

1 **TYPE EXAMINATION CERTIFICATE**

2 **Intrinsically Safe System Intended for use in Potentially Explosive Atmospheres**

3 Type Examination Certificate **Baseefa03Y0366**
Number:

4 System: **A Transmet I.S. Dewpoint Transmitter System No. 2**

5 Certificate Holder: **MICHELL INSTRUMENTS LIMITED**

6 Address: **Nuffield Close, Cambridge, CB4 1SS**

7 This system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 Baseefa (2001) Ltd. certifies that this system has been found to comply with the following standards
EN 50039: 1980

9 The examination and test results are recorded in confidential Report No. **02(C)0473**

10 If the sign "X" is placed after the certificate number, it indicates that the system is subject to special conditions of safe use specified in the schedule to this certificate.

11 This TYPE EXAMINATION CERTIFICATE relates only to the design of the specified intrinsically safe system and not to specific items of equipment therein. It is the responsibility of the system certificate holder to supply the relevant documentation to the installer of the intrinsically safe electrical system referred to in this certificate. The installer has the responsibility to ensure that the system conforms to the specification laid down in the Schedule to this certificate and has satisfied routine verifications and tests specified therein.

12 The marking of the system shall include the following :

EEx ia IIC T4

This certificate may only be reproduced in its entirety, without any change, schedule included.

Baseefa (2001) Ltd. Customer Reference No. **4014**

Project File No. **02/0473**

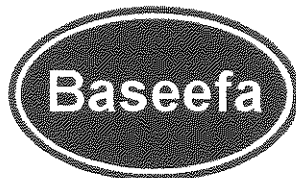
This certificate is granted subject to the general terms and conditions of Baseefa (2001) Ltd. It does not necessarily indicate that the system may be used in particular industries or circumstances.

A handwritten signature in black ink, appearing to read "R S Sinclair".

Baseefa (2001) Ltd.

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R S SINCLAIR
DIRECTOR
On behalf of
Baseefa (2001) Ltd.



13

Schedule

14

Certificate Number Baseefa03Y0366

15 System Description

A Transmet I.S. Dewpoint Transmitter System No. 2 comprises:

1. Apparatus that may be installed in a Non Hazardous Area (Safe Area.)

1.1 A Pepperl + Fuchs GB Ltd Transformer Isolated Solenoid Driver Type KFD2-SD-Ex1.48 to Certificate No.BAS00ATEX7216 and coded Ex II (1) GD [EEx ia] IIC (-20°C ≤ Ta ≤ +60°C).

Terminals 1 and 2.

$$U_o = 25.2V$$

$$I_o = 93mA$$

$$P_o = 0.59W$$

and having a 270Ω, 1%, 1W, metal film resistor connected in series with Terminal 1.

1.2 And a Pepperl + Fuchs GB Ltd Transformer Isolated Current Separator Type KFD0-CS-Ex1.50P or KFD0-CS-Ex1.50 to Certificate No.BAS98ATEX7343 and coded Ex II (1) GD [EEx ia] IIC (-20°C ≤ Ta ≤ +60°C).

Terminals 1 and 2.

$$U_o = 25.2V$$

$$I_o = 93mA$$

$$P_o = 0.585W$$

and having a 270Ω, 1%, 1W, metal film resistor connected in series with Terminal 1.

Both the Terminal 2 of the above units must be interconnected locally to the interface units and may optionally be connected to the cable screen.

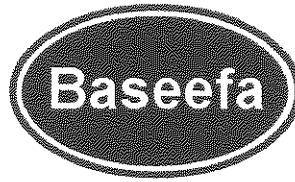
NB These units, although meeting the segregation requirements for unspecified safe area apparatus of 375V peak, are subject to an operational limit on voltage of 40V.

1.3. The above apparatus is to be supplied from apparatus situated in the safe area which is unspecified except that it must not be supplied from nor contain in normal or abnormal conditions a source of potential with respect to earth in excess of 253 volts r.m.s. or 253 volts d.c.

2. Apparatus that may be installed in an area suitable for Category 1 equipment.

2.1 A Michell Instruments Ltd., Transmet I.S. Dewpoint Transmitter to Certificate No.BAS01ATEX1240X and coded Ex II 1 G EEx ia IIC T4 (-20°C ≤ Ta ≤ +60°C).

