Control Valve Diagnostic Testing

Tag Number:	**CV308 RP PS2**
Mfgr. Serial Number:	**JPL-231**
Alt. Serial Number:	**N/A**
Unit Name:	**NEW UNIT**
Plant Name:	**NEW MILL/PLANT**
Company:	**NEW COMPANY**
Location:	**SOMEWHERE, USA**
P&I Drawing Number:	
Valve Application:	

Date of Report:

02/19/2021

5:18:19PM

Report Prepared By:

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BenchMark
Control Valve Diagnostics

Valve Configuration Summary

Tag Number	**CV308 RP PS2**
Mfgr. Serial #	**JPL-231**
Alt. Serial #	**N/A**

Valve Identification

Company	**NEW COMPANY**	P&I Drawing Number	
Plant	**NEW MILL/PLANT**	Valve Application	
Location	**SOMEWHERE, USA**	Year Installed	
Unit	**NEW UNIT**	Risk Class	
Notes			

Valve Configuration

Configuration	**ROTARY**		Packing Type		
Manufacturer			Packing Mat'l		
Valve Type			Stem (Shaft) Diameter	**0.00**	in
Valve Model			Specified Friction		lbf
Pressure Class	**0**	psig	Specified Torque	**0.00**	in-lbf
Rotary Type			Moment Arm	**0.00**	in
Flow Direction			Link Arm	**0.00**	in
Valve Size		in			
Notes					

Valve Seat (Trim)

Seat Diameter		in	Balance / Unbalanced	
Rated Cv			PBal Seat Mat'l	
Seat Leak Class			Unbalance Area	in2
Flow Characteristic				
Notes				

Valve Actuator

Actuator Style	**SINGLE ACTING**		Nominal Stroke	**80.0**	deg
Actuator Mfgr			Spring Displ.	**0.00**	in
Actuator Model			Springrate		lbf/deg
Air Action	**ATO**		Benchset, Min.		psig
Fail Mode	**CLOSE**		Benchset, Max.		psig
Actuator Area	**20.00**	in2			
Bottom Area		in2			
Notes					

Valve Positioning System

Signal Range	**4-20 MA**	I/P Nominal, Min.	**3.00**	psig
Signal Source	**HART**	I/P Nominal, Max.	**15.00**	psig
Positioner		Air Pressure, Min.	**0**	psig
Cam Profile	**LINEAR**	Boosters/QExhaust		

BenchMark Baseline Test

Tag Number	**CV308 RP PS2**
Mfgr. Serial #	**JPL-231**
Alt. Serial #	**N/A**

Test Identification

Test Number	**B10066ET**	Company	**NEW COMPANY**
Test Date	**2/19/2021 16:52**	Plant	**NEW MILL/PLANT**
Ramp Time	**50** sec (Nominal Span)	Unit	**NEW UNIT**
Operator	**George Wang**	Location	**SOMEWHERE, USA**

Test Results

Parameter	Results	Units	Status	Max Std	Min Std	Comment
Measured Total Travel						
Measured Total Rotation	**72.8**	deg				
Signal, Min Travel	**4.54**	mA				
Signal, Max Travel	**19.86**	mA				
Signal, Nom Travel		mA				
HDL Error, Average	**3.11**	% fs				
HDL Error, Max	**4.26**	% fs				
Linearity Error	**0.56**	% fs				
Friction, Average	**342**	lbf				
Friction, Max	**434**	lbf				
Torque, Average	**329**	in-lbf				
Torque, Maximum	**434**	in-lbf				
Benchset, Min.	**29.2**	psig				
Benchset, Max.	**113.7**	psig				
Spring Rate	**21.1**	lbf/deg				
Seatload Act & Spring						
Seatload Spring Only						
Signal Pressure, Min Travel						
Signal Pressure, Max Travel						
Signal Pressure, Nom Travel						
Pos HDL Error, Average	**3.11**	% fs				
Pos HDL Error, Max	**4.26**	% fs				
Pos Linearity Error	**0.56**	% fs				
Pos Balance Pressure						
I/P Output, Min Signal						
I/P Output, Max Signal						
I/P HDL Error, Average						
I/P HDL Error, Maximum						
I/P Linearity Error						
Nominal Air Supply	**0.0**	psig				
Air Supply Decrease	**106.3**	% nom				

