



# UL 87A

## STANDARD FOR SAFETY

Power-Operated Dispensing Devices  
for Gasoline and Gasoline/Ethanol  
Blends with Nominal Ethanol  
Concentrations up to 85 Percent (E0 –  
E85)

ULNORM.COM : Click to view the full PDF of UL 87A 2020

[ULNORM.COM](https://www.ulnorm.com) : Click to view the full PDF of UL 87A 2020

UL Standard for Safety for Power-Operated Dispensing Devices for Gasoline and Gasoline/Ethanol Blends with Nominal Ethanol Concentrations up to 85 Percent (E0 – E85), UL 87A

First Edition, Dated February 13, 2015

### **Summary of Topics**

***This revision of ANSI/UL 87A dated January 14, 2020 includes the following:***

***Add 16 percent isobutanol/gasoline blend; [1.8](#), [27.2](#), [29.1.1](#), [29.1.2](#), [33.2](#), [33.2A](#), [34.2](#), [34.2A](#), [42.4](#), [42.4A](#), [45.1.1](#), Supplement [SA](#)***

***Adding zones to the different divisions; [3.2](#), [3.5](#), [3.21](#), [3.22](#), [7.6](#), [21.1](#), Section [24](#), [25.7](#), [25.11](#), [Figure 3.1](#), [Figure 3.2](#), [Figure 7.1](#), and [Figure 8.1](#).***

Text that has been changed in any manner or impacted by UL's electronic publishing system is marked with a vertical line in the margin.

The revised requirements are substantially in accordance with Proposal(s) on this subject dated August 23, 2019 and October 25, 2019.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form by any means, electronic, mechanical photocopying, recording, or otherwise without prior permission of UL.

UL provides this Standard "as is" without warranty of any kind, either expressed or implied, including but not limited to, the implied warranties of merchantability or fitness for any purpose.

In no event will UL be liable for any special, incidental, consequential, indirect or similar damages, including loss of profits, lost savings, loss of data, or any other damages arising out of the use of or the inability to use this Standard, even if UL or an authorized UL representative has been advised of the possibility of such damage. In no event shall UL's liability for any damage ever exceed the price paid for this Standard, regardless of the form of the claim.

Users of the electronic versions of UL's Standards for Safety agree to defend, indemnify, and hold UL harmless from and against any loss, expense, liability, damage, claim, or judgment (including reasonable attorney's fees) resulting from any error or deviation introduced while purchaser is storing an electronic Standard on the purchaser's computer system.

No Text on This Page

[ULNORM.COM](https://www.ulnorm.com) : Click to view the full PDF of UL 87A 2020

**FEBRUARY 13, 2015**  
(Title Page Reprinted: January 14, 2020)



**ANSI/UL 87A-2019**

1

**UL 87A**

**Standard for Power-Operated Dispensing Devices for Gasoline and  
Gasoline/Ethanol Blends with Nominal Ethanol Concentrations up to 85  
Percent (E0 – E85)**

Prior to the first edition, the requirements for the products covered by this standard were included in the Outline of Investigation for Power-Operated Dispensing Devices for Gasoline and Gasoline/Ethanol Blends with Nominal Ethanol Concentrations up to 85 Percent (E0 – E85), UL 87A.

**First Edition**

**February 13, 2015**

This ANSI/UL Standard for Safety consists of the First Edition including revisions through January 14, 2020.

The most recent designation of ANSI/UL 87A as an American National Standard (ANSI) occurred on December 12, 2019. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, and Title Page.

Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at <https://csds.ul.com>.

UL's Standards for Safety are copyrighted by UL. Neither a printed nor electronic copy of a Standard should be altered in any way. All of UL's Standards and all copyrights, ownerships, and rights regarding those Standards shall remain the sole and exclusive property of UL.

**COPYRIGHT © 2020 UNDERWRITERS LABORATORIES INC.**

No Text on This Page

[ULNORM.COM](http://ULNORM.COM) : Click to view the full PDF of UL 87A 2020

## CONTENTS

### INTRODUCTION

1	Scope .....	5
2	General .....	6
	2.1 Components .....	6
	2.2 Units of measurement .....	6
	2.3 Undated references .....	6
3	Glossary .....	6

