

MSS SP-45-2020

Drain and Bypass Connections

Standard Practice
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This Standard Practice has been substantively revised from the previous 2003 (R2008) edition. It is suggested that if the user is interested in knowing what changes have been made, that a direct page by page comparison should be made of this document and that of the previous edition.

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FOREWORD

The original 1953 edition of MSS SP-45-1953, *Bypass and Drain Connection Standard*, was a combination of two former MSS Standard Practices: MSS SP-5-1944, *By-Pass Size Standard*, and MSS SP-28-1943, *Drain Tapping Standard*. As the subject matter of these two Standard Practices was so closely related, they were combined as a convenience to the user.

MSS SP-5 was originally adopted in 1924 and applied to steel gate valves only. Bosses on steel castings of that period presented a more complex problem than castings of other metals and the diversification of requests in regard to size, location, and number of bosses on the part of users prompted the MSS to initiate a standardization program on the subject. The original Standard Practice established the number of bosses, minimum O.D. of a boss, and the pipe thread size for steel gate valves in sizes 3 to 24 inch inclusive. The bosses were intended to be used for both drain and bypass connections.

In 1937 a new edition of SP-5 was adopted. This edition was greatly expanded over the original and included both cast iron and steel valves in the gate, globe and angle patterns. The subject matter was confined to by-passes only and standard locations were established for the bypass on each type of valve. Two sets of bypass sizes were established; one for the purpose of warming up main lines before opening the main valve and one for the purpose of balancing the pressure on both sides of the main valve to facilitate its operation. The edition has been reaffirmed periodically up to the promulgation of the new MSS SP-45.

MSS SP-28 was originally adopted in 1937 and was also prompted by the variety of user requests for connections on valves and fittings at odd locations and varying sizes, with and without bosses. MSS SP-28 established standard drain sizes for each size valve and fitting, standard maximum sizes for unbossed tapping's, and standard locations with standard symbols to designate the location. MSS SP-28 was revised in 1945 at which time a standard method of designating openings of reducing fittings was added. This Standard Practice was also periodically reaffirmed.

The 1953 edition of MSS SP-45 combined these two Standard Practices so that the user has all information pertaining to drain and bypass connections in a single document. In this edition the newer methods of making attachments, such as butt welding were recognized.

The 1971 edition expanded the coverage of the document by including coverage of ball valves. In preparing this edition, the entire Standard Practice was reviewed and up-dated to keep pace with the expanding technology.

The 1976 edition expanded the coverage of the bypass sizes to include valves through NPS 48 and the document was metricized.

The 1982 edition expanded the coverage of the document to include plug valves and included a minor change in title to "*By-Pass and Drain Connection Standard*".

The 1987 edition was a reaffirmation of the 1982 edition with no substantive change.

The 1992 edition changed the title to "*Bypass and Drain Connections*", removed metric units, and made several editorial changes.

The 1998 edition added metric units and made several editorial and format changes.

The 2003 edition was issued with only editorial changes.

The 2008 edition was a reaffirmation of the 2003 edition with one editorial correction in Annex A.

This 2020 edition revised the title to "*Drain and Bypass Connections*", added additional drain sizes, revised Sections 1 through 6, revised Table 1, Table 2 (including Notes), Table 3, and Table 4, updated Figures 1 and 2 (including Notes), updated Annex A references, in addition to other editorial, clarifying, and format related changes.

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Manufacturers Standardization Society of the Valve and Fittings Industry

DRAIN AND BYPASS CONNECTIONS

1. SCOPE

1.1 This Standard Practice establishes requirements for connections to valves and fittings to accommodate drains and bypasses in all pressure classes.

1.2 Specific requirements contained in this Standard Practice include:

- a) Standard symbols and locations of openings for drains and bypasses
- b) Standard sizes of drain and bypass openings
- c) Minimum pipe thread lengths in drain and bypass tapping's
- d) Minimum diameter and depth of socketweld connection for drains and bypasses
- e) Butt-welding connections for drains and bypasses
- f) Bosses for drain and bypass connections
- g) Method for designating outlets of reducing fittings

2. STANDARD SYMBOLS, LOCATIONS, AND DEFINITIONS

2.1 Figures 5 and 6 illustrate the application of standard symbols for the locations of openings for drain and bypass connections recognized as standard. These symbols should be regularly employed on drawings, specifications, requisitions, and other documents, as they pertain to these types of connections.

2.2 When a tap is required at some other location, it is recommended that the manufacturer be consulted as to its practicability, and both the inquiry and the order should be accompanied by a sketch indicating the location upon the valve or fitting.

2.3 Standardized definitions for terms contained in this Standard Practice may be found in MSS SP-96.

3. STANDARD DRAIN SIZES

3.1 When valves and fittings require drain openings, they are regularly furnished with the size shown in Table 1 unless otherwise specified by purchaser.

TABLE 1
Standard Drain Sizes

Valve or Fitting		Drain	
NPS	DN	NPS	DN
2 – 4	50 – 100	1/2	15
5 – 8	125 – 200	3/4	20
10 – 24	250 – 600	1	25
30 – 36	750 – 900	2	50
42 – 48	1050 – 1200	2½	65