

1 **EU - TYPE EXAMINATION CERTIFICATE**

2 **Safety Device, Controlling Device or Regulating Device intended for use outside a potentially explosive atmosphere but required for or contributing to the safe functioning of Equipment and Protective Systems with respect to the risks of explosion**
Directive 2014/34/EU

3 EU - Type Examination Certificate **Baseefa07ATEX0174 – Issue 1**
Number:

3.1 In accordance with Article 41 of Directive 2014/34/EU, EC-Type Examination Certificates referring to 94/9/EC that were in existence prior to the date of application of 2014/34/EU (20 April 2016) may be referenced as if they were issued in accordance with Directive 2014/34/EU. Supplementary Certificates to such EC-Type Examination Certificates, and new issues of such certificates, may continue to bear the original certificate number issued prior to 20 April 2016.

4 Product: **Type KFD2-HLC-Ex1.D.** HART Loop Converter**

5 Manufacturer: **Pepperl + Fuchs GmbH**

6 Address: **Lilienthalstrasse 200, 68307 Mannheim, Germany**

7 This re-issued certificate extends EC Type Examination Certificate No. Baseefa07ATEX0174 to apply to product designed and constructed 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.

8 SGS Baseefa, Notified Body number 1180, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential Report No. **See Certificate History**

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 60079-0:2012+A11:2013 EN 60079-11:2012

except in respect of those requirements listed at item 18 of the Schedule.

10 If the sign “X” is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

11 This EU - TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

12 The marking of the product shall include the following :

⊕ II (1) G [Ex ia Ga] IIC (-20°C ≤ Ta ≤ +60°C)

⊕ II (1) D [Ex ia Da] IIIC (-20°C ≤ Ta ≤ +60°C)

SGS Baseefa Customer Reference No. **0808**

Project File No. **17/0738**

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TECHNICAL MANAGER
On behalf of SGS Baseefa Limited

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Schedule

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Certificate Number Baseefa07ATEX0174 – Issue 1

15 Description of Product

The Type KFD2-HLC-Ex1.D.** HART Loop Converter is designed to transfer up to three dynamic variables from a HART field device located in the hazardous area to unspecified apparatus located in the non-hazardous area using the HART protocol. The voltage and current passed to the hazardous area is limited to intrinsically safe levels. The hazardous area circuit is galvanically isolated from the non-hazardous area circuit using transformers.

The Type KFD2-HLC-Ex1.D.** HART Loop Converter comprise a number of electronic components, including isolating transformers, fuses, zener diodes and resistors mounted on two inter-connected printed circuit boards and housed in a plastic enclosure with polarised plug-in terminals for hazardous and non-hazardous area connections. A Liquid Crystal Display (LCD) with push buttons is provided on the front of the enclosure to allow the user to monitor and configure the operation of the apparatus in addition to LED indication for Power-on and channel status. A jack socket is provided for updating the apparatus firmware using a data terminal.

There are three models of the Type KFD2-HLC-Ex1.D.** HART Loop Converter, the Type KFD2-HLC-Ex1.D providing the basic functions and the Type KFD2-HLC-Ex1.D.2W HART Loop Converter with two output relays and the Type KFD2-HLC-Ex1.D.2W HART Loop Converter with four output relays. The models fitted with relays provide either two or four relay outputs to the non-hazardous area for fault indication. All models in terms of intrinsic safety are identical.

Input / Output Parameters

Non-Hazardous Area Terminals 7 to 24, Power Rail Connections PR1 & PR2 & Jack Socket

$$U_m = 253V \text{ r.m.s.}$$

The power supply circuit connected to non-hazardous area terminals 23 & 24 or Power Rail Connections PR1 & PR2 are designed to operate from a d.c. supply of up to 30V.

Where fitted (Types KFD2-HLC-Ex1.D.2W & KFD2-HLC-Ex1.D.4S), non-hazardous area terminals 10 to 12 and 16 to 18 are connected to relay contacts which can switch up to 253V r.m.s and 1A.