Valve Configuration **[Partial Specification]**

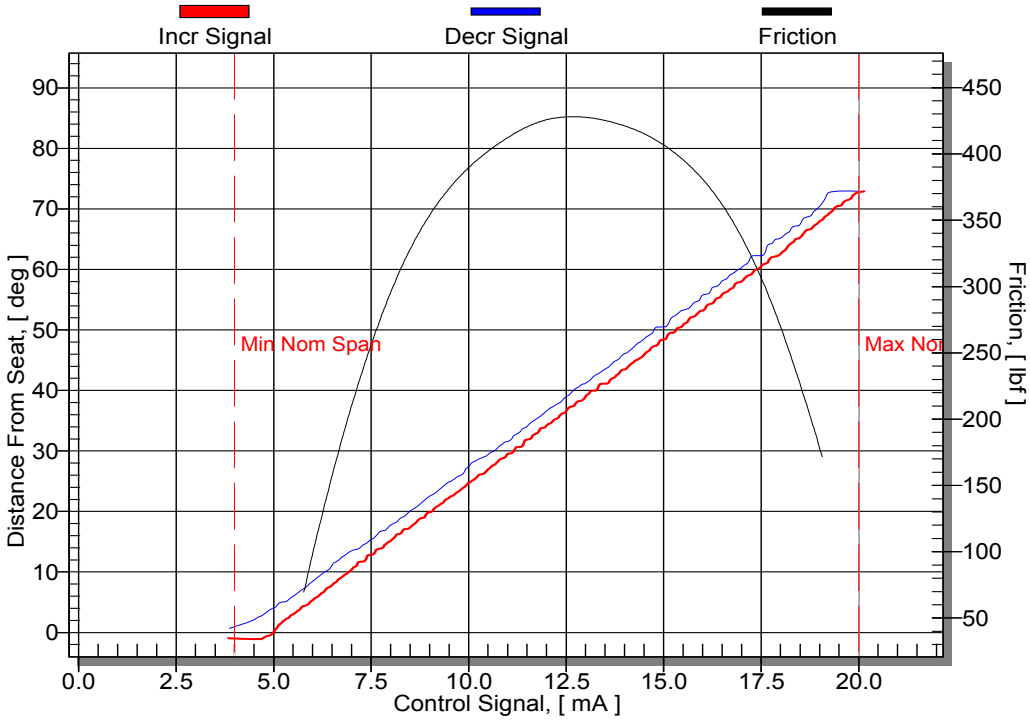
Manufacturer		Actuator		Positioner	
Valve Size	0 in	Actuator Style	SINGLE ACTING	Pos Cam	LINEAR
Configuration	ROTARY	Actuator Area	20 in	Signal Source	HART
Packing Style		Nominal Stroke	80.00 deg	Signal Range	4-20 MA
Packing Material		Air Action	ATO	Seat Leakage	
Flow Direction		Fail Mode	CLOSE	Rotary Type	

