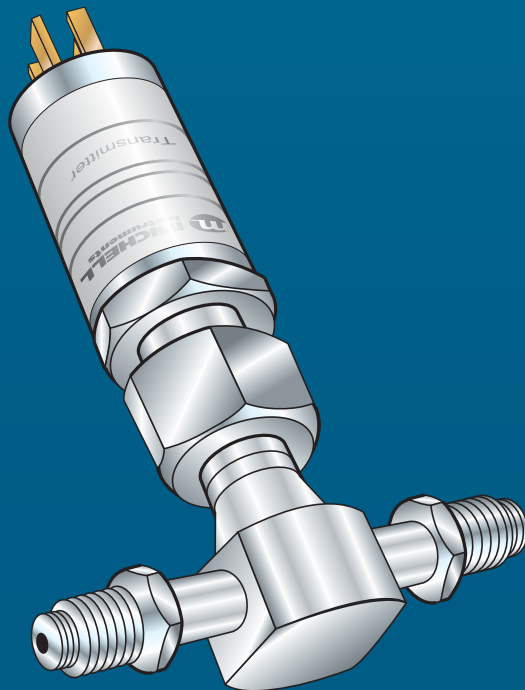




Pura

Hazardous Area Transmitter 2-wire

User's Manual



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Pura Hazardous Area Transmitter

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Safety

The manufacturer has designed this equipment to be safe when operated using the procedures detailed in this manual. The user must not use this equipment for any other purpose than that stated. Do not apply values greater than the maximum value stated.

This manual contains operating and safety instructions, which must be followed to ensure the safe operation and to maintain the equipment in a safe condition. The safety instructions are either warnings or cautions issued to protect the user and the equipment from injury or damage. Use competent personnel using good engineering practice for all procedures in this Manual.

Electrical Safety

The instrument is designed to be completely safe when used with options and accessories supplied by the manufacturer for use with the instrument.

Pressure Safety

DO NOT permit pressures greater than the safe working pressure to be applied to the instrument. The specified safe working pressure is 24 MPa (240 barg / 3480 psig).

Toxic Materials

The use of hazardous materials in the construction of this instrument has been minimized. During normal operation it is not possible for the user to come into contact with any hazardous substance which might be employed in the construction of the instrument. Care should, however, be exercised during maintenance and the disposal of certain parts.

Repair and Maintenance

The instrument must be maintained either by the manufacturer or an accredited service agent. Refer to Appendix D for details of Michell Instruments' worldwide offices' contact information.

Calibration

The recommended calibration interval for this instrument is 12 months unless it is to be used in a mission-critical application or in a dirty or contaminated environment in which case the calibration interval should be reduced accordingly. The instrument should be returned to the manufacturer, Michell Instruments Ltd., or one of their accredited service agents for re-calibration.

Safety Conformity

This product meets the essential protection requirements of the relevant EU directives. Further details of applied standards may be found in the product specification.

EU Declaration of Conformity

NOTE: The PURA I.S. product incorporates the ATEX/IECEX/CSA/FM approved Easidew I.S. product and it is the Hazardous Area Certification for the Easidew I.S. that provides the necessary approvals for the PURA I.S.

EU Declaration of Conformity

Manufacturer: **Michell Instruments Limited**
48 Lancaster Way Business Park
Ely, Cambridgeshire
CB6 3NW. UK.



On behalf of the above named company, I declare that, on the date that the equipment accompanied by this declaration is placed on the market, the equipment conforms with all technical and regulatory requirements of the directives.

PURA Premium, PURA OEM and PURA Transmitter

and complies with all the essential requirements of the EU directives listed below.

2004/108/EC EMC Directive
and (effective from 20th April 2016)

2014/30/EU EMC Directive

(effective from 22nd July 2017)

2011/65/EU Restriction of Hazardous Substances Directive (RoHS2)

RoHS2 EU Directive 2011/65/EU (Article 3, [24]) states, "*industrial monitoring and control instruments means monitoring and control instruments designed exclusively for industrial or professional use*". (mandatory compliance effective date 22nd July 2017).

and has been designed to be in conformance with the relevant sections of the following standards or other normative documents.

EN61326-1:1997 Electrical equipment for measurement, control and laboratory use – EMC requirements –Class B (emissions) and Industrial Locations (immunity).

EN61010-1:2010 Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements

Andrew M.V. Stokes, Technical Director

April 2016

EUD PURA Issue 02

Abbreviations

The following abbreviations are used in this Manual:

AC	alternating current
atm	pressure unit (atmosphere)
barg	pressure unit (=100 kP or 0.987 atm)
°C	degrees Celsius
°F	degrees Fahrenheit
DC	direct current
ft	foot (feet)
g	gram(s)
Hz	Hertz
"	inch(es)
kg	kilogram(s)
lb	pound
NI/min	normal liters per minute
m	meter(s)
mA	milliampere
max	maximum
min	minute(s)
mm	millimeter(s)
MPa	megapascal (Pascals x10 ⁶)
m/sec	meters per second
Nm	Newton meter
ppm _v	parts per million (by volume)
RS232	serial data transmission standard
Rx	receive
scfh	standard cubic feet per hour
scfs	standard cubic feet per second
sec	second(s)
temp	temperature
Tx	transmit
V	Volts
Ω	Ohms

Warnings

The following general warnings listed below are applicable to this instrument. They are repeated in the text in the appropriate locations.



Where this hazard warning symbol appears in the following sections it is used to indicate areas where potentially hazardous operations need to be carried out.

Recycling Policy



Michell Instruments is concerned with the protection of the environment. It is our commitment to reduce and eliminate from our operations, wherever possible, the use of substances which may be harmful to the environment. Similarly, we are increasingly using recyclable and/or recycled material in our business and products wherever it is practical to do so.

The product that you have purchased may contain recyclable and/or recycled parts and we will be happy to provide you with information on these components if required.

WEEE And RoHS Compliance

The Waste Electronic and Electrical Equipment (WEEE) Directive, and the Restriction of Hazardous Substances (RoHS) Directive place rules upon European manufacturers of electrical and electronic equipment. The directive's aim is to reduce the impact that electronic devices have on the environment.

Michell products are currently exempt from the RoHS directive, however all future products will be developed entirely using compliant materials. Furthermore, Michell is taking active steps to remove non-compliant materials and components from existing products wherever possible.

Michell is in full compliance with the WEEE Directive (Registration No. WEE/JB0235YW). Customers may be required to return certain instruments for treatment at the end of their working life.

