IAPMO IGC 352-2018a2020

PUBLIC REVIEW DRAFT

Industry Standard for
Diverter Valves for Diversion of Rainwater or Storm Water for use in Alternate Nonpotable Water Source Systems
IAPMO Standard

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Preface

This is the third edition of IAPMO IGC 352, Diverter Valves for Diversion of Rainwater or Storm Water for use in Alternate Nonpotable Water Source Systems. This Standard supersedes IAPMO IGC 352-2018a, Diverter Valves for Diversion of Rainwater or Storm Water for use in Alternate Nonpotable Water Source Systems. The previous editions of this standard are: May 2018, and October 2018

This Standard was developed by the IAPMO Standards Review Committee (SRC) in accordance with the policies and procedures regulating IAPMO industry standards development, Policy S-001, Standards Development Process. This Standard was approved as an IAPMO Industry Standard on Month DD, YYYY.

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IAPMO IGC 352-2018\textsuperscript{a} 2020

Diverter Valves for \textit{Diversion of Rainwater or Storm Water for use in Alternate Nonpotable Water Source Systems}

1 Scope

1.1 General

1.1.1 This Standard covers 150 to 300 mm (6 to 12 in) diverter valves intended for diversion of rainwater, graywater or storm water for use in alternate nonpotable water source systems (\textit{not for use in sanitary waste systems}) and specifies requirements for materials, physical characteristics, performance testing, and markings.

1.1.2 This standard covers valves specifically designed to divert high flows of non-potable water which includes, but not limited to, rainwater, stormwater, graywater rainwater or storm water and to address the special need for alternative large diameter valves for use with alternate water source systems, which cannot be practically met by existing valve designs compliant with IAPMO PS 59. The large diameter valves covered by this standard are either specially designed to fit the application and for use in alternate water source systems or are existing designs modified to fit the application such as gate, globe, angle, and butterfly valves. The latter options are traditionally accepted for use in pressurized systems and municipal stormwater management and do not meet the existing requirements applied to fittings and valves used in sanitary drainage applications. In particular, that waterways shall be smooth and free of obstruction and shall not restrict the flow or produce excessive turbulence.

1.2 Alternative Materials and Designs

The requirements of this Standard are not intended to prevent the use of alternative materials, designs or methods of construction provided such alternatives meet the intent and requirements of this Standard.

1.3 Terminology

In this Standard,
(a) “shall” is used to express a requirement, i.e., a provision that the user is obliged to satisfy to comply with the Standard;
(b) “should” is used to express a recommendation, but not a requirement;
(c) “may” is used to express an option or something permissible within the scope of the Standard; and
(d) “can” is used to express a possibility or a capability.

Notes accompanying sections of the Standard do not specify requirements or alternative requirements; their purpose is to separate explanatory or informative material from the text. Notes to tables and figures are considered part of the table or figure and can be written as
requirements.

1.4 **Units of Measurement**
Sl units are the primary units of record in global commerce. In this Standard, the inch/pound units are shown in parentheses. The values stated in each measurement system are equivalent in application, but each unit system is to be used independently. All references to gallons are to U.S. gallons.

1.5 **Amendments**
Proposals for amendments to this Standard will be processed in accordance with the standards-writing procedures of IAPMO.

1.6 **Patents**
The user’s attention is called to the possibility that compliance with this Standard might require use of an invention covered by patent rights. By publication of this Standard, no position is taken with respect to the validity of any such claim(s) or of any patent rights in connection therewith. If a patent holder has filed a statement of willingness to grant a license under these rights on reasonable and nondiscriminatory terms and conditions to applicants desiring to obtain such a license, then details can be obtained from IAPMO.

2 **Reference Publications**
This Standard refers to the following publications and, where such reference is made, it shall be to the current edition of those publications, including all amendments published thereto.

**ASTM International**
ASTM B117
Standard Practice for Operating Salt Spray (Fog) Apparatus

ASTM C1277

ASTM C1541

ASTM D1784

ASTM D2661

ASTM D2665
Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and
Fittings

ASTM D2751
Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings

ASTM D3311
Standard Specification for Drain, Waste, and Vent (DWV) Plastic Fittings Patterns

ASTM D3965
Standard Classification System and Basis for Specifications for Rigid Acrylonitrile-Butadiene-Styrene (ABS) Materials for Pipe and Fittings

ASTM F438
Standard Specification for Socket-Type Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 40

ASTM F439

ASTM F1970
Standard Specification for Special Engineered Fittings, Appurtenances or Valves for use in Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Systems

ASTM F1866
Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Schedule 40 Drainage and DWV Fabricated Fittings

CSA Group (Canadian Standards Association)

