



M O D F I K 9 9 1 3 C

HIGH PRESSURE CALIBRATION WORKSTATION

- Save time and improve efficiency with automated calibration
- Turnkey system includes all needed components
- Dynamically calibrate pressure transducers as they are used in the field
- Improve accuracy by implementing curve fitting to impulse calibration data
- Calibration data allows transducer trending for better instrumentation management
- Create customizable ISO compliant certificates

TYPICAL APPLICATIONS

- Metrology laboratories
- Research & development

DYNAMIC PRESSURE TO 15 000 PSI

The K9913C Dynamic Pressure Calibration System features accurate dynamic calibration of pressure sensors over a midpressure range (200 to 15 000 psi) using a stable tourmaline reference sensor. A pressure impulse is simultaneously applied to both the reference and sensor under test (SUT) to determine the sensitivity of a pressure sensor at a particular amplitude. By varying the amplitude level, the linearity of the SUT can also be determined. Using a high quality data acquisition system, the K9913C automatically measures, stores and reports calibration results on an ISO 17025 compliant calibration certificate.

Dynamic pressure calibration is also available as an option with the 9155 Series Accelerometer Calibration Workstation. Option number 9155D-913 adds the 9913 Hydraulic Impulse Calibrator, sensor, and software verification to the 9155 base system. The PC system controller and data acquisition hardware are core to the base 9155 workstation, while the -913 control software runs integrated with the 9155 user interface and database. Model K9913C01 upgrades a PCB Model 913B02 to a turnkey K9913C.

AUTOMATED IMPULSE CALIBRATION SOFTWARE

A Model 9913C records the instantaneous output of both the sensor under test (SUT) and a piezoelectric reference sensor following an impulse. The peak voltage output of both the sensor under test and reference sensor are measured. Three values (two voltage measurements and the known reference sensitivity) are used to calculate the sensitivity of the sensor under test. The test activity and results are shown in the easy-to-use software:

- Displayed time data allows technician to view waveform and check for anomalies in the hydraulic impulse
- Linearity plot provides an overview of test results in real-time
- Software automatically computes values such as sensitivity, pressure level, and pulse duration
- Results table provides a snapshot of average results for all test levels