June 2010

Calibration Facilities

Michell Instruments' calibration facilities are among the most sophisticated in the world and have been recognized for their excellence.

Traceability to the National Physical Laboratory (NPL) UK is achieved through our UKAS Accreditation (Number 0179). This covers dew point over the range -90 to +90°C (-130 to +194°F) and also Relative Humidity.

Dew-point calibrations are also traceable to the National Institute for Standards & Technology (NIST) USA over the range -75 to +20°C (-103 to +68°F).

NOTE: Standard traceable calibration certificates for instruments and sensors are not issued under our UKAS accreditation. UKAS certificates are usually to special order and are clearly identified.

Manufacturing Quality

Michell Instruments is registered with the British Standards Institute for Quality Assurance to:

BS EN ISO 9001: 2008

Rigorous procedures are performed at every stage of production to ensure that the materials of construction, manufacturing, calibration and final test procedures meet the requirements laid down by our BSI approved Quality System.

Please contact Michell Instruments if the product does not arrive in perfect working order.

Warranty

Unless otherwise agreed, the Supplier warrants that, as from the date of delivery for a period of 12 months, the goods and all their component parts, where applicable, are free from any defects in design, workmanship, construction or materials.

The Supplier warrants that the services undertaken shall be performed using reasonable skill and care, and of a quality conforming to generally accepted industry standards and practices.

Except as expressly stated all warranties, whether express or implied, by operation of law or otherwise, are hereby excluded in relation to the goods and services to be provided by the Supplier.

All warranty services are provided on a return to base basis. Any transportation costs for the return of a warranty claim shall reside with the Customer.

Return Policy

If a Michell Instruments' product malfunctions within the warranty period, the following procedure must be completed:

1. Notify a Michell Instruments' representative, giving full details of the problem, the model variant and the serial number of the product.
2. If the nature of the problem indicates the need for factory service then the instrument should be returned to Michell Instruments, carriage prepaid, preferably in the original packaging, **with a full description of the fault and the customer contact information.**
3. Upon receipt, Michell Instruments will evaluate the product to determine the cause of the malfunction. Then, one of the following courses of action will be taken:
 - If the fault is covered under the terms of the warranty, the instrument will be repaired at no cost to the owner and returned.
 - If Michell Instruments determines that the fault is not covered under the terms of the warranty, or if the warranty has expired, an estimate for the cost of the repairs, at standard rates, will be provided. Upon receipt of the owner's approval to proceed, the product will be repaired and returned.

1 INTRODUCTION

The Pura Series of transmitters has been manufactured, tested and calibrated to the highest available standards and should arrive in perfect working order, ready for installation into a gas measurement application. If there are any questions about the transmitter or how to install it, not detailed in this Manual, contact your local representative. Refer to Appendix D for details of Michell Instruments' worldwide offices' contact information.

The Pura is a continuous, on line instrument for the measurement of moisture content in air and other gases over an operating range of -120°C to -40°C dew point. The Pura operates as a 4-20 mA or digital transmitter providing an output to an external control or monitoring device, and is factory set over the range -120°C to -40°C dew point. However, the range can be adjusted using the Pura application software available as a free download via the website: www.michell.com.

2 DESCRIPTION

Their key features of the Pura Transmitter are:

- up to $\pm 1^{\circ}\text{C}$ dp accuracy
- 0.5°Cdp (0.9°Fdp) repeatability
- 2-wire connection - linear 4 –20 mA signal
- Operating pressure range - up to 24 MPa (240 barg / 3480 psig)
- Operating range - 120 to -40°C dew point
- Moisture content ppm_v
- Powered by any DC source from 12 to 28 V

3 PREPARATION FOR USE

On delivery, check that all the following standard components are present in the packing box:

Pura Transmitter	Pura OEM	Pura Premium
Calibration Certificate	Calibration Certificate	Calibration Certificate
Transmitter Connector	Leak Test Certificate	Leak Test Certificate
Connector Gasket	Transmitter Connector	Transmitter Connector
97306 User's Manual	Connector Gasket	Connector Gasket
	97306 User's Manual	97306 User's Manual

The recommended gas flow rate, when mounted in the system, is 1 to 10 NI/min (2.1 to 21.2 scfh) (5 NI/min (10.6 scfh) optimum).

4 SENSOR INSTALLATION

4.1 Installing the Sensor

The effective operation of the Pura I.S. Transmitter, in a flowing gas environment, relies on the sensor being installed directly into the gas stream or by having a fully representative gas sample directed over the sensor measurement surface. Where possible avoid installing the sensor in a "dead" or unswept volume.

Michell Instruments recommends the use of Swagelok® retained gasket assemblies, containing silver plated, stainless steel ¼" VCR gaskets, when connecting the Pura I.S. Transmitter into a gas line. The distance between the inlet and outlet gas connection ports is set at a pitch of 120mm.

- Install the sealing gasket onto the VCR connections on either the Pura I.S. Transmitter or the connecting gas lines. Ensure that the Pura I.S. Transmitter is offered into the gas line with reference to the gas flow direction and the inlet port as indicated on the Pura I.S. Transmitter body.
- Tighten the female nut firmly - finger tight.
- While holding the Pura I.S. Transmitter stationary with a spanner/wrench, tighten the gas line nut 1/8 (one eighth) of a turn using a second spanner.



CAUTION: Over-tightening the nuts can cause irrecoverable damage to the seals and seatings.

- Repeat this operation on the remaining gas connection port.

