NFPA Recommended Standard
NFPA/T3.6.8 R2-2007
Third edition
10 May 2007

AN INDUSTRY STANDARD FOR FLUID POWER

Fluid power systems – Cylinders – Dimensions for accessories for cataloged square head industrial types

(Revision of NFPA/T3.6.8 R1-1984)

Descriptors: dimensions mounting accessories cylinder pressure rating square head fluid power square tie rod

published by
NATIONAL FLUID POWER ASSOCIATION, INC.
3333 N. Mayfair Road / Milwaukee, WI 53222-3219 USA
PHONE: +1 414 778 3344 / FAX: +1 414 778 3361 / E-mail: nfpa@nfpa.com

All standards, recommended practices, information reports, and bibliographies (collectively, “NFPA Documents”) are advisory only. Use thereof by anyone for any purpose is entirely voluntary and in any event without risk of any nature to the National Fluid Power Association (NFPA), its officers, directors or authors of such work. There is no agreement by or between anyone to adhere to any NFPA Document. In formulating and approving NFPA Documents, NFPA and/or its councils and committees will not investigate or consider citations, references or patents which may or may not apply to such subject matter since prospective users of such NFPA Documents alone are responsible for establishing necessary safeguards in connection with utilization of such matters, including technical data, proprietary rights or patentable materials.

The information and data contained in NFPA Documents has been obtained from sources believed to be reliable. However, it should not be assumed that all acceptable or applicable sources of information, procedures, methods or techniques are contained in NFPA Documents, or that additional measures may not be required under certain circumstances or conditions.

NFPA Documents and/or policies and procedures are subject to periodic review and may be changed without notice. NFPA Documents are only current as of their publication date. NFPA Documents, after publication, may be revised or withdrawn at any time and current information on all NFPA Documents may be received by calling or writing NFPA. Additionally, the various codes and regulations referenced in NFPA Documents may be amended from time to time and it should not be assumed that the versions referenced therein are the most current versions of such codes and regulations. Please consult the appropriate regulatory authorities for the most up-to-date versions.

NFPA Documents imply a consensus of those substantially concerned with their scope and provisions and are intended as a guide to aid the manufacturer, the consumer and the general public. The publication of NFPA Documents does not in any respect preclude anyone, whether they have participated in the development of or approved such NFPA Documents or not, from manufacturing, marketing, purchasing, or using of products, processes or procedures not conforming to the NFPA Documents. NFPA Documents do not constitute or indicate a warranty of any sort, express or implied, including but not limited to a warranty or representation as to quality, merchantability or fitness for a particular use or purpose.

Participation by federal agency representative(s) or person(s) affiliated with the industry is not to be interpreted as government or industry endorsement of an NFPA Document(s).

NOTICE

NFPA Documents do not express or imply any judgment, certification or endorsement of or with respect to, the safety, design or performance of any product, component, or its use.

NFPA does not examine, investigate, test, recommend, or certify the design, use or safety of any product or component, even those which may incorporate one or more NFPA Documents. NFPA Documents therefore have no application to and do not express or imply any recommendation, representation or warranty, with respect to the safety, design, use, performance, or functional interchangeability of components or products which incorporate NFPA Documents.

Foreword

This Foreword is not part of National Fluid Power Association (NFPA) Recommended Standard *Fluid power systems – Cylinders – Dimensions for accessories for cataloged square head industrial types*, NFPA/T3.6.8 R2-2007. This third edition replaces NFPA/T3.6.8 R1-1984 in its entirety.

This document was initiated on 10 February 1999 at the NFPA/T3.6 meeting, at which it was decided that ANSI/B93.29M-1986, which was the adoption of NFPA/T3.6.8 R1-1984, would be revised to add nomenclature levels. A new project number of NFPA/T3.6.8 R2-200x was assigned. The Technical Board approved the Title, Scope and Purpose (TSP) on 8 April 1999. Lido Boni (Parker Hannifin) agreed to serve as Project Chair.

Draft no. 1 of NFPA/T3.6.8 R2-200x was circulated to NFPA/T3.6 on 30 August 1999, for discussion at a meeting on 22 September 1999. At this meeting, Mr. Boni indicated that the group should notify him, no later than 15 January 2000, if they do not agree to the document in its revised form. The group agreed that if there were no changes after this date, Mr. Boni would submit the document to Headquarters for first draft review circulation.

On 14 December 2004, Mr. Boni, the Project Chair, e-mailed updated figures and tables to Headquarters, for inclusion in the document. Draft no. 2 was circulated with the 9 February 2000 meeting minutes.

At the 17 May 2000 meeting of NFPA/T3.6, the group reviewed draft no. 2 and suggested additional changes, which included 1) the deletion of “and the following apply. 3.1x:x” from clause 3, Definitions; and 2) the deletion of “7” next to “EK,” and changing “Mm” to “mm” in the table in figure 1, AA4: Pivot pin, plan (retainer ring or cotter pin type). The group approved a recommendation to circulate the updated draft for general review.