### CONSTRUCTION

4	General Construction .....	10
	4.1 General .....	10
	4.2 Hose assemblies .....	11
	4.3 Strainers .....	11
	4.4 Electrically operated valves .....	11
	4.5 Hose nozzle valve .....	11
	4.6 Mechanically operated valves .....	11
5	Materials .....	12
	5.1 Metallic materials .....	12
	5.2 Nonmetallic materials .....	14
	5.3 Casting impregnation materials .....	16
	5.4 Internal parts .....	17
	5.5 Blending options .....	17
6	Frame and Enclosure .....	17
	6.1 Base .....	17
	6.2 Pedestal .....	18
	6.3 Housing .....	18
7	Vapor Barrier .....	19
8	Air Gap .....	21
9	Pumping Units .....	22
10	Pressure Relief .....	22
11	Springs .....	23
12	Strainers .....	23
13	Valves .....	24
	13.1 Electrically operated valves .....	24
	13.2 Hose nozzle valves .....	24
	13.3 Shear valves .....	24
	13.4 Mechanically operated valves .....	24
14	Mechanical Line Leak Detectors .....	24
15	Piping and Fittings .....	25
16	Hose Assemblies .....	26
17	Control System .....	26
18	Meter .....	27
19	Breakaway Couplings and Swivel Connectors .....	27
20	Vapor Recovery Devices .....	27

### ELECTRICAL EQUIPMENT

21	General .....	27
22	Motors .....	30
23	Switches .....	30

24	Class I, Group D, Division 2 or Zone 2 Location, Lighting, Electrical, and Electronic Equipment .....	30
25	Wiring Methods .....	31
26	Locking Mechanism .....	33

## PERFORMANCE

27	General .....	34
28	Test Sequence .....	34
	28.1 General .....	34
	28.2 General dispenser test sequence .....	34
29	Long Term Exposure Test .....	35
	29.1 General .....	35
	29.2 Samples .....	35
	29.3 Method .....	36
	29.4 Results .....	36
30	High Pressure Leakage Test .....	37
31	Hydrostatic Strength Test .....	37
32	Start-To-Discharge Test .....	37
33	Dimensional Stability of Floats .....	38
34	Weight Change of Floats .....	39
35	Endurance Test – Hose Retrieving Mechanism .....	39
36	Endurance Test – Hose Fastening Means .....	40
37	Marking Adhesion Test .....	40
38	Torque Test .....	40
39	Rain Test .....	41
40	Temperature Reduction Test .....	44
41	Leakage of Wire Seal Test .....	44
42	Tests on Sealing Compounds .....	44
43	Moist Ammonia-Air Stress Cracking Test .....	45
44	Blending Cycling Test .....	46

## MARKING

45	General .....	46
	45.1 Details .....	46
	45.2 Cautionary markings .....	47

## INSTRUCTIONS

46	General .....	48
47	Instructions Pertaining to Risk of Fire, Electric Shock, or Injury to Persons .....	49
48	Installation Instructions .....	49
49	Operating Instructions .....	50
50	Maintenance Instructions .....	50

## SUPPLEMENT SA – Test Fluids

SA.1	Details .....	51
------	---------------	----

## INTRODUCTION

### 1 Scope

1.1 These requirements apply to power-operated dispensing devices, rated 600 V ac or less, for use with motor fuels. Motor fuels, as defined by these requirements, include one or more of the fuels described in [1.2](#).

1.2 Dispensing devices covered by these requirements are intended for use with one or more of the following:

a) Gasoline formulated in accordance with the Standard Specification for Automotive Spark-Ignition Fuel, ASTM D4814;

b) Gasoline/ethanol blends with nominal ethanol concentrations up to 25 percent ethanol (E25), consisting of gasoline formulated in accordance with the Standard Specification for Automotive Spark-Ignition Fuel, ASTM D4814, when blended with denatured fuel ethanol formulated to be consistent with the Standard Specification for Denatured Fuel Ethanol for Blending with Gasoline for Use as Automotive Spark-Ignition Engine Fuel, ASTM D4806; or

c) Gasoline/ethanol blends with nominal ethanol concentrations above 25 percent formulated in accordance with the Standard Specifications in item (b) or formulated in accordance with the Standard Specification for Ethanol Fuel Blends for Flexible-Fuel Automotive Spark-Ignition Engines, ASTM D5798, as applicable.

1.3 Requirements for the installation and use of dispensing devices are included in the Code for Motor Fuel Dispensing Facilities and Repair Garages, ANSI/NFPA 30A, and the National Electrical Code, ANSI/NFPA 70.

1.4 These requirements apply to wiring methods used to install or interconnect such control equipment when the equipment is located directly on or within the housing of the dispensing device.

1.5 These requirements do not apply to control equipment that may authorize, monitor, or interrupt operation of a power-operated dispensing device, nor other auxiliary equipment. These products would be covered under the Standard for Control Equipment for Use with Flammable Liquid Dispensing Devices, UL 1238.