CSA B1800
Thermoplastic Non-Pressure Piping Compendium

CSA B181.1
Acrylonitrile-Butadiene-Styrene (ABS) Drain, Waste, And Vent Pipe and Pipe Fittings

CSA B181.2
Polyvinylchloride (PVC) and Chlorinated Polyvinylchloride (CPVC) Drain, Waste, and Vent Pipe and Pipe Fittings

CSA B602
Mechanical Couplings for Drain, Waste, and Vent Pipe and Sewer Pipe

CSA C22.2 No. 14
Industrial Control Equipment

CSA C22.2 No. 66.1
Low Voltage Transformers - Part 1: General Requirements

CSA C22.2 No. 66.3
Low Voltage Transformers - Part 3: Class 2 and Class 3 Transformers

CSA C22.2 No. 68
Motor-Operated Appliances (Household and Commercial)

CSA C22.2 No. 108
Liquid Pumps

CSA C22.2 No. 223
Power Supplies with Extra-Low-Voltage Class 2 Outputs

IAPMO (International Association of Plumbing and Mechanical Officials)
IAPMO PS 59
Wastewater Diverter Valves and Diversion Systems

IAPMO PS 90
Elastomeric Test Caps, Cleanout Caps, and Combination Test Caps/Shielded Couplings

UL
UL 778
Standard for Motor-Operated Water Pumps

UL 1310
Standard for Class 2 Power Units

UL 1951
Standard for Electric Plumbing Accessories

UL 5085-1
Low Voltage Transformers – Part 1: General Requirements

UL 5085-3
Low Voltage Transformers – Part 3: Class 2 and Class 3 Transformers

3 Definitions and Abbreviations

3.1 Definitions
The following definitions shall apply in this Standard:

This section is reserved for later use. Graywater — Untreated wastewater that has not been contaminated by any toilet discharge, has not been affected by infectious, contaminated, or unhealthy bodily wastes, and does not present a threat from contamination by unhealthful processing, manufacturing, or operating wastes. "Graywater" includes, but is not limited to, wastewater from bathtubs, showers, bathroom washbasins, clothes washing machines, and laundry tubs, but does not include wastewater from kitchen sinks or dishwashers.
Nonpotable Water — Water that has been collected, treated, and intended to be used on-site and is suitable for direct beneficial use. Sources for on-site treated nonpotable water include, but are not limited to, gray water; rainwater, stormwater, reclaimed (recycled) water, cooling tower blow-down water, and foundation drainage.

3.2 Abbreviations
The following abbreviations apply in this Standard:

ABS — acrylonitrile-butadiene-styrene
CPVC — chlorinated polyvinylchloride
PVC — polyvinylchloride

4 General Requirements

4.1 General

4.1.1 The cross-sectional area of the sanitary outlet shall be equal to or larger than the cross-sectional area of the inlet.

4.1.2 Diverter valves shall have a means to indicate which outlet is selected. When operated by a remote control, the control shall also have a means to indicate which outlet is selected.

4.1.3 Diverter valves operated by a motor, solenoid, or any other power-actuated mechanism only shall automatically revert to directing the flow through the sanitary drainage outlet in case of a power failure. Diverter valves or systems that can be manually operated shall be exempt from this requirement.

4.1.4 Diverter valves used in pressurized diversion systems shall be rated for pressure applications.

4.2 Materials

4.2.1 Diverter bodies shall be made of
(a) ABS compounds that comply with or exceed the properties of cell classification 32222 specified in ASTM D3965;
(b) CPVC compounds that comply with or exceed the properties of cell classification 23447 or 23448 specified in ASTM D1784; or,
(c) PVC compounds that comply with or exceed the properties of cell classification 12454 or 14333 specified in ASTM D1784.

4.2.2 Reworked materials may be used provided the components containing reworked material comply with all of the requirements of this Standard and shall be
(a) clean;
(b) generated from the manufacturer’s own production of diverter bodies and not supplied by any other manufacturer; and
(c) blended back into the same type of compound or product.
4.2.3 Other materials may be used provided they comply with all of the applicable requirements of this Standard.

4.2.4 Other diverter parts shall be made of materials that will not corrode under their intended use.

4.3 Inlets and Outlets

4.3.1 Diverter valves shall have one inlet and at least two outlets.

4.3.2 Diverter inlets and outlets shall comply with the dimensional requirements of ASTM D2661, ASTM D2665, ASTM D3311, ASTM F438, ASTM F439, CSA B181.1, or CSA B181.2, as applicable.

4.4 Access for Maintenance
Divers shall have a means of access for repair and maintenance. The size of the access opening(s) shall be adequate for performing repair and maintenance.