NFPA/T3.6.8 R2-200x was circulated for general review on 14 July 2000 to NFPA/T3.6, U.S. TAG SC 3 and the Technical Board; the ballot closed on 14 August 2000 with 15 votes of approval, zero disapprovals, two abstentions and 28 no replies.

At the 20 September 2000 meeting of NFPA/T3.6, the group reviewed the results of the general review ballot, resolved the comments from the general review, and suggested additional changes. The group approved a recommendation to circulate the updated draft for final ballot, pending the receipt of a technical auditor report.

The technical auditor submitted his approval to headquarters on 20 October 2000, agreeing that all comments had been resolved, but that two misspellings were found in the draft and should be corrected. At its 30 November 2000 meeting, the Technical Board approved the technical auditor’s suggestion to correct these misspellings and NFPA/T3.6’s recommendation to submit the document for final ballot.

NFPA/T3.6.8 R2-200x was circulated for final ballot on 15 December 2000 to NFPA/T3.6, U.S. TAG SC 3 and the Technical Board; the ballot closed on 18 January 2001 with 13 votes of approval, zero disapprovals, three abstentions and 25 no replies.

At the 7 February 2001 meeting of NFPA/T3.6, the group reviewed the results of the final

ballot and resolved the comments from the final ballot. The group approved a recommendation to make the requested changes to the document and recommend to the Technical Board that the document be approved for publication.

At its 5 April 2001 meeting, the Technical Board approved NFPA/T3.6's recommendation to publish NFPA/T3.6.8 R2-200x, pending the technical auditor's report.

On 24 September 2001, Headquarters sent a copy of the publication draft of NFPA/T3.6.8 R2-200x to the project chair, who suggested a few changes and approved the publication of this document.

In the interim, on 21 March 2003, ANSI/B93.29M-1986 (R1992) was administratively withdrawn. On 11 November 2003, NFPA/T3.6.8 R1-1984 was republished to replace it, until NFPA/T3.6.8 R2-200x was published.

On 28 June 2004, Dr. Ronald Zielinski provided a technical auditor's report from the final ballot of this document.

On 10 March 2005, the project chair clarified that the standard would be published as an NFPA standard.

Project group members who developed this standard:

Lido Boni
Project Chair
Parker Hannifin Corporation

Don Blackman*
Technology Committee Chair
Miller Fluid Power Corporation

Douglas Miller
Project Vice Chair
HYDRO-LINE, Inc.

Ronald E. Zielinski
Technical Auditor
PolyMod® Technologies Inc.

June VanPinsker*
Technical Coordinator
National Fluid Power Association

Jenna Wetzel*
Standards Development Coordinator
National Fluid Power Association

Matt Boswell*
Bosch Automation Technology

Pete Molloy
SMC Corporation of America

Don Zahrobsky*
Balluff, Inc.

* No longer with the company.

/jw

Introduction

In fluid power systems, power is transmitted and controlled through a fluid (liquid or gas) under pressure within an enclosed circuit.

One component of such systems is the fluid power cylinder. This is a device that converts fluid power into linear mechanical force and motion. It consists of a movable element, such as a piston and piston rod, plunger or ram, operating within a cylindrical bore.

The square head cylinder is a specific design initially developed for industrial (in-plant) use. Dimensions for these cylinders are standardized in NFPA/T3.6.7 R2. The square head cylinder is manufactured and sold as an interchangeable component by a majority of suppliers. In addition to the basic cylinder, many of the mounting accessories are also considered to be interchangeable. Recognition of this interchangeability is one of the purposes of this document.

Fluid power systems – Cylinders – Dimensions for accessories for cataloged square head industrial types

1 Scope

1.1 This standard includes

— nominal dimensions of accessories for cataloged industrial square head fluid power cylinders. Such accessories include pivot pins, female eyes, female clevis and eye brackets [basic cylinder dimensions are standardized in NFPA/T3.6.7 R2];

— dimensional identification code for envelope and mounting dimensions not already set forth in ISO 6099;

— dimensions for simplification of variety and dimensional interchangeability purposes only. This document is in no way intended to imply suitability of dimensioned components for any particular service or application. A method to determine load ratings will be handled through subsequent documents;

— dimensions for mounting accessories that will have a load rating compatible to that of the cylinder pressure rating for which the accessory is intended.

1.2 This standard

— simplifies varieties of sizes and configurations;

— promotes accessory interchangeability by establishing uniform mounting dimensions;

— allows manufacturers freedom of design and still provides basic guidelines necessary for component interchangeability.

1.3 This standard provides

— common language for dimension identification;

— a simplified pattern for dimension presentation.