3. Permissible Interconnecting Cables



3.1 The capacitance and either the inductance or the inductance to resistance ratio (L/R) of the hazardous area cables must not exceed the following values:-

GROUP	C μF	L mH	OR	L/R Ratio $\mu\text{H}/\Omega$
IIC	0.03	3.8		39
IIB	0.6	11.4		117
IIA	2.1	30.4		312

These values take into consideration the $C_i = 0.052 \mu\text{F}$ for Transmet I.S. Dewpoint Transmitter.

3.2 Wiring to terminals of the safe area apparatus may be achieved by separate cables or by separate circuits within a Type A or Type B multicore cable (as defined in clause 5.3 of EN50 039:1980) subject to the following:-

- a. The circuit to be individually screened when used within a Type A multicore cable.
- b. The peak voltage of any other circuit within a Type B multicore cable must not exceed 60V.

16 Report

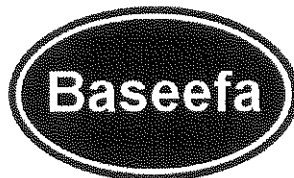
02(C)0473

17 Special Conditions for Safe Use

None

18 Drawings and Documents

Number	Sheet	Issue	Date	Description
Ex90197	1	4		Transmet I.S. Dewpoint Transmitter System No. 2 Diagram
Ex80389	1	1	19/05/1999	Resistor Enclosure



1 **SUPPLEMENTARY TYPE EXAMINATION CERTIFICATE**

2 **Intrinsically safe System Intended for use in Potentially Explosive Atmospheres**

3 Supplementary Type Examination Certificate Number: **Baseefa03Y0366/1**

4 Equipment: **A Transmet I.S. Dewpoint Transmitter System No. 2**

5 Manufacturer: **MICHELL INSTRUMENTS LIMITED**

6 Address: **Nuffield Close, Cambridge, CB4 1SS**

7 This supplementary certificate extends Type Examination Certificate No. Baseefa03Y0366 to apply only to the design of the specified intrinsically safe system, and not to specific items of equipment therein, in accordance with the specification set out in the Schedule of the said certificate but having any variations specified in the Schedule attached to this certificate and the documents therein referred to.

This supplementary certificate shall be held with the original certificate.

This certificate may only be reproduced in its entirety, without any change, schedule included.

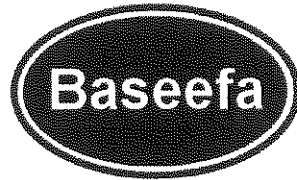
Baseefa (2001) Ltd. Customer Reference No. 4014

Project File No. 03/0787

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R S SINCLAIR
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On behalf of
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13

Schedule

14

Certificate Number Baseefa03Y0366/1

15 Description of the variation to the Equipment

Variation 1.1

To permit the addition of one channel of a dual channel version of the Pepperl + Fuchs GB Ltd Transformer Isolated Current Separator to Certificate No. BAS98ATEX7343 to be used as an alternative to the single channel version originally shown in Clause 1.2. To clarify the permitted terminal connections, Clause 1, incorporating the changes is reproduced below. The System Code and the Permissible Interconnecting Cables are not affected by this Variation.

1. Apparatus that may be installed in a Non Hazardous Area (Safe Area.)

- 1.1 A Pepperl + Fuchs GB Ltd Transformer Isolated Solenoid Driver Type KFD2-SD-Ex1.48 to Certificate No. BAS00ATEX7216 and coded Ex II (1) GD [EEx ia] IIC ($-20^{\circ}\text{C} \leq T_a \leq +60^{\circ}\text{C}$).

Terminals 1 and 2.

$$U_o = 25.2\text{V}$$

$$I_o = 93\text{mA}$$

$$P_o = 0.59\text{W}$$

and having a 270Ω , 1%, 1W, metal film resistor connected in series with Terminal 1.

- 1.2 And EITHER a Pepperl + Fuchs GB Ltd Transformer Isolated Current Separator Type KFD0-CS-Ex1.50P or KFD0-CS-Ex1.50 OR one channel from a Pepperl + Fuchs GB Ltd Transformer Isolated Current Separator Type KFD0-CS-Ex2.50P or KFD0-CS-Ex2.50, all to Certificate No. BAS98ATEX7343 and coded Ex II (1) GD [EEx ia] IIC ($-20^{\circ}\text{C} \leq T_a \leq +60^{\circ}\text{C}$).

