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TYPE EXAMINATION CERTIFICATE[2] Equipment or Protective Systems Intended for use in Potentially Explosive Atmospheres
Directive 2014/34/EU[3] Type Examination Certificate Number: **EXA 16 ATEX 0035X** Issue: **1**[4] Product: **Digital Output modules (with Position Feedback)**Type: **LB6016/17* and LB2016/17***[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 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 16CR055**

[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 Type Examination Certificate relates only to the design, examination and test of the specified product in accordance with Annex III.

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

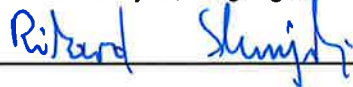
 **II 3 G Ex nA [ic] IIC T4 Gc** or **II 3 G Ex nAc [ic] IIC T4**

Date: 07.09.2016.

PB.15.TI.370/RS

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**Ex-Agencija**
Department of equipment certification
Approved by:

Stipo Đerek, dipl.ing.el.



[13]

SCHEDULE

[14] TYPE EXAMINATION CERTIFICATE No.:

EXA 16 ATEX 0035X

[15] Description of product

The Digital Output modules type LB6016/17* and LB2016/17* (with Position Feedback) are associated apparatus which are also suitable for installation in areas requiring category 3G equipment.

The modules provide one (LB2xnn) or two binary outputs (LB6xnn), e.g. for driving valves (nn = number: [1, 217]) and two or none digital inputs according to Namur Standard (8.2 V supply for "dry contacts"/Namur switch). The inputs are for use with dry contacts (passive actors, like switch w./w.o. resistors) only.

The modules are only permitted to operate in connection with approved LB-Backplanes providing a power supply from a dedicated power supply module. A SELV/PELV power supply is required to supply the LB System.

Intrinsically safe circuits
All Namur inputs:

LB2016/17*	Digital Input ch1: Pin 2(+)-4/5/6 (-) ch2: Pin 3(+)-4/5/6 (-)	
Maximum values:	$U_o = 10\text{ V}$ $I_o = 13\text{ mA}$ $P_o = 33\text{ mW (linear)}$ $C_i = 12\text{ nF}$ $L_i = \text{negligible}$	
Ex ic IIC	$C_o = 19.8\ \mu\text{F}$ $L_o = 100\text{ mH}$	$L_o/R_o = 1.094\text{ mH}/\Omega$
Ex ic IIB	$C_o = 448\ \mu\text{F}$ $L_o = 100\text{ mH}$	$L_o/R_o = 4.376\text{ mH}/\Omega$
Ex ic IIA	$C_o = 998\ \mu\text{F}$ $L_o = 100\text{ mH}$	$L_o/R_o = 8.752\text{ mH}/\Omega$

All outputs:

LB6016*	Digital Output ch1: Pin 1(+) - 4/5/6/8(-) ch2: Pin 7(+) - 4/5/6/8(-)	
Maximum values:	$U_o = 24.2 \text{ V}$ $I_o = 108 \text{ mA}$ $P_o = 654 \text{ mW (linear)}$ $C_i = 12 \text{ nF}$ $L_i = \text{negligible}$	
Ex ic IIC	$C_o = 122 \text{ nF}$ $L_o = 3.04 \text{ mH}$	$L_o/R_o = 0.054 \text{ mH}/\Omega$
Ex ic IIB	$C_o = 910 \text{ nF}$ $L_o = 12.1 \text{ mH}$	$L_o/R_o = 0.216 \text{ mH}/\Omega$
Ex ic IIA	$C_o = 3.27 \mu\text{F}$ $L_o = 24.3 \text{ mH}$	$L_o/R_o = 0.432 \text{ mH}/\Omega$
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:	$U_o = 24.2 \text{ V}$ $I_o = 216 \text{ mA}$ $P_o = 1308 \text{ mW (linear)}$ $C_i = 24 \text{ nF}$ $L_i = \text{negligible}$	
Ex ic IIC	$C_o = 424 \text{ nF}$ $L_o = 1.71 \text{ mH}$	$L_o/R_o = 0.027 \text{ mH}/\Omega$
Ex ic IIB	$C_o = 2.64 \mu\text{F}$ $L_o = 6.85 \text{ mH}$	$L_o/R_o = 0.108 \text{ mH}/\Omega$
Ex ic IIA	$C_o = 10.6 \mu\text{F}$ $L_o = 13.7 \text{ mH}$	$L_o/R_o = 0.216 \text{ mH}/\Omega$