Power Rail Connection PR4 (Fault Bus)

$$U_m = 253V \text{ r.m.s.}$$

The circuit connected to the power rail connection PR4 is designed to operate from a d.c. supply voltage of 30V.

Hazardous Area Terminals 1 / 4 w.r.t. 3

$$\begin{array}{ll} U_o = 25.2V & C_i = 1.1nF \\ I_o = 93mA & L_i = 0 \\ P_o = 586mW & \end{array}$$

Hazardous Area Terminals 2 / 5 w.r.t. 3

$$\begin{array}{ll} U_o = 1.1V & U_i = 28V \\ I_o = 11.9mA & P_i = 1.33W \\ P_o = 4mW & \\ C_i = 0 & \\ L_i = 0 & \end{array}$$

Hazardous Area Terminals 1 / 4 w.r.t. 3 (with external link between terminals 4 & 5)

$$\begin{array}{ll} U_o = 25.2V & C_i = 1.1nF \\ I_o = 104.9mA & L_i = 0 \\ P_o = 661mW & \end{array}$$

Hazardous Area Terminals 2 / 5 w.r.t. 3 (with external link between terminals 5 & 6)

$$\begin{array}{ll}
 U_o = 1.1V & U_i = 28V \\
 I_o = 11.9mA & P_i = 1.33W \\
 P_o = 4mW & \\
 C_i = 0 & \\
 L_i = 0 &
 \end{array}$$

The capacitance and either the inductance or the inductance to resistance ratio (L/R) of the load connected to the output terminals of the apparatus must not exceed the following values:

GROUP	CAPACITANCE (μ F)	INDUCTANCE (mH)	OR	L/R RATIO (μ H/ohm)
Hazardous Area Terminals 1 / 4 w.r.t. 3				
IIC	0.105	4.1		60
IIB / IIIC	0.81	16.4		240
IIA	2.89	32.8		480
Hazardous Area Terminals 2 / 5 w.r.t. 3 (with or without external link between terminals 5 & 6)				
IIC	100	251		10,000
IIB / IIIC	1,000	1,004		43,000
IIA	1,000	2,008		86,000
Hazardous Area Terminals 1 / 4 w.r.t. 3 (with external link between terminals 4 & 5)				
IIC	0.105	3.2		53
IIB / IIIC	0.81	12.9		215
IIA	2.89	25.8		430

NOTE:

The above parameters apply when one of the two conditions below is given:

- the total L_i of the external circuit (excluding the cable) is < 1% of the L_o value or
- the total C_i of the external circuit (excluding the cable) is < 1% of the C_o value.

The above parameters are reduced to 50% when both of the two conditions below are given:

- the total L_i of the external circuit (excluding the cable) \geq 1% of the L_o value and
- the total C_i of the external circuit (excluding the cable) \geq 1% of the C_o value.

Note: the reduced capacitance of the external circuit (including cable) shall not be greater than 1 μ F for Groups IIA & IIB/IIIC and 600nF for Group IIC.

16 Report Number

See Certificate History

17 Specific Conditions of Use

None

18 Essential Health and Safety Requirements

In addition to the Essential Health and Safety Requirements (EHSRs) covered by the standards listed at item 9, the following are considered relevant to this product:

Clause	Subject	Compliance
1.2.7	LVD type requirements	Manufacturer responsibility
1.2.8	Overloading of equipment (protection relays, etc.)	User/Installer responsibility
1.4.1	External effects	User/Installer responsibility
1.4.2	Aggressive substances, etc.	User/Installer responsibility

19 Drawings and Documents

New drawings submitted for this issue of certificate.

Number	Sheet	Issue	Date	Description
366-034BS-A	1 of 1	A	2018-May-31	Summary
366-34BS-09A	1 & 2	A	2018-May-31	Instructions for HART-loop-converter type KFD2-HLC-Ex1.D.xx
366-034BS-10A	1 – 5	A	2018-May-31	Type Label

Current drawings also associated with this certificate.

