

(1) **CERTIFICATE OF CONFORMITY**

(2) KEMA No. **Ex-01.E.1127 X**

(3) This certificate is issued for the electrical apparatus:
Indicator Model 0100 Series

(4) Manufacturer:

**Fluidwell B.V.
Zuidkade 17
5462 CD Veghel
The Netherlands**

(5) This electrical apparatus and any acceptable variation thereto is specified in the Annex to this certificate and the documents therein referred to.

(6) KEMA Quality B.V., being an Approved Certification Body in accordance with Article 14 of the Council Directive of the European Communities of 18 December 1975 (76/117/EEC), confirms that the apparatus has been found to comply with the harmonised European standards:

Electrical apparatus for potentially explosive atmospheres

EN 50014: 1992, General requirements

EN 50020: 1994, Intrinsic safety "i"

and has successfully met the examination and test requirements which are recorded in confidential report no. 2014166.

(7) The apparatus marking shall include the code:

EEx ia IIB/IIC T4

(8) The manufacturer of the electrical apparatus referred to in this certificate, has the responsibility to ensure that the apparatus conforms to the specification laid down in the Annex to this certificate and has satisfied routine verifications and tests specified therein.

(9) This apparatus may be marked with the Distinctive Community Mark specified in Annex II to the Commission Directive of 16 January 1984 (84/47/EEC).

Arnhem, 5 March 2002
KEMA Quality B.V.



T. Pijpker
Certification Manager

° This Certificate may only be reproduced in its entirety and without any change

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Description

The range of Model 0100 series Indicators includes the following basic models:

Model 01...-P-.,	indicators with maximum 2 pulse inputs, sensor voltage output (8,2 V, 3,3 V or 1,2 V) and maximum 3 (optional) analog inputs (0/4 ... 20 mA, 0 ... 10 V);
Model 01...-A-.,	indicators with 1 analog input (0/4 ... 20 mA), maximum 2 analog inputs (0/4 ... 20 mA, 0 ... 10 V), maximum 1 pulse input and sensor voltage output (maximum 30 V);
Model 01...-U-.,	indicators with 1 analog input (0 ... 10 V), maximum 2 analog inputs (0/4 ... 20 mA, 0 ... 10 V), maximum 1 pulse input and sensor voltage output (maximum 30 V);
Model 01...-R-.,	indicators with maximum 2 analog inputs (0 ... 3,3 V), maximum 2 analog inputs (0/4 ... 20 mA, 0 ... 10 V), maximum 1 pulse output and sensor voltage output (maximum 3,3 V);
Model 01...-A-PL-.,	indicators with 1 analog input (4 ... 20 mA, loop powered), maximum 2 analog inputs (0/4 ... 20 mA, 0 ... 10 V) and sensor voltage output (maximum 30 V);
Model 01...-T-.,	indicators with 1 or 2 Pt100 inputs, maximum 2 pulse inputs and/or maximum 3 analog inputs (0/4 ... 20 mA, 0 ... 10 V).

All indicators optionally can have internal battery supply and/or external supply, pulse outputs, status input, analog output loop (floating or output loop powered), communication connection (TTL level) and 1 or 2 Pt100 connections (2 or 3 wire).

Ambient temperature range $-30\text{ }^{\circ}\text{C} \dots +70\text{ }^{\circ}\text{C}$.

Electrical data

When applying the following electrical data, for the combined connection of the different supply, input and output circuits, the special conditions for safe use mentioned in this certificate and the installation instructions of the manufacturer must be observed.

Internal supply (connector)	for use with the certified replaceable battery type FW-LiBAT-... or to another certified non rechargeable battery in type of explosion protection intrinsic safety EEx ia IIC, with the following maximum values:
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$$\begin{aligned}
 U_i &= 4 \text{ V} \\
 I_i &= 50 \text{ mA} \\
 P_i &= 200 \text{ mW}
 \end{aligned}$$

The effective internal capacitance and inductance are negligibly small.

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Electrical data (continued)

External supply input
(terminals 0 and 1, all models) in type of explosion protection intrinsic safety EEx ia IIB,
only for connection to a certified intrinsically safe circuit,
with following maximum values:

$$\begin{aligned} U_i &= 30 \text{ V} \\ I_i &= 100 \text{ mA} \\ P_i &= 750 \text{ mW} \end{aligned}$$

The effective internal capacitance and inductance are negligibly small.

However, if external circuits are connected to the external supply outputs, terminals 0 and 2 and where applicable the terminals 9 and 11 and/or 12 and 14, the total amount of external capacitance and inductance of the circuits, connected to that terminals, is added to the effective internal capacitance and inductance of this external supply input circuit.

