Certificate of Calibration

Issued By Trescal Ltd

Date of Issue: 15 May 2019 Certificate Number: 3003790001

UKAS CALIBRATION
0013

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APPROVED SIGNATORY

.....
David Gresty

Customer:
Mecmesin Ltd, Spring Copse Business Park
Slinfold, West Sussex, RH20 3LZ

Equipment Details

Description:	Speed Verification Tool		
Manufacturer:	ELV		
Type No:	LSU 100	Date of Receipt:	03/May/2019
Range:		Order No:	260933
Serial No:	TM0407	Our Reference:	00527554
Engineer:	Joe Williams	**Date:**	14/May/2019

Calibration Summary

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Ambient Conditions Temperature: 20°C ± 2 °C

Date of next calibration:

The results given within this certificate only relate to the item calibrated. The uncertainty limits quoted refer to the measured values only, with no account being taken of the instruments ability to maintain its calibration. The reported expanded uncertainty is based upon a standard uncertainty multiplied by a coverage factor $k=2$ providing a confidence level of approximately 95%. The uncertainty evaluation has been derived from EA-4/02 M:2013 "Evaluation of the Uncertainty of Measurement In Calibration".

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Instrument Status:	In Tolerance	Out of Tolerance	Malfunctioning	Operational	Damaged
As Received				X	
As Returned				X	

	Full Calibration	Special Calibration	Operational Verification	Adjusted	Repaired	Returned As Received
Action Taken	X					

Receipt Comments:

Technical Remarks:

Calibration Equipment Used

Asset No	Due Date
121580	31/07/2019
121843	31/01/2020
122119	30/09/2019
FC160	31/07/2019
FC552	30/09/2019

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Basis of Test: Measured Results.

This speed verification instrument has been measured using laboratory standards for the distance between the laser sensors operating the stopwatch, with the datum laser being at the bottom of the column . Repeat readings were taken to determine the accuracy and the measured results reported in the following tables:

Reading Ref	Nominal Length (mm)	Start Position (mm)	Stop Position (mm)	Measured Length (mm)
1	21	142.3147	163.1741	20.8594
2	21	142.3161	163.1797	20.8636
3	21	142.3181	163.1758	20.8577
4	21	142.3192	163.1747	20.8555
5	21	142.3132	163.1753	20.8621
Mean		142.3163	163.1759	20.8597
Maximum variation		0.0060	0.0056	0.0081

Reading Ref	Nominal Length (mm)	Start Position (mm)	Stop Position (mm)	Measured Length (mm)
1	100	142.3190	242.3645	100.0455
2	100	142.3265	242.3666	100.0401
3	100	142.3234	242.3644	100.0410
4	100	142.3232	242.3617	100.0385
5	100	142.3220	242.3680	100.0460
Mean		142.3228	242.3650	100.0422
Maximum variation		0.0075	0.0063	0.0075

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The dovetail bracket was measured for the distance between faces with the following results:

Feature	Position	Nominal Distance (mm)	Measured Results (mm)	Mean Value (mm)	Parallelism (mm)
Upwards Distance	1	20	19.948	19.944	0.017
	2		19.951		
	3		19.940		
	4		19.949		
	5		19.934		

Feature	Position	Nominal Distance (mm)	Measured Results (mm)	Mean Value (mm)	Parallelism (mm)
Downwards Distance	1	20	19.891	19.887	0.024
	2		19.889		
	3		19.882		
	4		19.867		
	5		19.875		

Note! The Position 1 is located next to the body of the dovetail bracket.

Uncertainty of measurement : ±0.003 mm Linear
±0.005 mm Laser Displacement

Calibration Procedure : QCD/CALP/18

Our Reference : AFD300379

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Calibration Procedure: The instrument was placed in the Laboratory for 24 hours prior to calibration for stabilisation purposes. Tests were made by comparison with a standard counter at the given indications. The equipment was calibrated in a controlled environment using devices having known and traceable values. The uncertainties reported refer to the measured values only with no account being taken of the instrument ability to maintain its calibration.

Equipment Calibrated - Refer to Results

Time Checks

UUT Indication	Standard Indication	Standard Equivalent
00 hr 00 min 05.034 sec	5.016 sec	0 min 05.016 sec
00 hr 00 min 09.974 sec	9.952 sec	0 min 09.952 sec
00 hr 00 min 30.015 sec	29.991 sec	0 min 29.991 sec
00 hr 00 min 59.893 sec	59.893 sec	0 min 59.893 sec
00 hr 04 min 59.982 sec	299.893 sec	4 min 59.893 sec
00 hr 10 min 00.021 sec	599.942 sec	9 min 59.942 sec

The overall uncertainty in the measurement was:

± (0.01 seconds of indication)

Specification taken from:

No specification available, results as found.

End of Results