

DAP Deutsches Akkreditierungssystem Prüfwesen GmbH

Signatory to the Multilateral Agreement of EA for Mutual Recognition  
and to the Mutual Recognition Arrangement of ILAC

represented in the

Deutscher Akkreditierungsrat



Accreditation

The DAP Deutsches Akkreditierungssystem Prüfwesen GmbH herewith confirms that the

**AUCOTEAM**  
Ingenieurgesellschaft für  
Automatisierungs- und  
Computertechnik mbH Berlin

with its

**Testing Laboratory for climatic,  
mechanical and corrosive  
environmental exposures**

Storkower Straße 115 a  
10407 Berlin

is competent under the terms of DIN EN ISO/IEC 17025:2005 to carry out tests in the fields of

**climatic, corrosive and dynamic-mechanical environmental testing;  
weathering test;  
protection and safety tests;  
type testing of electrical meters;  
testing of high voltage switch gears**

in accordance with the test methods listed in the annex. The annex forms part of the certificate and comprises 8 pages.

The accreditation is valid from 2008-09-05 to 2013-09-04.

DAR registration number: **DAP-PL-3439.00**

Berlin, 2008-09-05

*P.-P. Ziegler*

Univ.-Prof. Dr.-Ing. habil. K. Ziegler  
Managing Director  
DAP Deutsches Akkreditierungssystem  
Prüfwesen GmbH



**Annex to the Accreditation Certificate DAP-PL-3439.00  
Accreditation based on DIN EN ISO/IEC 17025:2005**

Period of validity: 2008-09-05 to 2013-09-04

Certificate holder:

**AUCOTEAM  
Ingenieurgesellschaft für  
Automatisierungs- und  
Computertechnik mbH Berlin**

for its

**Testing Laboratory for climatic,  
mechanical and corrosive  
environmental exposures**

Storkower Straße 115 a  
10407 Berlin

Testing in the fields:

**climatic, corrosive and dynamic-mechanical environ-  
mental testing; weathering test; protection and safety  
tests; type testing of electrical meters; testing of high  
voltage switch gears**

abbreviations used:

see last page

*Within any given testing area indicated with \* the laboratory is permitted, without being required to inform and obtain prior approval from the DAP Deutsches Akkreditierungssystem Prüfwesen GmbH, the free choice of standard methods or equivalent/similar methods. The listed test methods are given only as examples.*



## 1 Tests in the field of climatic, corrosive and dynamic-mechanical environmental testing

DIN EN 60068-1 Environmental testing - Part 1: General and guidance  
1995-03

### 1.1 Climatic tests \*

#### 1.1.1 Types of testing

Type of testing	Test parameter	Measurement range	Measurement uncertainty	Characteristic test methods
cold dry heat temperature change, rapid temperature change, slow damp heat, constant damp heat, cyclic composite temperature / humidity combined tests condensation	Temperature	- 75 ... 25° C	3.0 K	DIN EN 60068-2-1 DIN EN 60068-2-2 DIN EN 60068-2-14 DIN EN 60068-2-30 DIN EN 60068-2-78 DIN EN 50155 DIN EN ISO 6270-1 DIN EN ISO 6270-2 DIN EN 60068-2-38
		25 ... 180° C	2.0 K	
		25 ... 1300° C		
	relative humidity	10 ... 100 % r.H.	3.0 % r.H.	
	Change or pause duration	> 1 s	1.0 %	
Lower air pressure with or without temperature		> 200 mbar	5 %	DIN EN 60068-2-13 DIN EN 60068-2-40 DIN EN 60068-2-41
Artificial weathering	Temperature (without radiation exposure) Temperature (with radiation exposure) relative air humidity spray duration Wave length range	-20 ...+90° C +10 ...+90° C 15 ... 95 % r.H. arbitrary 290 ...400 nm -(UV-A)		DIN EN ISO 4892-1 DIN EN ISO 4892-3 DIN EN ISO 11507

#### 1.1.2 Standard methods

DIN EN 50155 2008-03	Railway applications - Electronic equipment used on rolling stock all clauses except EMC
DIN EN 60068-2-1 2008-01	Environmental testing - Part 2-1: Tests - Test A: Cold
DIN EN 60068-2-2 2008-05	Environmental testing - Part 2-1: Tests - Test B: Dry heat
DIN EN 60068-2-13 2000-02	Environmental testing - Part 2: Tests; test M: Low air pressure
DIN EN 60068-2-14 2000-08	Environmental testing - Part 2: Tests; test N: Change of temperature
DIN EN 60068-2-30 2006-06	Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle)



