

TECHNICAL DATA SHEET

CP20
CRYOGENIC PROVER FOR FIELD
CALIBRATIONS OF BULK TRANSPORT SYSTEMS

Features:

- Simple and reliable cryogenic field calibration system with enhanced electronic unit.
- Includes a thermal printer for calibration and system check reports.
- Compact, lightweight electronic unit only 6.9 lbs.
- Intuitive user interface with touch screen.
- Calibration data stored for two master meters
- Failure detection for RTD, analog and flow meter inputs.
- Calibration services available. Hoffer's flow meter calibration lab is A2LA accredited in accordance with ISO/IEC 17025 and ANSI/NCSL Z54-1.

The CP20 Cryogenic Prover is an accurate, easy to use field calibration system for cryogenic flow metering applications. The system includes a transfer standard master flow meter and metering run mounted on a mobile cart for easy transport. An integrally mounted control valve allows the operator to adjust the flowrates and pressures to those typically seen in service.

The portable electronic unit is housed in a rugged IP67 rated enclosure and includes military style connectors and a compact thermal printer. The electronic unit is engineered using the latest technology to provide the most comprehensive features and has been designed in accordance with the cryogenic metering section of NIST HANDBOOK 44 and OIML R-81. The CP20 uses the NIST traceable

master flow meter to compare measurements from the unit under test (UUT) in order to generate a series of K-Factors over the specified range of the flow meter. Data collected during the calibration runs is used to calculate the variables used for reports that may be displayed and printed. A System Check utility provides a way to verify the overall accuracy of the UUT system including any temperature probes and pressure sensors.

Hoffer's [flow meter calibration lab](#) is A2LA accredited in accordance with ISO/IEC 17025 and ANSI/NCSL Z540-1. In addition, Hoffer offers the "only" approved ISO/IEC 17025 cryogenic field calibrations available in the industry.

CP20 Home Screen



Various settings and process parameters are displayed here as well as warning messages for any system faults. Two buttons on the touch screen provide direct access to the UUT Meter Cal and System Check features.



CP20 Portable Case



Optional Prover Cart



System Check Screen

SYSTEM CHECK			
Run	Gal/min	Gallons	UUT Total
1	85.4	171.47	169.88
2	85.6	171.96	168.50
Old K-Factor:		135.000	
New K-Factor:		133.011	
% Difference:		1.47%	
			START

Press PRINT to print report

The System Check is used to prove the accuracy of the UUT measuring system. The test is executed at a single flow rate and is repeated 2-10 times based on the Repeat Points setting. At the end of each 2 minute test run, the user enters the total displayed on the UUT. At the end of all test runs, the old Average K-Factor is entered and the Prover calculates a new Average K-Factor.

UUT Meter Cal Screens

UUT METER CALIBRATION				
CAL POINT 1				
Run	Gal/min	Gallons	Freq	K-Factor
1	24.8	45.43	91.0	220.26
2	25.3	45.50	93.0	220.27
Avg:	25.0	45.47	91.9	220.26
Repeatability:	0.00%		NEXT	

Press NEXT to continue CLEAR to repeat

CALIBRATION RESULTS				
Point	Gal/min	Freq	K-Factor	
1	25.33	92.97	220.27	Average K: 220.43
2	49.25	181.0	220.45	
3	74.15	272.7	220.61	Linearity: 0.35%
4	99.16	364.9	220.81	
5	125.1	458.9	220.03	

Press PRINT or select Cal Point to repeat

The UUT Meter Cal is used to generate a table of frequencies and k-factors to be entered into the UUT electronics. The calibration consists of either 5 or 10 calibration points spread over the flow range specified for the selected master meter. Each point is repeated 2-10 times based on the value of the Repeat Points setting. Each calibration run is performed using a sample of 10,000 pulses from the UUT flow meter.

Meter Run Specifications

Calibration Traceability:	All systems are provided with a water calibration at no extra charge. Traceability through Hoffer's Cryogenic Field Standards or directly from NIST are available at competitive pricing.
Meter Run:	Includes upstream and downstream meter runs and pressure and temperature taps. Standard sizes are 1-1/2" and 2". Stainless steel construction; standard. End fittings per user specification.
Standard Flow Ranges:	1-1/2" 8 to 130 GPM 2" 15 to 225 GPM
Service Fluid:	LIN/LOX/LAR, CO2, LN20 and LNG. Consult factory for others.
Flowmeter Compatibility:	Compatible with magnetic pickup coils.
Pressure Rating:	300 PSI
Oxygen Compatibility:	Cleaning for oxygen service is provided at no charge.
Overrange Compatibility:	Gas spinning for 6 months at 300% of liquid design velocity without damage.
Temperature Probe:	Two wire RTD, 1000 ohm at 0°C, 0.003902 ohm/degree C.
Pressure Transmitter:	4-20 mA (Optional)

Prover Electronic Unit Specifications

Environmental:	Operating Temperature: -10°C to 50°C Storage Temperature: -30°C to 70°C Relative Humidity: 0-95% Non-condensing
Physical:	Dimensions: 13.6"L x 10.72"W x 6.28"H Weight: 6.9 lbs.
Enclosure:	Waterproof, crush resistant portable case 2-way locking latch system IP67 rated MIL-STD 810F 512.4 certified
Display:	4.3" color LCD with touch screen
Keypad:	3 rugged, sealed pushbuttons for CLEAR, PRINT and MODE functions Numeric keypad for data entry via touch screen
Power Supply:	Switched, fused IEC 320-C14 power receptacle with EMI, RFI filtering
Voltage:	100-240 Volts VAC
Current:	3A
Battery:	3V lithium coin cell for real time clock 2-4 years typical battery life
Flow Meter Inputs:	Frequency range: 0.2 to 5000 Hz Amplitude: 15mV RMS to 50V RMS Impedance: 10 kW Linearization: 10-point flow meter linearization Pickup Coil Diagnostics: Coil Short/Open Detection
RTD Temperature Input:	RTD type: 1000Ω platinum probe, 2-wire Resolution: 12-bit Accuracy: 0.025% Diagnostics: Probe Short/Open Detection
Pressure Input:	Type: 4-20mA Resolution: 12-bit Accuracy: 0.025% Diagnostics: Sensor Fail Detection
Printer:	Integrated compact thermal printer 1.417" (36mm) diameter thermal paper roll
Units of Measure:	Rate and Total: gal, L, lb, kg, ft3, ft3 x 100, m3 Temperature: K, F, C Pressure: psia, psig, bar-g, bar-a

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