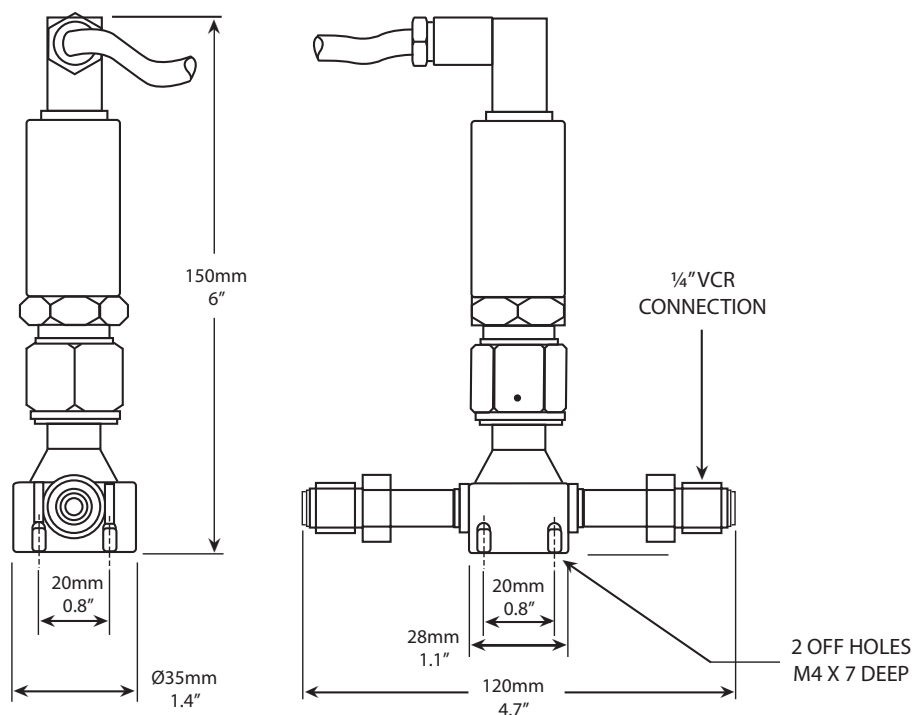


Figure 4.1 Pura Premium & Pura OEM Dimensional Drawings

4.2 Pura Transmitter (Sensor Only Version) Installation

The Pura Transmitter (Sensor only version) is supplied fitted with a protective guard. It is recommended that this guard be removed before installation, as, although clean, it is not manufactured to the same high level of surface finish as the sensor itself; its intended purpose is only to protect the measurement element of the sensor during handling.

Any use of the transmitter with the guard attached will not affect the sensor accuracy but may induce an extended measurement response and provide an opportunity for moisture entrapment points, creating potentially false measurement of the sample.

It is recommended that the guard remains fitted until the transmitter is completely ready to be installed into the point of measurement. Once removed, the guard should be retained and reinstalled as protection, should the transmitter be removed from its point of installation e.g. for re-calibration.



CAUTION: Care should be exercised when withdrawing the guard from the transmitter ensuring no contact is made with the sensor's measurement surface; doing so can affect the performance of the sensor.

Similarly, when inserting the sensor into the point of measurement, avoid contact with the sensor measurement surface.

The Pura transmitter installation interface is made by way of a 1/2" VCR sealing face on the body of the transmitter. Effective installation can only be completed by mating this sealing face with a similar sealing face and via the use of a metal gasket.

Michell Instruments recommend the use of Swagelok® retained gasket assemblies, containing silver plated, stainless steel 1/2" VCR gaskets, when connecting the Pura into a measurement point. Gaskets are available from Michell, part no. 20904.

Installation Instructions

- Install the sealing gasket onto the transmitter body of the Pura.
- Tighten the joining female nut firmly finger tight.
- Hold the Pura transmitter stationary with a spanner/wrench and tighten the gas line nut 1/8 (one eighth) of a turn using a second spanner/wrench.



CAUTION: Over tightening the nuts can cause irrecoverable damage to the seals and seatings.

Pura Transmitter

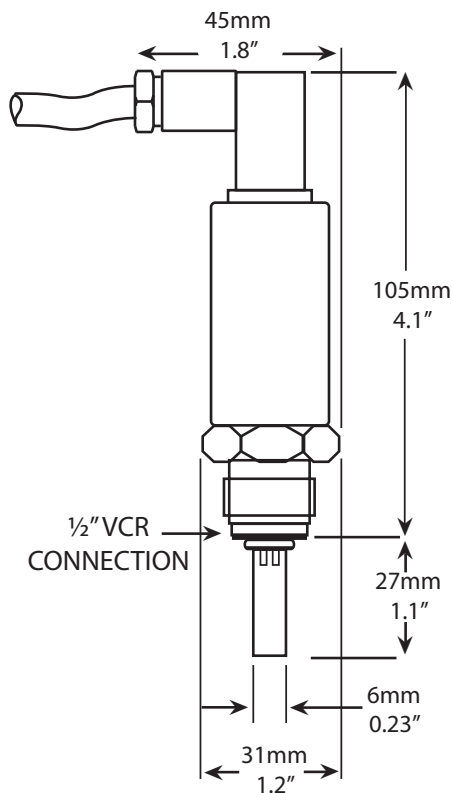


Figure 4.2 Pura Sensor Dimensional Drawing

4.3 Transmitter Cable

Cable connection to the Pura I.S. Transmitter is made via the removable connector.



When removing the central screw ensure that the small sealing O-ring is retained on the screw and present during re-installation.

Removing the central screw enables the connector terminal block to be removed from the outer housing by using a small screwdriver to prise it off.

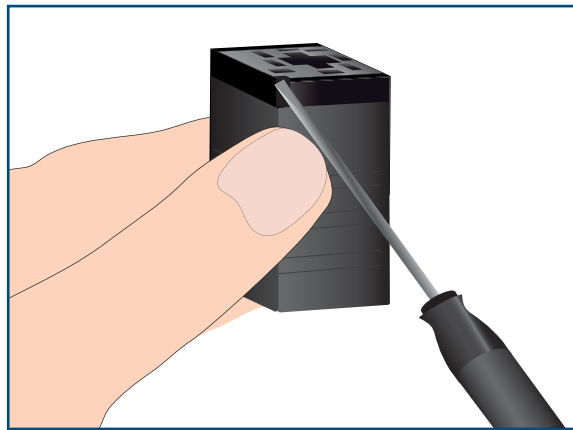


Figure 4.3 *Terminal block Removal*

When reinstalling the connector, and to ensure that full ingress protection is achieved, the securing screw must be tightened to a minimum torque setting of 3.4Nm (2.5 lbs/in) and the sensor cable used must have a minimum diameter of 4.6mm (0.2").

4.4 Preparation of the Sensor Cable



It is essential that, to comply with Hazardous Area Certification of the product, the crimps supplied must be fitted onto any cable installed into the connector.

NOTE: Figures 4.4 to 4.7 shown below, should be followed in detail. The crimps should be applied such that there is no possibility of a conductor strand of a core becoming free.