Test Notes

2/19/2021/16:52 /

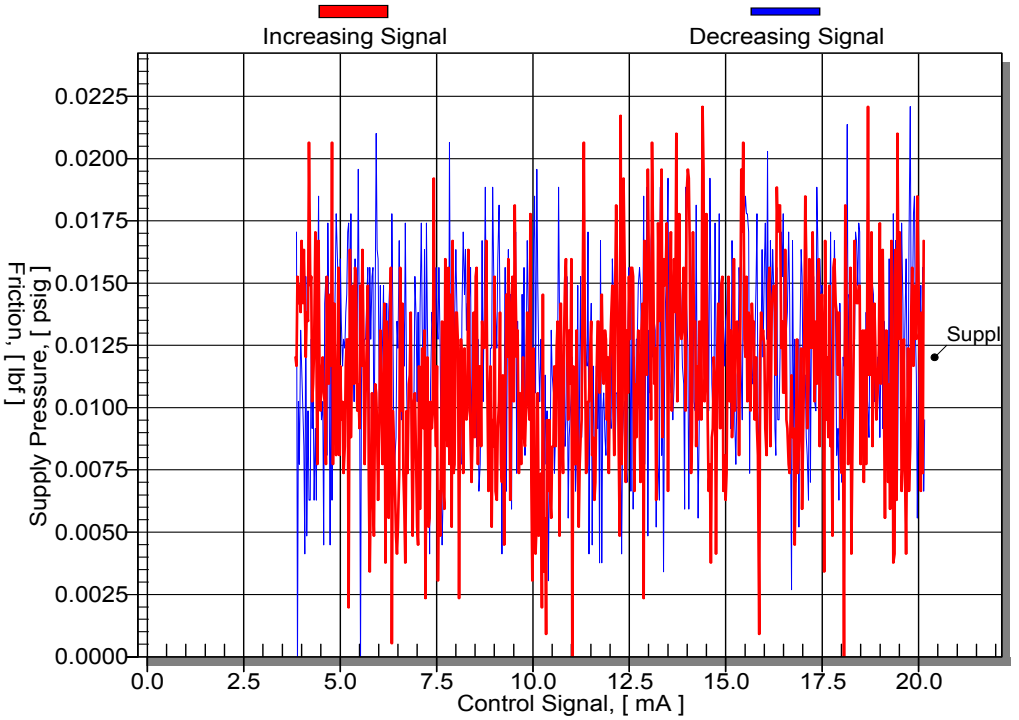
BenchMark Overall Valve Performance

B10066ET / CV308 RP PS2/JPL-231/N/A



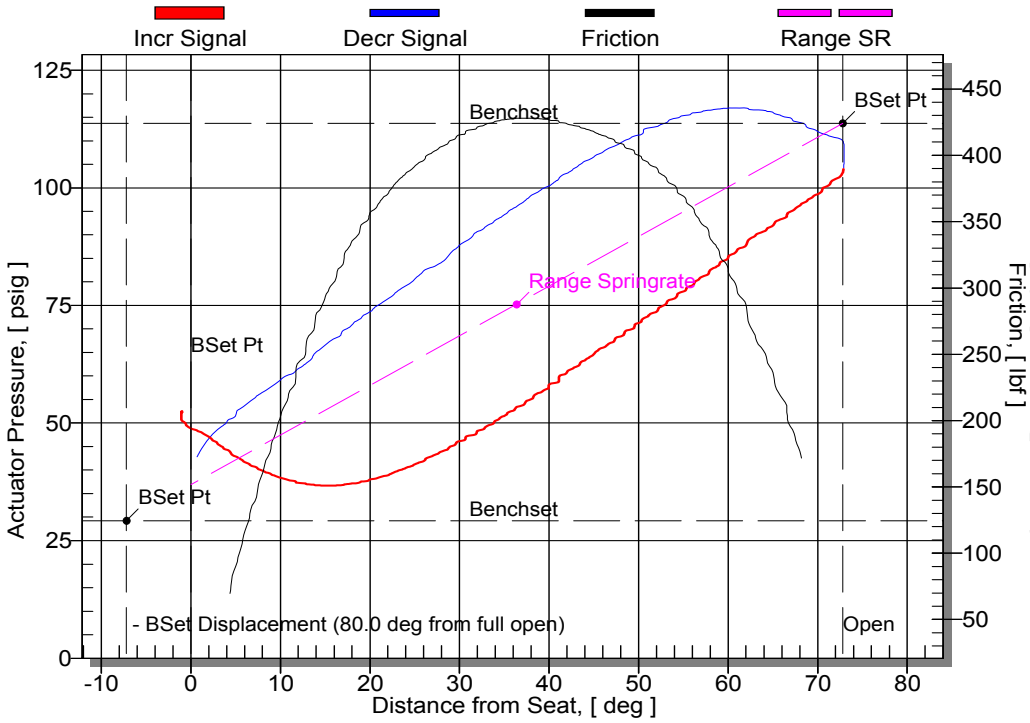
Supply Pressure Response

B10066ET / CV308 RP PS2/JPL-231/N/A



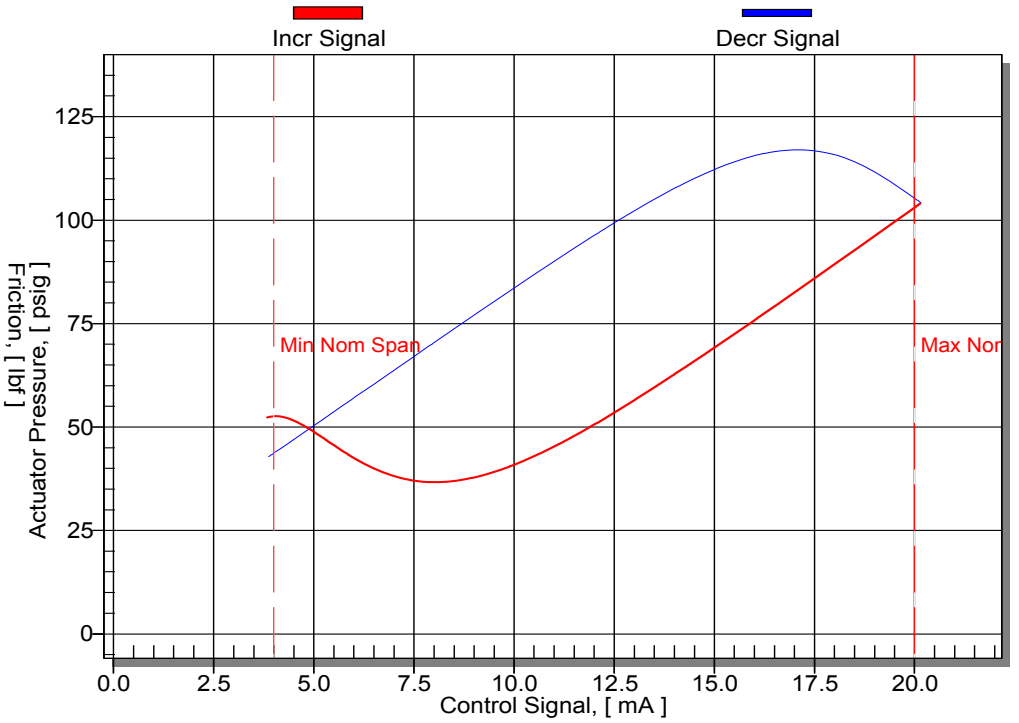
Actuator Performance

B10066ET / CV308 RP PS2/JPL-231/N/A



Valve Positioner Performance

B10066ET / CV308 RP PS2/JPL-231/N/A



BenchMark HDRL Test

Tag Number	**CV308 RP PS2**
Mfgr. Serial #	**JPL-231**
Alt. Serial #	**N/A**

