

## CERTIFICATE OF CONFORMANCE

CUSTOMER: R/V SIKULIAQ, SWEARD MARINE CENTER

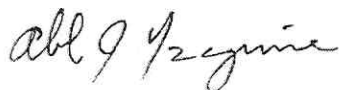
PURCHASE ORDER: PO537315

DIGIQUARTZ MODEL: MET4A

PART NUMBER: 1564-301

SERIAL NUMBER(S): 146581, 146582

*PAROSCIENTIFIC INCORPORATED certifies that the part(s) identified above complies with the requirements of the above order and has been manufactured in accordance with engineering drawings, material and process specifications, testing procedures, and applicable specification drawing of Paroscientific Incorporated. The Digiquartz model(s) identified has been calibrated and tested over the specified pressure and temperature range and meets the requirements of the applicable specification drawing. Primary pressure, temperature standards and transfer standards used at Paroscientific Incorporated for calibration and testing have traceability to the National Institute of Standards and Technology and to the SI through recognized national measurement institutes, ratiometric techniques or natural physical constraints and are regularly checked and calibrated according to Paroscientific QA Procedure Q8521, Inspection Test and Measurement Equipment, in accordance with the requirements of ISO 9001:2015.*



AUTHORIZED SIGNATURE

Abel J Yzaguirre, Quality Assurance Manager

8/8/19

DATE



**Technology**

**Precision Pressure Instrumentation**

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CERTIFICATION OF TRACEABILITY  
TO  
The SI and  
NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

*Primary pressure and temperature standards used in the calibration and testing of Paroscientific DigiQuartz Models have traceability to the National Institute of Standards and Technology and to the SI through the following documentation.*

Bell and Howell Primary Pressure Standard:

Bell and Howell, Model 6-201-0001, Piston/Cylinder P2-919/C2-1523 via DH Calibration Report No. 15441, 16653 and 1500190591 traceable to NIST. Weight Set 1, P/N 6-002-0002, via DH Calibration Report No. 14481, 16654, 1284473284 and 1500190311 traceable to NIST. Weight Set 2, P/N 6-002-0002, via DH Calibration Report No. 31227, 39628, 68390, 1317389777, 1500156263, 1500195122 and 1500238176-1 traceable to NIST. Piston/Cylinder P2-652/C2-1378 via DH Instruments Calibration Report No. 31226, 39627, 68389, 1317739617, 1500156259, 1500195119 and 1500238176 traceable to NIST. Piston/Cylinder P1-231/C1-384 via DH Instruments Calibration Report No. 13170 and 1284475131 traceable to NIST. Piston/Cylinder P/N 6-201, No. P1-949/C1-922, via DH Instruments Calibration Report 17176 and 17445, traceable to NIST.

DH Primary Pressure Standard, Oil Operated Gauge:

DH Instruments, Model 5306, Piston/Cylinder S/N 3375, via DH Calibration Certificate Report No. 32354, 45306, 66563, 1305698573, 1500163455 and 1500217726 traceable to NIST and to the SI. Piston/Cylinder 3511 via DH Calibration Report No. 32353, 45307, 66562, 1305625084, 1500163363 and 1500217811 traceable to NIST and to the SI. Mass Set S/N 2032 via DH Calibration Report No. 45305, 45308, 1305538925, 1305530461, 150016339, 1500163394 and 1500217685 traceable to NIST and to the SI.

DH Primary Pressure Standard, Pneumatic Operated Gauge:

DH Instruments, Model 5203, Piston/Cylinder S/N 4845, via DH Calibration Certificate No. 38275, 1300177141, 1500162809 and 1500217494 traceable to NIST and to the SI. Mass Set S/N 2032/3293 via DH Calibration Certificate No. 45305, 1300200369, 1500162832 and 1500217766 traceable to NIST and to the SI.

DH Primary Pressure Standard, Pneumatic Operated Gauge:

DH instruments, Model PG7601 via DH Instruments Calibration No. 41492, 69127 and 1500172365 traceable to NIST. Piston/Cylinder S/N 305 via DH Instruments Calibration No. 32161, 41490, 69125 and 1500172367 traceable to NIST. DH Instruments 35 kg Mass Set No. 2052 and Bell No. 261A via DH Instruments Calibration Report No. 32164, 41491, 41493, 69126, 69124 and 1500172362 and 1500172363 traceable to NIST.