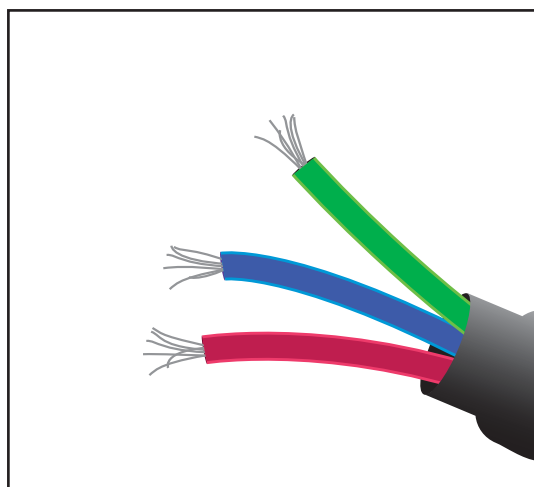


Figure 4.4 Bare wires

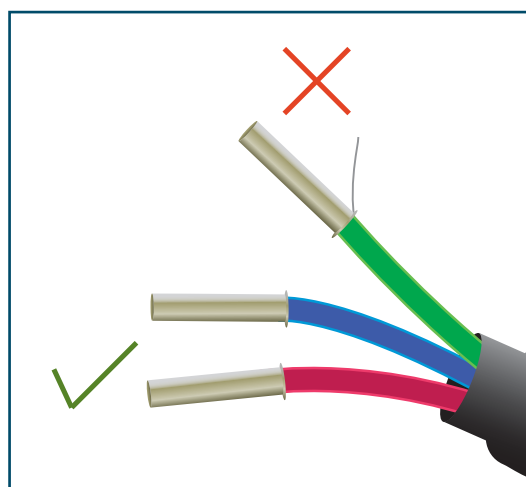


Figure 4.5 Crimped wires

When the crimp is made it should have a minimum of 2 positions of crimping. After the crimp is made it should be trimmed to a length of 5mm (see *Figure 4.6*). When the crimps are installed into the connector terminal block ensure they are fully inserted, as shown in *Figure 4.7*, before tightening the terminal clamping screw.

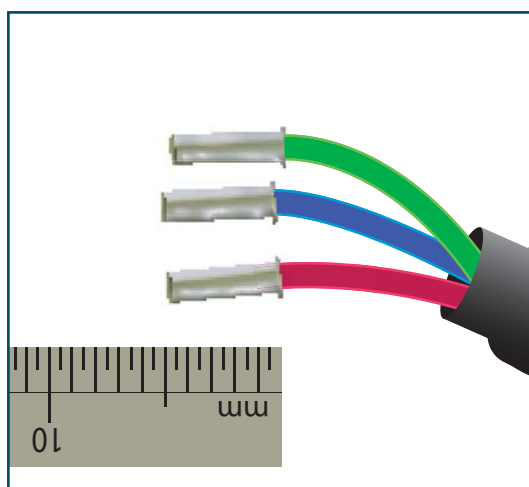


Figure 4.6 Cut to 5mm

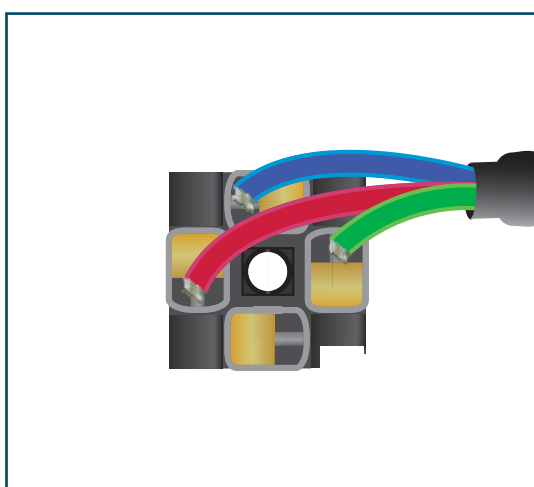


Figure 4.7 Connection to Pura I.S.TX

When all wire connections are made, ensure that there is a minimum clearance distance and a minimum creepage distance in air of 2mm (0.8") between each terminal.

The diagram below shows the identity of the connector terminals:

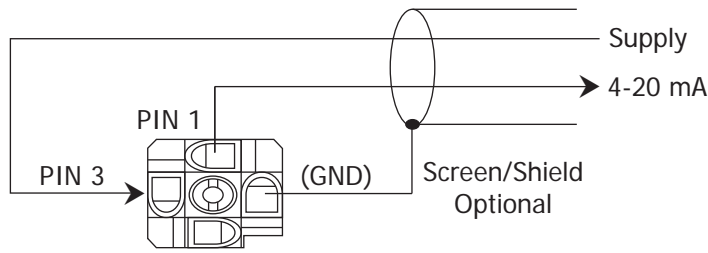


Figure 4.8 Rear of connector terminal block



Always connect the 4-20 mA return signal to a suitable load (see Figure 4.9) before the power is applied. Without this connection the transmitter may be damaged if allowed to operate for prolonged periods.

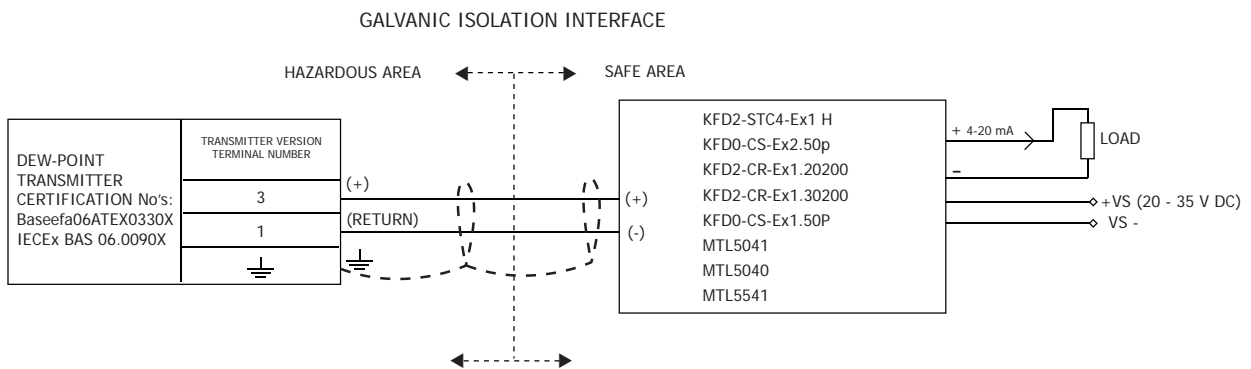
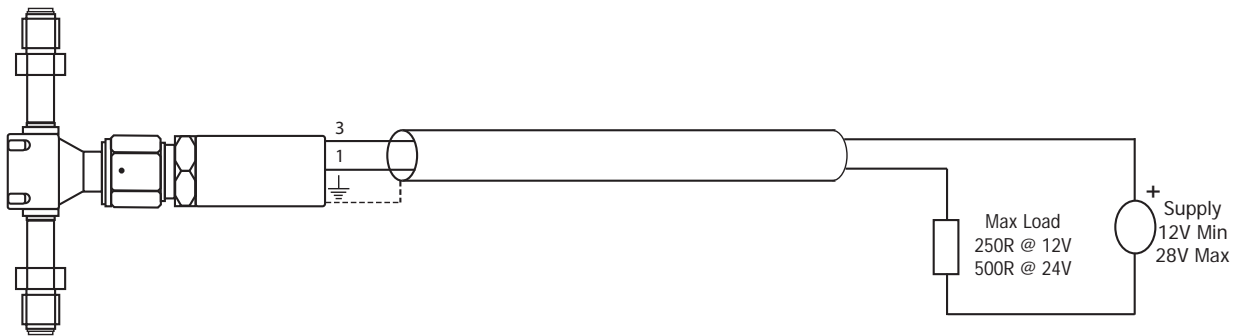