Terminals 1 and 2 (or 4 and 5 for Channel 2 of the dual channel version).

$$U_o = 25.2\text{V}$$

$$I_o = 93\text{mA}$$

$$P_o = 0.585\text{W}$$

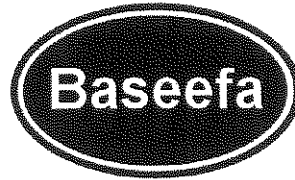
and having a 270Ω , 1%, 1W, metal film resistor connected in series with Terminal 1 (or Terminal 4 - dual channel).

EITHER Terminal 2 of the Type KFD2-SD-Ex1.48 and Terminal 2 of the Type KFD0-CS-Ex1.50P or KFD0-CS-Ex1.50 or Channel 1 from Type KFD0-CS-Ex2.50P or KFD0-CS-Ex2.50;

OR Terminal 2 of the Type KFD2-SD-Ex1.48 and Terminal 5 of the Channel 2 from Type KFD0-CS-Ex2.50P or KFD0-CS-Ex2.50;

must be interconnected locally to the interface units, and may optionally be connected to the cable screen.

NB: These units, although meeting the segregation requirements for unspecified safe area apparatus of 375V peak, are subject to an operational limit on voltage of 40V.



1.3. The above apparatus is to be supplied from apparatus situated in the safe area which is unspecified except that it must not be supplied from nor contain in normal or abnormal conditions a source of potential with respect to earth in excess of 253 volts r.m.s. or 253 volts d.c.

16 Report Number

None

17 Special Conditions for Safe Use

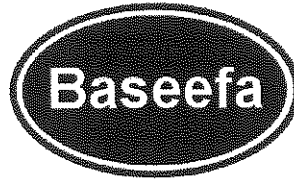
None

18 Essential Health and Safety Requirements

Compliance with the Essential Health and Safety Requirements is not affected by this variation.

19 Drawings and Documents

Number	Sheet	Issue	Date	Description
Ex90197	1	5	05/09/2003	Transmet I.S. Dewpoint Transmitter System No. 2 Diagram.



1 SUPPLEMENTARY TYPE EXAMINATION CERTIFICATE

2 Intrinsically safe System Intended for use in Potentially Explosive Atmospheres

3 Supplementary Type Examination Certificate Number: Baseefa03Y0366/2

4 Equipment: A Transmet I.S. Dewpoint Transmitter System No. 2

5 Manufacturer: Michell Instruments Limited

6 Address: Nuffield Close, Cambridge, CB4 1SS

7 This supplementary certificate extends Type Examination Certificate No. Baseefa03Y0366 to apply only to the design of the specified intrinsically safe system, and not to specific items of equipment therein, in accordance with the specification set out in the Schedule of the said certificate but having any variations specified in the Schedule attached to this certificate and the documents therein referred to.

This supplementary certificate shall be held with the original certificate.

This certificate may only be reproduced in its entirety, without any change, schedule included.

Baseefa (2001) Ltd. Customer Reference No. 4014

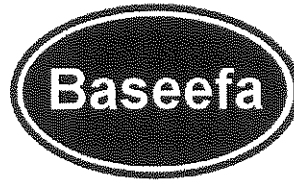
Project File No. 03/0787

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Baseefa (2001) Ltd.

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R S SINCLAIR
DIRECTOR
On behalf of
Baseefa (2001) Ltd.



13

Schedule

14

Certificate Number Baseefa03Y0366/2

15 Description of the variation to the Equipment

Variation 2.1

To permit the addition of further Pepperl + Fuchs GB Ltd Transformer Isolated Interfaces. One channel to be used as an alternative to the Solenoid Driver Interface shown in Clause 1.1 and one channel as an alternative to the Current Separator Interface shown in Clause 1.2 of the original schedule. To clarify the permitted terminal connections the Isolators are shown in the following Table.

This table includes the Transformer Isolated Interfaces already included in the original schedule (*) and Variation 1.1 (**) for completeness.

