



**INSTITUTE FOR TESTING AND CERTIFICATION, a.s.**

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**TESTING LABORATORY No. 1004.3**

accredited by the Czech Institute for Accreditation, o. p. s  
according to CSN EN ISO/IEC 17025

**Test Report No: 414103467AM1**

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# TEST REPORT

about the test

DIN rail transmitters PXN30/R, PX310/R, AC24/R, PXN/R, PX24/R



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Applicant (Copy No. 2, 3)

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The test results mentioned below relate solely to the Equipment under Test.

## 1 GENERAL SPECIFICATIONS

### 1.1 Equipment Under Test (EUT)

DIN rail transmitters:

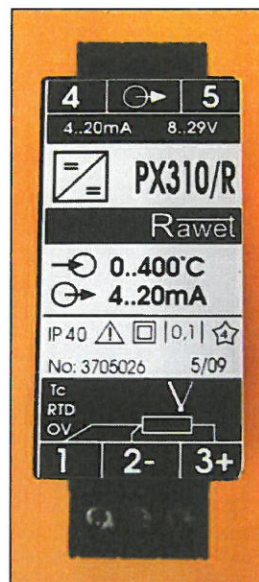
1	PXN30/R	Programmable transducer with galvanic isolation and active output designed for rail vehicles.	S/N 3705013
2	PX310/R	Programmable DC signals transducer with galvanic isolation designed for rail vehicles.	S/N 3705026
3	AC24/R	AC current and voltage transducer designed for rail vehicles.	S/N 3705822
4	PXN/R	DC voltage transducer with galvanic isolation designed for rail vehicles.	S/N 3705497
5	PX24/R	DC current transducer with galvanic isolation designed for rail vehicles.	S/N 3705592

where delivered 2017-05-24 for execution of the tests. Testing laboratory integrated them into the test schedule under the Job No. 414103467.

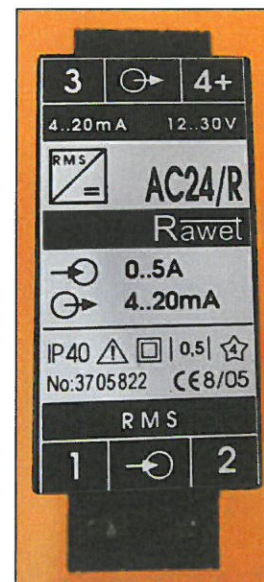
Picture 1.1.A – PXN30/R



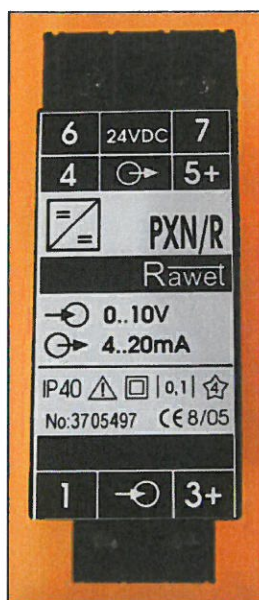
Picture 1.1.B – PX310/R



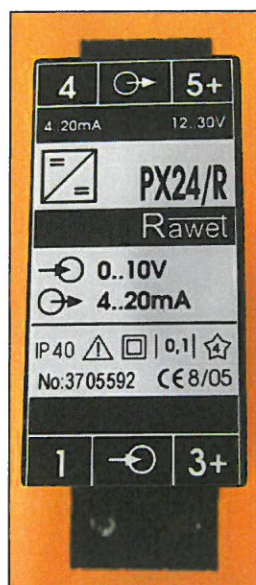
Picture 1.1.C – AC24/R



Picture 1.1.D – PXN/R



Picture 1.1.E – PX24/R



## 1.2 Applicant

Rawet s.r.o.  
Čapkova 22  
678 01Blansko  
Czech Republic

Company ID: 47901411  
Tax ID: CZ47901411

Order No: -  
as of 2017-05-12

## 1.3 Manufacturer

Rawet s.r.o.  
Čapkova 22  
678 01Blansko  
Czech Republic

## 1.4 Test Period

Started on: 2017-05-25  
Finished on: 2017-05-27

## 1.5 Test Condition

Ambient temperature (+15 up to +25) °C, (+59 up to +77) °F  
Barometric pressure (86 up to 106) kPa, (25.4 up to 31.3) inHg  
Relative humidity (25 up to 75) %