Figure 4.9 Electrical Connections

4.5 Installation in Hazardous Areas

The Transmitter is certified intrinsically safe for use in hazardous areas, by Notified Body Baseefa Ltd. The instrument conforms to the ATEX & IECEx standards with certification code:

 II 1 G Ex ia IIC T4 (-20°C ≤ Ta ≤ +70°C)

The Transmitter is also certified for use in Hazardous Areas by FM Approvals and CSA, with certification code:

IS / I / 1 / ABCD / T4 Ta = +70°C, Entity Ex90385, IP66

Also see Appendix B for more information on certification.

Before using the Transmitter in any hazardous environment, ensure that you are fully familiar with the relevant standards relating to the certification of this instrument; and also with the further information relating to intrinsically safe apparatus to be found in standard EN 60079-14:1997 or equivalent, and up-to-date codes of practice in the country of installation.

The Transmitter must be installed using a specified GALVANICALLY ISOLATED INTERFACE unit as shown in the system drawings in Appendix C



Installation of the Transmitter *MUST* be as per the system drawings in Appendix C in order to comply with the Intrinsic Safety Certification.

5 WHICH GASES TO MEASURE?

The Pura Hygrometer is suitable for measurement of the moisture content of a wide variety of gases. In general, if the gas (in conjunction with water vapor) is not corrosive to ceramics or base metals then it will be suitable for measurement by the Pura Hygrometer.

6 MAINTENANCE

Routine maintenance of the Pura I.S. Transmitter is confined to regular re-calibration. This work can only be done by exposure of the Pura I.S. Transmitter to sample gases of known moisture content. Calibration services traceable to the National Physical Laboratory (UK) and the National Institute of Standards and Technology (USA) are provided by Michell Instruments. In most applications, annual re-calibration ensures that the stated accuracy of the Pura I.S. Transmitter is maintained. Pura I.S. Transmitters are fully interchangeable and interchangeability is not affected by cable length; therefore, this method of maintaining calibration can be used for all Pura I.S. Transmitter installations. For applications where it is not required for continuous operation, re-calibration of the Pura I.S. Transmitter can be achieved by return of the complete instrument to Michell Instruments.

7 FAULT CONDITIONS

7.1 Sampling Hints

Be Sure the Sample is Representative of the Gas Under Test

The sample point should be as close to the critical measurement point as possible. Also, never sample from the bottom of a pipe (see *Figure 7.1*), as entrained gas or particulate contamination may be drawn into the sensing element.

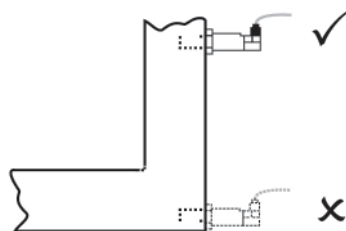


Figure 7.1 Installation location

Minimize Dead Space in Sample Lines

Dead space (see *Figure 7.2*) causes moisture entrapment points, increased system response times and measurement errors, as a result of the trapped moisture being released into the passing sample and causing an increase in partial vapor pressure.

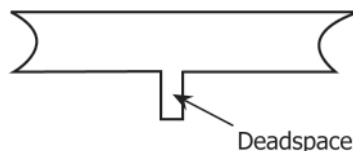


Figure 7.2 Indication of dead space

Remove Any Particulate Matter from the Sample

Particulate matter at high velocity can damage the sensing element and similarly at low velocity, they may "blind" the sensing element and reduce its response speed. If particulate, such as degraded desiccant, pipe scale or rust is present in the sample, use an in-line filter.

Use High Quality Sample Tube and Fittings

Michell Instruments recommends that, wherever possible, stainless steel tubing and fittings should be used. This is particularly important at low dew points since other materials have hygroscopic characteristics and adsorb moisture on the tube walls, slowing down response and, in extreme circumstances, giving false readings.