Test Identification

Test Number	**H10011ET**	Company	**NEW COMPANY**
Test Date	**2/19/2021**	Plant	**NEW MILL/PLANT**
Test Time	**17:16**	Unit	**NEW UNIT**
Operator	**George Wang**	Location	**SOMEWHERE, USA**

Positioning System HDRL Results

Parameter	Results	Units	Status	Max Std
Hysteresis + Db, Avg	1.68	% fs		
Hysteresis + Db, Max	2.19	% fs		
Repeatability, Avg	0.27	% fs		
Repeatability, Max	2.08	% fs		
Linearity	0.37	% fs		

I/P Transducer HDRL Results

Parameter	Results	Units	Status	Max Std
Hysteresis + Db, Avg		% fs		
Hysteresis + Db, Max		% fs		
Repeatability, Avg		% fs		
Repeatability, Max		% fs		
Linearity		% fs		

Hold Time 15 sec

Valve Configuration [Partial Specification]

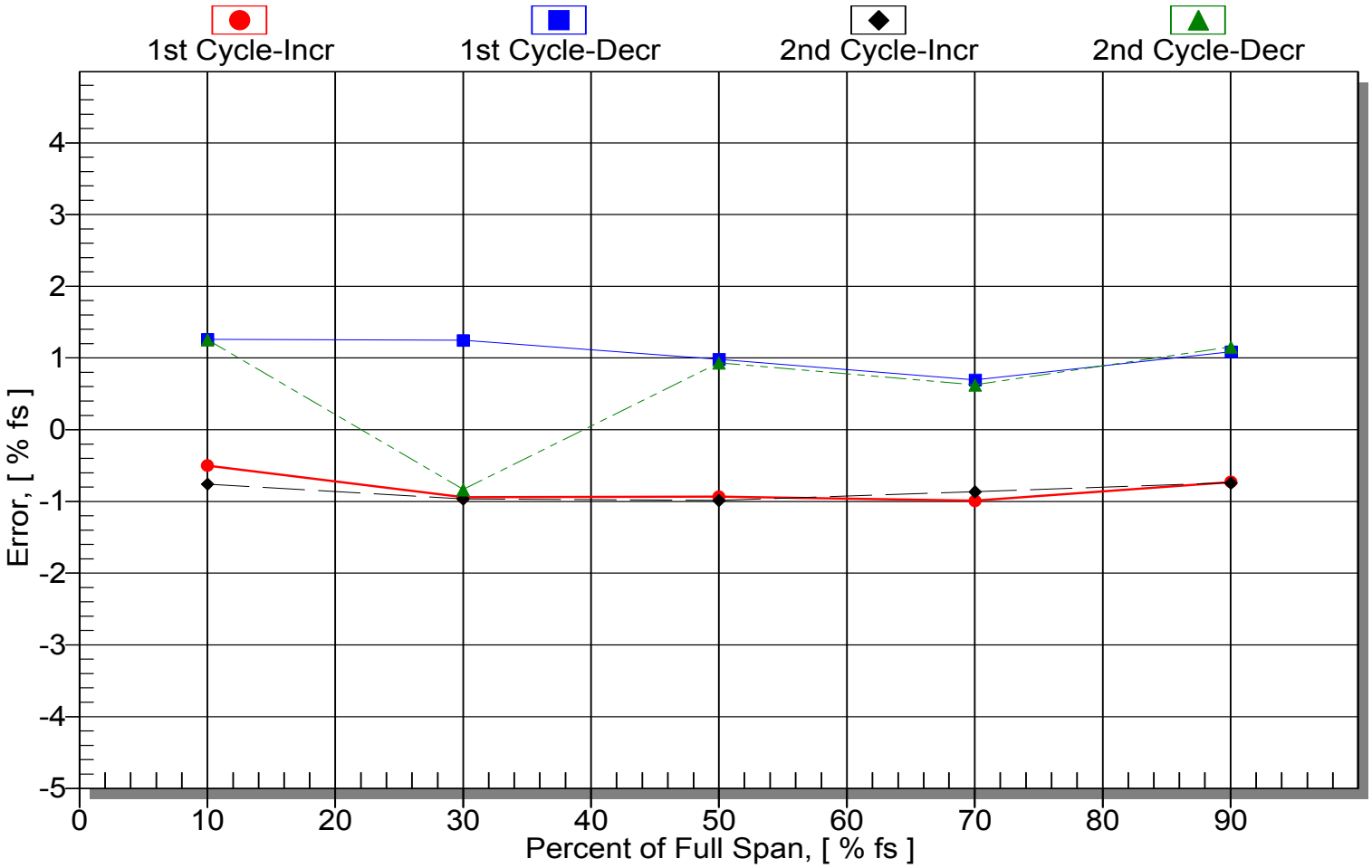
Manufacturer		Nominal Stroke	80.00	deg
Valve Size	0 in	Air Action	ATO	
Configuration	ROTARY	Fail Mode	CLOSE	
Packing Style		Positioner		
Packing Material		Pos Cam	LINEAR	
Flow Direction		Signal Source	HART	
Actuator		Signal Range	4-20 MA	
Actuator Style	SINGLE ACTING	Seat Leakage		
Actuator Area	20 in	Moment Arm		in

