



ATIS STANDARD

ATIS-0600337.2019 (R2024)

**Requirements for Maximum Voltage, Current, and Power
Levels Used in Communications Circuits**

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ATIS-0600337.2019(R2024), Requirements for Maximum Voltage, Current, and Power Levels Used in Communications Circuits

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American National Standard for Telecommunications

Requirements for Maximum Voltage, Current, and Power Levels Used in Communications Circuits

Alliance for Telecommunications Industry Solutions

Approved November 19, 2019

American National Standards Institute, Inc.

Abstract

This document provides a summary of the maximum dc steady-state and duration limited voltage, current, and power limits to be maintained when telecommunications systems provide or receive power over conventional telecommunications twisted-pair conductors/cabling.

Foreword

The information contained in this Foreword is not part of this American National Standard (ANS) and has not been processed in accordance with the American National Standards Institute's (ANSI) requirements for an ANS. As such, this Foreword may contain material that has not been subjected to public review or a consensus process. In addition, it does not contain requirements necessary for conformance to the Standard.

The Alliance for Telecommunication Industry Solutions (ATIS) serves the public through improved understanding between providers, customers, and manufacturers. The Sustainability in Telecom: Energy and Protection (STEP) Committee – formerly the Network Interface, Power, and Protection Committee (NIPP) – engages industry expertise to develop standards and technical reports for telecommunications equipment and environments in the areas of energy efficiency, environmental impacts, power, and protection. The work products of STEP enable vendors, operators, and their customers to deploy and operate reliable, environmentally sustainable, energy efficient communications technologies. STEP is committed to proactive engagement with national, regional, and international standards development organizations and forums that share its scope of work.

ANSI guidelines specify two categories of requirements: mandatory and recommendation. The mandatory requirements are designated by the word shall and recommendations by the word should. Where both a mandatory requirement and a recommendation are specified for the same criterion, the recommendation represents a goal currently identifiable as having distinct compatibility or performance advantages.

Suggestions for improvement of this document are welcome. They should be sent to the Alliance for Telecommunications Industry Solutions, STEP, 1200 G Street NW, Suite 500, Washington, DC 20005.

At the time it approved this document, STEP, which is responsible for the development of this Standard, had the following leadership:

Ernie Gallo, STEP Chair (Ericsson)
John Fuller, STEP Vice-Chair and STEP NEP Vice-Chair (AT&T)
Dan Ashton, STEP NEP Chair (CenturyLink)
Jim Wiese, Technical Editor (ADTRAN)

The **Network Electrical Protection (NEP)** Subcommittee was responsible for the development of this document.

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American National Standard for Telecommunications on –

Requirements for Maximum Voltage, Current, and Power Levels Used in Communications Circuits

1 Scope, Purpose, & Application

1.1 Scope

This document provides a summary of the maximum dc steady-state, pulsed dc, and duration limited voltage, current, and power limits to be maintained when communications systems provide or receive power over conventional twisted-pair conductors/cabling. The technical requirements contained herein are based on industry-recognized safety and design standards, address the Information Communications Telecommunication (ICT) locations (e.g., Central Offices and data centers), Outside Plant (OSP) and customer locations, and are independent of the telecommunications system architectures deployed. Telecommunication signaling levels and transients are not addressed in this document, but should be considered when evaluating a system for conformance to these requirements if they will impact voltage, current, or power level.

This standard is based on the historical and current requirements for telecommunications systems in North America that originated in the Bell System, and are incorporated in NFPA 70® (NEC), Telcordia GR-1089-CORE, ACTA 968, FCC CFR 68, UL/CSA-60950-1, UL/CSA-60950-21, UL-2591, UL/CSA 62368-1, and UL/CSA 62368-3.

- For relatively low voltage/current levels the safety standards are used:
 - TNV (UL/CSA 60950-1). (effective through December, 2020)
 - ES1 for dc and ES2 for interrupted ringing (UL/CSA 62368-3). (effective beginning December 2020)
- When the voltage/current levels in these two standards are exceeded in North America, the GR-1089-CORE limits are used. These GR-1089-CORE limits are consistent with RFT-V limits (ITU-T K.50, UL/CSA 60950-21, and UL/CSA 62368-1).

Similar requirements exist internationally with the exception that the UL/CSA standards are variants of IEC/EN/AS/NZ with various deviations. In addition, country requirements often replace the NEC®, Telcordia, ACTA, and FCC requirements. When voltage/current levels exceed 60 V dc or ES1, non-North American countries traditionally use ES2 (IEC 62368-1) or RFT-C limits (ITU-T K.50 and IEC 60950-21).

This standard should be used in conjunction with ATIS-0600030, *Line Powering of Telecommunications Equipment on OSP Twisted Copper Pair Loops*.

1.2 Purpose

The purpose of this document is to provide requirements for the maximum limits for dc steady-state, pulsed dc, and duration limited voltage, current, and power used to operate communications systems over telecommunications twisted-pair conductors that are consistent with industry-accepted electrical safety and design standards and criteria. These requirements are intended to provide a safe and consistent network electrical environment for the communications service provider technicians, as well as for the customers and system users who may encounter powering voltages and currents on their business/residential telecommunications wiring. Additionally, through informative annexes, this document is intended to inform the reader regarding pertinent criteria contained in various safety and design standards, provide accessibility and service personnel work practice recommendations, and present a brief overview of the physiological effects of electric current on the human body (see further details and tests in ATIS-0600030).