Appendix A

Technical Specifications

Appendix A Technical Specifications

Transmitter									
Measurement Range (dew point)	-120 to -40°C (-184 to -40°F) dew point								
Accuracy (dew point)	±1°C from -40 up to -60°C ±2°C from -60 up to -100°C ±4°C from -100 up to -120°C (estimated)								
Repeatability	0.5°C (0.9°F) dew point								
Electrical Output/Input									
Output Signal	4-20 mA (2-wire connection, current source) User-configurable over range								
Output	Dew point, moisture content for ppm _v , ppb _v								
Output Range	Dew point: -120 to -40°C (-184 to -40°F)								
Supply Voltage	12-28 V DC								
Load Resistance	Max 250 Ω @ 12 V (500 Ω @ 24 V)								
Current Consumption	23 mA								
Supply Voltage Influence	±0.005% RH/V								
Operating Conditions									
Operating Humidity	0–100% RH								
Operating Temperature	-40 to +60°C (-40 to +140°F)								
Operating Pressure	24 MPa (240 barg / 3480 psig) max								
Flow Rate	1 to 10 NI/min (2.1 to 21.2 scfh) (5 NI/min (10.6 scfh) optimum)								
Mechanical Specification									
Hazardous Area Certificates	ATEX - II 1 G Ex ia IIC T4 (-20°C ≤ Ta ≤ +70°C) FM - IS / I / 1 / ABCD / T4 Ta = +70°C CSA - IS Class 1 Div 1 Groups ABCD T4 IECEX - Ex ia IIC T4 (-20°C ≤ Ta ≤ +70°C)								
Ingress Protection	IP66 in accordance with standard BS EN 60529:1992, and NEMA 4 in protection accordance with standard NEMA 250-2003								
Housing Material	Stainless steel								
Mounting Thread	¼" male VCR connection ½" male VCR connection								
Weight	Premium and OEM versions: 450g (15.87oz) Pura Sensor version: 180g (6.34oz)								
Interchangeability	Fully interchangeable transmitter								
Electrical Connections	Screw terminal								
Fault Conditions (factory programmed)	<table border="1"> <thead> <tr> <th>Condition</th> <th>Output</th> </tr> </thead> <tbody> <tr> <td>Sensor fault</td> <td>23 mA</td> </tr> <tr> <td>Under-range dew point</td> <td>4 mA</td> </tr> <tr> <td>Over-range dew point</td> <td>20 mA</td> </tr> </tbody> </table>	Condition	Output	Sensor fault	23 mA	Under-range dew point	4 mA	Over-range dew point	20 mA
Condition	Output								
Sensor fault	23 mA								
Under-range dew point	4 mA								
Over-range dew point	20 mA								
Approved Galvanic Isolators	KFD2-CR-Ex1.20200 / KFD2-CR-Ex1.30200 KFD0-CS-Ex1.50P / KFD0-CS-Ex2.50P KFD2-STC4-Ex1 H / MTL5041, MTL5040, MTL5541								
Approved Galvanic Isolators	KFD2-CR-Ex1.20200 / KFD2-CR-Ex1.30200 KFD0-CS-Ex1.50P / KFD0-CS-Ex2.50P KFD2-STC4-Ex1 H / MTL5041, MTL5040, MTL5541								

Appendix B

Hazardous Area Certification

Appendix B Hazardous Area Certification

NOTE: The PURA I.S. product incorporates the ATEX/IECEX/CSA/FM approved Easidew I.S. product and it is the Hazardous Area Certification for the Easidew I.S. that provides the necessary approvals for the PURA I.S.

The Transmitter is certified compliant to the ATEX Directive (94/9/EC), and IECEx for safe use within a hazardous area and has been assessed so by Baseefa Ltd (Notified Body 1180).

This product uses the Easidew TX I.S. PCB assembly and therefore conforms to the Standards EN 60079-0:2004, EN60079-11:2007, IEC60079-0:2004, IEC60079-11:1999 and is attributed with a product certification code:

 II 1 G Ex ia IIC T4 (-20°C ≤ Ta ≤ +70°C)

ATEX Certificate Number : Baseefa06ATEX0330X
ATEX System Certificate Number: Baseefa07Y0027
IEC Certificate Number: IECEx BAS 06.0090X

It is also certified for use in Hazardous Areas by FM Approvals and CSA, with certification code:

IS / I / 1 / ABCD / T4 Ta = +70°C, Entity Ex90385, IP66

FM Certificate Number: 3030238
CSA Certificate Number: 2013218

These certificates can be viewed or downloaded from our website (under Easidew TX I.S.) at: <http://www.michell.com/accreditations>

B1 Terminal Parameters

Ui	= 28V
Ii	= 93mA
Pi	= 651mW
Ci	= 37nF
Li	= 0

B2 Special Conditions of Use

Wiring to the free socket must be made via crimped connectors such that all strands of the wires are retained securely by the crimp.

The plastic plug & socket provide potential for electrostatic discharge. Do not rub with a dry cloth and do not clean with solvents.

The Transmitter does not withstand the 500 V AC insulation test to frame. This must be taken into account when installing the equipment.

Appendix C

System Drawings

Appendix C System Drawings

NOTE: The Pura I.S. sensor uses the Easidew I.S. PCB assembly and therefore this certification is valid for this instrument.

C1 Baseefa Approved System Drawing

TABLE A

Type	Certificate Number	Interface	Connection to Easidew I.S.
Isolated Repeater	BAS98ATEX7343	KFD0-CS-Ex1.50P	Pin 1 (+) Pin 2 (-)
Dual Isolated Repeater	BAS98ATEX7343	KFD0-CS-Ex2.50P	Channel 1 - Pin 1 (+) Channel 1 - Pin 2 (-) Channel 2 - Pin 4 (+) Channel 2 - Pin 5 (-)
Transmitter Supply Isolator	BAS00ATEX7164	KFD2-CR-Ex1.20200	Pin 1 (+) Pin 3 (-)
Transmitter Supply Isolator	BAS00ATEX7164	KFD2-CR-Ex1.30200	Pin 1 (+) Pin 3 (-)
Smart Transmitter Power Supply	BAS98ATEX7060	KFD2-STC4-Ex1.H	Pin 1 (+) Pin 3 (-)
Repeater Power Supply	BAS01ATEX7155	MTL5041	Pin 2 (+) Pin 1 (-)
Dual Loop Isolator	BAS98ATEX2227	MTL5040	Pin 2 (+) Pin 1 (-) Pin 5 (+) Pin 4 (-)
Repeater Power Supply	BaseefaATEX0213	MTL5541	Pin 2 (+) Pin 1 (-)

THE CAPACITANCE AND EITHER THE INDUCTANCE OR THE INDUCTANCE TO RESISTANCE RATIO (L/R) OF THE CABLE MUST NOT EXCEED THE FOLLOWING VALUES:

GROUP	CAPACITANCE (µF)	INDUCTANCE (mH) OR	L/R RATIO (µH/ohm)
IIC	SEE NOTE 1 * 40 nF	4.2mH	54 µH/Ω
IIB	613 nF	12.6mH	217 µH/Ω
IIA	2.11 µF	33mH	435 µH/Ω

THE ISOLATION OF THE SIGNAL WIRES WITH THE EASIDEW DISCONNECTED, MUST BE ABLE TO WITHSTAND A 500V AC INSULATION TEST.

AT INSTALLATION OF SYSTEM PERFORM A RISK ASSESSMENT IN ACCORDANCE WITH EN60079-25:2004 cl.10 AND INSTALL LIGHTENING PROTECTION AS NECESSARY.

