

Subject 943

August 25, 2017

SUMMARY OF TOPICS

The following changes in requirements to the Standard for Safety for Ground-Fault Circuit-Interrupters, UL 943, are being proposed:

- 1. Expansion of Auto-Monitoring and End of Life Requirements to All Types of GFCIs***
- 2. Addition of Requirements for Programmable Components***
- 3. Improving the Auto-Monitoring Function of Permanently Connected Ground-Fault Circuit Interrupters***

STP BALLOTS AND ALL COMMENTS DUE: September 25, 2017

For your convenience in review, proposed additions to existing requirements are shown underlined and proposed deletions are shown ~~lined-out~~.

1. Expansion of Auto-Monitoring and End of Life Requirements to All Types of GFCIs

RATIONALE

Proposal submitted by: Fred Reyes, UL LLC

UL 943 currently requires permanent type GFCIs (ie. Circuit Breaker GFCI, Receptacle type GFCI) to meet End of Life requirements per clauses 5.15 and 6.26 and Auto-Monitoring requirements per clauses 5.16 and 6.30, exempting cord and plug connected portable GFCIs.

These requirements followed the concern for public safety by CPSC, product manufacturers, and standard organizations that end users were not regularly operating a GFCIs manual test and reset supervisory circuit.

Portable and cord-connected devices are excluded from these requirements, based on the argument that they can be readily tested by the user as they are portable, however realistically this is not the case. In many situations portable and cord connected GFCIs are plugged into relatively inaccessible receptacles and left unattended for long periods, behind furniture, vending machines, etc. Additionally, many GFCI portable power tap adapters should be considered as fixed installation types as many have the ability to be permanently secured in place to the receptacle.

At this time the technology for self-test and end of life is well established and readily available, as the UL 943 requirements for self-test and end of life are now also established and published, the inclusion of these requirements for portable and cord connected GFCIs should be a straight forward process.

PROPOSAL

5.15.5 When the reset is operated, a ~~permanently connected~~ ground-fault circuit-interrupter that has reached its end of life shall comply with Clause 6.26.

5.16 Auto-Monitoring Function

5.16.1 In addition to the Supervisory Circuit specified in 5.15, a ~~permanently connected~~ ground-fault circuit interrupter shall be provided with an auto-monitoring function that will allow for periodic, automatic testing of the ability of the device to respond to a ground fault. This testing shall be done without opening the circuit interrupter contacts.

Table 6.4
Representative device test program^a

Test	Clause	Representative device number	
		Portable GFCI	Permanently connected GFCI
Visual inspection	6.22	1 ^b	1 ^b
Humidity	6.5.7	1	1
Leakage current	6.5	1	1
Ball impact	6.3.1	—	1 ^d
Drop impact	6.3.5	1	—
Voltage surge	6.6	1	1
High resistance ground fault	6.7	1	1
Open neutral	6.7.2.1(c)	1 ^b	—
Most adverse	6.7.3.4	1 ^b	1 ^b
Trip threshold	6.7	1	1
Trip times	6.7	1	1
Grounded neutral	6.7.4	1	1
False tripping	6.8	1 ^b	1 ^b
Dielectric	6.11	1	1
Overload	6.12	2	2
Low resistance ground fault	6.13	3	3
Endurance	6.14	4	4
Dielectric	6.11	4	4
Abnormal	6.15	c	c
Extra low resistance ground fault	6.18	5, 6	5, 6
Short circuit	6.19	7	7
Dielectric	6.11	5 – 7	5 – 7
Normal temperature	6.10	8	8
Immunity to conducted disturbances, induced by RF fields	6.9	9	9
Surge current	6.16	10 – 12	10 – 12
Abnormal overvoltage	6.17	13 – 17	13 – 17
Corrosion	6.21	18	18
Reverse line-load miswire	6.23	—	19 ^e
Reverse line-load miswire — repeated	6.24	—	19 ^{b, e}
Supplemental voltage surge immunity	6.25	19 ^b	20 ^b
Operating mechanism	6.26	20	21