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DIN EN 60068-2-38 2000-02	Environmental testing - Part 2: Tests; test Z/AD: Composite temperature/humidity cyclic test
DIN EN 60068-2-40 2000-08	Environmental testing - Part 2: Tests; test Z/AM: Combined cold/low air pressure tests
DIN EN 60068-2-41 2000-08	Environmental testing - Part 2: Tests; test Z/BM: Combined dry heat/low air pressure tests
DIN EN 60068-2-66 1995-06	Environmental testing - Part 2: Test methods - Test Cx: Damp heat, steady state
DIN EN 60068-2-67 1996-01	Environmental testing - Part 2: Tests; test Cy: Damp heat, steady state, accelerated test primarily intended for components
DIN EN 60068-2-78 2002-09	Environmental testing - Part 2-78: Tests; Test Cab: Damp heat, steady state
DIN EN ISO 6270-1 2002-02	Paints and varnishes - Determination of resistance to humidity - Part 1: Continuous condensation
DIN EN ISO 6270-2 2007-10	Paints and varnishes - Determination of resistance to humidity - Part 2: Procedure for exposing test specimens in condensation-water atmospheres
DIN EN ISO 4892-1 2001-09	Plastics - Methods of exposure to laboratory light sources - Part 1: General guidance
DIN EN ISO 4892-3 2006-05	Plastics - Methods of exposure to laboratory light sources - Part 2: Xenon-arc lamps
DIN EN ISO 11507 2007-05	Paints and varnishes - Exposure of coatings to artificial weathering - Exposure to fluorescent UV lamps and water
RTCA / DO-160 D / 07.97/ 12.00/06.01/05.02 1997-07	Environmental conditions and test Procedures for airborne equipment
Det Norske Veritas 2001	Certification Notes No. 2.4 - Environmental Test Specification for Instrumentation and Automation Equipment Pkt.: 1-14
Germanischer Lloyd 2003	Procedures on performing type testing; Part 1: test requirements for electrical/electronic equipment, computer and accessories Pt.: 1-14
Lloyds Register of Shipping 2002	Procedures on performing of type testing, LR Type Approval System - Test Specification Number Pt.: 1-14



## Annex to Accreditation Certificate DAP-PL-3439.00

each in connection with:

*DIN EN 60068-2-61*      *Environmental testing; part 2: test methods; test Z/ABDM: climatic sequence*  
1993-12

*DIN EN 60068-2-33*      *Environmental testing - Part 2: Tests; guidance on change of temperature tests*  
2000-09

### 1.2 Corrosive tests \*

#### 1.2.1 Types of testing

Type of testing	Test parameters	Test range	measurement uncertainty	characteristic test methods
Salt spray test (constant)	concentration of solution	5 % NaCl	0,1 % NaCl	DIN EN 60068-2-11 DIN EN ISO 9227 DIN EN 50155
	test room temperature	33-37°C	3,0 ° K	
	test room humidity	30 ... 100 % r.H.	3,0 % r.H	
Salt spray test (cyclic)	concentration of solution	5 % NaCl	0,1 % NaCl	DIN EN 60068-2-52
	test room temperature	15-35°C 38-40°C (nur Feuchte ohne Salz)	3,0 ° K	
	test room humidity	30 ... 100 % r.H.	3,0 % r.H	

#### 1.2.2 Standard methods

DIN EN 50155 2008-03	Railway applications - Electronic equipment used on rolling stock all clauses except EMC
DIN EN 60068-2-11 2000-02	Environmental testing - Part 2: Tests; test Ka: Salt mist
DIN EN 60068-2-52 1996-10	Environmental testing - Part 2: Tests, Test Kb: Salt mist, cyclic (sodium chloride solution)
DIN EN ISO 9227 2006-10	Corrosion tests in artificial atmospheres - Salt spray tests
Germanischer Lloyd 2003	Procedures on performing type testing; Part 1: test requirements for electrical/electronic equipment, computer and accessories Pt.: 1-14
Lloyds Register of Shipping 2002	Procedures on performing of type testing, LR Type Approval System - Test Specification Number Pt.: 1-14
Det Norske Veritas 2001	Certification Notes No. 2.4 Environmental Test Specification for Instrumentation and Automation Equipment Pkt.:1-14