**1.6 Specification of Used Regulations**

<i>i</i>	<i>Regulation used</i>	<i>As Czech implementation of</i>
1	ČSN EN 61373 ed.2:2011, Cor. 1:2013, Cor.2:2014, Cor. 3:2017	EN 61373:2010
2	ČSN EN 60068-2-64 ed.2:2009	EN 60068-2-64:2008
3	ČSN EN 60068-2-27 ed.2: 2010	EN 60068-2-27:2009

**1.7 List of Used Instruments and Equipment**

<i>i</i>	<i>Instrument / Equipment</i>	<i>Identification Nr.</i>
1	Vibration equipment TIRA VIB 5142	Ser. No. 34/88
2	Vibration control system VR8500	Ser. No.12BA36
3	Accelerometer 4371	Ser. No.1075141
4	Supply source PXN	Ser. No.A03061
5	Multimeter 34401A	Ser. No.US36022194
6	Multimeter 2000	Ser. No.0708697
7	Multimeter 2700	Ser. No.1105061
8	Multimeter 2700	Ser. No.1130532
9	Multimeter 34401A	Ser. No.US36022183
10	AC current source 5A	Ser. No.-
11	Pkon1 502-S250B1	Ser. No.-
12	Current shunt HP 34330A	Ser. No.US36022194

All listed instruments/equipment have been duly calibrated and passed a regular metrological inspection.

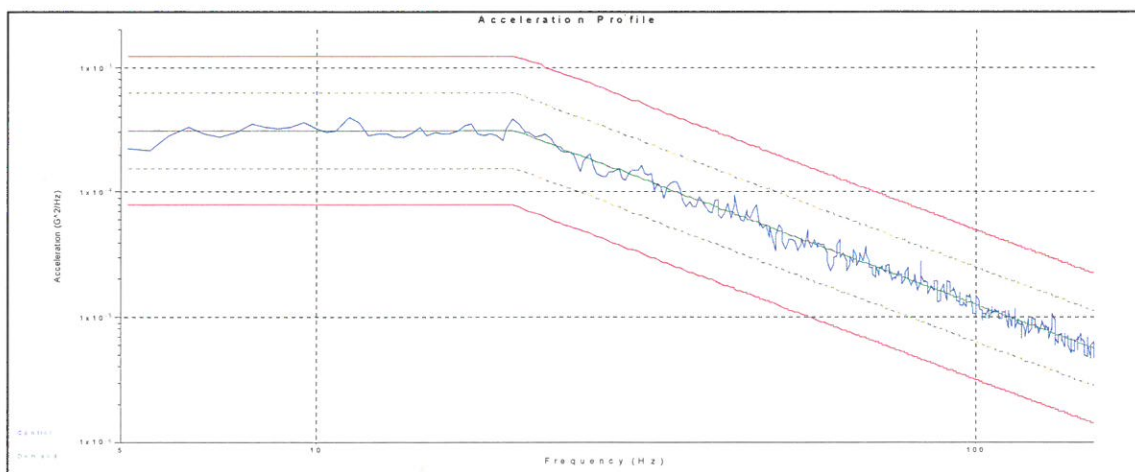
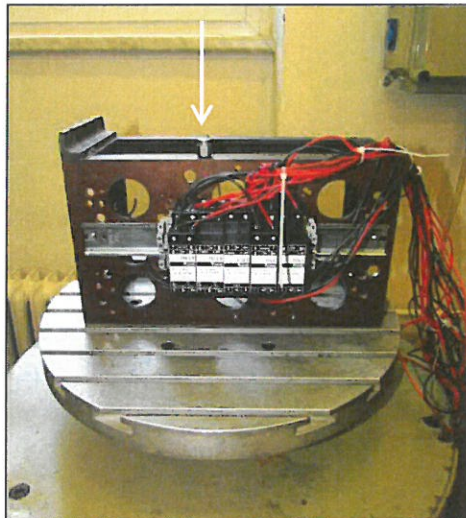
## 2 RESULTS OF INDIVIDUAL TESTS AND EVALUATION