Clause	Certificate No.	Isolation Interface	Title	Connections to 270Ω		Interconnect Clause 1.1 & 1.2
				C or D	A or B	
*1.1	BAS00ATEX7216	KFD2-SD-Ex1.48	Solenoid Driver	1 (+Out)		2 (-Out)
1.1	BAS00ATEX7216	KFD2-SD-Ex1.48.90A	Solenoid Driver	1 (+Out)		2 (-Out)
*1.2	BAS98ATEX7343	KFD0-CS-Ex1.50	Current Separator		1 (+Out)	2 (-Out)
*1.2	BAS98ATEX7343	KFD0-CS-Ex1.50P	Current Separator		1 (+Out)	2 (-Out)
**1.2	BAS98ATEX7343	KFD0-CS-Ex2.50	Current Separator		1 or 4 (+Out)	2 or 5 (-Out)
**1.2	BAS98ATEX7343	KFD0-CS-Ex2.50P	Current Separator		1 or 4 (+Out)	2 or 5 (-Out)
1.2	BAS00ATEX7127	KFD2-STC1-Ex1(.P) or KFD2-STV1-Ex1-1(.P)	Current Separator		1 (+Out)	3 (-Out)
1.2	BAS00ATEX7164	KFD2-CR-Ex1.20.200(.P)	Current Separator		1 (+Out)	3 (-Out)
1.2	BAS01ATEX7369	KFD2-STC3-Ex1(.P) or KFD2-STV3-Ex1-1(.P) or KFD2-STV3-Ex1-2(.P)	Current Separator		1 (+Out)	3 (-Out)
1.2	BAS99ATEX7060	KFD2-STC4-Ex1(.P) or KFD2-STC4-Ex1.2O(.P)	Current Separator		1 (+Out)	3 (-Out)

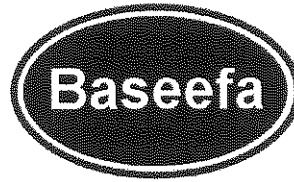
Alternatively the following Dual Channel Transformer Isolated Interface may be used.

One channel replaces the Solenoid Driver Interface from Clause 1.1, and the other replaces the Current Separator Interface from Clause 1.2 of the original schedule.

Clause	Certificate No.	Isolation Interface	Title	Connections to 270Ω		Interconnect Channels 1 & 2
				C or D	A or B	
Dual Channel Ch1 - 1.1 Ch2 - 1.2	BAS99ATEX7025	KFD2-STC4-Ex2(.P) or KFD2-STV4-Ex2-1(.P) or KFD2-STV4-Ex2-2(.P)	Transmitter Isolator	1 (+Out)	4 (+Out)	Connect 3 and 6 for (-Out)

Connections C or D and A or B are to 270Ω, 1%, 1W, metal film resistors connected in series with the (+ Out) terminal of the interface.

Channels 1 and 2 must be interconnected locally to the interface units, and may optionally be connected to the cable screen.



NB: All of these units, although meeting the segregation requirements for unspecified safe area apparatus of 375V peak, are subject to an operational limit on voltage of 40V.

The System Code and the Permissible Interconnecting Cables are not affected by this Variation.

16 Report Number

03/0814

17 Special Conditions for Safe Use

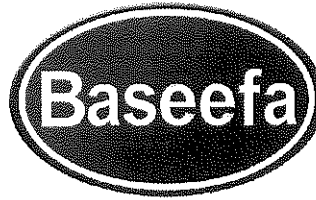
None

18 Essential Health and Safety Requirements

Compliance with the Essential Health and Safety Requirements is not affected by this variation.

19 Drawings and Documents

Number	Sheet	Issue	Date	Description
Ex90197	1	6	07/10/2003	Transmet I.S. Dewpoint Transmitter System No. 2 Diagram.
Ex90197	2	6	07/10/2003	Transmet I.S. Dewpoint Transmitter System No. 2 Diagram.



1 **SUPPLEMENTARY TYPE EXAMINATION CERTIFICATE**

2 **Intrinsically safe System Intended for use in Potentially Explosive Atmospheres**

3 Supplementary Type Examination Certificate Number: **Baseefa03Y0366/3**

4 Equipment: **A Transmet I.S. Dewpoint Transmitter System No. 2**

5 Manufacturer: **Michell Instruments Limited**

6 Address: **Ely, Cambridgeshire, CB6 3NW
(formerly Cambridge, CB4 1SS.)**

7 This supplementary certificate extends Type Examination Certificate No. Baseefa03Y0366 to apply only to the design of the specified intrinsically safe system, and not to specific items of equipment therein, in accordance with the specification set out in the Schedule of the said certificate but having any variations specified in the Schedule attached to this certificate and the documents therein referred to.

