
**Hydraulic fluid power — Electrically
modulated hydraulic control valves —**

**Part 3:
Test methods for pressure control
valves**

*Transmissions hydrauliques — Distributeurs hydrauliques à
modulation électrique —*

*Partie 3: Méthodes d'essai pour distributeurs de commande de
pression*

Document Preview

ISO 10770-3:2020

<https://standards.iteh.ai/catalog/standards/iso/9db6249e-7986-4dbc-8667-abf4bflb3e42/iso-10770-3-2020>



iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

ISO 10770-3:2020

<https://standards.iteh.ai/catalog/standards/iso/9db6249e-7986-4dbc-8667-abf4bf1b3e42/iso-10770-3-2020>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2020

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

	Page
Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms, definitions and symbols	1
3.1 Terms and definitions	1
3.2 Symbols	2
4 Standard test conditions	3
5 Test installation	3
6 Accuracy	6
6.1 Instrument accuracy	6
6.2 Dynamic range	7
7 Electrical tests for valves without integrated electronics	7
7.1 General	7
7.2 Coil resistance	7
7.2.1 Coil resistance (cold)	7
7.2.2 Coil resistance (hot)	7
7.3 Coil inductance (optional test)	7
8 Relief valve	9
8.1 Steady-state tests	9
8.1.1 General	9
8.1.2 Proof pressure tests (optional)	9
8.1.3 Internal leakage test	10
8.1.4 Test to establish the valve-controlled pressure versus input signal characteristic with constant flow	11
8.1.5 Threshold test	12
8.1.6 Pressure versus flow with constant input signal	13
8.1.7 Pressure versus fluid temperature	15
8.2 Dynamic tests	16
8.2.1 General	16
8.2.2 Test circuit	16
8.2.3 Step response (change in input signal)	17
8.2.4 Step response (change in flow)	19
8.2.5 Frequency response	21
9 Reducing valve	22
9.1 Steady-state tests	22
9.1.1 General	22
9.1.2 Proof pressure test (optional)	23
9.1.3 Pilot flow test	23
9.1.4 Test to establish the valve-controlled pressure versus input signal characteristics with constant flow	24
9.1.5 Threshold	25
9.1.6 Valve pressure versus flow characteristic with constant input signal	26
9.1.7 Controlled pressure versus fluid temperature	29
9.2 Dynamic tests	29
9.2.1 General	29
9.2.2 Test circuit	30
9.2.3 Step response (change in input signal)	30
9.2.4 Step response (change in flow)	30
9.2.5 Frequency response	33

10	Pressure impulse test	33
11	Presentation of results	34
11.1	General	34
11.2	Test reports	34
11.2.1	General	34
11.2.2	Test reports for production acceptance tests	34
11.2.3	Test reports for type test	35
12	Identification statement	35
Annex A (informative) Testing guidance		36
Bibliography		37

iTeh Standards
(<https://standards.itih.ai>)
Document Preview

[ISO 10770-3:2020](https://standards.itih.ai/catalog/standards/iso/9db6249e-7986-4dbc-8667-abf4bf1b3e42/iso-10770-3-2020)

<https://standards.itih.ai/catalog/standards/iso/9db6249e-7986-4dbc-8667-abf4bf1b3e42/iso-10770-3-2020>

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 131, *Fluid power systems*, Sub-committee SC 8, *Product testing*.

This second edition cancels and replaces the first edition (ISO 10770-3:2007), which has been technically revised.

A list of all parts in the ISO 10770 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document describes methods of testing electro-hydraulic pressure relief and pressure reducing valves. These types of electro-hydraulic valves prevent the pressure in a hydraulic system rising above a level defined or set by an electrical input signal.

Relief valves are used to control the pressure in a closed volume by increasing the flow out of the volume if the pressure exceeds the set pressure level. The excess flow is dumped directly to a tank.

Reducing valves are used to control the pressure in a closed volume by restricting the flow into the volume if the pressure exceeds the set pressure level.

The design of the system and the position of the valve within the system dictates which type of valve is appropriate to use.

This document has been prepared with the intention of improving the uniformity of valve testing and hence the consistency of recorded valve performance data so that these data can be used for system design, regardless of the data source.

iTeh Standards
(<https://standards.itih.ai>)
Document Preview

[ISO 10770-3:2020](https://standards.itih.ai/catalog/standards/iso/9db6249e-7986-4dbc-8667-abf4bf1b3e42/iso-10770-3-2020)

<https://standards.itih.ai/catalog/standards/iso/9db6249e-7986-4dbc-8667-abf4bf1b3e42/iso-10770-3-2020>