### 2.1 Random vibration - functional test (ČSN EN 61373 ed.2, Chapter 8)

The EUTs Category 1 Class B were exposed for 10 minutes to a random vibration in each of its axes. The EUTs were in the course of vibration in operation.

#### 2.1.1 Vertical orientation (ČSN EN 61373 ed.2 /Category 1, Class B)

Picture 2.1.1.A - Vertical orientation



*Breakpoint table*

Frequency	G <sup>2</sup> /Hz	dB/Octave
5 Hz	0.000313	0
20 Hz	0.000313	-6
150 Hz	5.641e-006	

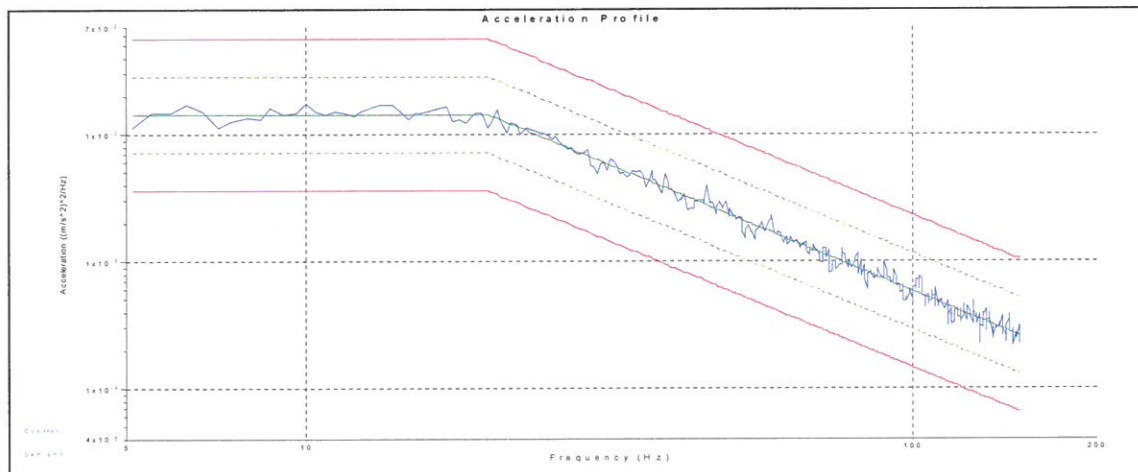
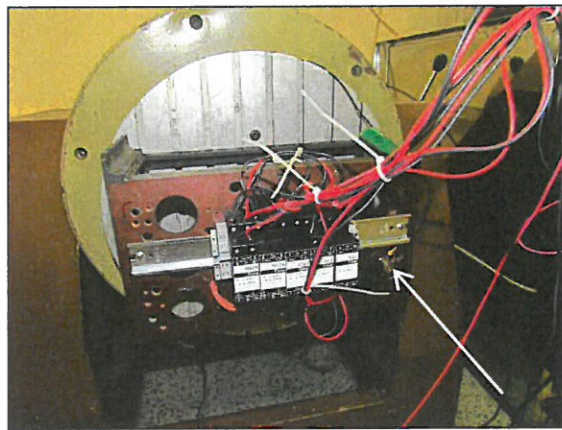
*Test level schedule:*

	Duration	Level
1)	0:10:00	100 %

EUT	lout (mA) - Before the test	lout (mA) during the test
PXN30/R	12,486	12,486
PX310/R	12,487	12,486
AC24/R	19,850	19,855
PXN/R	20,085	20,086
PX24/R	20,081	20,081

