99.95 kHz		1.9e-004	1.2e-002	kHz	100.0	51.3 : 1
	150mVrms										
	199.50kHz	±( 0.005% Rdg + 1 LSD)	199.48	199.52	199.50 kHz		3.9e-004	1.2e-002	kHz	100.0	51.5 : 1
	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	100.0	51.3 : 1
	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	100.0	51.3 : 1
	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	100.0 : 1
	3.4Vp-p										
<b>Duty Cycle</b>											
Duty Cycle - 6 V DC Range	1kHz	±( 0.3 %)	49.7	50.3	50.0 %		9.8e-005	1.2e-001	%	100.0	100.0 : 1
	5Vp-p										
<b>DC Volts Measure</b>											
6 V Range	3.300V	±( 0.05% Rdg + 1 LSD)	3.297	3.303	3.300 V		5.0e-005	1.2e-003	V	100.0	59.5 : 1
60 V Range	33.00V	±( 0.05% Rdg + 1 LSD)	32.97	33.03	33.00 V		6.3e-004	1.2e-002	V	100.0	47.8 : 1
600 V Range	330.0V	±( 0.05% Rdg + 1 LSD)	329.7	330.3	330.0 V		6.0e-003	1.2e-001	V	100.0	50.1 : 1
1000 V Range	1000V	±( 0.05% Rdg + 1 LSD)	998	1002	1000 V		1.6e-002	1.2e+000	V	100.0	100.0 : 1
600 mV Range	33.0mV	±( 0.1% Rdg + 1 LSD)	32.9	33.1	33.0 mV		1.3e-003	1.2e-001	mV	100.0	76.7 : 1
	330.0mV	±( 0.1% Rdg + 1 LSD)	329.6	330.4	330.0 mV		4.6e-003	1.2e-001	mV	100.0	86.8 : 1

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<b>Resistance 2 Wire Comp Measure</b>											
600 Ohm Range	330.00hm	±( 0.2% Rdg + 2 LSD)	329.1	330.9	330.1 Ohm		2.4e-002	1.4e-001	Ohm	100.0	36.8 : 1
6 kOhm Range	3.300kOhm	±( 0.2% Rdg + 1 LSD)	3.292	3.308	3.300 kOhm		2.4e-004	1.4e-003	kOhm	100.0	32.7 : 1
60 kOhm Range	33.00kOhm	±( 0.2% Rdg + 1 LSD)	32.92	33.08	33.02 kOhm		2.4e-003	1.4e-002	kOhm	100.0	32.7 : 1
600 kOhm Range	330.0kOhm	±( 0.6% Rdg + 1 LSD)	327.9	332.1	330.3 kOhm		2.6e-002	1.4e-001	kOhm	100.0	81.9 : 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	100.0	39.2 : 1
50 MOhm Range	30.00MOhm	±( 1% Rdg + 3 LSD)	29.67	30.33	30.09 MOhm		7.9e-003	1.5e-002	MOhm	100.0	41.6 : 1
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
60 nS Range	100MOhm	±( 1% Rdg + 30 LSD)	9.60	10.40	9.93 nS		4.6e-003	1.3e-002	nS	100.0	87.2 : 1
<b>Diode Test</b>											
Diode Test	3.000V	±( 2% Rdg + 1 LSD)	2.939	3.061	3.000 V		2.9e-005	1.2e-003	V	100.0	100.0 : 1
<b>A AC Measure</b>											
6 A Range	3.000A	±( 1% Rdg + 2 LSD)	2.968	3.032	2.999 A		3.0e-003	3.4e-003	A	100.0	10.7 : 1
	60Hz										
<b>A DC Measure</b>											
6 A Range	3.000A	±( 0.2% Rdg + 4 LSD)	2.990	3.010	3.001 A		1.9e-003	2.3e-003	A	100.0	5.2 : 1
10 A Range	10.00A	±( 0.2% Rdg + 2 LSD)	9.96	10.04	10.00 A		5.5e-003	1.3e-002	A	100.0	7.3 : 1
<b>mA AC Measure</b>											
60 mA Range	33.00mA	±( 1% Rdg + 2 LSD)	32.65	33.35	32.97 mA		2.7e-002	3.2e-002	mA	100.0	13.0 : 1
	60Hz										
400 mA Range	330.0mA	±( 1% Rdg + 2 LSD)	326.5	333.5	330.0 mA		2.1e-001	2.6e-001	mA	100.0	16.7 : 1
	60Hz										