1.6 These requirements do not cover dispensing devices for use with diesel fuel, biodiesel fuel, diesel/biodiesel fuel blends, fuel oil, or kerosene, which are covered in the Standard for Power-Operated Dispensing Devices for Diesel Fuel, Biodiesel, Diesel/Biodiesel Blends with Nominal Biodiesel Concentrations up to 20 Percent (B20), Kerosene and Fuel Oil, UL 87B.

1.7 These requirements do not cover dispensing devices for use with LP-Gas, which are covered under the Standard for Power-Operated Dispensing Devices for LP-Gas, UL 495.

1.8 Products intended to be rated for use with gasoline or gasoline/ethanol blends or gasoline/isobutanol blends with nominal alcohol concentrations:

a) Up to 25 percent (E0 – E25) shall be evaluated using the CE25a test fluid as the only applicable test fluid;

b) Up to 40 percent (E0 – E40) shall be evaluated using both the CE25a and CE40a test fluid;

c) Up to 85 percent shall be evaluated using both the CE25a and the CE85a test fluids; or

d) Up to 16 percent (CiBu0 – CiBu16) shall be evaluated using the CiBu20a test fluid as the only applicable test fluid.

## 2 General

### 2.1 Components

2.1.1 Except as indicated in [2.1.2](#), a component of a product covered by this outline shall comply with the requirements for that component.

2.1.2 A component is not required to comply with a specific requirement that:

- a) Involves a feature or characteristic not required in the application of the component in the product covered by this standard, or
- b) Is superseded by a requirement in this standard.

2.1.3 A component shall be used in accordance with its rating established for the intended conditions of use.

2.1.4 Specific components are incomplete in construction features or restricted in performance capabilities. Such components are intended for use only under limited conditions, such as certain temperatures not exceeding specified limits, and shall be used only under those specific conditions.

### 2.2 Units of measurement

2.2.1 Values stated without parentheses are the requirement. Values in parentheses are explanatory or approximate information.

### 2.3 Undated references

2.3.1 Any undated reference to a code or standard appearing in the requirements of this standard shall be interpreted as referring to the latest edition of that code or standard.

## 3 Glossary

3.1 For the purpose of this standard, the following definitions apply.

3.2 AIR GAP – A minimum of 1 inch (25.4 mm) free air space provided between the planes of Division 1, Division 2, Zone 1 or Zone 2 hazardous locations and an unclassified area of a dispensing device.

3.3 BASE – The part of the assembly that is intended to be secured to the foundation on which the device will be installed.

3.4 BLENDING OPTION – Dispensing devices may be provided with an option that blends two specific fuels into one fuel to be dispensed. This blending occurs at the dispenser level and can be in two forms:

a) Fixed blending – Blending at the dispenser level that blends two specific fuels into one fuel to be dispensed, and that fuel to be dispensed is fixed. For example, fixed blending includes blend options where gasoline and denatured fuel ethanol can be blended to achieve E85, which is the actual dispensed fuel.

b) Variable blending – Blending at the dispenser level that blends two specific fuels into the fuel to be dispensed, but the fuel to be dispensed can be any of a number of previously set points. For

example, variable blending includes blend options where gasoline and E85 can be blended to achieve E40, E60, and E85 as the actual dispensed fuel.

3.5 CLASS I HAZARDOUS LOCATIONS – Locations in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures. For the purpose of these requirements, as applied to dispensing devices, the flowing classified areas are further defined. The area of the dispensing system covered by these requirements is the envelope defined by the maximum outer dimensions. See [Figure 3.1](#) and [Figure 3.2](#) for an illustration of Class I hazardous locations.

a) Class I, Group D, Division 1 or Zone 1 –

- 1) The area within a dispenser housing up to 4 feet (1.2 m) vertically above the base, except for that area defined as Division 2 or Zone 2 or unclassified.
- 2) Any area within a nozzle boot.

b) Class I, Group D, Division 2 or Zone 2 –

- 1) Areas within a dispenser housing above the Division 1 or Zone 1 area.
- 2) The area surrounding the dispenser housing within 18 inches (46 cm) horizontally in all directions from the Division 1 Zone 1 area located within the housing.
- 3) The area within 18 inches horizontally, in all directions from the opening of a nozzle boot not isolated by a vapor tight partition, except that the area is not required to be extended around a 90 degree or greater corner.

**Figure 3.1**

**Hazardous location classification within a typical dispenser**