Test Notes

2/19/2021/17:16/

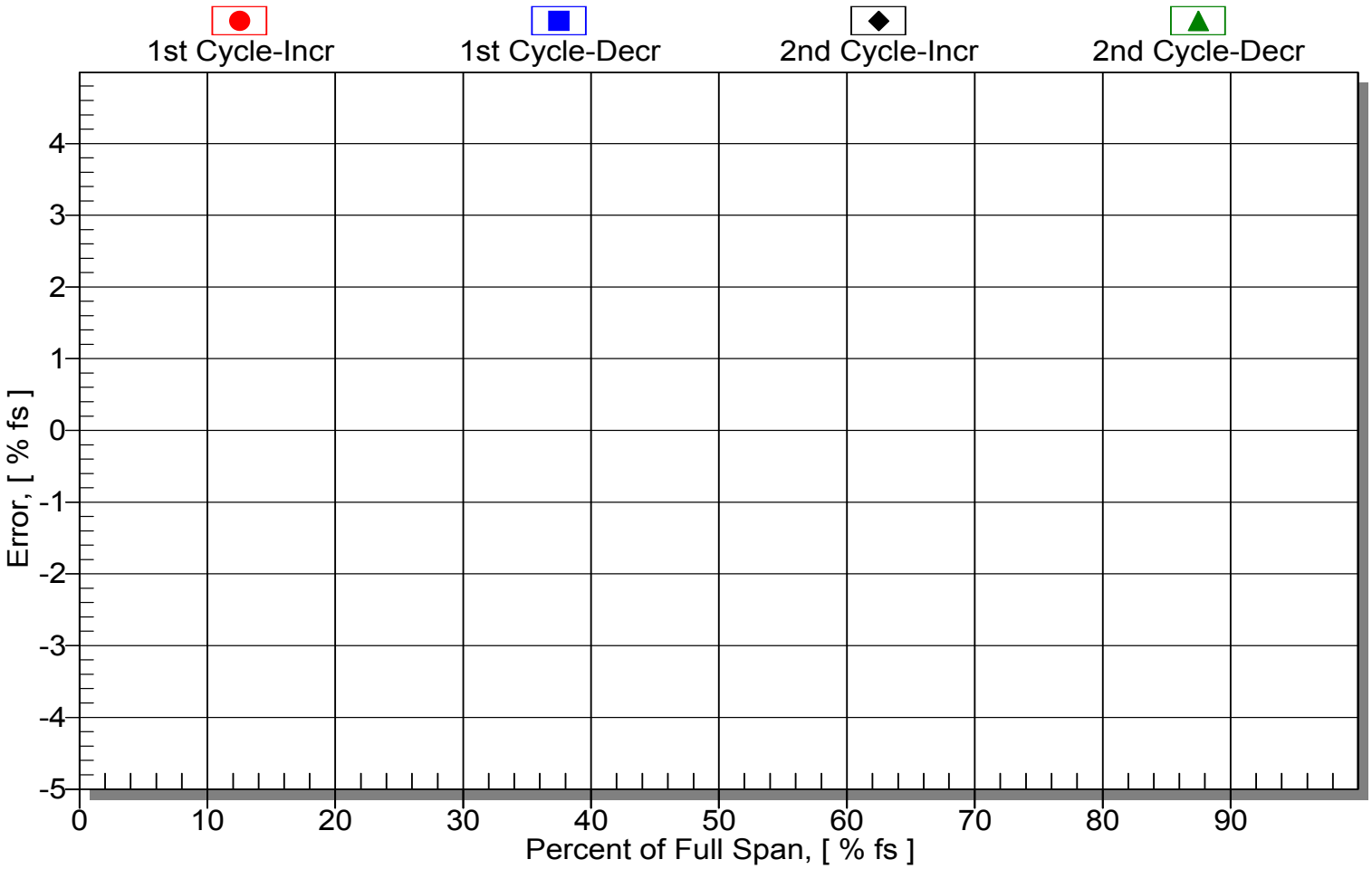
Overall Positioning HDRL Results

H10011ET / CV308 RP PS2/JPL-231/N/A



I/P Transducer HDRL Results

H10011ET / CV308 RP PS2/JPL-231/N/A



BenchMark Sensitivity Test

BenchMark Control Valve Diagnostics

Tag Number	**CV308 RP PS2**
Mfgr. Serial #	**JPL-231**
Alt. Serial #	**N/A**

Test Identification

Test Number	**N10027ET**	Company	**NEW COMPANY**
Test Date	**2/19/2021**	Plant	**NEW MILL/PLANT**
Test Time	**16:56**	Unit	**NEW UNIT**
Operator	**George Wang**	Location	**SOMEWHERE, USA**

Test Results

Parameter	**Units**	**5%**	**5%**	**2%**	**2%**	**1%**	**1%**	**0.5%**	**0.5%**
Signal		INCR	DECR	INCR	DECR	INCR	DECR	INCR	DECR
Ideal Step	deg	3.739	3.739	1.496	1.496	0.748	0.748	0.3739	0.3739
Actual Step	deg	3.703	4.052	1.627	1.446	0.784	0.660	0.3112	0.4056
Step Error	deg	-0.036	0.312	0.131	-0.050	0.036	-0.088	-0.0627	0.0317
Step Error	%step	-1.0	8.4	8.8	-3.3	4.8	-11.8	-16.8	8.5
Standard	%step								
Test Result									