External supply outputs
(terminals 0 and 2 of all models,
terminals 9 and 11,
terminals 12 and 14
of models 01..-A., 01..-U
and 01..-A-PL) in type of explosion protection intrinsic safety EEx ia IIB,
only for connection to an intrinsically safe circuit.

The maximum output values, including the maximum allowed external capacitance and inductance values are equal to the parameters of the intrinsically safe circuit, connected to terminals 0 and 1.

Signal input circuits
(terminals 9 and 10,
terminals 12 and 13,
terminals 17 and 18
of all models;
terminals 17 and 19
of all models, except
model 01..-A-PL) in type of explosion protection intrinsic safety EEx ia IIB,
only for connection to certified intrinsically safe circuits,
with the following maximum values for either circuit:

$$\begin{aligned} U_i &= 30 \text{ V} \\ I_i &= 100 \text{ mA} \\ P_i &= 750 \text{ mW} \end{aligned}$$

The effective internal capacitance and inductance are negligibly small.

Analog output circuit
(terminals 7 and 8,
all models with
option -AP or option -AF) in type of explosion protection intrinsic safety EEx ia IIB,
only for connection to a certified intrinsically safe circuit,
with the following maximum values for either circuit:

$$\begin{aligned} U_i &= 30 \text{ V} \\ I_i &= 100 \text{ mA} \\ P_i &= 750 \text{ mW} \end{aligned}$$

The effective internal capacitance $C_i = 17 \text{ nF}$, the effective internal inductance is negligibly small.

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Electrical data (continued)

Pulse output circuits in type of explosion protection intrinsic safety EEx ia IIB,
(terminals 3 and 4, only for connection to certified intrinsically safe circuits,
terminals 5 and 6 with the following maximum values for either circuit:
of all models)

$$\begin{aligned} U_i &= 30 \text{ V} \\ I_i &= 100 \text{ mA} \\ P_i &= 750 \text{ mW} \end{aligned}$$

The effective internal capacitance and inductance are negligibly small.

Pulse/status input circuit in type of explosion protection intrinsic safety EEx ia IIB
(terminals 15 and 16 or EEx ia IIC, only for connection to a certified
of all models) intrinsically safe circuit, with the following maximum values for either circuit:

$$\begin{aligned} U_i &= 30 \text{ V} \\ I_i &= 100 \text{ mA} \\ P_i &= 750 \text{ mW} \end{aligned}$$

The effective internal capacitance and inductance are negligibly small,

or in type of explosion protection intrinsic safety EEx ia IIB or EEx ia IIC, with the following maximum values:

$$\begin{aligned} U_o &= 5,4 \text{ V} \\ I_o &= 1 \text{ mA} \\ P_o &= 2 \text{ mW} \end{aligned}$$

max. allowed external capacitance $C_o = 65 \mu\text{F}$,
max. allowed external inductance $L_o = 1 \text{ H}$

Coil input circuits in type of explosion protection intrinsic safety EEx ia IIB
(terminals 10 and 11, or EEx ia IIC, with the following maximum values for
terminals 13 and 14, either circuit:
model 01...-P)

Externally powered	Battery powered
$U_o = 8,7 \text{ V}$	$U_o = 5,4 \text{ V}$
$I_o = 25 \text{ mA}$	$I_o = 5,2 \text{ mA}$
$P_o = 150 \text{ mW}$	$P_o = 27 \text{ mW}$

The max. allowed external capacitance C_o and the max. allowed external inductance L_o depend on the apparatus group, in accordance with the following table:

	IIB	IIC ext. power	IIC battery power
$L_o \leq$	210 mH	52,6 mH	1 H
$C_o \leq$	50 μF	5,9 μF	65 μF

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Electrical data (continued)

Switch (PNP) input circuits in type of explosion protection intrinsic safety EEx ia IIB
(circuit 1: terminals 10 and 11, or EEx ia IIC, with the following maximum values for
circuit 2: terminals 13 and 14, either circuit:
model 01..-P)

Externally powered	Battery powered
$U_o = 8,7 \text{ V}$	$U_o = 5,4 \text{ V}$
$I_o = 25 \text{ mA}$	$I_o = 5,2 \text{ mA}$
$P_o = 150 \text{ mW}$	$P_o = 27 \text{ mW}$

The max. allowed external capacitance C_o and the max. allowed external inductance L_o depend on the apparatus group, in accordance with the following table:

	IIB	IIC ext. power	IIC battery power
$L_o \leq$	210 mH	52,6 mH	1 H
$C_o \leq$	50 μF	5,9 μF	65 μF

Switch (or NPN) input circuits in type of explosion protection intrinsic safety EEx ia IIB
(terminals 9 and 10, or EEx ia IIC, with the following maximum values for
terminals 12 and 13, either circuit:
model 01..-P)