MIT I			1.39961						
ensor Under Test	Present Test	Referenc	Accept		Previous	Tests at Th	is Level		
Manufacturer PCB	1.87	SUT	_		Output (r	nAO Pre	ssure (osi)	PulseDur I	no)
		\	Sensitivity		1412.6	102	33.8	5.7700	
Model 108A04	1.6		0.1379	Wipsi	1410.4	103	73.0	5.7600	
, , , , , , , , , , , , , , , , , , , ,	141	\			1411.4	103	27.3	5.7700	
Serial Number 19251			Test Level		1406.8	101	96.2	5.7800	
sena number j	1.2*		9899.87 p		1402.4	101	67.2	5.8000	
			,,		1389.7	933	9.9	5.2100	
	- //		Pulse Duration						
ta Acquisition Turns	§ 0.8-	- \	5.21 n	.					
ta Acquisition Target Levels			0.21	1				7	Entri
F0000	0.6-		l'		Del	lete Selected	Dača	37	Eners
Armed 10000	0.4-	N N	Test Status		F	1.00			٧.
					1399.636	1.007	511	5.696	Ave
Include in BPSL 20000	0.2-		OK.						W.
& Re-Arm	0	\			37,8172	266 /	1434	0.2222	9td
	07								
	-0.2								
		kido 4,00 5,00 6,00 7,0	0.7.65		Averaged	Darube			
	Time (ns)				Hitchages	rice suits			
ViewChange		Time Duration 10.2 ns	Store Time Wa	reforms	Target	Avg	Test	Avrg	% Lir
Gain & A/D FS	ICEM	ime Lurason			Level	Output	Level	Duration	Ref
		Ano Linearity	277		5000	683.49	4790.1	4.18	0.73
	Amplitude Linearity (deviation from BFSL)		Combined Da	ia.					
VensChange	3200 -	168			10000	1389.6	10073	5,6957	0.99
Viewp.hange Trigger	3000-		Pressure (psi) U	10000	19000	0	0	0	0
	2900 -		Cutanta facility Communication		20000	3026.8	20799	5.4	3.54
Acceptance Tolerance (%) (5	2800 -		Output (mil) Pressi	re (ps)	20000	3026.0	20799	5.4	3.54
Acceptance Tolerance (%) (5			1412.6 10233	re (ps)	20000	3026.0	20799	5.4	3.54
	2600 -		1412.6 10233 1418.4 10233	re (ps)	20000	3026.0	20799	[S.4	3.5
	2600 - \$ 2600 - \$ 2200 -		1412.6 10233 1418.4 10233 1411.4 10223	re (ps)	20000	3026.0	20799	S.4	3.54
Acceptance Tolerance (%) \$\frac{1}{2}\$ Low Pass Filter Sidtle Low Pass	2000 - 2400 - \$ 2200 - \$ 2000 -		1412.6 10233 1418.4 10233 1411.4 10223 1406.0 10196	re (ps)	20000	3026.0	20799	5.4	3.54
	2000 - 2000 - 5 2000 - 5 2000 - 6 1000 -		1412.6 10233 1418.4 10273 1411.4 10223 1401.0 10194 1402.4 10163	re (ps) .0 .0 .3 .2 .2	20000	3026.0	20799	5.4	3.54
Low Pass Filter 5 lifts Low Pass	2000 - \$ 2000 - \$ 2000 - \$ 2000 - \$ (000 -		1412.6 10233 1418.4 10233 1411.4 10223 1406.0 10196	re (ps) .0 .0 .3 .2 .2	20000	3026.0	20799	5.4	3.54
Low Pass Filter 5 lifts Low Pass	2003- \$2003- \$2003- \$3003- \$1000- \$1000-		1412.6 10233 1418.4 10273 1411.4 10223 1401.0 10194 1402.4 10163	re (ps) .0 .0 .3 .2 .2	20000	1026.0	20799	5.4	3.54
Low Pass Filter Sidtle Low Pass st Parameters	2001- \$2203- \$2000- 1000- 1000-		1412.6 10233 1418.4 10273 1411.4 10223 1401.0 10194 1402.4 10163	re (ps) .0 .0 .3 .2 .2	20000	1026.0	20799	5.4	3.54
Low Pass Filter Skifts Low Plans st Parameters st Description	2003- \$2003- \$2003- \$3003- \$1000- \$1000-		1412.6 10233 1418.4 10273 1411.4 10223 1401.0 10194 1402.4 10163	re (ps) .0 .0 .3 .2 .2	20000	3026.0	20799	5.4	3.54
Low Pass Filter Slatte Low Pass It Peremieters it Description	2001- \$2203- \$2000- 1000- 1000-		1412.6 10233 1418.4 10273 1411.4 10223 1401.0 10194 1402.4 10163	re (ps) .0 .0 .3 .2 .2	20000	3026.0	20799	5.4	3.54
st Perameters st Description net 5000 to 20000 pai	2000 - 24900 - \$ 2200 - \$ 2000 - \$ 2000 - \$ 1000 -		1412.6 10020 1418.4 10077 1411.4 10072 1410.4 10072 1400.0 10199 1400.0 10199 1400.0 10199 1359.7 9869.	re (ps) .0 .0 .3 .2 .2	20000	1026.0	20799	5.4	3.54
Low Pass Filter SHIfts Low Pass st Parameters st Description st 2000 to 20000 psi	\$ 2007- \$ 2007- \$ 2009- \$ 2009	1600 16000 18000 20000	1412.6 10020 1418.4 10077 1411.4 10072 1410.4 10072 1400.0 10199 1400.0 10199 1400.0 10199 1359.7 9869.	re (ps)	20000	3006.0	20799	5.4	3.54
Low Pass Filter S14ts Low Pless st Parameters 65 Description at 2000 to 20000 pill ference Level (psi)	\$ 2001- \$ 2001- \$ 2000- \$ 2000- \$ 1000- 1000- 1000- 1000- 000- 000- 000-		1412.6 10020 1418.4 10027 1411.4 10022 1406.0 10194 1406.0 10195 1406.2 10165 1559.7 9659.	re (56) 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	20000	2006.0	20799	5.4	3.54
Low Pass Filter S14ts Low Pless st Parameters 65 Description at 2000 to 20000 pill ference Level (psi)	\$ 2007- \$ 2007- \$ 2009- \$ 2009		1412.6 10020 1418.4 10077 1411.4 10072 1411.4 10072 1400.0 10199 1400.0 10199 1400.0 10199 1359.7 9859.	re (56) 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	20000	3006.0	20799	5.4	3.54
Low Pass Filter Sight Low Plans st Parameters st Description st DODG 20000 pail ference Level (ps)	\$ 2001- \$ 2001- \$ 2000- \$ 1000- \$ 1000		1412.6 10022 1411.4 10027 1411.4 10022 1410.6 10195 1400.4 10185 1359.7 9859.	re (56) 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	20000	3006.0	20799	5.4	3.54
Low Pass Filter Sight Low Plans st Parameters st Description st DODG 20000 pail ference Level (ps)	\$ 2001- \$ 2001- \$ 2000- \$ 1000- \$ 1000	vel Delete	1412.6 10022 1411.4 10027 1411.4 10022 1410.6 10196 1400.4 10106 1559.7 9659. Delete Selector Areg Cuspus (m/r) (r)	re (ps)	20000	3006.0	20799	5.4	3.54
Low Pass Filter Side Low Pleas st Parameters st Description with 5000 to 20000 pail ference Level ((sd))	2000- 2000-	Slope 0.14073	1412.6 10022 1411.4 10027 1411.4 10022 1410.6 10196 1400.4 10106 1559.7 9659. Delete Selector Areg Cuspus (m/r) (r)	re (ps)	20000	3006.0	20799	5.4	3.54

Impulse Calibrator - Pressure Response

9913C calibrates at predetermined levels and calculates linearity over the testing range

SPECIFICATIONS			
Performance (Actuator)			
Manufacturer Model Number	PCB Model 913B02		
Amplitude Range (usable)	200 to 15 000 psi (13.8 to 1034.2 Bar)		
Typical Rise Time	3 ms		
Typical Pulse Duration	6 to 8 ms		
Performance (Ref Transducer)			
Manufacturer Model Number	PCB Model 136A		
Sensitivity (+/- 15%)	0.2 pC/psi (0.029 pC/kPa)		
Measurement Range	15 000 psi (1034.2 Bar)		
Resolution	0.5 psi (3.45 kPa)		
Resonant Frequency	≥ 1.0 MHz		
Linearity	≤ 0.5% FS		

K9913C System	Components	
TMS 9913C [1]	Actuator	
PCB 136A [1]	Reference transducer	
PCB 443B02	Charge amplifier and accessories (QTY. 2)	
PCB 108A04 [1]	Verification pressure transducer	
PC System Controller	Pre-installed software [1]	
	Data acquisition system	
	System acceptance testing	

[1] Included in 9155D-913 option for integration with 9155 Accelerometer Calibration Workstation