THE SYSTEM MUST BE MARKED WITH A DURABLE LABEL. THE LABEL SHOULD APPEAR ON OR ADJACENT TO THE PRINCIPAL ITEM OF ELECTRICAL APPARATUS IN THE SYSTEM OR AT THE INTERFACE BETWEEN THE INTRINSICALLY SAFE AND NON-INTRINSICALLY SAFE CIRCUITS. THIS MARKING SHALL INCLUDE THE FOLLOWING INFORMATION:

Baseefa 07Y0027 AND THE WORD SYST OR SYSTEM.

NOTE 1. 46nF MAXIMUM CABLE CAPACITANCE IS ACCEPTABLE IN IIC INSTALLATIONS FOR THE INTRINSIC SAFETY ISOLATORS SHOWN IN THE LIST BELOW.

FOR ISOLATORS NOT LISTED BELOW, BUT APPEARING IN TABLE A, ONLY 40nF MAXIMUM CABLE CAPACITANCE IS ACCEPTABLE.

KFD0-CS-Ex1.50P
KFD0-CS-Ex2.50P
KFD2-CR-Ex1.20200
KFD2-CR-Ex1.30200
MTL5041
MTL5040
MTL5541

SYSTEM LABEL

MICHELL Instruments
SYSTEM CERTIFICATE No's: Baseefa07Y0027
Ex. IIc IIC T4 (20C TO + 60C)

DEWPOINT TRANSMITTER
CERTIFICATION No's:
Baseefa06ATEX0330X
IECEx BAS 06.0090X

TRANSMITTER VERSION
TERMINAL NUMBER
EASIDEW PRO I.S.
3 2 (+)
1 4 (RETURN)
3

GALVANIC ISOLATION INTERFACE

HAZARDOUS AREA ← → SAFE AREA

INTERFACE BARRIER
REFER TO TABLE ABOVE.

LOAD
+ 4/20mA
+VS (20 TO 35V DC)
VS -

3d ANGLE PROJECTION
TOLERANCES: UNLESS OTHERWISE STATED
0 DEC. PLACE ± 0.5 HOLE Ø: -0.0
1 DEC. PLACE ± 0.1 ANGLES: ± 0.5°
2 DEC. PLACE ± 0.1

SCALE
UNITS: NTS
DRAWING UNITS: mm

DRIVING SCALE
UNITS: NTS

04 11165 1008/11 IMA
03 PRD 1602/09 IMA
02 08057 27/05/08 IMA
01 CERT ISS 28/01/07 MSB
ISSUE MOD. No. DATE SIGN

TITLE
EASIDEW I.S. and EASIDEW PRO I.S.
DEWPOINT TRANSMITTER SYSTEM
DRAWING

USED ON
MICHELL INSTRUMENTS LTD. CAMBRIDGE ©

DRAWN
MSB
DATE 12/01/11

CHECKED
juel
DATE 12/01/11

APPROVED
juel
DATE 12/01/11

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MICHELL Instruments

100mm
4 Inches

MICHELL INSTRUMENTS LTD. 011105 D0F03

DRAWING NUMBER
EX90352

SHEET 1 OF 1 A3

C2 FM Approved System Drawing

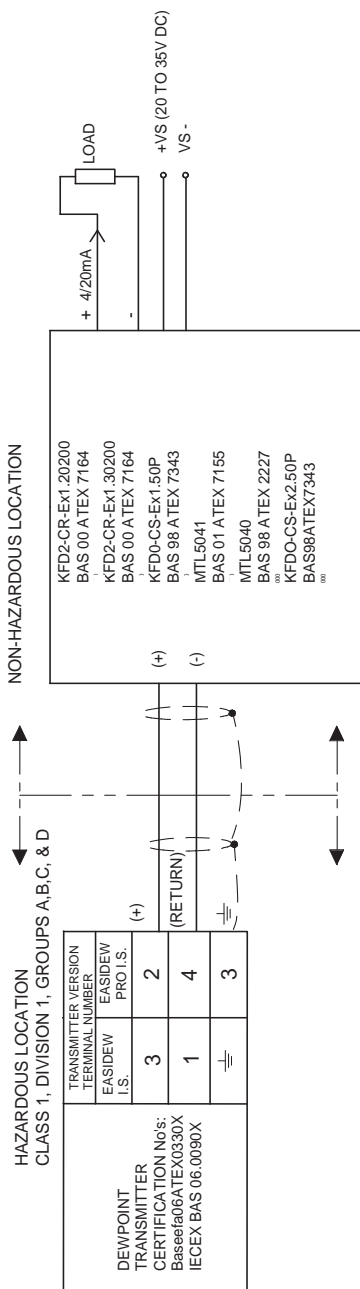
THE CAPACITANCE AND EITHER THE INDUCTANCE OR THE INDUCTANCE TO RESISTANCE RATIO (L/R) OF THE CABLE MUST NOT EXCEED THE FOLLOWING VALUES:

GROUP	CAPACITANCE (µF)	INDUCTANCE (mH) OR	L/R RATIO (µH/ohm)
D	2.11 µF	33mH	435 µH/Ω
C	613 nF	12.6 mH	217 µH/Ω
AB	46 nF	4.2mH	54µH/Ω

THE ISOLATION OF THE SIGNAL WIRES WITH THE EASIDEW DISCONNECTED, MUST BE ABLE TO WITHSTAND A 500V AC INSULATION TEST.

THE INSTALLATION MUST COMPLY WITH THE INSTALLATION PRACTICES OF THE COUNTRY OF USE, i.e. ANSI/ISA12.6(INSTALLATION OF INTRINSICALLY SAFE SYSTEMS FOR HAZARDOUS (CLASSIFIED) LOCATIONS) AND THE NATIONAL ELECTRICAL CODE (ANSI/NFPA 70).

THE CAPACITANCE AND THE INDUCTANCE OF THE HAZARDOUS AREA CABLES MUST NOT EXCEED THE VALUES GIVEN IN TABLE 1.