Number	Sheet	Issue	Date	Description
366-034BS-00	1 to 22	Original	2007-July-24	Description – KFD2-HLC-Ex1.D.**
366-034BS-01	1 to 2	Original	2007-Jul-25	Schematic Drawing – KFD2-HLC-Ex1.D.xx microprocessor + analog section
366-034BS-01	3	Original	2007-Jul-25	Schematic Drawing – KFD2-HLC-Ex1.D.xx supply section
366-034BS-02	1 to 5	Original	2007-Jul-25	Component List – KFD2-HLC-Ex1.D.4S microprocessor and analog section
366-034BS-02	6 to 8	Original	2007-Jul-25	Component List – KFD2-HLC-Ex1.D.4S supply section
366-034BS-03	1	Original	2007-Apr-11	Component Layout TOP – KFD2-HLC-Ex1.D.xx microprocessor and analog section
366-034BS-03	2	Original	2007-Apr-11	Component Layout TOP – KFD2-HLC-Ex1.D.xx supply section
366-034BS-04	1 to 11	Original	2007-Jul-24	Mechanical Parts – KFD2-HLC-Ex1.D.**
366-034BS-05	1	Original	2007-Apr-11	PCB Layout component side (L1) – KFD2-HLC-Ex1.D.** microprocessor and analog section
366-034BS-05	2	Original	2007-Apr-11	PCB Layout internal layer L2 – KFD2-HLC-Ex1.D.** microprocessor and analog section
366-034BS-05	3	Original	2007-Apr-11	PCB Layout internal layer L3 – KFD2-HLC-Ex1.D.** microprocessor and analog section
366-034BS-05	4	Original	2007-Apr-11	PCB Layout solder side (L4) – KFD2-HLC-Ex1.D.** microprocessor and analog section
366-034BS-05	5	Original	2007-Apr-11	PCB Layout component side (L1) – KFD2-HLC-Ex1.D.** supply section
366-034BS-05	6	Original	2007-Apr-11	PCB Layout internal layer L2 – KFD2-HLC-Ex1.D.** supply section
366-034BS-05	7	Original	2007-Apr-11	PCB Layout internal layer L3 – KFD2-HLC-Ex1.D.** supply section
366-034BS-05	8	Original	2007-Apr-11	PCB Layout solder side (L4) – KFD2-HLC-Ex1.D.** supply section
366-034BS-06	1 to 4	Original	11.04.2007	Supply Transformer for KFD2-HLC-Ex1.D.**
366-034BS-06	5 to 8	Original	11.04.2007	HART Transformer for KFD2-HLC-Ex1.D.**
366-034BS-07	1	Original	2007-Apr-11	Lacquering component side – KFD2-HLC-Ex1.D.** microprocessor and analog section
366-034BS-07	2	Original	2007-Apr-11	Lacquering solder side – KFD2-HLC-Ex1.D.** microprocessor and analog section
366-034BS-07	3	Original	2007-Apr-11	Lacquering component side – KFD2-HLC-Ex1.D.** supply section

Number	Sheet	Issue	Date	Description
366-034BS-07	4	Original	2007-Apr-11	Lacquering solder side – KFD2-HLC-Ex1.D.** supply section

The above drawings are associated and held with IECEx Certificate No. IECEx BAS 07.0047

20 Certificate History

Certificate No.	Date	Comments
Baseefa07ATEX0174	5 October 2007	The release of the prime certificate. The associated test and assessment against the requirements of EN 60079-0:2006, EN 60079-11:2007, EN 61241-0:2006 & EN 61241-11:2005 is documented in Test Report No. GB/BAS/ExTR07.0092/00. Project File No. 07/0422.
Baseefa07ATEX0174 Issue 1	25 June 2018	To confirm that the equipment covered by this certificate has been reviewed against the requirements of EN 60079-0:2012+A11:2013 & EN 60079-11:2012 in respect of the differences from EN 60079-0:2006, EN 60079-11:2007, EN 61241-0:2006 & EN 61241-11:2005 and that none of these differences, with the exception of marking, affect this equipment. The equipment is now marked as follows: [Ex ia Ga] IIC [Ex ia Da] IIIC Report No. GB/BAS/ExTR18.0148/00. Project File No. 17/0738
For drawings applicable to each issue, see original of that issue.		