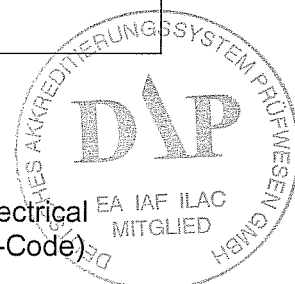
### 1.3 Dynamic-mechanical tests \*

#### 1.3.1 Types of tests

Type of testing	Test parameter	Test range	Measurement uncertainty	Typische Prüfverfahren
Vibration sinusoidal Vibration, Broad band random (noise) Shocks permanent shock	Frequency	5 ... 2000 Hz	0,3 %	DIN EN 60068-2-6 DIN EN 60068-2-27 DIN EN 60068-2-50 DIN EN 60068-2-51 DIN EN 60068-2-55 DIN EN 60255-21-1 DIN EN 60255-21-2 DIN EN 60255-21-3 DIN EN 60068-2-29 DIN EN 60068-2-57 DIN EN 60068-2-64 DIN EN 50155 DIN EN 61173
	Acceleration	0 ... 250 m/s <sup>2</sup> (20 ... 1000 Hz)	3,8 % (0,34 dB)	
		0 ... 250 m/s <sup>2</sup> (5 ... 2000 Hz)	19,9 % (1,58 dB)	
	Shock duration	1 ... 50 ms	5,0 %	
Impact test	Impact energy	0,5 ... 5,0 J	3,0 %	DIN EN 60068-2-75 DIN EN 60068-2-77
	Ambosdiameter	25 / 50 mm	1,0 %	
Free Fall Drop and topple	Fall depth	0 ... 1000 mm	5,0 %	DIN EN 60068-2-31 DIN EN 60068-2-32
	Measured acceleration	0 ... 5000 m/s <sup>2</sup>	5,0 %	
	Measured duration	0 ... 100 ms	3,0 %	

#### 1.3.2 Standard methods

DIN EN 50102 1997-09	Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK-Code)
DIN EN 50155 2008-03	Railway applications - Electronic equipment used on rolling stock all clauses except EMC
DIN EN 60068-2-6 1996-05	Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal)
DIN EN 60068-2-27 1995-03	Environmental testing - Part 2-27: Tests - Test Ea and guidance: Shock
DIN EN 60068-2-29 1995-03	Basic environmental testing procedures - Part 2: Tests; test Eb and guidance: Bump
DIN EN 60068-2-31 1995-03	Basic environmental testing procedures - Part 2: Tests; test Ec: Drop and topple, primarily for equipment-type specimens
DIN EN 60068-2-32 1995-03	Basic environmental testing procedures - Part 2: Tests; test Ed: Free fall



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DIN EN 60068-2-50 2000-08	Environmental testing- Part 2: Tests; tests Z/AFc: Combined cold/vibration (sinusoidal) tests for both heat-dissipating and non-heat-dissipating specimens
DIN EN 60068-2-51 2000-08	Environmental testing - Part 2: Tests; tests Z/BFc: Combined dry heat/vibration (sinusoidal) tests for both heat-dissipating and non-heat-dissipating specimens
DIN EN 60068-2-55 1995-03	Basic environmental testing procedures - Part 2: Tests; test Ee and guidance: Bounce
DIN EN 60068-2-64 1995-08	Environmental testing - Part 2: Test methods; test Fh: Vibration, broad-band random (digital control) and guidance
DIN EN 60068-2-75 1998-06	Environmental testing - Part 2: Tests; test Eh: Hammer tests
DIN EN 60068-2-77 1999-10	Environmental testing - Part 2-77: Tests; test 77: Body strength and impact shock
DIN EN 60255-21-1 1996-05	Electrical relays - Part 21: Vibration, shock, bump and seismic tests on measuring relays and protection equipment; section 1: Vibration tests (sinusoidal)
DIN EN 60255-21-2 1996-05	Electrical relays - Part 21: Vibration, shock, bump and seismic tests on measuring relays and protection equipment; section 2: Shock and bump tests
DIN EN 60255-21-3 1995-11	Electrical relays - Part 21: Vibration, shock, bump and seismic tests on measuring relays and protection equipment; section 3: Seismic tests
Germanischer Lloyd 2003	Procedures on performing type testing; Part 1: test requirements for electrical/electronic equipment, computer and accessories Pt.: 1-14
Lloyds Register of Shipping 2002	Procedures on performing von type testing, LR Type Approval System - Test Specification Number Pt.: 1-14
Det Norske Veritas 2001	Certification Notes No. 2.4 Environmental Test Specification for Instrumentation and Automation Equipment Pkt.: 1-14