**2.1.2 Longitudinal orientation 1 (ČSN EN 61373 ed.2/Category 1, Class B)**

*Picture 2.1.2.A – longitudinal 1 (Transverse and longitudinal orientation unknown)*





*Breakpoint table*

Frequency	(m/s <sup>2</sup> ) <sup>2</sup> /Hz	dB/Octave
5 Hz	0.0144	0
20 Hz	0.0144	-6
150 Hz	0.0002596	

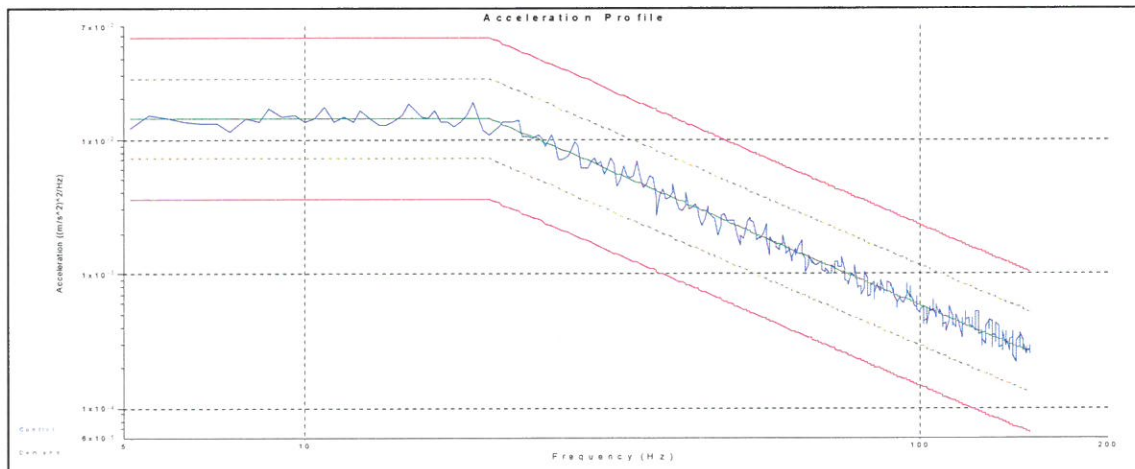
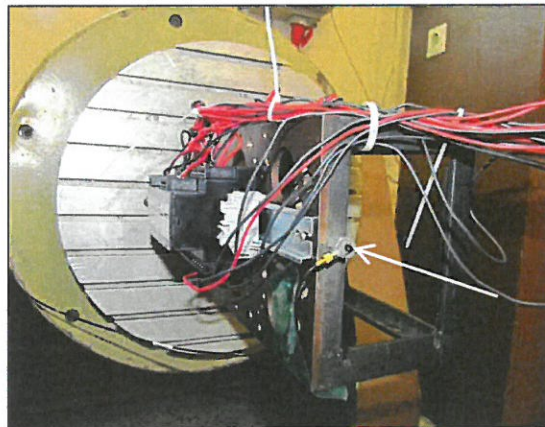
*Test level schedule:*

	Duration	Level
1)	0:10:00	100 %

EUT	lout (mA) - Before the test	lout (mA) during the test
PXN30/R	12,489	12,490
PX310/R	12,483	12,484
AC24/R	20,063	20,081
PXN/R	20,087	20,086
PX24/R	20,081	20,080

**2.1.3 Longitudinal orientation 2 (ČSN EN 61373 ed.2/Category 1, Class B)**

*Picture 2.1.3.A – longitudinal 2 (Transverse and longitudinal orientation unknown)*





Breakpoint table

Frequency	(m/s <sup>2</sup> ) <sup>2</sup> /Hz	dB/Octave
5 Hz	0.0144	0
20 Hz	0.0144	-6
150 Hz	0.0002596	