3rd ANGLE PROJECTION	TOLERANCES: UNLESS OTHERWISE STATED 0 DEC. PLACE: ±0.5 HOLE Ø: -0.0 DIMENSIONS: 1 DEC. PLACE: ±0.2 ANGLES: ±0.5° 2 DEC. PLACE: ±0.1	DRAWING UNITS	SCALE	05	11081	06/04/11	IMA
MATERIAL	FINISH	mm	NTS	04	CERT ISS	24/03/09	IMA
THIS DOCUMENT IS THE PROPERTY OF MICHELL INSTRUMENTS LTD. AND MUST NOT BE COPIED NOR DISCLOSED TO A THIRD PARTY WITHOUT THE CONSENT OF MICHELL INSTRUMENTS.		TITLE EASIDEW I.S. DEWPOINT TRANSMITTER FM SYSTEM DRAWING		03	CERT ISS	21/01/09	IMA
DRAWN: MSB CHECKED: MSB DATE: 10/03/06 DATE:		DRAWING NUMBER Ex90385		02	CERT ISS	23/12/08	IMA
APPROVED:		USED ON: MICHELL INSTRUMENTS LTD. CAMBRIDGE ©		01	CERT ISS	16/07/07	IMA
DATE:		SHEET 1 OF 1		ISSUE	MOD. No.	DATE	SIGN
MICHELL Instruments		SHEET NUMBER		A3			

C3 CSA Approved System Drawing

INTRINSICALLY SAFE (ENTIRETY), CLASS 1, DIV 1, GROUP A,B,C,D
Hazardous Location Installations

- 1) Control room equipment may not use or generate over 250Vrms
- 2) Wire all circuits for power supply per CEC Part 1.
- 3) Use only entity approved safety barrier or other associated equipment that satisfy the following conditions:
 $V_{oc} \leq V_{max}$, $I_{sc} \leq I_{max}$, $C_i \geq C_{cable}$, $L_i \geq L_i + L_{cable}$

Transmitter entity parameters are as follows:

$V_{max} < 2.8Vdc$
 $I_{max} < 93mA$
 $C_i = 37nF$
 $L_i = 0uH$

4) WARNING - SUBSTITUTION OF COMPONENTS MAY IMPARE INTRINSIC SAFETY.
 5) Ex (a) is defined as Intrinsically Safe.

Type	Certificate Number	Interface	Connection to Easidew I.S.
Isolated Repeater	BAS99ATEX7343 UL Canada E106379CUL	KFD0-CS-Ex1.50P	Pin 1 (+) Pin 2 (-)
Dual Isolated Repeater	BAS00ATEX7343 UL Canada E106379CUL	KFD0-CS-Ex2.50P	Channel 1 - Pin 1 (+) Channel 1 - Pin 2 (-) Channel 2 - Pin 4 (+) Channel 2 - Pin 5 (-)
Transmitter Supply Isolator	BAS00ATEX7164 UL Canada E106379CUL	KFD2-CR-Ex1.20200	Pin 1 (+) Pin 3 (-)
Transmitter Supply Isolator	BAS00ATEX7164 UL Canada E106379CUL	KFD2-CR-Ex1.30200	Pin 1 (+) Pin 3 (-)
Smart Transmitter Power Supply	BAS99ATEX7060 UL Canada E106379CUL	KFD2-STC4-Ex1 H	Pin 1 (+) Pin 3 (-)

THE CAPACITANCE AND EITHER THE INDUCTANCE OR THE INDUCTANCE TO RESISTANCE RATIO (L/R) OF THE CABLE MUST NOT EXCEED THE FOLLOWING VALUES:

GROUP	CAPACITANCE (µF)	INDUCTANCE (mH) OR L/R RATIO (µH/ohm)
IIC	46 nF	54 µH/Ω
IIB	613 nF	217 µH/Ω
IIA	2.1 µF	435 µH/Ω

THE ISOLATION OF THE SIGNAL WIRES WITH THE EASIDEW DISCONNECTED, MUST BE ABLE TO WITHSTAND A 500V AC INSULATION TEST.
 THE INSTALLATION MUST COMPLY WITH THE INSTALLATION PRACTICES OF THE COUNTRY OF USE, i.e. ANSI/ISA RP12.6 (INSTALLATION OF INTRINSICALLY SAFE SYSTEMS FOR HAZARDOUS [CLASSIFIED] LOCATIONS) AND THE NATIONAL ELECTRICAL CODE ANSI/NFPA 70.
 THE CAPACITANCE AND THE INDUCTANCE OF THE HAZARDOUS AREA CABLES MUST NOT EXCEED THE VALUES GIVEN IN TABLE 1

TRANSMITTER VERSION	TERMINAL NUMBER	EASIDEW I.S.
2	3	
4	1	
3	3	

3rd ANGLE PROJECTION UNLESS OTHERWISE STATED
 0 DEC. PLACE: ±0.5 HOLE Ø: -0.0
 DIMENSIONS: 1 DEC. PLACE: ±0.2 ANGLES: ±0.5°
 2 DEC. PLACE: ±0.1

SCALE: NTS
 DRAWING UNITS: mm

TOLERANCES: UNLESS OTHERWISE STATED
 0 DEC. PLACE: ±0.5 HOLE Ø: -0.0
 DIMENSIONS: 1 DEC. PLACE: ±0.2 ANGLES: ±0.5°
 2 DEC. PLACE: ±0.1

FINISH

MATERIAL

TITLE: EASIDEW I.S. & EASIDEW PRO I.S.
 DEWPOINT TRANSMITTER SYSTEM DRAWING, CSA

USED ON: MICHELL INSTRUMENTS LTD. CAMBRIDGE ©

DRAWING NUMBER: EX90385CSA

SHEET 1 OF 1 A3

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DRAWN: M/SB DATE: 10/03/06
 CHECKED: DATE: APPROVED: DATE:

MICHELL INSTRUMENTS LTD. 0117 005 D0F03

Appendix D

List of Worldwide Michell Instruments' Offices

Appendix D List of Worldwide Michell Instruments' Offices

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<p>China Michell Instruments (Shanghai) Ltd Room 1007, Qilai Building 889 Yishan Road Shanghai, 200233 P R China Tel: +86 21 5401 2255 Fax: +86 21 5401 2085 E-mail: cn.info@michell.com Web: www.michell.com/cn</p>	<p>France Michell Instruments SAS 2-4, rue Jean Desparmet 69008 Lyon France Tel: +33 437 53 88 20 Fax: +33 437 53 88 21 E-mail: fr.info@michell.com Web: www.michell.com/fr</p>
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<p>Japan Michell Japan KK Musashino Center Building 1-19-18 Nakacho, Musashino Tokyo 180-0006 Japan Tel: +81 422 502600 Fax: +81 422 521700 E-mail: info@michell-japan.co.jp Web: www.michell-japan.co.jp</p>	<p>Middle East Michell Instruments Middle East P-06, #097 Sharjah Airport Int'l free zone Sharjah, United Arab Emirates Tel: +971 6 5575028 Fax: +971 6 5575029 E-mail: me.info@michell.com</p>
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NOTES:



<http://www.michell.com>