[1] # EU – TYPE EXAMINATION CERTIFICATE

[2] Equipment or Protective Systems Intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU

[3] EU-Type Examination Certificate Number: **EXA 16 ATEX 0025X** Issue: **2**

[4] Product: **Digital Output modules (with Position Feedback)**

Type: **LB6116/17* and LB2116/17***

[5] Manufacturer: **Pepperl+Fuchs GmbH**

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

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

[8] Ex-Agencija, Notified Body number 2465 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 of the Directive.

The examination and test results are recorded in confidential Report No.: **EXA 16CR074**

[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** **EN 60079-15:2010**

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 Specific Conditions of Use specified in the schedule to this certificate.

[11] This EU-Type Examination Certificate relates only to the design, examination and test of the specified product in accordance with Annex III. Further requirements of the Directive apply to the manufacturing process and supply of this products. These are not covered by this certificate.

[12] The marking of the product shall include the following:

II 3 (1) G Ex nA [ia Ga] IIC T4 Gc
II (1) D [Ex ia Da] IIIC
I (M1) [Ex ia Ma] I

or

II 3(1) G Ex nAc [ia Ga] IIC T4
II (1) D [Ex ia] IIIC
I (M1) [Ex ia] I

Date: 07.11.2016.

PB.15.TI.974/RS

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[13] **SCHEDULE**

[14] **EU - TYPE EXAMINATION CERTIFICATE No.: EXA 16 ATEX 0025X**

[15] **Description of product**

The Digital Output modules type LB6116/17* and LB2116/17* (with Position Feedback) are associated apparatus which are also suitable for installation in areas requiring category 3G equipment.
The modules provide one (LB2116* or LB2117*) or two binary outputs (LB6116* or LB6117), e.g. for driving valves and two (LB2116* or LB2117*) or none (LB6116* or LB6117*) digital inputs according to Namur Standard (8.2 V supply for "dry contacts"/Namur switches/passive actors – like switches with/without resistors).
The modules are only permitted to operate in connection with approved LB-Backplanes providing a power supply from a dedicated power supply module. SELV/PELV power supply/supplies are required to supply the LB System.

Intrinsically safe circuits
All Namur inputs:

LB2116/17*	**Digital Input** **ch1: Pin 2(+) - 4/5/6(-)** **ch2: Pin 3(+) - 4/5/6(-)**	
Maximum values:	U_O = 10 V I_O = 13 mA P_O = 33 mW (linear) Ci = 12 nF Li = negligible	
Ex ia IIC	C_0 = 2.97 µF L_0 = 100 mH	L_0/R_0 = 1.094 mH/Ω
Ex ia IIB	C_0 = 19.7 µF L_0 = 100 mH	L_0/R_0 = 4.376 mH/Ω
Ex ia IIA	C_0 = 99.7 µF L_0 = 100 mH	L_0/R_0 = 8.752 mH/Ω
Ex ia I	C_0 = 177 µF L_0 = 100 mH	L_0/R_0 = 14.358 mH/Ω

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All outputs:

LB6116*	**Digital Output** **ch1: Pin 1(+) - 4/5/6/8(-)** **ch2: Pin 7(+) - 4/5/6/8(-)**	
Maximum values:	U_O = 24.2 V I_O = 108 mA P_O = 654 mW (linear) Ci = 12 nF Li = negligible	
Ex ia IIC	C_0 = 110 nF L_0 = 3.04 mH	L_0/R_0 = 0.054 mH/Ω
Ex ia IIB	C_0 = 898 nF L_0 = 12.1 mH	L_0/R_0 = 0.216 mH/Ω
Ex ia IIA	C_0 = 3.25 µF L_0 = 24.3 mH	L_0/R_0 = 0.432 mH/Ω
Ex ia I	C_0 = 5.15 µF L_0 = 40.0 mH	L_0/R_0 = 0.708 mH/Ω
Parameters for the use of both outputs in parallel (SW option to assert outputs simultaneously; connector Pin 1 must be directly connected externally to Pin 7 at the connector)*		
Maximum values:	U_O = 24.2 V I_O = 216 mA P_O = 1308 mW (linear) Ci = 24 nF Li = negligible	
Ex ia IIB	C_0 = 886 nF L_0 = 3.04 mH	L_0/R_0 = 0.027 mH/Ω
Ex ia IIA	C_0 = 3.24 µF L_0 = 6.09 mH	L_0/R_0 = 0.108 mH/Ω
Ex ia I	C_0 = 5.14 µF L_0 = 10.0 mH	L_0/R_0 = 0.216 mH/Ω

