

## STANDARD INFORMATION

**Standard:** UL 347A

**Standard ID:** Medium Voltage Power Conversion Equipment [UL 347A:2021 Ed.2]

**Previous Standard ID:** Medium Voltage Power Conversion Equipment [UL 347A:2015 Ed.1+R:28Aug2019]

## EFFECTIVE DATE OF NEW/REVISED REQUIREMENTS

**Effective Date:** **March 5, 2023**

## IMPACT, OVERVIEW, AND ACTION REQUIRED

**Impact Statement:** Per our accreditation, Intertek is required to review reports against the standard revisions to confirm compliance. Once compliance is confirmed, the standard reference in the report is updated to show continued compliance to the technical requirements of the standard. Reports not updated to this version by the effective date above will be withdrawn.

### Overview of Changes:

- Requirements for Surge Arrestors
- Arrangement of Components / Operating Handles and Control Devices
- Requirements for Low Voltage Field Wiring Terminals
- Requirements for Interlocking of Precharge Circuits
- Short Circuit Testing Conducted for a Time Duration
- Adding Requirements for Service Equipment to UL 347A

Specific details of new/revisted requirements are found in table below.

***Current Listings Not Active? – Please immediately identify any current Listing Reports or products that are no longer active and should be removed from our records. We will do this at no charge as long as Intertek is notified in writing prior to the review of your reports.***



## STANDARD INFORMATION

CLAUSE	VERDICT	COMMENT
		<i>Additions to existing requirements are <u>underlined</u> and deletions are shown <del>lined-out</del> below.</i>
3	Info	<b>Components</b> <i><b>New clause added;</b></i>
3.6		Metal oxide surge arrestors connected to the medium voltage line shall comply with IEEE C62.11 or IEC 60099-4 and shall have voltage ratings no less than the maximum voltage at which the arrestor is applied.
	Info	<b>CONSTRUCTION</b>
8	Info	<b>Enclosure</b>
8.6	Info	<b>Protection against corrosion</b>
8.6.1		<del>The requirements of 5.102.207 of the Standard for Medium Voltage AC Contactors, Controllers, and Control Centers, UL 347 apply.</del> <u>Enclosures shall be designed so that aluminum will not contact a concrete mounting pad when installed in accordance with the manufacturer's instructions.</u> <i><b>New clause added;</b></i>
8.6.2		Ferrous metals shall be suitably protected against corrosion as required by the Standard for Enclosures for Electrical Equipment, Non-Environmental Considerations, UL 50, and the Standard for Enclosures for Electrical Equipment, Environmental Considerations, UL 50E.
9	Info	<b>Arrangement of Components</b>
9.3		<del>The requirements of 5.102.208 of the Standard for Medium Voltage AC Contactors, Controllers, and Control Centers, UL 347 apply.</del> <u>External operating handles and control devices shall comply with 9.4 through 9.6.</u> <i><b>New clause added;</b></i>
		Control, instrument, switch, and operator handles or external handles and pushbuttons shall be located in accordance with the following:
9.4		a) Pushbuttons, control switch handles, and transfer switch handles shall be located in a readily accessible location at an elevation above the mounting surface not in excess of 2 m (79 in). b) Operating handles requiring more than 222 N (50 lbf) to operate shall not be higher than 1.7 m (66 in) in either the open or closed position. c) Operating handles for infrequently operated devices, such as reset devices, drawout fuses, fused voltage transformer or CPT primary disconnects, and bus transfer switches, need not comply with (a) and (b) above.



CLAUSE	VERDICT	COMMENT
		<b><i>New clause added;</i></b>
9.5		In determining compliance with 9.3, measurements shall be made from the mounting surface to the center of the handle grip with the handle in its highest possible position. If the handle grip is not clearly defined, the center of the handle grip shall be considered to be at a point 76 mm (3 in) in from the end of the handle.
		<b><i>New clause added;</i></b>
9.6		If the mechanism of a switching device is such that operation of a remote or automatic tripping device will permit sudden movement of an operating handle, the motion of the handle shall be restricted or the handle shall be guarded.
15	Info	<b>Service Equipment</b>
		<b><i>New clause added;</i></b>
15.1		An assembly intended for use as service equipment shall comply with the construction requirements of 5.204 of the Standard for Medium Voltage AC Contactors, Controllers, and Control Centers, UL 347.
16	Info	<b>Interlocking</b>
		<b><i>New clause added;</i></b>
16.6		<p>When circuitry is provided to energize the bus capacitors, and this circuit can be energized with the main isolating means in the open position, this circuit shall be provided with a separate isolating means. Interlocking of this charging circuit isolating means shall be provided by a solely mechanical means and shall provide the following features:</p> <p>a) Prevent the opening of a door when the charging circuit isolating means is closed, if the door provides access to the bus capacitors or any compartment that contains medium-voltage energized parts or medium-voltage wiring; and b) Prevent closing the charging circuit isolating means when any medium-voltage-compartment door of the controller is open.</p>
20	Info	<b>Terminals and Connections</b>
		<b><i>New clauses added;</i></b>
20.4 – 20.12		These clauses contain requirements for requirements for low voltage field wiring terminals. See standard for details.