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<b>mA DC Measure</b>											
60 mA Range	33.00mA	±( 0.2% Rdg + 4 LSD)	32.89	33.11	33.00 mA		4.5e-003	1.4e-002	mA	100.0	24.6 : 1
400 mA Range	330.0mA	±( 0.2% Rdg + 2 LSD)	329.1	330.9	329.9 mA		8.2e-002	1.6e-001	mA	100.0	10.9 : 1
<b>µA AC Measure</b>											
600 µA Range	330.0µA	±( 1% Rdg + 2 LSD)	326.5	333.5	329.9 µA		3.8e-001	4.0e-001	µA	100.0	9.3 : 1
	60Hz										
6000 µA Range	3300µA	±( 1% Rdg + 2 LSD)	3265	3335	3299 µA		2.8e+000	3.3e+000	µA	100.0	12.7 : 1
	60Hz										
<b>µA DC Measure</b>											
600 µA Range	330.0µA	±( 0.2% Rdg + 4 LSD)	328.9	331.1	330.0 µA		6.7e-002	1.6e-001	µA	100.0	16.4 : 1
6000 µA Range	3300µA	±( 0.2% Rdg + 2 LSD)	3291	3309	3300 µA		5.1e-001	1.4e+000	µA	100.0	17.5 : 1
<b>Capacitance Measure</b>											
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
100 nF Range	5.0nF	±( 1% Rdg + 2 LSD)	4.7	5.3	5.0 nF		1.6e-002	1.3e-001	nF	100.0	18.3 : 1
100 µF Range	9.5µF	±( 1% Rdg + 2 LSD)	9.2	9.8	9.5 µF		2.5e-002	1.3e-001	µF	100.0	11.8 : 1
<b>Low Pass Filter</b>											
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	100.0 : 1
	400Hz										
(Not spec'd - Approx 226 to 340Vrms)	400Vrms				289 Vrms		7.2e-002	1.2e+000	Vrms		4 : 1
	800Hz										
<b>Low Pass Filter @ 800Hz</b>											
Filter follows an expected roll-off curve.			P	P	P						

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<b>Peak MIN/MAX</b>											
MAX - 6 VDC Range	6Vp-p 2kHz	±( 0.103 V)	3.897	4.103	4.025 V		5.6e-004	1.4e-003	V	100.0	100.0 : 1
MIN	6Vp-p 2kHz	±( 0.102 V)	-2.102	-1.898	-2.009 V		2.8e-004	1.3e-003	V	100.0	100.0 : 1
<b>Temperature Measure</b>											
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
	100.0°C	±( 1% Rdg + 10 LSD)	98.0	102.0	100.1 °C		1.6e-001	2.0e-001	°C	100.0	12.5 : 1
<b>Function Check</b>											
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

When compliance statements are present, they are reported without factoring in the effects of uncertainty and comply with the guidelines as follows: The acceptance zone is defined as: less than or equal to the high limit, and/or greater than or equal to the low limit. The rejection zones are defined as greater than the high limit and/or less than the low limit. Single measurement results in the acceptance zone are identified as in-tolerance. Single measurement results in the rejection zone are identified as out-of-tolerance (OOT). When all measurement results are in the acceptance zone for repeated measurements, for the same characteristic, the test is identified as in-tolerance. For repeated characteristic measurements, a single measurement result in the rejection zone, will cause the test to be identified as out-of-tolerance (OOT). Data rejection for cause, (outliers) is permitted after the "Determining and Verifying Out Of Tolerance (OOT) and/or Op Fail Readings" procedure outlined in this document has been completed and the anomalous reading cannot be repeated, and the anomalous reading does not represent the system under test. 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:**

**Reviewed By:**

Kevin Kita  
Calibration Technician

Kevin OGrady  
Lab Manager



**Date Received:** November 09, 2020  
**Service Level :** R11  
**Revised On:** Revised on March 16, 2021