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LB6117*	**Digital Output** **ch1: Pin 1(+) - 4/5/6/8(-)** **ch2: Pin 7(+) - 4/5/6/8(-)**	
Maximum values:	U_O = 17.8 V I_O = 162 mA P_O = 721 mW (linear) Ci = 12 nF Li = negligible	
Ex ia IIC	C_0 = 309 nF L_0 = 1.35 mH	L_0/R_0 = 0.049 mH/Ω
Ex ia IIB	C_0 = 1.82 µF L_0 = 5.41 mH	L_0/R_0 = 0.196 mH/Ω
Ex ia IIA	C_0 = 7.88 µF L_0 = 10.83 mH	L_0/R_0 = 0.392 mH/Ω
Ex ia I	C_0 = 10.4 µF L_0 = 17.7 mH	L_0/R_0 = 0.643 mH/Ω
Parameters for the use of both outputs in parallel (SW option to assert outputs simultaneously; connector Pin 1 must be directly connected externally to Pin 7 at the connector)*		
Maximum values:	U_O = 17.8 V I_O = 324 mA P_O = 1442 mW (linear) Ci = 24 nF Li = negligible	
Ex ia IIC	C_0 = 297 nF L_0 = 0.338 mH	L_0/R_0 = 0.024 mH/Ω
Ex ia IIB	C_0 = 1.81 µF L_0 = 1.35 mH	L_0/R_0 = 0.096 mH/Ω
Ex ia IIA	C_0 = 7.87 µF L_0 = 2.70 mH	L_0/R_0 = 0.192 mH/Ω
Ex ia I	C_0 = 10.3 µF L_0 = 4.44 mH	L_0/R_0 = 0.315 mH/Ω

LB2116*	**Digital Output** **ch1: Pin 1(+) - 4/5/6 (-)**	
Maximum values:	U_O = 24.2 V I_O = 108 mA P_O = 654 mW (linear) Ci = 12 nF Li = negligible	
Ex ia IIC	C_0 = 110 nF L_0 = 3.04 mH	L_0/R_0 = 0.054 mH/Ω
Ex ia IIB	C_0 = 898 nF L_0 = 12.1 mH	L_0/R_0 = 0.216 mH/Ω
Ex ia IIA	C_0 = 3.25 µF L_0 = 24.3 mH	L_0/R_0 = 0.432 mH/Ω
Ex ia I	C_0 = 5.15 µF L_0 = 40.0 mH	L_0/R_0 = 0.708 mH/Ω

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LB2117*	**Digital Output** **ch1: Pin 1(+) - 4/5/6 (-)**	
Maximum values:	U_O = 17.8 V I_O = 162 mA P_O = 721 mW (linear) Ci = 12 nF Li = negligible	
Ex ia IIC	C_0 = 309 nF L_0 = 1.35 mH	L_0/R_0 = 0.049 mH/Ω
Ex ia IIB	C_0 = 1.82 µF L_0 = 5.41 mH	L_0/R_0 = 0.196 mH/Ω
Ex ia IIA	C_0 = 7.88 µF L_0 = 10.83 mH	L_0/R_0 = 0.392 mH/Ω
Ex ia I	C_0 = 10.4 µF L_0 = 17.7 mH	L_0/R_0 = 0.643 mH/Ω

The above parameters for capacitance and inductance apply when one of the two conditions below is met:
- The total Li of the external circuit (excluding the cable) is < 1% of the Lo value or
- The total Ci of the external circuit (excluding the cable) is < 1% of the Co value.

The above parameters for capacitance and inductance are reduced to 50% when both of the two conditions below are met:
- the total Li of the external circuit (excluding the cable) > 1% of the Lo value and
- the total Ci of the external circuit (excluding the cable) > 1% of the Co value.

The reduced capacitance of the external circuit (including cable) shall not be greater than 1µF for I, IIA, IIB and 600nF for IIC.

Rated data:
Tamb = -40°C to +60°C
Ingress protection: IP20

[16] Confidential Report No. EXA 16CR055

[16.1] Routine testing
The manufacturer shall carry out the following routine test:

Routine test for infallible transformer.

[17] Specific Conditions of Use

- The devices must be installed and operated only in an environment that ensures a pollution degree 2 (or better) according to EN 60664-1.
  Installation in safe area:
  The device must be installed
  - in an enclosure with a degree of protection at least IP54 according to EN 60529 and EN 60079-0
  or
  - in a controlled environment providing pollution degree 2, or better.

  Installation in areas requiring category 3G equipment :

  - The equipment shall be installed in an enclosure that provides a degree of protection not less than IP 54 in accordance with EN 60529 and EN 60079-15.

- All circuits connected to the device must comply with overvoltage category II (or better) according to EN 60664-1.
- SELV/PELV power supply is required to supply the LB-system.

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[18] Essential Health and Safety Requirements

Covered by the standards listed at item 9.

[19] Drawings and Documents

Title:	Drawing No.:	Rev. level:	Date:
Overview	16-1009EX_A	-	24.10.2016
Description	16-1009EX-00A	-	24.10.2016
Schematic drawing (Base PCB)	16-1009EX-01	-	12.04.2016
Schematic drawing (Shunt-PCB)		-	18.04.2016
Safety relevant components	16-1009EX-02A	-	24.10.2016
Assembly plan (Base-PCB)	16-1009EX-03A	-	24.10.2016
Assembly plan (Shunt-PCB)	16-1009EX-03	-	12.04.2016
Layer drawing (Base/Shunt PCB)	16-1009EX-04	-	20.04.2016
PCB Layout (Base-PCB)	16-1009EX-05A	-	24.10.2016
PCB Layout (Shunt-PCB)	16-1009EX-05	-	12.04.2016
Transformer drawings PWR- and Com-Transformer	16-1009EX-06	-	20.02.2015
Safety Instructions	16-1009EX-09	-	27.04.2016
Type Label	16-1009EX-10	-	27.04.2016

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