IIB	IIC
$U_o = 8,7 \text{ V}$	$U_o = 5,4 \text{ V}$
$I_o = 25 \text{ mA}$	$I_o = 5,2 \text{ mA}$
$P_o = 150 \text{ mW}$	$P_o = 27 \text{ mW}$

The max. allowed external capacitance C_o and the max. allowed external inductance L_o depend on the apparatus group, in accordance with the following table:

	IIB	IIC ext. power	IIC battery power
$L_o \leq$	210 mH	52,6 mH	1 H
$C_o \leq$	50 μF	5,9 μF	65 μF

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Electrical data (continued)

Potentiometer input circuits
(terminals 9, 10 and 11,
terminals 12, 13 and 14,
model 01...-R)

in type of explosion protection intrinsic safety EEx ia IIB
or EEx ia IIC, with the following maximum values for
either circuit:

Externally powered	Battery powered
$U_o = 5,4 \text{ V}$	$U_o = 5,4 \text{ V}$
$I_o = 162 \text{ mA}$	$I_o = 40 \text{ mA}$
$P_o = 750 \text{ mW}$	$P_o = 200 \text{ mW}$

The max. allowed external capacitance C_o and the max.
allowed external inductance L_o depend on the apparatus
group, in accordance with the following table:

	IIB	IIC ext. power	IIC battery power
$L_o \leq$	5,3 mH	1 mH	20 mH
$C_o \leq$	1000 μF	65 μF	65 μF

Pt100 input circuits
(terminals 20, 21 and 22,
terminals 23, 24 and 25
of all models)

in type of explosion protection intrinsic safety EEx ia IIB
or EEx ia IIC, with the following maximum values for
both circuits together:

Externally powered	Battery powered
$U_o = 5,4 \text{ V}$	$U_o = 5,4 \text{ V}$
$I_o = 162 \text{ mA}$	$I_o = 40 \text{ mA}$
$P_o = 750 \text{ mW}$	$P_o = 200 \text{ mW}$

The max. allowed external capacitance C_o and the max.
allowed external inductance L_o depend on the apparatus
group, in accordance with the following table (for both
circuits together):

	IIB	IIC ext. power	IIC battery power
$L_o \leq$	5,3 mH	1 mH	20 mH
$C_o \leq$	1000 μF	65 μF	65 μF

Data communication circuit
(terminals 26, 27, 28,
29, 30 and 31 of all
models)

in type of explosion protection intrinsic safety EEx ia IIB,
only for connection to a certified intrinsically safe circuit,
with the following maximum values for either circuit:

$$\begin{aligned} U_i &= 30 \text{ V} \\ I_i &= 250 \text{ mA} \\ P_i &= 850 \text{ mW} \end{aligned}$$

The effective internal capacitance and inductance are
negligibly small.

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Installation instructions

When two or more active intrinsically safe circuits are connected to the indicator, in order to prevent voltage and/or current addition, applicable to the external circuits, precautions must be taken to separate the intrinsically safe circuits in accordance with EN 50020.

Special condition for safe use

Normally, the indicator is classified as apparatus group IIB. However, classification of the indicator as apparatus group IIC is possible, only under the following conditions:

- the indicator is either supplied by the internal battery, or by an external supply connected to terminals 0 and 1, or by the circuit connected to terminals 7 and 8 or by the circuit connected to terminals 9 and 10;
- no other active external intrinsically safe circuits may be connected to the indicator, with exception of circuits connected to terminals 3 and 4 and/or terminals 5 and 6.

Test documentation

1. Component Certificate KEMA No. Ex-00.E.1108 U

	<u>dated</u>
2. Description 0100 series, version 3 (61 pages)	04.12.2001
Specification safety components, version 2 (3 pages)	30.11.2001
Specification printed circuit board control (2 pages)	25.02.2002
3. Schematic diagram Base board, V02.01.03 (2 pages))
PCB lay-out Base board, V02.01.03 (3 pages))
Parts list Base board, V02.01.04 (4 pages))
Schematic diagram Interface board, V02.41.01 (2 pages)) 30.11.2001
PCB lay-out Interface board, V02.41.01 (3 pages))
Parts list Interface board, V02.41.01 (3 pages))
Drawing No. 100_01_EXI_01)
100_02_EXI_01)
100_03_EXI_01)
100_04_EXI_01)
100_05_EXI_01) 29.06.2001
100_06_EXI_01)
100_07_EXI_01)
100_08_EXI_01)
Label drawing No. FW1LB1	29.06.2001
FW1PCE2)
FW1AC2)
FW1UCE2) 04.03.2002
FW1RCE2)
FW1TCE2)
FW1APCE2)
4. Samples