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Baseefa Customer Reference No. 4014

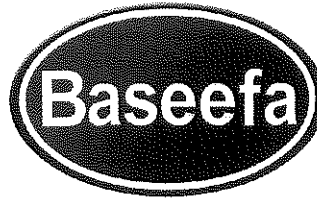
Project File No. 08/0350

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R S SINCLAIR
DIRECTOR
On behalf of
Baseefa



13

Schedule

14

Certificate Number Baseefa03ATEX0366/3

15 Description of the variation to the Equipment

Variation 3.1

To permit the use of additional Pepperl + Fuchs Transformer Isolated Interfaces types KFD0-SD2-Ex1.1045 and KFD0-SD2-Ex2.1045. One channel is to be used as an alternative to the Solenoid Driver Interface shown in Clause 1.1 of the original schedule and one channel as an alternative to the Current Separator Interface shown in Clause 1.2 of the original schedule.

To clarify the permitted terminal connections they are shown in the following table.

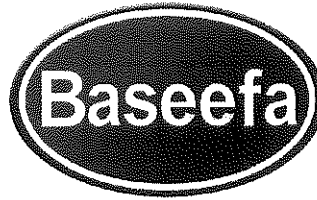
To simplify the table, isolators no longer shown on the system drawing have been removed.

These tables include the Transformer Isolated Interfaces already included in the original schedule (marked *), those introduced in variation 1.1 (marked \$) and those introduced in variation 2.1 (marked #).

Clause	Certificate No.	Isolation Interface	Isolator Title	Connections to 270Ω		Interconnect
				C or D	A or B	Clause 1.1 & 1.2
1.1 *	BAS00ATEX7216	KFD2-SD-Ex1.48	Solenoid Driver	1(+out)		2(-out)
1.1 #	BAS00ATEX7216	KFD2-SD-Ex1.48.90A	Solenoid Driver	1(+out)		2(-out)
1.1	Baseefa06ATEX0252	KFD0-SD2-Ex1.1045	Solenoid Driver	4(+out)		5(-out)
1.1	Baseefa06ATEX0252	KFD0-SD2-Ex2.1045	Solenoid Driver	4(+out)		5(-out)
1.2 *	BAS98ATEX7343	KFD0-CS-Ex1.50P	Current Separator		1(+out)	2(-out)
1.2 \$	BAS98ATEX7343	KFD0-CS-Ex2.50P	Current Separator		1 or 4 (+out)	2 or 5(-out)
1.2 #	BAS00ATEX7127	KFD2-STC1-Ex1 or KFD2-STV1-Ex1-1	Current Separator		1(+out)	3(-out)
1.2 #	BAS00ATEX7164	KFD2-CR-Ex1.20.200	Current Separator		1(+out)	3(-out)
1.2 #	BAS01ATEX7369	KFD2-STC3-Ex1 or KFD2-STV3-Ex1-1 or KFD2-STV3-Ex1-2	Current Separator		1(+out)	3(-out)
1.2 #	BAS99ATEX7060	KFD2-STC4-Ex1 or KFD2-STC4-Ex1-1.20	Current Separator		1(+out)	3(-out)

Alternatively the following Dual Channel Transformer Isolated Interface may be used.

One channel replaces the Solenoid Driver Interface from Clause 1.1 of the original schedule and the other replaces the Current Separator Interface from Clause 1.2 of the original schedule.



Clause	Certificate No.	Isolation Interface	Isolator Title	Connections to 270Ω		Interconnect
				C or D	A or B	Clause 1.1 & 1.2
Dual Channel Ch1 – 1.1 Ch2 – 1.2	BAS99ATEX7025	KFD2-STC4-Ex2 or KFD2-STV4-Ex2-1 or KFD2-STV4-Ex2-2	Transmitter Isolator	1(+out)	4(+out)	Connect 3 & 6 for (-out)

Connections C or D and A or B are to 270Ω 1% 1W metal film resistors connected in series with the (+out) terminal of the isolating interface.

Channels 1 and 2 must be interconnected locally to the interface units and may be optionally connected to the cable screen.

16 Report Number

None.

17 Special Conditions for Safe Use

None

18 Essential Health and Safety Requirements

Compliance with the Essential Health and Safety Requirements is not affected by this variation.

19 Drawings and Documents

Number	Sheet	Issue	Date	Description
Ex90197	1 & 2	07	15/05/08	Transmet I.S. Dewpoint Transmitter System 2