Hygroclip S3 MET4/4A Part number 1560-XXX and 1561-XXX:

Humidity and Temperature calibrations are traceable to NIST through Rotronic Instrument Corporation; 160 E. Main Street, Huntington, NY 11743.

Hygroclip HC2-S3 MET4/4A Part number 1563-XXX and 1564-XXX Swiss Calibration Service (SCS)

Humidity and Temperature calibrations are traceable to SCS through Rotronic AG Grindelstrasse 6 8303 Bassersdorf Phone: 044-838-1111 E-mail: info@rotronic.ch



**Technology**

**Precision Pressure Instrumentation**

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## CERTIFICATE OF CALIBRATION

DIGIQUARTZ MODEL: MET4A

SERIAL NUMBER(S): 146581, 146582

The Paroscientific Digi Quartz Model (s) identified above has been calibrated and tested with one or more of the following primary pressure standards. All have traceability to the National Institute of Standards and Technology and to the SI.

### Bell and Howell Primary Pressure Standard

Pneumatic Absolute or Gauge Dead Weight Tester Part Number: 6-201-0001, S/N 4034 and S/N 1014

- |                                     |  |                          |  |
|-------------------------------------|--|--------------------------|--|
| <input type="checkbox"/>            | Piston/Cylinder: 6-001-0002, P2-919/C2-1523,<br>Weight Set 1: 6-002-0002<br>Range: 1.5 to 50 psi [10 to 345 kPa]<br>Accuracy: 0.010 percent of reading | <input type="checkbox"/> | Piston/Cylinder: 6-001-0001, P1-949/C1-922, Weight Set<br>2: 6-002-0002<br>Range: 0.3 to 5 psi [2 to 34 kPa]<br>Accuracy: 0.015 percent of reading |
| <input checked="" type="checkbox"/> | Piston/Cylinder: 6-001-0002, P2-652/C2-1378,<br>Weight Set 2: 6-002-0002<br>Range: 1.5 to 50 psi [10 to 345 kPa]<br>Accuracy: 0.010 percent of reading |                          |  |

### DH Primary Pressure Standard

Pneumatic Absolute or Gauge Dead Weight Tester Part Number: PG7601 S/N 161

- Piston/Cylinder: S/N 305, Mass Set: S/N 2052  
Range: 0.7 to 50 psi [5 to 345 kPa] absolute mode, 0.29 to 50 psi [2 to 345 kPa] gauge mode  
Accuracy: 0.002 percent of reading

### DH Primary Pressure Standard

Pneumatic Gauge Dead Weight Tester, Model 5203, S/N 5557

- Piston/Cylinder: S/N 4845, Mass Sets: S/N 2032, S/N 3293  
Range: 20 to 1,600 psi [0.14 to 11 MPa]  
Accuracy: 0.005 percent of reading

### DH Primary Pressure Standard

Oil Operated Gauge Dead Weight Tester, Model 5306, S/N 3505

- Piston/Cylinder: S/N 3375, Mass Set: S/N 2032  
Range: 40 to 20,000 psi [0.3 to 138 MPa]  
Accuracy: 0.01 percent of reading above 200 psi [1.4 MPa]  
or 0.02 psi [0.14 kPa] at lower pressure
- Piston/Cylinder: S/N 3511, Mass Set: S/N 2032  
Range: 145 to 72,500 psi [1 to 500 MPa]  
Accuracy: 0.02 percent of reading above 725 psi [5 MPa]  
or 0.145 psi [1 kPa] at lower pressure

Tested By:  DATE: 8/8/19



**Paroscientific, Inc.**  
**Pressure Instrument Configuration**

**SN: 146581** Part Number: 1564-301 Model: MET4A Port:  
 Calibration Date: 08-Aug-19 Report No: 22626 Technician: RM  
 Pressure Range: 500 to 1100 hPa Temperature Range: -40 to 60 deg C

Customer: R/V Sikuliaq, Seward Marine Center Report Date: 08-Aug-19  
 Address : 201 Railway AVE PO Box 730 Sales Order: 36569  
 Seward, AK 99664 USA S/R Number :

