

Gauge R&R Evaluation

Gauge R&R Evaluation		OPERATOR	NAME	DATE
Part Number: 20097419	Supplier: Hansin Precision Engineering	1	Bai Ao Cheng	29-May-2024
Part Name: COVER, RIGHT TOP	Date: 29-May-2024	2	Tian Yuanhui	29-May-2024
Part Revision: C	Prepared By: Chu Libo	3	Zhou Liujian	29-May-2024

Number of Operators	3
Number of Trials	3

SPECIFICATION: 266.98 + TOL: 0.5 - TOL: 0.5 TOTAL TOLERANCE: 1 UNITS: mm INSPECTION METHOD: SS																		
MEASUREMENT	OPERATOR 1						OPERATOR 2						OPERATOR 3					
	Trial 1	Trial 2	Trial 3	Min	Max	Range	Trial 1	Trial 2	Trial 3	Min	Max	Range	Trial 1	Trial 2	Trial 3	Min	Max	Range
1	266.940	266.950	266.950	266.940	266.950	0.010	266.940	266.940	266.940	266.940	266.940	0.000	266.950	266.940	266.950	266.940	266.950	0.010
2	266.950	266.960	266.960	266.950	266.960	0.010	266.960	266.960	266.980	266.960	266.980	0.020	266.960	266.960	266.960	266.960	266.960	0.000
3	266.950	266.960	266.950	266.950	266.960	0.010	266.950	266.950	266.960	266.950	266.960	0.010	266.980	266.950	266.960	266.950	266.980	0.030
4	266.980	266.950	266.960	266.950	266.980	0.030	266.960	266.960	266.950	266.950	266.960	0.010	266.960	266.960	266.950	266.950	266.960	0.010
5	266.960	266.950	266.950	266.950	266.960	0.010	266.960	266.960	266.950	266.950	266.960	0.010	266.950	266.950	266.970	266.950	266.970	0.020
6	266.950	266.950	266.950	266.950	266.950	0.000	266.950	266.950	266.950	266.950	266.950	0.000	266.960	266.950	266.950	266.950	266.960	0.010
7	266.940	266.930	266.940	266.930	266.940	0.010	266.940	266.940	266.940	266.940	266.940	0.000	266.930	266.930	266.950	266.930	266.950	0.020
8	266.950	266.950	266.940	266.940	266.950	0.010	266.950	266.950	266.940	266.940	266.950	0.010	266.950	266.950	266.940	266.940	266.950	0.010
9	266.950	266.950	266.960	266.950	266.960	0.010	266.960	266.950	266.950	266.950	266.960	0.010	266.960	266.960	266.970	266.960	266.970	0.010
10	266.960	266.950	266.950	266.950	266.960	0.010	266.960	266.950	266.950	266.950	266.960	0.010	266.950	266.950	266.950	266.950	266.950	0.000
TOTALS	2669.530	2669.500	2669.510			0.110	2669.530	2669.510	2669.510			0.080	2669.550	2669.500	2669.550			0.120
X _{MIN} * 266.9513	Operator R _A 0.011						R _B 0.008						R _C 0.012					
X _{MAX} * 266.9533	SUM 8008.540						SUM 8008.550						SUM 8008.600					
X _{diff} * 0.0020	X _A 266.951						X _B 266.952						X _C 266.953					

TEST FOR CONTROL

Upper Control Limit, $UCL_r = D_4 \bar{R}$

$$D4: \boxed{2.570} \times R: \boxed{0.010} = \boxed{0.027}$$

If any individual range exceeds this limit, the measurement or reading should be reviewed, repeated, corrected, or discarded and new averages and ranges should be computed

MEASUREMENT SYSTEM ANALYSIS

STATISTICAL CONSTANT VALUE					
# Trials	2.00	3.00	# Oprs	2	3
K1	4.56	3.05	K2	3.65	2.70
D4	3.27	2.57	n = # of parts		m = # of trials

QUALITY GOAL
ACCEPTABLE: LESS THAN 10%
CONDITIONALLY ACCEPTABLE: BETWEEN 10% to 30%
NOT ACCEPTABLE: GREATER THAN 30%

Repeatability - Equipment Variation (E.V)

E.V. = $K_1 R$	3.050	x	0.010	=	0.032	% E.V. =	3.2
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Reproducibility - Appraiser Variation (A.V)

$$\text{A.V.} = \ddot{O} [(X_{\text{Diff}}) \times (K_2)]^2 - [(E.V.)^2 / (n \times m)] \quad \ddot{O} \boxed{2.916\text{E-}05} - \boxed{3.31\text{E-}05} = \boxed{0} \quad \% \text{A.V.} = \boxed{0.0}$$

Repeatability and Reproducibility (R & R)

$$R\&R = \ddot{O} (E.V)^2 + (A.V)^2 = 0.0009933 + 0 = 0.031517 \quad \% R\&R = 3.2$$

COMMENTS	

RESULT: Acceptable