ANSI/(NFPA)T3.21.8 R1-2008
3 September 2008

Pneumatic fluid power — Measurement of response time — Directional control valves

[revision of ANSI/(NFPA)T3.21.8-1990 (R1997)]

This standard is to be used as an alternative to ISO 12238, which is recognized as the preferred method.

A NATIONAL INDUSTRY STANDARD FOR FLUID POWER

Approved by the National Fluid Power Association
an ANSI-Accredited Standards Developer

Descriptors: fluid power; pneumatic; valve, pneumatic; response time; valve, testing; valve, directional control.

Developed and 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

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Foreword

This Foreword is not part of American National Standard *Pneumatic fluid power — Measurement of response time — Directional control valves*, ANSI/(NFPA)T3.21.8 R1-2008 [revision of ANSI/(NFPA)T3.21.8-1990 (R1997)].

At its 1 April 2004 meeting, the NFPA Technical Board recommended that ANSI/(NFPA)T3.21.8-1990 (R1997) be revised. At its 19 May 2004 meeting, NFPA/T3.21 appointed Rob Dickman (SMC Corporation of America) as project leader for the revision and asked him to prepare a TSP and first draft.

At the 8 June 2005 meeting, the group approved a motion to submit version 3 of the TSP to the NFPA Technical Board for approval, and to circulate draft no. 1 for general review. At its 11 August 2005 meeting, the NFPA Technical Board approved the TSP. ANSI/(NFPA)T3.21.8 R1-200x was circulated for general review on 8 March 2006. The voting resulted in five approval votes, no disapprovals, two abstentions, and one comment which was satisfactorily resolved.

At the 17 May 2006 joint meeting of NFPA/T3.21 and U.S. TAG to ISO/TC 131/SC 5/Pneumatic, a motion was approved to ask the NFPA Technical Board for permission to circulate the document for simultaneous NFPA final and ANSI approval ballots. The NFPA Technical Board gave such approval on 10 August 2006.

The document was circulated for simultaneous NFPA final and ANSI approval ballots on 7 August 2007 and closed on 21 September 2007. The NFPA ballot resulted in four approval votes, zero disapprovals and one abstention. No comments were received.

At the 19 September 2007 joint meeting of NFPA/T3.21 and U.S. TAG to ISO/TC 131/SC 5/Pneumatic, a motion was approved to ask the NFPA Technical Board for approval to publish the document. At its 10 January 2008 meeting, the Technical Board approved a motion to publish the document, pending administrative approval by ANSI.

Project Group members who developed this standard:

Rob Dickman
Project Chairman
SMC Corporation of America.

James Rosenbury
Section Chairman
Nass Controls LP

Tom Wanke
Technical Auditor
Milwaukee School of Engineering

Carrie Tatman Schwartz
Industry/National Standards Development Manager
National Fluid Power Association

The ANSI ballot resulted in nine approval votes, zero disapprovals and zero abstentions. No comments were received. ANSI/(NFPA)T3.21.8 R1-2008 was approved by ANSI for publication on 3 September 2008.

Members of the ANSI consensus body who participated in the approval ballot:

Tom Weinkauf
Daman Products Co.

Gary Garcia
G.W. Lisk Co., Inc.

William Reich
J.E. Myles

Ron McEntire
Kemlite

Gary Baumgardner
John Berninger*
Larry Schrader*
Parker Hannifin Corp.

David Prevallet
Prevallet Technical Services

Joel Nelson
Prince Mfg. Corp.

Steve Sawzin
RA Jones Company

Kenneth Jelinek
Zinga Industries Inc.

*Alternate voter from same company

Introduction

In pneumatic fluid power systems, power is transmitted and controlled through a gas under pressure within an enclosed circuit. In some circumstances, the time required to charge or vent a volume of a pneumatic directional control valve is of importance to the fluid power system designer.

Pneumatic fluid power — Measurement of response time — Directional control valves

1 Scope and field of application

This standard is to be used as an alternative to ISO 12238, which is recognized as the preferred method.

This standard is intended:

— to include a standardized procedure for defining, determining and reporting the response time of electrically or pneumatically operated pneumatic directional control valves. The results are applicable only to compressed air at the pressure and temperature at which the test was conducted. Although the method contained can be applied to other gases, pressures or temperatures, these cases are outside the scope of this standard.

— to establish a standard definition of response time.

— to promote improved pneumatic fluid power systems by providing manufacturers and users with a standardized procedure for measurement of the dynamic performance of electrically or pneumatically operated pneumatic directional control valves.

— to establish a standard means of communicating these results.

2 Normative references

ISO 1000 (latest edition), *SI units and recommendations for the use of their multiples and of certain other units*

ISO 1219-1 (latest edition), *Fluid power systems and components — Graphic symbols and circuit diagrams — Part 1: Graphic symbols*

ISO 5598 (latest edition), *Fluid power systems and components — Vocabulary*

ISO 12238 (latest edition), *Pneumatic fluid power – Directional control valves – Measurement of shifting time*

3 Terms and definitions

For the purpose of this standard, the definitions given in ISO 5598 and the following apply.

3.1 response time: Time interval in which the pressure in a test chamber connected to an outlet port of a pneumatic directional control valve changes by 90 % between specified pressure levels in response to a change in the control signal to that valve.

3.2 test chamber: Vessel of measured volume capable of statically containing an imposed pressure.

3.3 output volume: Sum of the downstream volumes under test, composed of the test chamber, its connecting conductors, connectors and the pressure transducer.

NOTE Internal volume of the valve under test is not included.