Configuration		Calibration Coefficients	
BL: 0	PT: N	U0: 5.806784	μsec
BR: 9600	QD: -	Y1: -4041.64	deg C / μsec
DD: -	QO: -	Y2: -9129.143	deg C / μsec <sup>2</sup>
DL: 0	SL: 0	Y3: 0	deg C / μsec <sup>3</sup>
DM: 0	SN: 146581	C1: 96.48096	psi
DO: 0	ST: 10	C2: 4.277946	psi / μsec
DP: 6	SU: 0	C3: -106.6632	psi / μsec <sup>2</sup>
ID: 01	TI: 666	D1: 0.0340303	
IM: -	TR: 952	D2: 0.0000000	
LL: -	TU: 0	T1: 27.79406	μsec
LH: -	UF: 1.000000	T2: 0.612522	μsec / μsec
MC: Y	UL:	T3: 20.86147	μsec / μsec <sup>2</sup>
MD: 0	UM: user	T4: 0	μsec / μsec <sup>3</sup>
MN: MET4A	UN: 3	T5: 0.000	μsec / μsec <sup>4</sup>
OP: -	US: 0	TC: 0.6781689	
PF: 1.103161	VR: M3.10	PA: 0.0000000	
PI: 666	ZI: 0	PM: 1.0000000	
PL: 19.00000	ZS: 0		
PO: 0	ZL: 0		
PR: 238	ZV: .000000		
PS: 0			

Met4/Met4A Coefficients		
GD: 0	JC: .0000000	LN: 0
GT: 0	JD: .0	LO: 00:00:00
PC: -	JE: 0	LT: .0000000
HY: 2	JF: .0	LW: 0
H1: 20268722	JG: 0	PX: 3
S1: 1.000000	JJ: 0	
S2: 1.000000	JK: 0	
Z1: 0	JS: .0	
Z2: 0	JU: 0	

Paroscientific, Inc.  
 4500 148th Ave. N.E. Redmond, WA 98052  
 Phone: (425)883-8700 Fax: (425)867-5407  
 Web: <http://www.paroscientific.com>  
 Email: [support@paroscientific.com](mailto:support@paroscientific.com)

Prepared by



Technology

**Paroscientific, Inc.**  
**Pressure Instrument Configuration**

**SN: 146582** Part Number: 1564-301 Model: MET4A Port:  
 Calibration Date: 08-Aug-19 Report No: 22625 Technician: RM  
 Pressure Range: 500 to 1100 hPa Temperature Range: -40 to 60 deg C

Customer: R/V Sikuliaq, Seward Marine Center Report Date: 08-Aug-19  
 Address : 201 Railway AVE PO Box 730 Sales Order: 36569  
 Seward, AK 99664 USA S/R Number :

Configuration		Calibration Coefficients	
BL: 0	PT: N	U0: 5.810645	$\mu\text{sec}$
BR: 9600	QD: -	Y1: -3898.677	deg C / $\mu\text{sec}$
DD: -	QO: -	Y2: -8714.596	deg C / $\mu\text{sec}^2$
DL: 0	SL: 0	Y3: 0	deg C / $\mu\text{sec}^3$
DM: 0	SN: 146582	C1: 96.26717	psi
DO: 0	ST: 10	C2: 4.313641	psi / $\mu\text{sec}$
DP: 6	SU: 0	C3: -106.196	psi / $\mu\text{sec}^2$
ID: 01	TI: 666	D1: 0.0315788	
IM: -	TR: 952	D2: 0.0000000	
LL: -	TU: 0	T1: 27.74710	$\mu\text{sec}$
LH: -	UF: 1.000000	T2: 0.610670	$\mu\text{sec} / \mu\text{sec}$
MC: Y	UL:	T3: 18.21239	$\mu\text{sec} / \mu\text{sec}^2$
MD: 0	UM: user	T4: 0	$\mu\text{sec} / \mu\text{sec}^3$
MN: MET4A	UN: 3	T5: 0.000	$\mu\text{sec} / \mu\text{sec}^4$
OP: -	US: 0	TC: 0.6781684	
PF: 1.103161	VR: M3.10	PA: 0.0000000	
PI: 666	ZI: 0	PM: 1.0000000	
PL: 19.00000	ZS: 0		
PO: 0	ZL: 0		
PR: 238	ZV: .000000		
PS: 0			

Met4/Met4A Coefficients		
GD: 0	JC: .0000000	LN: 0
GT: 0	JD: .0	LO: 00:00:00
PC: -	JE: 0	LT: .0000000
HY: 2	JF: .0	LW: 0
H1: 20268816	JG: 0	PX: 3
S1: 1.000000	JJ: 0	
S2: 1.000000	JK: 0	
Z1: 0	JS: .0	
Z2: 0	JU: 0	

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 Email: [support@paroscientific.com](mailto:support@paroscientific.com)

Prepared by



Technology



# Free Zero Adjustment Certificate

This certificate entitles the bearer to one free inspection, zero adjustment, and a new certificate of NIST traceability for all Digiquartz® absolute transducers, transmitters, portable standards, broadband meteorological measurement systems and depth sensors, with full scale pressure ranges of 500 psia or less within the first two years of shipment.

