

STN	Kozmická technika Požiadavky na návrh a rozhranie pre elektrické napájanie	STN EN 16603-20-20 31 0543
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Space engineering - Electrical design and interface requirements for power supply

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 01/19

Obsahuje: EN 16603-20-20:2018

127895

EUROPEAN STANDARD

EN 16603-20-20

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2018

ICS 49.140

English version

Space engineering - Electrical design and interface requirements for power supply

Ingénierie spatiale - Exigences de conception et d'interface électriques pour l'alimentation bord

Raumfahrttechnik - Anforderungen an Schnittstellen für elektrische Leistung

This European Standard was approved by CEN on 10 April 2017.

This European Standard was corrected and reissued by the CEN-CENELEC Management Centre on 23 January 2019.

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Table of contents

European Foreword	5
Introduction	6
1 Scope	7
2 Normative references	8
3 Terms, definitions and abbreviated terms	9
3.1 Terms from other standards.....	9
3.2 Terms specific to the present standard	9
3.3 Abbreviated terms.....	18
3.4 Nomenclature	18
4 Principles	20
4.1 General.....	20
4.2 Standard assumptions	20
5 Requirements	21
5.1 Reference power bus specifications	21
5.2 Functional/Source interface requirements.....	23
5.2.1 LCL/HLCL class	23
5.2.2 RLCL class	23
5.2.3 Current limitation section.....	23
5.2.4 Trip-off section	24
5.2.5 UVP section	24
5.2.6 Telecommand section features	25
5.2.7 Conditions at start-up/ switch-off	25
5.2.8 Telemetry section.....	26
5.2.9 Status section	28
5.2.10 Repetitive overload	28
5.2.11 Reverse current tolerance.....	28
5.2.12 Parallel connection.....	29
5.2.13 Switching options	29
5.2.14 LCL Switch dissipative failure.....	31

5.2.15	Loss of LCL lines	32
5.2.16	Noise immunity	32
5.2.17	Output impedance envelope, when in limitation	32
5.2.18	Noise immunity feature	33
5.2.19	Output LCL load (Input load characteristic)	33
5.3	Functional/Load interface requirements	34
5.3.1	Nominal feature.....	34
5.3.2	Switch-on	34
5.3.3	LCL switch dissipative failure	35
5.3.4	Load test condition	35
5.3.5	User UVP at bus input side	35
5.4	Performance/Source interface requirements.....	36
5.4.1	Overall requirements.....	36
5.4.2	Start-up/Switch-off requirements	37
5.4.3	UVP	38
5.4.4	Switch-on capability	39
5.4.5	Voltage drop.....	40
5.4.6	Stability	40
5.4.7	Current Telemetry, accuracy	41
5.4.8	Current Telemetry, offset.....	41
5.4.9	Retrigger interval.....	42
5.4.10	dI/dt limit on retrigger ON edge	42
5.4.11	dI/dt limit on retrigger OFF edge.....	42
5.4.12	Status, accuracy	42
5.5	Performance/Load interface requirements	43
5.5.1	Load reverse current.....	43
5.5.2	Load characteristic	43
5.5.3	Source-load characteristic.....	44
5.5.4	Start-up surge input current.....	44
5.5.5	Internal load Input current limitation	45
Annex A (informative) Requirements mapping		46
Bibliography.....		60

Figures

Figure 3-1: LCL overload timing diagram (case 1)	13
Figure 3-2: LCL overload timing diagram (case 2)	13
Figure 3-3: Typical start-up current profile of a DC/DC converter attached to a LCL.....	14
Figure 3-4: RLCL overload timing diagram	14

Tables

Table 3-1: LCL classes.....	15
Table 3-2: RLCL classes	16
Table 3-3: HLCL classes	17
Table 5-1: Reference Power Bus Specifications	22

European Foreword

This document (EN 16603-20-20:2018) has been prepared by Technical Committee CEN-CENELEC/TC 5 "Space", the secretariat of which is held by DIN.

This standard (EN 16603-20-20:2018) originates from ECSS-E-ST-20-20C.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2019, and conflicting national standards shall be withdrawn at the latest by February 2019.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a standardization request given to CEN by the European Commission and the European Free Trade Association.

This document has been developed to cover specifically space systems and has therefore precedence over any EN covering the same scope but with a wider domain of applicability (e.g. : aerospace).

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This standard identifies the requirements needed to specify, procure or develop a space power distribution based on Latching Current Limiters, both from source and load perspective.

For a reference architecture description, it is possible to refer to ECSS-E-HB-20-20.

ECSS-E-HB-20-20 includes a clarification of the principles of operation of a power distribution based on LCLs, identifies important issues related to LCLs and explains the requirements of the present standard.

Note that the present issue of the standard covers electrical design and interface requirements for power distribution based on Latching Current Limiters only. Future issues of the present standard will cover additional power interfaces.

1

Scope

The target applications covered by this standard are all missions traditionally provided with power distribution and protection by LCLs/RLCLs (science, earth observation, navigation) with exclusion of applications for which the power distribution and protection is provided by fuses (e.g. most of the GEO telecom satellites).

The present standard applies to power distribution by LCLs/RLCLs for power systems, and in general for satellites, required to be Single Point Failure Free.

The present standard document applies exclusively to the main bus power distribution by LCLs/RLCLs to external satellite loads.

A particular case of LCLs (Heater LCLs, or HLCLs) is also treated. The HLCLs are the protection elements of the power distribution to the thermal heaters in a spacecraft.

Internal power system protections of LCLs/RLCLs are not covered.

Paralleling of LCLs to increase power supply line reliability is not covered by the present standard, since this choice does not appreciably change the reliability of the overall function (i.e. LCL plus load).

In fact, a typical reliability figure of the LCL (limited to the loss of its switch-on capability) is 20 FIT or less.

If the load to be connected to the LCL line has a substantial higher failure rate than this, it is not necessary to duplicate the LCL to supply that load.

This standard may be tailored for the specific characteristic and constraints of a space project in conformance with ECSS-S-ST-00.

2**Normative references**

The following normative documents contain provisions which, through reference in this text, constitute provisions of this ECSS Standard. For dated references, subsequent amendments to, or revision of any of these publications do not apply. However, parties to agreements based on this ECSS Standard are encouraged to investigate the possibility of applying the more recent editions of the normative documents indicated below. For undated references, the latest edition of the publication referred to applies.

EN reference	Reference in text	Title
EN 16601-00-01	ECSS-S-ST-00-01	ECSS system - Glossary of terms
EN 16603-20	ECSS-E-ST-20	Space engineering - Electrical and electronic

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