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Planning for functional performance testing for building commissioning —

Part 1: Secondary hydronic pump, system and associated controls

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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

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Foreword

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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).

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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 205, *Building environment design*.

A list of all parts in the ISO 19455 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.

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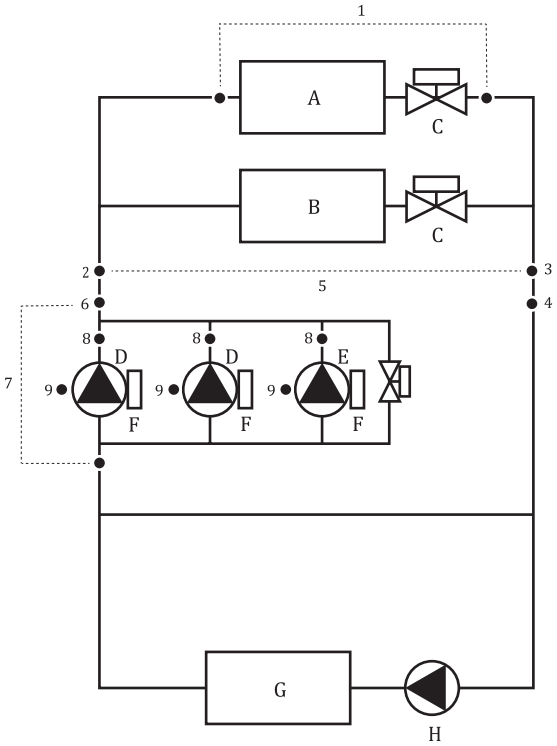
Introduction

This document gives a methodology of planning for functional performance testing of secondary hydronic pump, system and associated controls for building commissioning, and has been prepared for building designers, i.e. architects, environmental designers and building system designers, as well as building clients, contractors, commissioning providers, government officials, and academic staff.

The aim of this document is to assist the building designers in applying a commissioning plan and a commissioning test, which are defined in ISO 16813. In order to achieve effective energy saving in building equipment systems that consume a large amount of energy, it is important not only to introduce energy efficient technologies to the system but also to verify their functional performance by tests and adjustments after the completion whether the system works properly according to its design intent. This document makes it possible to verify performance of secondary hydronic pump, system and associated controls with clear and specific processes.

As well as the intended usage for heating, ventilation and air conditioning (HVAC) systems, the secondary hydronic pump system targeted by this document is described in Figure 1.

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Key

A	farthest air handling unit	1	dPw_AHU: end-pressure difference (in Pa)
B	air handling units	2	Tw_AHUin: inlet water temperature of air handling units (in °C)
C	valve	3	Tw_AHUout: outlet water temperature of air handling units (in °C)
D	secondary hydronic pumps	4	Vw_AHUout: water flow rate of air handling units (in kg/s)
E	reserve hydronic pumps	5	Qw _AHU: amount of heat exchanged in air handling units (in kW)
F	inverter	6	Pw_PSout: supply-side pressure (in Pa)
G	heat source equipment	7	dPw_PS: pump pressure difference (in Pa)
H	primary hydronic pump	8	Vw_PS: water flow rate of each secondary hydronic pump (in kg/s)
		9	E_PS: energy consumption of each secondary hydronic pump (in kW)

Figure 1 — Secondary hydronic pump system targeted by this document

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Planning for functional performance testing for building commissioning —

Part 1:
Secondary hydronic pump, system and associated controls

1 Scope

This document specifies a planning method for functional performance testing (FPT). This document is applicable to the planning of the FPT during the design phase of new buildings and retrofit projects, which is defined in ISO 16813.

This document establishes how to design building environmental systems when the FPT is being carried out. This document defines the following:

— what kind of information regarding the system is required (for example, design documents, drawings and product specifications);

— what kind of data should be measured (though concrete measurement techniques are not specified in this document);

— how the measured data is analysed.

Such clear definition of the FPT makes it possible for building designers to prepare and plan for FPT throughout the design process.

This document specifies an FPT method for secondary hydronic pump, system and associated controls in heating, ventilation and air conditioning (HVAC) systems.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 16813, *Building environment design — Indoor environment — General principles*

ISO 16484-1, *Building automation and control systems (BACS) — Part 1: Project specification and implementation*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 16813, ISO 16484-1 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

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