### each in connection with:

*DIN EN 60068-2-47  
2006-03*

*environmental testing - Part 2-47: Tests -  
Mounting of specimens for vibration,  
impact and similar dynamic tests*



**1.4 Other tests**

DIN EN ISO 2409 2007-08	Paints and varnishes - Cross-cut test
DIN EN 45502-1 1998-07	Active implantable medical devices - Part 1: General requirements for safety, marking and information to be provided by the manufacturer
EN 60601-1 2008-08	Medical electrical equipment - Part 1: General requirements for basic safety and essential performance
DIN EN 50470-1 2008-06	Electricity metering equipment (a.c.) - Part 1: General requirements, tests and test conditions - Metering equipment (class indexes A, B and C)
DIN EN 50470-2 2007-05	Electricity metering equipment (a.c.) - Part 2: Particular requirements - Electromechanical meters for active energy (class indexes A and B)
DIN EN 50470-3 2007-05	Electricity metering equipment (a.c.) - Part 3: Particular requirements - Static meters for active energy (class indexes A, B and C)
DIN EN 60695-2-11 2001-11	Fire hazard testing - Part 2-11: Glowing/hot-wire based test methods; Glow-wire flammability test method for end-products
DIN EN 60695-2-12 2001-11	Fire hazard testing - Part 2-12: Glowing/hot-wire based test methods; Glow-wire flammability test method for materials
DIN EN 61036 2001-01	Alternating current static watt-hour meters for active energy (classes 1 and 2)
DIN EN 60950-1 2006-11	Information technology equipment - Safety - Part 1: General requirements
DIN EN 61010-1 2002-11	Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements
DIN EN 62271-203 2004-11	High-voltage switchgear and controlgear - Part 203: Gas-insulated metal-enclosed switchgear for rated voltages above 52 kV
MIL STD 810 2000-01	Environmental Engineering considerations and laboratory tests
MIL-STF 883 1996-12	Test method standard microcircuits

**each in connection with:**

*DIN EN 62052-11  
2003-11*

*Electricity metering equipment (AC) -  
General requirements, tests and test  
conditions - Part 11: Metering equipment*



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DIN EN 62053-21  
2003-11

Electricity metering equipment (a.c.) -  
Particular Requirements - Part 21: Static  
meters for active energy (classes 1 and 2)

### 2 Degrees of protection and safety tests

DIN EN 60529 VDE 0470 part 1 2000-09	Degrees of protection provided by enclosures (IP code)
DIN 40050-9 1993-05	Road vehicles; degrees of protection (IP-code); protection against foreign objects; water and contact; electrical equipment
ISO 20653 2006-08	Road vehicles - Degrees of protection (IP-Code) - Protection of electrical equipment against foreign objects, water and access

#### abbreviations used:

DIN	German Institute for Standardisation
EN	European Standard
ISO	Internationale Organisation for Standardisation
VDE	German Association for electrotechnic, electronic information technology.
RTCA	Radio technical commission for aeronautics
MIL STD	Military standard of the US Army

For **all** the above-mentioned fields of testing, the approved signatories are indicated below:

Rosemarie Lein	<i>Diplom-Ingenieur für technische und biomedizinische Kybernetik</i> Engineer for Technical and Biomedical Cybernetics
Michael Geburtig	<i>Diplom-Ingenieur für Automatisierungstechnik</i> Engineer for Automation Teechnology
Manfred Rode	<i>Diplom-Ingenieur für Automatisierungs- und Fernwirktechnik</i> Engineer for Automation and Remote control technology
Christian Kretschmer	<i>Diplom-Ingenieur für Elektrotechnik</i> Electrotechnical Engineer
Michael Hirt	<i>Diplom-Ingenieur für Elektrotechnik</i> Electrotechnical Engineer
Marijan Cusic	<i>Diplom-Ingenieur für Maschinenbau</i> Mechanical Engineer
Gordon Zieten	<i>Diplom-Ingenieur für Maschinenbau, Verfahrens- und Umwelt- technik</i> Engineer for Mechanical Engineering, Process and Environ- mental Technology

