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ULC/ORD-C3141:2025

POWER CONTROL SYSTEMS

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FOREWORD

Certification organizations are periodically requested to promptly provide certification services for devices, constructions, materials and systems where Canadian recognized Standards do not currently exist or are not entirely applicable. Accordingly, the certification organization utilizes its experience, existing specifications and requirements in related areas, together with assistance from its advisory councils to develop and prepare Other Recognized Documents (ORDs) for use in conducting the necessary tests and evaluation investigation.

Underwriters Laboratories of Canada Inc. has prepared many ORDs in response to requests from, and in conjunction with, industry, code writing bodies, regulatory agencies and others prior to promulgating a certification program. In many instances such documents have become published ULC Standards and subsequently National Standards of Canada. It is the intention of Underwriters Laboratories of Canada Inc. to continue this practice, as appropriate.

Comments on the content of this ORD should be directed to the Head Office of Underwriters Laboratories of Canada Inc., 7 Underwriters Road, Toronto, Ontario, Canada, M1R 3A9.

NOTE: These Other Recognized Documents are accepted under the National Standards System of Canada. Reference may be made to the Document "Guidelines for the Development and Maintenance of Other Recognized Documents (ORDs)", published by the Standards Council of Canada located at 55 Metcalfe Street, Suite 600, Ottawa, Ontario, Canada, K1P 6L5.

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PREFACE

This is the First Edition of the Other Recognized Document for Power Control Systems, ULC/ORD-C3141:2025.

The proposed Other Recognized Document ULC/ORD-C3141 covers Power Control Systems (PCS) used in Distributed Energy Resource (DER) systems which include one or more power sources in addition to the primary power source, typically the utility grid.

Only metric SI units of measurement are used in this ORD. If a value for measurement is followed by a value in other units in parentheses, the second value may be approximate. The first stated value is the requirement.

Appendices A and C, identified as normative, form a mandatory part of this ORD. Appendix B, identified as informative, are for informational purposes only.

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

Requests for interpretation of this ORD should be sent to the ULC Mark Program Owner of Underwriters Laboratories of Canada Inc. The requests should be worded in such a manner as to permit a “yes” or “no” answer based on the literal text of the requirement concerned.

ORDs are valid for use by Certification Bodies for certifications for up to 5 years from date of initial validation, or revalidation, unless superseded or withdrawn.

This ORD is intended to be used for conformity assessment.

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1. SCOPE

1.1 These requirements cover Power Control Systems (PCS) used in Distributed Energy Resource (DER) systems which include one or more power sources in addition to the primary power source, typically the utility grid. The PCS electronically limits or controls current or power to stay within defined limits and may consist of a single device or multiple devices operating together as a system. The current or power measurement reference point(s) may be located internally to equipment or externally within the system. All elements of the PCS are intended to be installed in accordance with the Canadian Electrical Code, Part I Safety Standard for Electrical Installations, CSA C22.1 (CE Code).

1.2 PCS may be evaluated and rated for one or more of the primary types of PCS addressed in 1.3 – 1.5 as well as provide one or more of the PCS functions in accordance with 8.1.1 of this ORD. See 10.1 for details regarding rating requirement specifics.

1.3 A PCS may be evaluated as a single source PCS. Single source PCS provide an overload functionality when used with a passive protective device [e.g. Overcurrent Protective Device (OCPD)] used for the protection of service, feeder, or branch circuits. A single source PCS limits power drawn from a single source of supply [e.g. the area Electric Power System (EPS)] via load management.

NOTE 1: Uncontrolled sources may be present in a single source PCS however these sources are not controlled by the PCS. A single source PCS often provides overload control for power imported from the area EPS through load management.

NOTE 2: A single source PCS is located in a circuit(s) where branch circuit rated OCPD's located external to the PCS provide additional protection from overloads.

1.4 A PCS may be evaluated as a multisource PCS. Multisource PCS contain critical overload functionality addressing system overload conditions of systems supplied by more than one source and have control over more than one source. Multisource PCS may contain separate passive protective devices included in their design however these passive protective devices are unable to fully address overload conditions of the multisource system in the event the PCS fails.

NOTE: Multisource PCS may include passive protective devices (typically overcurrent protective devices (OCPDs) used for the protection of service, feeder, or branch circuits however the PCS controlled conductors are able to experience overload conditions that the passive protective devices are not able to fully address at the system level. The PCS functionality addresses these system overload conditions of the PCS controlled conductors

1.5 A PCS may be evaluated for power import limiting (PIL) and/or power export limiting (PEL) functionality where the PCS control and monitoring point is at an external reference point of applicability, such as the point of common coupling with the area EPS. The PCS may limit current and/or power flow from generation sources to the Area EPS (exporting) or limit current and power flow from the Area EPS to loads / the local EPS (importing). PEL and PIL functions do not address overload mitigation in accordance with 8.1.1, items (b) – (e) (overload conditions as described in the CE Code.

NOTE: PIL / PEL functions only address utility facing functionality (area EPS side of the PCC) and do not address CE Code overload conditions (local EPS side of the PCC). PCS may be evaluated only for PIL/PEL functionality, or a combination of both functionalities. The ratings of the PCS reflect which functionalities are included in the scope of the evaluation of the PCS.

1.6 In addition to the required autonomous operation, the PCS may respond to external commands or schedules provided by authorized third parties. The format for scheduling of export or import to or from utilities is defined in this ORD, but specific communication protocols, or other methods, used for transmitting commands or schedules are outside the scope of this ORD. See Annex A for further details.