MSS SP-45-2003
Reaffirmed 2008

Bypass and Drain Connections

Standard Practice
Developed and Approved by the
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This MSS Standard Practice was developed under the consensus of the MSS Technical Committee 106 and the MSS Coordinating Committee. The content of this Standard Practice is the result of the efforts of competent and concerned volunteers to provide an effective, clear, and non-exclusive specification that will benefit the industry as a whole. This MSS Standard Practice is intended as a basis for common practice by the manufacturer, the user, and the general public. The existence of an MSS Standard Practice does not in itself preclude the manufacture, sale, or use of products not conforming to the Standard Practice. Mandatory conformance is established only by reference in a code, specification, sales contract, or public law, as applicable.

U.S. customary units in this Standard Practice are the standard; the metric units are for reference only.

In this Standard Practice all notes, annexes, tables, and figures are construed to be essential to the understanding of the message of the standard, and are considered part of the text unless noted as "supplemental". All appendices appearing in this document are construed as "supplemental". Supplemental" information does not include mandatory requirements.

Non-toleranced dimensions in this Standard Practice are nominal, and, unless otherwise specified, shall be considered “for reference only”.

Originally Approved July, 1953

FOREWORD

The 1953 edition of MSS SP-45-1953 Bypass and Drain Connections Standard Practice was a combination of two former MSS Standard Practices; MSS SP-5-1944 By-Pass Size Standard Practice and MSS SP-28-1943 Drain Tapping Standard Practice. As the subject matter of these two Standard Practices is 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 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 bypass and drain 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. SP-28 established standard drain sizes for each size valve and fitting, standard maximum sizes for unbossed tappings 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 bypass and drain connections in a single document. In this edition the newer methods of making attachments, such as butt-weld have been 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 has been metricized.

The 1982 edition expanded the coverage of the document to include plug valves.

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

The 1992 edition changed the title, 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 change in Annex A.

TABLE OF CONTENTS

BYPASS AND DRAIN 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 are:

a) Standard symbols and locations of openings for drains and bypasses.

b) Standard size of drains and bypass openings.

c) Minimum thread lengths in drain and bypass tappings.

d) Minimum diameter and depth of socketweld connection for drain and bypass.

e) Butt-welding connection for drain and bypass.

f) Bosses for drain and bypass connection.

g) Method for designating outlets of reducing fittings.

2. LOCATION AND SYMBOLS

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 instruments used in the transactions of business.

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

3. STANDARD DRAIN SIZES

3.1 When fittings and valves 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 Size		Drain Size	
NPS	DN	NPS	DN
2-4	50-100	1/2	15
5-8	125-200	3/4	20
10-24	250-600	1	25

4. STANDARD BYPASS SIZES

4.1 When valves are ordered with bypass attached, the size of bypass shall be as shown in Table 2, except where unusual service conditions warrant consideration of a special oversize bypass, then the installation of the bypass around the main valve is recommended wherever possible.