HoldTime	15	sec
Offset	50.0	% fs
Measured Stroke	74.8	deg
HD Error	1.82	% fs

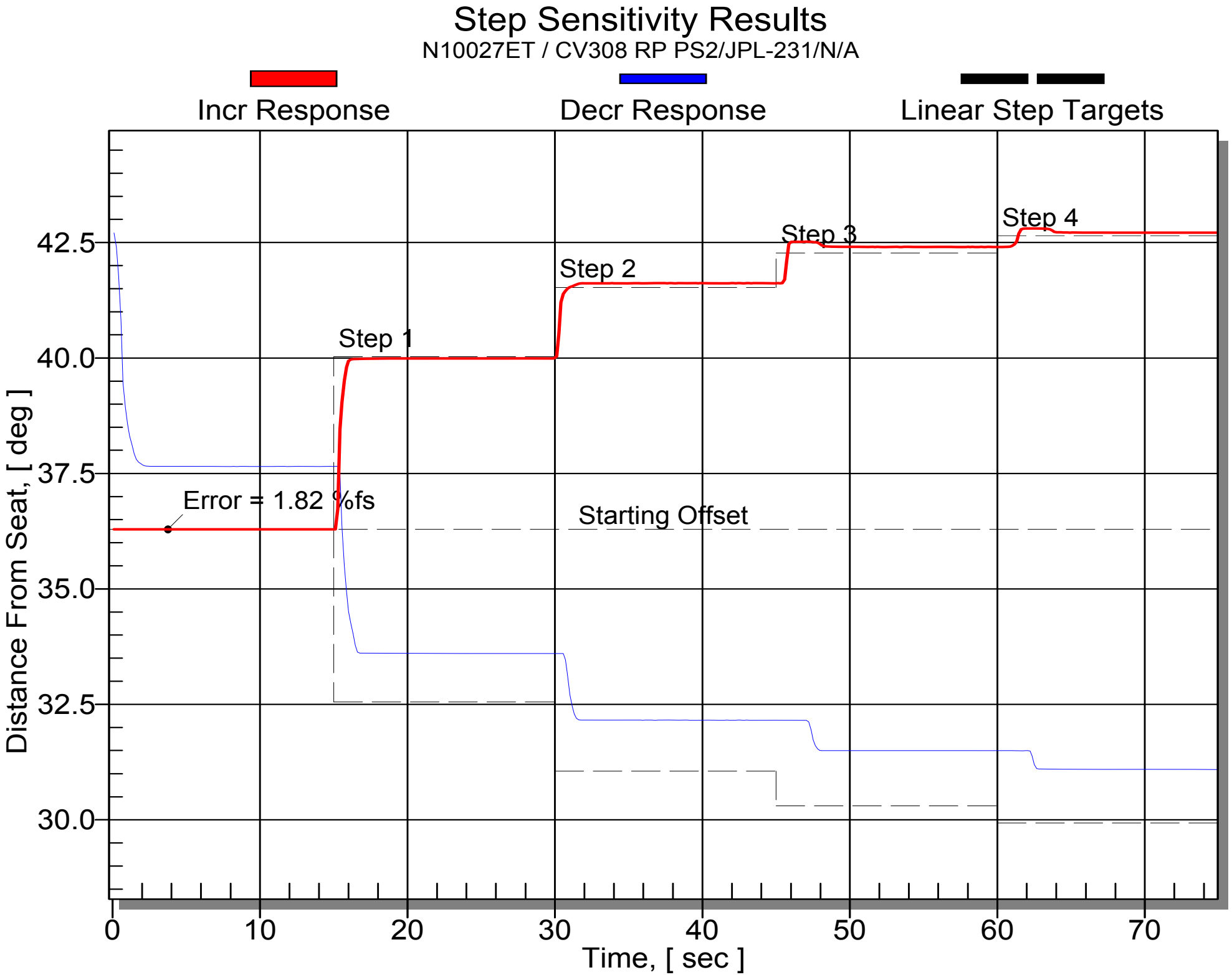
Valve Configuration

[Partial Specification]

Manufacturer			Nominal Stroke	80.00	deg
Valve Size	0	in	Air Action	ATO	
Configuration	ROTARY		Fail Mode	CLOSE	
Packing Style			Positioner		
Packing Material			Pos Cam	LINEAR	
Flow Direction			Signal Source	HART	
Actuator			Signal Range	4-20 MA	
Actuator Style	SINGLE ACTING		Seat Leakage		
Actuator Area	20	in	Moment Arm		in

Test Notes

2/19/2021 / 16:56/


Step Sensitivity Results
N10027ET / CV308 RP PS2/JPL-231/N/A
Incr Response
Decr Response
Linear Step Targets
Step 1
Step 2
Step 3
Step 4
Error = 1.82 %fs
Starting Offset
Distance From Seat, [deg]
42.5
40.0
37.5
35.0
32.5
30.0
0
10
20
30
40
50
60
70
Time, [sec]

BenchMark Control Valve Diagnostics

Tag Number	**CV308 RP PS2**
Mfgr. Serial #	**JPL-231**
Alt. Serial #	**N/A**

Test Identification

Test Number	**R10018ET**	Company	**NEW COMPANY**
Test Date	**2/19/2021**	Plant	**NEW MILL/PLANT**
Test Time	**17:01**	Unit	**NEW UNIT**
Operator	**George Wang**	Location	**SOMEWHERE, USA**

Test Results

Parameter	**%**	**5%**	**5%**	**2%**	**2%**	**1%**	**1%**	**0.5%**	**0.5%**
Signal		INCR	DECR	INCR	DECR	INCR	DECR	INCR	DECR
Ideal Step	deg	3.739	3.739	1.496	1.496	0.748	0.748	0.3739	0.3739
Actual Step	deg	3.780	3.966	1.476	1.480	0.800	0.015	-0.0004	-0.0006
Step Error	deg	0.041	0.227	-0.020	-0.015	0.052	-0.733	-0.3743	-0.3745
Step Error	%step	1.1	6.1	-1.3	-1.0	7.0	-98.0	-100.1	-100.2
Standard	%step								
Test Result									