LB6017*	Digital Output ch1: Pin 1(+) - 4/5/6/8(-) ch2: Pin 7(+) - 4/5/6/8(-)	
Maximum values:	$U_o = 17.8 \text{ V}$ $I_o = 162 \text{ mA}$ $P_o = 721 \text{ mW (linear)}$ $C_i = 12 \text{ nF}$ $L_i = \text{negligible}$	
Ex ic IIC	$C_o = 1.45 \text{ }\mu\text{F}$ $L_o = 3.04 \text{ mH}$	$L_o/R_o = 0.049 \text{ mH}/\Omega$
Ex ic IIB	$C_o = 9.58 \text{ }\mu\text{F}$ $L_o = 12.1 \text{ mH}$	$L_o/R_o = 0.196 \text{ mH}/\Omega$
Ex ic IIA	$C_o = 37.9 \text{ }\mu\text{F}$ $L_o = 24.3 \text{ mH}$	$L_o/R_o = 0.392 \text{ mH}/\Omega$
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:	$U_o = 17.8 \text{ V}$ $I_o = 324 \text{ mA}$ $P_o = 1442 \text{ mW (linear)}$ $C_i = 24 \text{ nF}$ $L_i = \text{negligible}$	
Ex ic IIC	$C_o = 1.45 \text{ }\mu\text{F}$ $L_o = 0.762 \text{ mH}$	$L_o/R_o = 0.024 \text{ mH}/\Omega$
Ex ic IIB	$C_o = 9.58 \text{ }\mu\text{F}$ $L_o = 3.04 \text{ mH}$	$L_o/R_o = 0.096 \text{ mH}/\Omega$
Ex ic IIA	$C_o = 37.9 \text{ }\mu\text{F}$ $L_o = 6.09 \text{ mH}$	$L_o/R_o = 0.192 \text{ mH}/\Omega$
LB2016*	Digital Output ch1: Pin 1(+) - 4/5/6 (-)	
Maximum values:	$U_o = 24.2 \text{ V}$ $I_o = 108 \text{ mA}$ $P_o = 654 \text{ mW (linear)}$ $C_i = 12 \text{ nF}$ $L_i = \text{negligible}$	
Ex ic IIC	$C_o = 436 \text{ nF}$ $L_o = 6.85 \text{ mH}$	$L_o/R_o = 0.054 \text{ mH}/\Omega$
Ex ic IIB	$C_o = 2.65 \text{ }\mu\text{F}$ $L_o = 27.4 \text{ mH}$	$L_o/R_o = 0.216 \text{ mH}/\Omega$
Ex ic IIA	$C_o = 10.6 \text{ }\mu\text{F}$ $L_o = 54.8 \text{ mH}$	$L_o/R_o = 0.432 \text{ mH}/\Omega$

LB2017*	Digital Output ch1: Pin 1(+)- 4/5/6 (-)	
Maximum values:	$U_o = 17.8 \text{ V}$ $I_o = 162 \text{ mA}$ $P_o = 721 \text{ mW (linear)}$ $C_i = 12 \text{ nF}$ $L_i = \text{negligible}$	
Ex ic IIC	$C_o = 1.45 \mu\text{F}$ $L_o = 3.04 \text{ mH}$	$L_o/R_o = 0.049 \text{ mH}/\Omega$
Ex ic IIB	$C_o = 9.58 \mu\text{F}$ $L_o = 12.1 \text{ mH}$	$L_o/R_o = 0.196 \text{ mH}/\Omega$
Ex ic IIA	$C_o = 37.9 \mu\text{F}$ $L_o = 24.3 \text{ mH}$	$L_o/R_o = 0.392 \text{ mH}/\Omega$

The above parameters for capacitance and inductance apply when one of the two conditions below is met:

- 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 for capacitance and inductance are reduced to 50% when both of the two conditions below are met:

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

The reduced capacitance of the external circuit (including cable) shall not be greater than $1\mu\text{F}$ for I, IIA, IIB and 600nF for IIC.

Rated data:

$T_{amb} = -40^\circ\text{C}$ to $+60^\circ\text{C}$

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.

[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	-	28.04.2016
Description	16-1009EX-00	-	20.04.2016
Schematic drawing (Base PCB)	16-1009EX-01	-	12.04.2016
Schematic drawing (Shunt-PCB)	16-1009EX-01	-	18.04.2016
Safety relevant components	16-1009EX-02	-	20.04.2016
Assembly plan (Base-PCB)	16-1009EX-03	-	12.04.2016
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-05	-	12.04.2016
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