Paroscientific reserves the right to repair or replace any unit at our option. All standard 5-year limited warranty provisions apply. The warranty does not apply to abused units that have been subjected to overpressure, excessive shock, or other out-of-specification conditions.

This certificate is valid for:

Serial Number: 146581

Date Printed: 8/8/2019

Part Number: 1564-301

Sales Order Number: 36569

Model Number: MET4A

Expiration Date: August 2021

## Instructions

1. Notify Paroscientific Service Department at (425) 883-8700 or [support@paroscientific.com](mailto:support@paroscientific.com) to indicate that you would like to return your instrument for your "Free Zero Adjustment".
2. Please package the unit carefully to avoid damage during shipment. Include a contact name, phone and fax numbers, and complete return address. This certificate must accompany the instrument in order to exercise your free service.
3. You are responsible for any freight and/or duty charges when returning your instrument. Our goal is to provide a 7 day turn-around after receipt of your instrument. Paroscientific will pay return shipping costs.



**Paroscientific, Inc**

**Digiquartz® Pressure Instrumentation**

4500 148th Ave. N.E. Redmond, WA 98052

Tel: (425) 883-8700 Fax: (425) 867-5407

Website: [www.paroscientific.com](http://www.paroscientific.com)

Email: [support@paroscientific.com](mailto:support@paroscientific.com)

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# Free Zero Adjustment Certificate

This certificate entitles the bearer to one free inspection, zero adjustment, and a new certificate of NIST traceability for all Digiquartz® absolute transducers, transmitters, portable standards, broadband meteorological measurement systems and depth sensors, with full scale pressure ranges of 500 psia or less within the first two years of shipment.

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This certificate is valid for:

Serial Number: 146582

Date Printed: 8/8/2019

Part Number: 1564-301

Sales Order Number: 36569

Model Number: MET4A

Expiration Date: August 2021

## Instructions

1. Notify Paroscientific Service Department at (425) 883-8700 or [support@paroscientific.com](mailto:support@paroscientific.com) to indicate that you would like to return your instrument for your "Free Zero Adjustment".
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**Digiquartz® Pressure Instrumentation**

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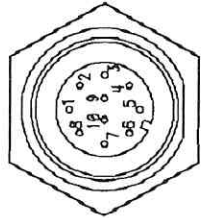
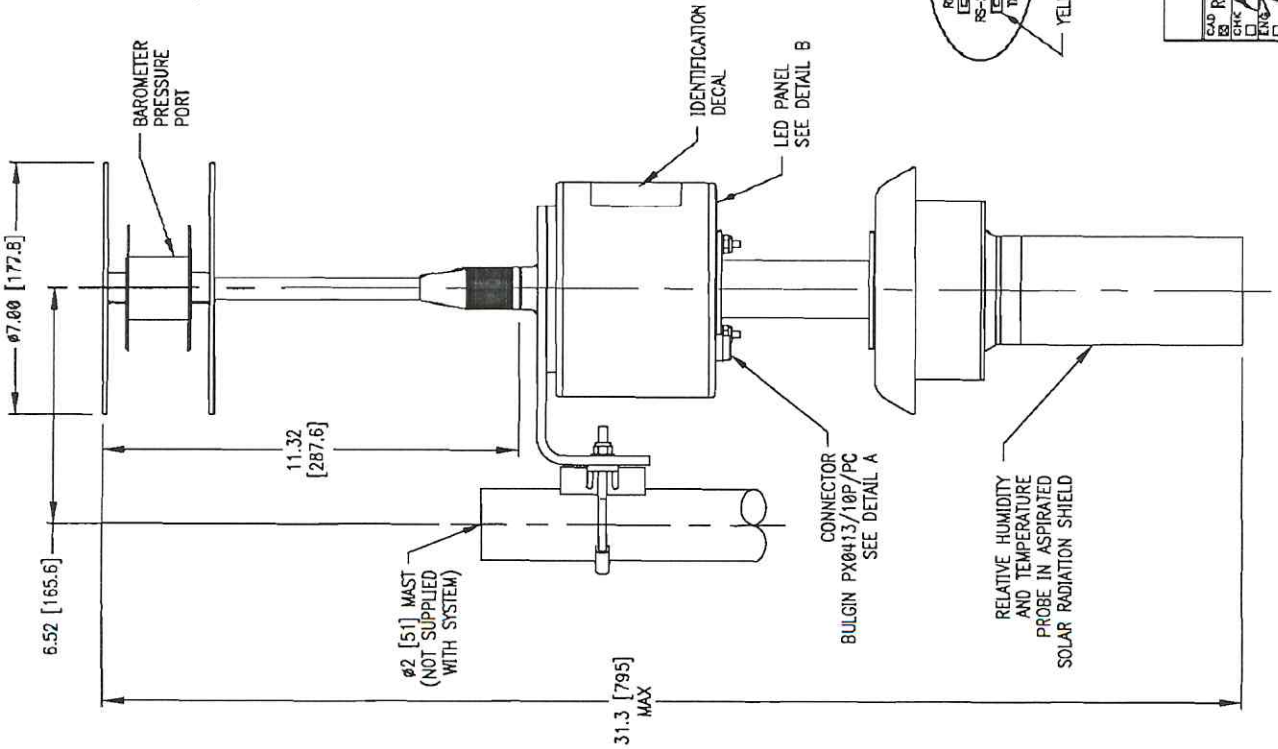
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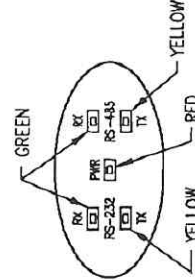
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**SPECIFICATION CONTROL DRAWING**