Test level schedule:

	Duration	Level
1)	0:10:00	100 %

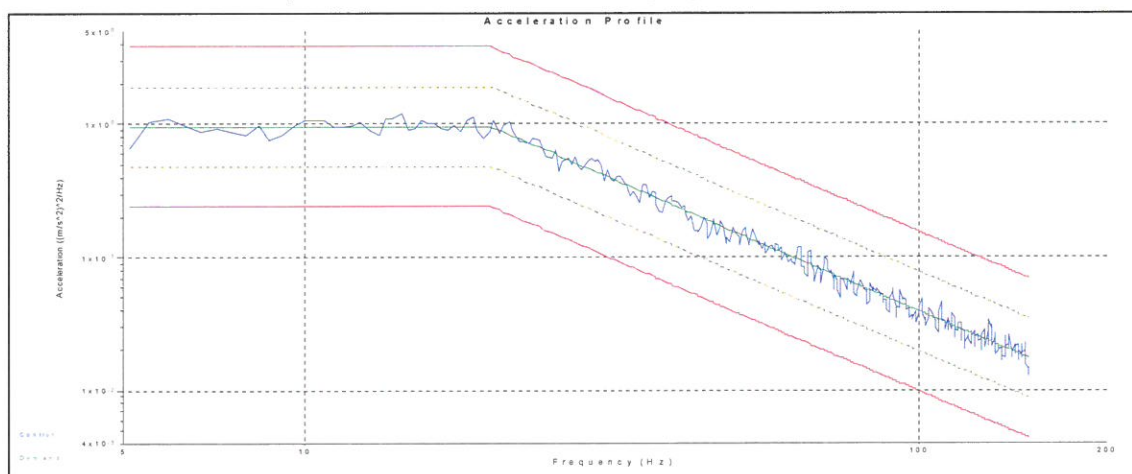
EUT	Iout (mA) - Before the test	Iout (mA) during the test
PXN30/R	12,485	12,484
PX310/R	12,486	12,486
AC24/R	20,005	20,008
PXN/R	20,087	20,087
PX24/R	20,081	20,080

No functional or mechanical fault was found.

2.2 Long life testing at increased random vibrations levels (ČSN EN 61373 ed.2, Chapter 9)

The EUTs Category 1 Class B were exposed for 5 hours to a random vibration in each of its axes. The EUTs were in the course of vibration in not operating mode.

2.2.1 Vertical orientation (ČSN EN 61373 ed.2 /Category 1, Class B)



Breakpoint table

Frequency	(m/s <sup>2</sup> ) <sup>2</sup> /Hz	dB/Octave
5 Hz	0.964	0
20 Hz	0.964	-6
150 Hz	0.01738	



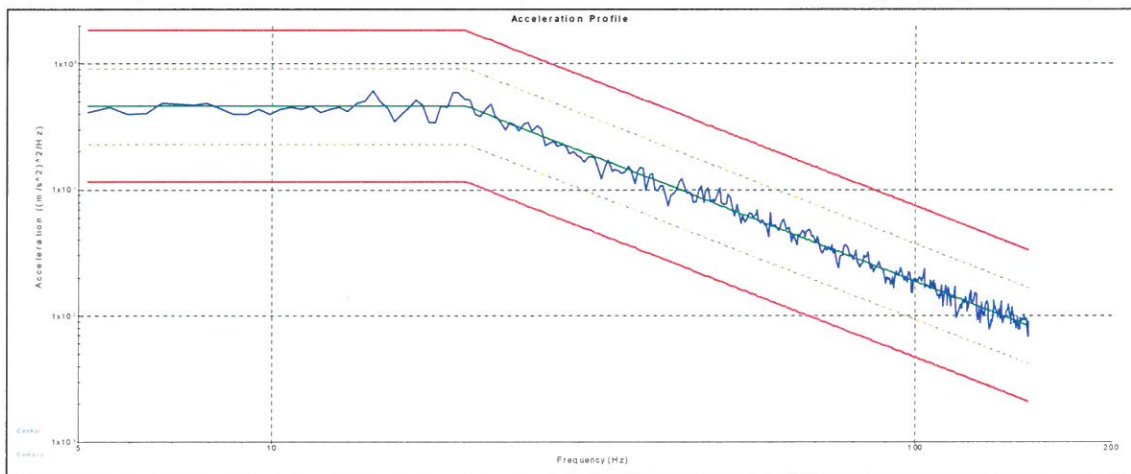


Test level schedule:

	Duration	Level
1)	5:00:00	100 %

EUT	lout (mA) - Before the test	lout (mA) - After the test
PXN30/R	12,486	12,489
PX310/R	12,486	12,482
AC24/R	19,995	20,020
PXN/R	20,086	20,086
PX24/R	20,081	20,082

2.2.2 Longitudinal orientation No. 1 (ČSN EN 61373 ed.2 /Category 1, Class B)



Breakpoint table

Frequency	$(m/s^2)^2/Hz$	dB/Octave
5 Hz	0.461	0
20 Hz	0.461	-6
150 Hz	0.008309	

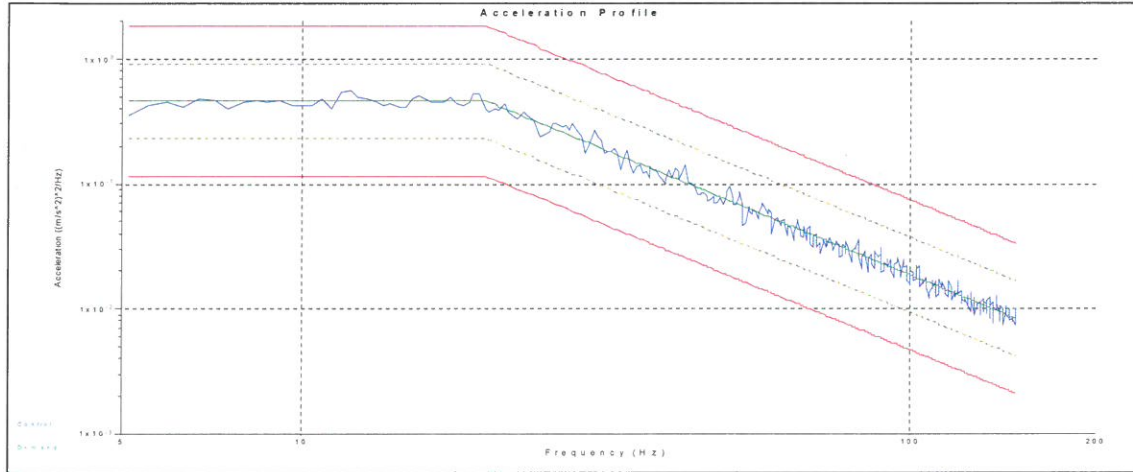
Test level schedule:

	Duration	Level
1)	5:00:00	100 %

EUT	lout (mA) - Before the test	lout (mA) - After the test
PXN30/R	12,490	12,487
PX310/R	12,485	12,485
AC24/R	20,068	20,063
PXN/R	20,085	20,088
PX24/R	20,080	20,082



2.2.3 Longitudinal orientation No. 2 (ČSN EN 61373 ed.2 /Category 1, Class B)



Breakpoint table

Frequency	$(m/s^2)^2/Hz$	dB/Octave
5 Hz	0.461	0
20 Hz	0.461	-6
150 Hz	0.008309	

Test level schedule:

	Duration	Level
1)	5:00:00	100 %

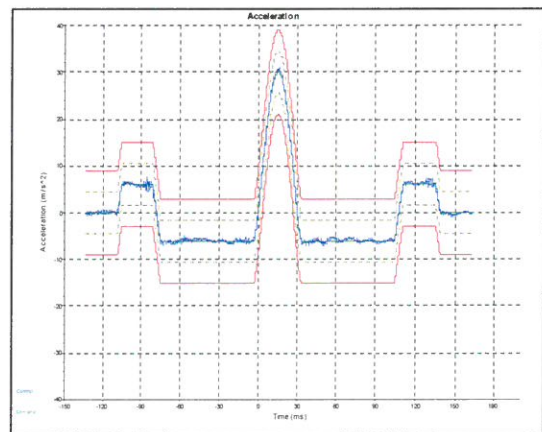
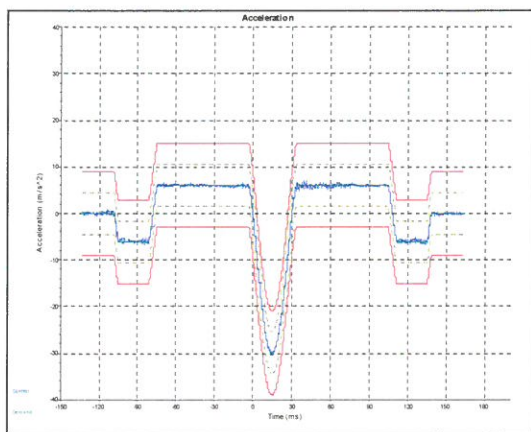
EUT	Iout (mA) - Before the test	Iout (mA) - After the test
PXN30/R	12,487	12,481
PX310/R	12,486	12,482
AC24/R	20,008	19,998
PXN/R	20,087	20,088
PX24/R	20,080	20,083

No functional or mechanical fault was found.

### 2.3. Shock test (ČSN EN 61373 ed.2, Chapter 10)

The EUTs Category 1 Class B were exposed for 18 shocks in each of its ± axes (See orientation Picture 2.1.1.A, 2.1.2.A and 2.1.3.A). The EUTs were in the course of shocks in operation.

#### 2.3.1 Vertical orientation (ČSN EN 61373 ed.2 /Category 1, Class B)



#### Pulse specification:

30 ms Half Sine Pulse with amplitude 30 m/s<sup>2</sup>

Pulse Orientation: Negative (Positive)

Input Filtering: Antialias

Pre-pulse amplitude: 20 % of the peak acceleration

Post-pulse amplitude: 20 % of the peak acceleration

Normal limits used

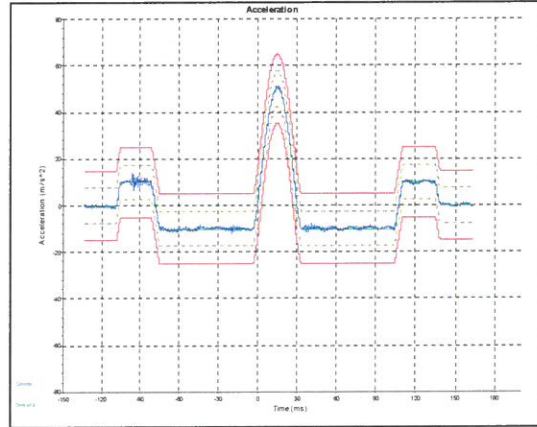
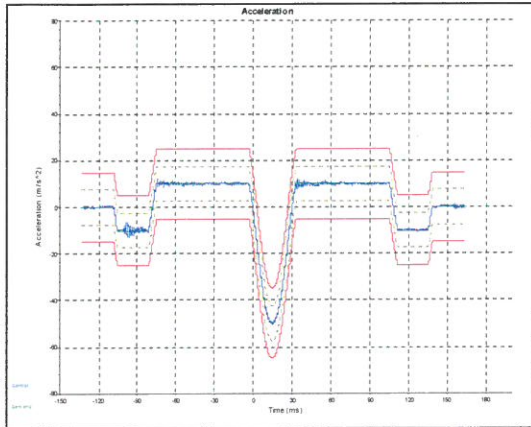
#### Test level schedule:

	Pulses	Level
1)	3 (3)	100 %

EUT	Iout (mA) - Before the test	Iout (mA) - After the test
PXN30/R	12,489	12,488
PX310/R	12,482	12,482
AC24/R	20,020	20,015
PXN/R	20,086	20,086
PX24/R	20,082	20,082



2.3.2 Longitudinal orientation No. 1 (ČSN EN 61373 ed.2 /Category 1, Class B)



Pulse specification:

30 ms Half Sine Pulse with amplitude 50 m/s<sup>2</sup>

Pulse Orientation: Negative (Positive)

Input Filtering: Antialias

Pre-pulse amplitude: 20 % of the peak acceleration

Post-pulse amplitude: 20 % of the peak acceleration

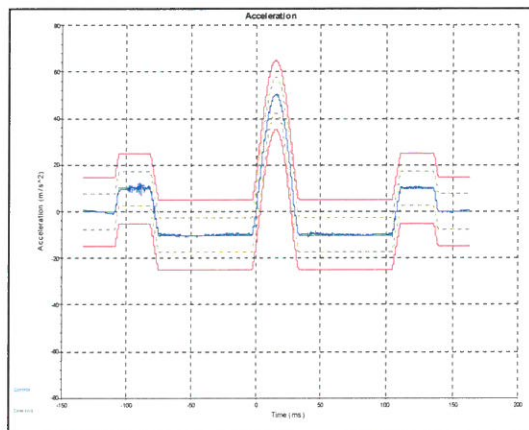
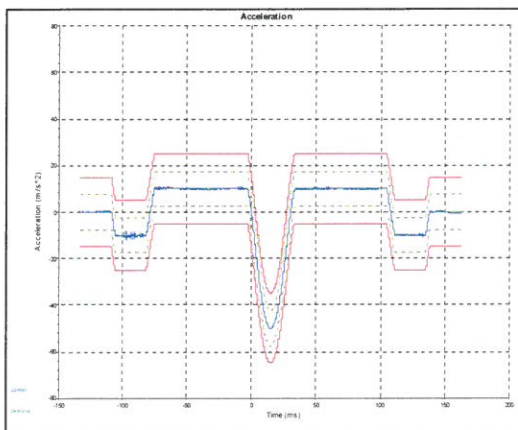
Normal limits used

Test level schedule:

	Pulses	Level
1)	3 (3)	100 %

EUT	Iout (mA) - Before the test	Iout (mA) - After the test
PXN30/R	12,489	12,490
PX310/R	12,483	12,484
AC24/R	20,063	20,081
PXN/R	20,087	20,086
PX24/R	20,081	20,080

2.3.3 Longitudinal orientation No. 2 (ČSN EN 61373 ed.2 /Category 1, Class B)



Pulse specification:

30 ms Half Sine Pulse with amplitude 50 m/s<sup>2</sup>

Pulse Orientation: Negative (Positive)

Input Filtering: Antialias

Pre-pulse amplitude: 20 % of the peak acceleration

Post-pulse amplitude: 20 % of the peak acceleration

Normal limits used

Test level schedule:

	Pulses	Level
1)	3 (3)	100 %

EUT	Iout (mA) - Before the test	Iout (mA) - After the test
PXN30/R	12,485	12,485
PX310/R	12,486	12,486
AC24/R	20,006	20,004
PXN/R	20,086	20,087
PX24/R	20,081	20,081

No functional or mechanical fault was found.

measurement uncertainty: 0,0173 mA

measurement uncertainty acceleration amplitude: 6 %

The extended measuring uncertainty is a product of a standard uncertainty and the extension coefficient k=2, which corresponds to the coverage probability approximately of 95 % using the normal distribution. Standard uncertainty is specified in accordance with the document EA4/16.



### **3 CONCLUSIONS**

The DIN rail transmitters PXN30/R, PX310/R, AC24/R, PXN/R, PX24/R complies with requirements of the following regulations in the range of performed tests:

- EN 61373:2010

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END OF THE REPORT