CLAUSE	VERDICT	COMMENT
35	Info	<b>Short Circuit Interruption Test</b>
35.3	Info	<b>Branch circuit short circuit protection requirements</b>
		<i>New clause added;</i>
		If the branch circuit short circuit protection is intended to be provided by an external circuit breaker only, the equipment may be tested without branch-circuit protection on the line side of the equipment when all of the following conditions are met:
35.3.6		<p>a) Protection circuitry within the equipment detects the short-circuit condition and provides a signal to trip the external circuit breaker on the line side of the equipment;</p> <p>b) The protection circuitry identified in (a) is subjected to the requirements of Section 53;</p> <p>c) The equipment is marked in accordance with 49.6 and provided with instructions in accordance with 49.7;</p> <p>d) The test voltage is maintained after the short-circuit is initiated and the trip signal is received, for no less than the time specified in the markings of 49.6, plus the 110% of the latency time of the protection circuit and signaling;</p> <p>e) The short circuit testing is conducted using a circuit capable of delivering no less than the rated short circuit current of the controller; and</p> <p>f) The cotton indicators, as described in 35.2.16, are not omitted during the testing.</p>
41	Info	<b>Breakdown of Components Test</b>
41.4		The circuit shall be capable of delivering no less than the rated short circuit current of the controller. Branch circuit protection shall be provided in accordance with 35.3.1, or, at the option of the manufacturer, this protection may be omitted in accordance with 35.3.5. <u>The option to omit branch circuit protection and conduct testing for a timed duration in accordance with 35.3.6 is also allowed, but only when the specific component breakdown causes the equipment to react and send a trip signal to the external circuit breaker.</u>
	Info	<b>MARKINGS</b>
47	Info	<b>General</b>
47.32		An assembly intended for use as service equipment shall comply with the marking requirements of 5.10.205 of the Standard for Medium Voltage AC Contactors, Controllers, and Control Centers, UL 347.
49	Info	<b>Branch Circuit Short Circuit Protection Markings</b>
		<i>New clause added;</i>
49.5		Equipment intended to be protected by an external circuit breaker only and tested in accordance with 35.3.6 shall be marked to indicate:
		a) An external circuit breaker is required to be installed on the line side of the equipment;



CLAUSE	VERDICT	COMMENT
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b) The external circuit breaker shall be capable of accepting a trip signal;  
 c) The maximum allowable opening time of the circuit breaker after receipt of a trip signal (see 49.6); and  
 d) How the trip signal is to be wired from the equipment to the circuit breaker, which may be by reference to a specific wiring diagram that indicates how the trip signal is to be wired.

***New clause added;***

49.6 The maximum allowable interrupting time of the circuit breaker indicated in 49.5 (c) shall be no longer than the test time recorded in 35.3.6(d), minus 110% of the latency time as described in 35.3.6(d). In no case shall the marked maximum allowable interrupting time of the circuit breaker be less than 3 electrical cycles.

***New clause added;***

49.7 Instructions for the equipment shall include all the details described in 49.5, including wiring diagrams that specifically indicate the proper connections of the trip circuit(s).

**Maximum Acceptable Temperature Rises**

Table 32.1

Part, material, or place of temperature measurements	Maximum rise, K
<u>3. Field-wiring terminals for low voltage conductors</u>	
<u>Equipment marked for use with 60°C or 60/75°C wire</u>	<u>50</u>
<u>Equipment marked for use with 75°C wire</u>	<u>65</u>
<u>7. Class 155 insulation systems</u>	
<u>Thermocouple method</u>	<u>95</u>
<u>Resistance method</u>	<u>115</u>
<u>8. Class 180 insulation systems</u>	
Thermocouple method	<del>125</del> <u>115</u>
Resistance method	<del>160</del> <u>140</u>
<u>9. Class 200 insulation systems</u>	
<u>Thermocouple method</u>	<u>135</u>
<u>Resistance method</u>	<u>160</u>
<u>10. Class 220 insulation systems</u>	
<u>Thermocouple method</u>	<u>150</u>
<u>Resistance method</u>	<u>180</u>
<u>11. Class 240 insulation systems</u>	
<u>Thermocouple method</u>	<u>165</u>
<u>Resistance method</u>	<u>200</u>