**DETAIL A**  
CONNECTOR PIN-OUT

PIN	SIGNAL
1	RS-485 TX+
2	RS-485 TX-
3	RS-485 RX+
4	RS-485 RX-
5	RS-232 TX
6	RS-232 RX
7	POWER
8	CHASSIS GROUND
9	GROUND
10	GROUND



**DETAIL B**  
LED PANEL

**STANDARD PRODUCT**

MODEL NO.	PART NO.	FEATURES
METHA	1564-301	ASPIRATED STANDARD CONFIGURATION

**PERFORMANCE:**

**PRESSURE:**  
 RANGE ..... 500 hPa TO 1100 hPa (7 PSIA TO 16 PSIA)  
 MAXIMUM PRESSURE ..... 1240 hPa (18 PSIA)  
 ACCURACY, INCLUDING PRESSURE HYSTERESIS, REPEATABILITY,  
 LINEARITY AND TEMPERATURE CONFORMANCE ..... BETTER THAN ±0.08 hPa  
 STABILITY ..... BETTER THAN 0.1 hPa PER YEAR  
 RESOLUTION ..... BETTER THAN 0.001 hPa

**TEMPERATURE SENSOR:**  
 RANGE ..... -40 °C TO +60 °C (-40 °F TO +140 °F)  
 ACCURACY ..... BETTER THAN ±0.1 °C (±0.2 °F) AT 23 °C (73 °F)  
 RESOLUTION: ..... BETTER THAN 0.01 °C (0.02 °F)

**RELATIVE HUMIDITY SENSOR:**  
 RANGE ..... 0 TO 100%  
 ACCURACY ..... BETTER THAN ±0.8% RH AT 23 °C (73 °F)  
 SATURATION RECOVERY TIME: ..... ≤ 20 SECONDS

**CHARACTERISTICS:**

OPERATING TEMPERATURE RANGE ..... -40 °C TO +60 °C (-40 °F TO +140 °F)  
 OPERATES FROM +11 VDC MIN TO +14 VDC MAX.  
 OPERATING SUPPLY CURRENT:  

RESOLUTION	MAXIMUM	TYPICAL (22°C/12VDC)
STANDARD	260 mA	210 mA
NANO	300 mA	240 mA

ASPIRATION FLOW RATE: ..... 3 METERS/SEC MINIMUM  
 WEIGHT ..... 9.4 LB (4.26 KG) MAX

**COMMUNICATIONS:**

RS-232/RS-485 COMMUNICATIONS PORTS MEETS EIA/TIA-232/485 SPECIFICATIONS.