4.5 Electrical Requirements

4.5.1 Electrical Components
Divers with electrical features shall comply with the applicable CSA or UL standards (e.g., CSA C22.2 No. 14, CSA C22.2 No. 68, or UL 1951) except when powered by a
(a) direct plug-in Class 2 power supply that complies with the applicable CSA or UL standards (e.g., CSA C22.2 No. 223 or UL 1310);
(b) low-voltage circuit (i.e., a circuit involving a peak open-circuit potential of not more than 42.2 V supplied by a battery or by a Class 2 power supply); or
(c) battery.

4.5.2 Button or Coin Cell Lithium Batteries
Divers incorporating button or coin cell lithium batteries shall comply with the applicable requirements of UL 4200A.

4.6 Other Components

4.6.1 Factory-supplied pipe and fittings shall comply with ASTM D2661, ASTM D2665, ASTM F1866, ASTM F1970, CSA B181.1, CSA B181.2, or other nationally recognized standards, as applicable.

4.6.2 Factory-supplied elastomeric couplings shall comply with IAPMO PS 90, ASTM C1277, ASTM C1541, CSA B602, or other nationally recognized standards, as applicable.

4.6.3 Factory-supplied pumps shall comply with CSA C22.2 No. 108 or UL 778.
5 Testing Requirements

5.1 Hydrostatic Pressure Test

5.1.1 Test Procedure
The hydrostatic pressure test shall be conducted as follows:
(a) Fill the test specimen with water.
(b) Seal the inlet and the outlets.
(c) Pressurize the test specimen to 69 kPa (10 psi).
(d) Hold the pressure for 15 min.

5.1.2 Performance Requirement
There shall be no leakage.

5.2 Life Cycle Test

5.2.1 Test Procedure
The life cycle test shall be conducted as follows:
(a) Install the test specimen in accordance with the manufacturer’s installation instructions.
(b) Subject moving parts to 10,000 cycles of operation.

5.2.2 Performance Requirements
The test specimen shall not leak and shall continue to operate as it did before the test.

5.3 Diversion Test

5.3.1 Test Procedure
The diversion test shall be conducted after conducting the life cycle test specified in Section 5.2, as follows:
(a) Flow water through the test specimen at 7.6 L/min (2.0 gpm).
(b) Direct the flow of water to the sanitary outlet. The test specimen shall direct the flow of water to the sanitary drainage outlet.
(c) Wait 5 s.
(d) Direct the flow of water to the diversion outlet. The test specimen shall divert the flow of water to the diversion outlet.

5.3.2 Performance Requirements
The test specimen shall operate as intended and shall not leak.
5.4 Corrosion Resistance Test for Metallic Parts

5.4.1 Test Procedure
The corrosion test for metallic parts shall be conducted in accordance with ASTM B117 and the following procedure:
(a) Wipe the plated surfaces of the test specimens with a soft cloth and a solvent (e.g., clear naphtha, gasoline, or clear paint thinner). No abrasive shall be used.
(b) Hang the test specimens in the test cabinet, using hangers that will not be affected by the salt fog. Care shall be taken not to touch or contaminate the cleaned surfaces.
(c) Leave the test specimens in the test cabinet for 96 h.
(d) Immediately after the conclusion of the 96 h test period, wash the test specimens under running water at 38°C (100°F) or less and dry them. Care shall be taken not to rub the specimens during washing, drying, or before being examined.
(e) Examine the test specimens for corrosion spots (e.g., weeping areas). The corrosion spots may be gently rubbed or brushed before measuring them.

5.4.2 Performance Requirement
Metallic parts shall not exhibit more than one corrosion spot on any 645 mm² (1 in²) of surface; however, there may be a maximum of three minor corrosion spots on each 25 mm (1 in) length of parting line. Corrosion spots shall be not more than 0.8 mm (0.03 in) in any dimension.

6 Markings and Accompanying Literature

6.1 Diverter valves complying with this Standard shall be marked with the:
(a) manufacturer’s name or trademark;
(b) nominal sizes;
(c) model number;
(d) material designation (e.g., ABS, CPVC or PVC);
(e) inlet, overflow outlet, and tank input; and
(f) direction of flow.

6.2 Markings shall be permanent, legible, and visible after installation.

6.3 In addition to the markings specified in Section 6.1, diverter valves for 150 to 350 mm (6 to 12 in) alternate water source systems shall be marked or labeled with a statement limiting the use (e.g. “Alternate water source systems only” or “Not for use in sanitary building drain systems”).

6.4 Labels shall be in the form of a permanently attached plate or adhesive label in accordance with UL 969.

6.5 Diverter valves shall be accompanied by instructions for their installation, operation, and care and maintenance. The installation instructions shall at a minimum specify a filter, screen or settling tank installed upstream of the diverter valve used for rainwater collection and diversion.