HoldTime	15 sec	
Offset	50.0 % fs	
Measured Stroke	74.8	deg

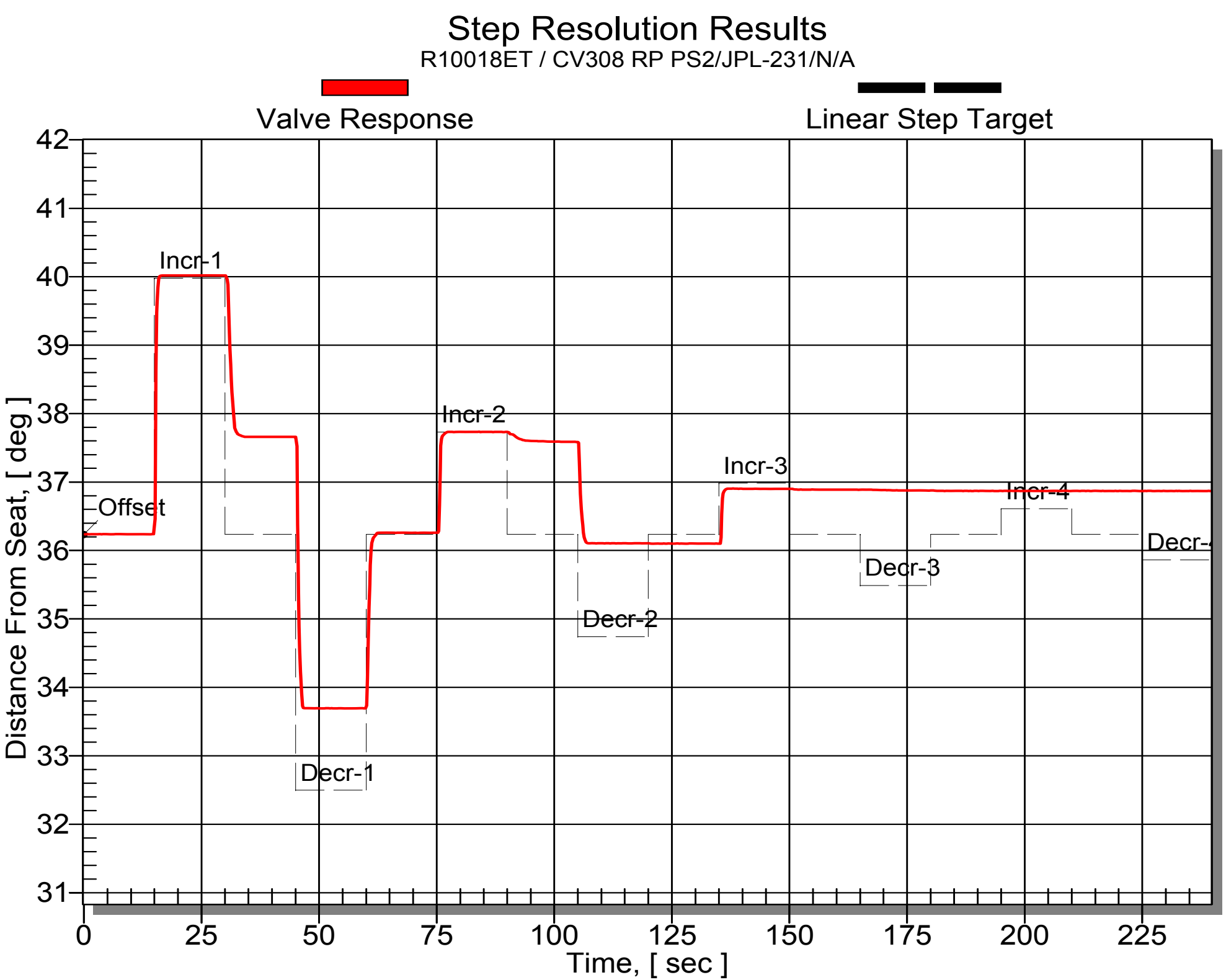
Valve Configuration

[Partial Specification]

Manufacturer			Nominal Stroke	80.00	deg
Valve Size	0	in	Air Action	ATO	
Configuration	ROTARY		Fail Mode	CLOSE	
Packing Style			Positioner		
Packing Material			Pos Cam	LINEAR	
Flow Direction			Signal Source	HART	
Actuator			Signal Range	4-20 MA	
Actuator Style	SINGLE ACTING		Seat Leakage		
Actuator Area	20	in	Moment Arm		in

Test Notes

2/19/2021 / 17:01/


Step Resolution Results
R10018ET / CV308 RP PS2/JPL-231/N/A
Valve Response
Linear Step Target
Distance From Seat, [deg]
Time, [sec]
42
41
40
39
38
37
36
35
34
33
32
31
0
25
50
75
100
125
150
175
200
225
Incr-1
Incr-2
Incr-3
Incr-4
Offset
Decr-1
Decr-2
Decr-3
Decr-