**NOTES:**

1. OPTIONS:  
 A. MODEL 715 DISPLAY. SEE SCD 7295-001.  
 B. CABLE AND POWER ADAPTER KIT. SEE SCD 7628-003.  
 C. RH AND TEMPERATURE PROBE REPLACEMENT KIT. SEE SCD 7628-015.  
 D. FAN REPLACEMENT KIT. SEE SCD 7628-004.
2. PRODUCT IS CE CERTIFIED.
3. OPERATIONS MANUAL 8088-001 CAN BE DOWNLOADED FROM PAROSCIENTIFIC WEBSITE.

NAME	DATE	APPROVALS	DATE	NAME	DATE	NAME	DATE
Raul Colado	7/24/15	[Signature]	7/24/15	[Signature]	7/24/15	[Signature]	7/24/15
[Signature]	8/21/15	[Signature]	8/21/15	[Signature]	8/21/15	[Signature]	8/21/15
[Signature]	7/24/15	[Signature]	7/24/15	[Signature]	7/24/15	[Signature]	7/24/15

EO NO/EFFECTIVE DATE: 8109, 8121

DESCRIPTION	SIZE	SCALE	SHEET	OF
DIGIQUARTZ® MET44 ASPIRATED METEOROLOGICAL MEASUREMENT SYSTEM	A	NONE	1	1
DOCUMENT NUMBER	7628-012			
REV	C			



**SPECIFICATION CONTROL DRAWING**

**STANDARD PRODUCT**

MODEL NO.	PART NO.	FEATURES
METHA	1564-301	ASPIRATED STANDARD CONFIGURATION

**PERFORMANCE:**

**PRESSURE:**  
 RANGE ..... 500 hPa TO 1100 hPa (7 PSIA TO 16 PSIA)  
 MAXIMUM PRESSURE ..... 1240 hPa (18 PSIA)  
 ACCURACY, INCLUDING PRESSURE HYSTERESIS, REPEATABILITY, LINEARITY AND TEMPERATURE CONFORMANCE ..... BETTER THAN ±0.08 hPa  
 STABILITY ..... BETTER THAN 0.1 hPa PER YEAR  
 RESOLUTION ..... BETTER THAN 0.001 hPa

**TEMPERATURE SENSOR:**

RANGE ..... -40 °C TO +60 °C (-40 °F TO +140 °F)  
 ACCURACY ..... BETTER THAN ±0.1 °C (±0.2 °F) AT 23 °C (73 °F)  
 RESOLUTION: ..... BETTER THAN 0.01 °C (0.02 °F)

**RELATIVE HUMIDITY SENSOR:**

RANGE ..... 0 TO 100%  
 ACCURACY ..... BETTER THAN ±0.8% RH AT 23 °C (73 °F)  
 SATURATION RECOVERY TIME: ..... ≤ 20 SECONDS

**CHARACTERISTICS:**

OPERATING TEMPERATURE RANGE ..... -40 °C TO +60 °C (-40 °F TO +140 °F)  
 OPERATES FROM +11 VDC MIN TO +14 VDC MAX.

**OPERATING SUPPLY CURRENT:**

RESOLUTION	MAXIMUM	TYPICAL (22°C/12VDC)
STANDARD	260 mA	210 mA
MANO	300 mA	240 mA

ASPIRATION FLOW RATE: ..... 3 METERS/SEC MINIMUM

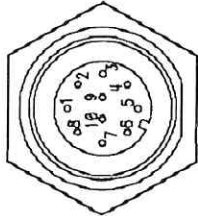
WEIGHT ..... 9.4 LB (4.26 KG) MAX

**COMMUNICATIONS:**

RS-232/RS-485 COMMUNICATIONS PORTS MEETS EIA/TIA-232/485 SPECIFICATIONS.

**NOTES:**

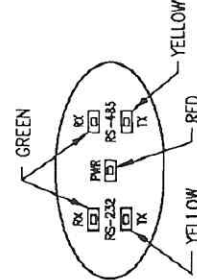
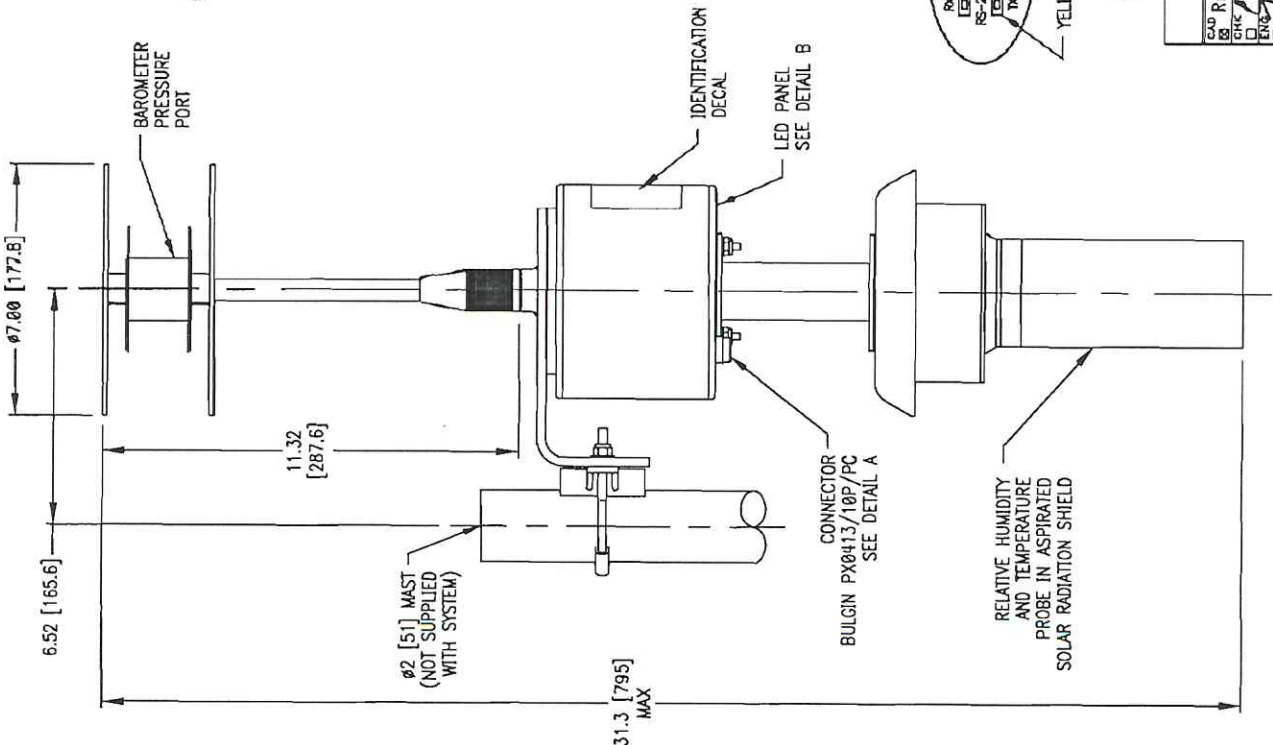
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 B. CABLE AND POWER ADAPTER KIT. SEE SCD 7628-003.  
 C. RH AND TEMPERATURE PROBE REPLACEMENT KIT. SEE SCD 7628-015.  
 D. FAN REPLACEMENT KIT. SEE SCD 7628-004.
2. PRODUCT IS CE CERTIFIED.
3. OPERATIONS MANUAL 8008-001 CAN BE DOWNLOADED FROM PAROSCIENTIFIC WEBSITE.



**DETAIL A**

**CONNECTOR PIN-OUT**

PIN	SIGNAL
1	RS-485 TX+
2	RS-485 TX-
3	RS-485 RX+
4	RS-485 RX-
5	RS-232 TX
6	RS-232 RX
7	POWER
8	CHASSIS GROUND
9	GROUND
10	GROUND



**DETAIL B**  
LED PANEL

NAME	CURRENT	APPROVALS	DATE
Raul Collado	7/24/15	[Signature]	7/24/15
[Signature]	7/24/15	[Signature]	7/24/15
[Signature]	7/24/15	[Signature]	7/24/15

Paroscientific, Inc. 4500 145th Avenue NE Redmond, WA 98052 Phone: 425.863.9700 Website: www.paroscientific.com Fax: 425.867.5407		DESCRIPTION METHA ASPIRATED METEOROLOGICAL MEASUREMENT SYSTEM	
ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED DIMENSIONS IN BRACKETS ARE IN MILLIMETERS DIMENSIONS ARE FOR REFERENCE ONLY	SCALE NONE	CASE DOCUMENT NUMBER A 54-535 7628-012	REV C
ACAD FILENAME: 7628-012		SHEET 1 OF 1	© REGISTERED TRADEMARK OF PAROSCIENTIFIC, INC.