
**Milking and cooling machine
installations — Monitoring device
for bulk milk cooling tanks —
Requirements**

*Installations de machines de traite et de refroidissement — Dispositif
de surveillance des réservoirs de refroidissement — Exigences*

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO 23130:2020](https://standards.iteh.ai/catalog/standards/sist/1f6dab8b-265a-4861-8069-637364f801a8/iso-23130-2020)

<https://standards.iteh.ai/catalog/standards/sist/1f6dab8b-265a-4861-8069-637364f801a8/iso-23130-2020>



iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 23130:2020

<https://standards.iteh.ai/catalog/standards/sist/1f6dab8b-265a-4861-8069-637364f801a8/iso-23130-2020>



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
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

	Page
Foreword.....	iv
Introduction.....	v
1 Scope.....	1
2 Normative references.....	1
3 Terms and definitions.....	1
4 Requirements.....	2
4.1 General.....	2
4.1.1 Functionality and suitability.....	2
4.1.2 Design.....	2
4.2 Technical requirements of the monitoring device.....	2
4.2.1 Functional requirements.....	2
4.3 Alarms for monitoring milk cooling, storage and agitation.....	4
4.3.1 Monitoring milk cooling and storage temperature.....	4
4.3.2 Monitoring agitation.....	4
4.4 Monitoring cleaning of bulk milk tank.....	5
4.5 Record information.....	5
5 Retrofitting of monitoring devices.....	5
6 Information for use.....	6
6.1 Operator's manual.....	6
6.2 Instructions for tanker driver.....	6
6.3 Instructions for installation.....	6

<https://standards.iteh.ai/catalog/standards/sist/1f6dab8b-265a-4861-8069-637364f801a8/iso-23130-2020>
 ISO 23130:2020

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 23, *Tractors and machinery for agriculture and forestry*.

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

As milk is a sensitive product, the cooling and storage conditions are of special importance. Monitoring devices for cooling tanks support the control of the cooling and storage conditions and indicate if actual conditions do not comply with the specified conditions.

As the monitoring device is part of the milking and cooling installation, it is essential that its design and installation are compatible with the complete installation and comply with the installation manufacturer's specifications.

This document complements the other standards for milking and cooling equipment provided by TC 23.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[ISO 23130:2020](https://standards.iteh.ai/catalog/standards/sist/1f6dab8b-265a-4861-8069-637364f801a8/iso-23130-2020)

<https://standards.iteh.ai/catalog/standards/sist/1f6dab8b-265a-4861-8069-637364f801a8/iso-23130-2020>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 23130:2020

<https://standards.iteh.ai/catalog/standards/sist/1f6dab8b-265a-4861-8069-637364f801a8/iso-23130-2020>

Milking and cooling machine installations — Monitoring device for bulk milk cooling tanks — Requirements

1 Scope

This document specifies minimum performance and information requirements for monitoring devices of bulk milk cooling tanks as part of milking and milk cooling machinery installations in agricultural operations. It also specifies the minimum requirements for materials, design and installation.

The purpose of this document is to contribute to a high-quality milk production by monitoring, collecting data and providing alarms with respect to defined parameters of the milk cooling, storage and cleaning processes.

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 3918, *Milking machine installations — Vocabulary*

ISO 5708, *Refrigerated bulk milk tanks*

3 Terms and definitions

ISO 23130:2020

<https://standards.iteh.ai/catalog/standards/sist/1f6dab8b-265a-4861-8069-659645058a22/iso-23130>

For the purposes of this document, the terms and definitions given in ISO 3918 and ISO 5708 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/>

3.1

monitoring device

means allowing to measure, to record and to evaluate specified technical or operational parameters of the bulk milk tank

3.2

first batch of milk

quantity of milk that is filled to the tank between T0 and T1

Note 1 to entry: See [Table 2](#) and [Figure 1](#).

3.3

blended batch

comprises the quantity of milk stored between T1 and T2

Note 1 to entry: See [Table 2](#) and [Figure 1](#).

3.4 milk

refers to the entire quantity of milk added between T0 and T2

Note 1 to entry: See [Table 2](#) and [Figure 1](#).

4 Requirements

4.1 General

4.1.1 Functionality and suitability

4.1.1.1 Monitoring devices provided by the milking and cooling equipment manufacturer, and being part of the installation, shall be included in the manufacturer's conformity procedure for the milking and cooling installation to ensure compliance with possible legal requirements, such as those related to safety and hygiene.

4.1.1.2 Manufacturers/installers of monitoring devices as independent products, for example for retrofitting of an installation, shall take into consideration any relevant legal requirements. In addition, the manufacturers/installers shall ensure compatibility with the installation to avoid negative effects, such as disturbances of functions or malfunctions, on the whole milking and cooling installation.

4.1.2 Design

4.1.2.1 Materials used for monitoring devices shall comply with ISO 5708.

4.1.2.2 The monitoring device shall inform about the operational status of the bulk milk tank.

4.1.2.3 The monitoring device shall be able to transfer data to external devices such as farm's cowshed PC, USB storage device or other electronic equipment.

4.1.2.4 The monitoring device shall be protected against unauthorized modifications (manipulations).

4.1.2.5 The sensor for monitoring the milk and cleaning temperature shall

- be independent of the sensor(s) for controlling the milk cooling and cleaning processes; or
- in case of tank controller with integrated monitoring unit, dual temperature sensors shall be used.

4.2 Technical requirements of the monitoring device

4.2.1 Functional requirements

The accuracy of measurements shall be:

- $\pm 0,5$ °C for temperatures between 0 °C and 20 °C;
- $\pm 1,0$ °C for temperatures between > 20 °C and < 100 °C.

4.2.1.1 The monitoring device shall monitor the milk cooling and storage conditions from at least 6,7 % of the rated tank volume.

4.2.1.2 The monitoring device and its components shall not affect milking, cooling or cleaning.

4.2.1.3 The monitoring device shall allow the reading and the adjustment of temperature and time limits for critical and informative alarms by the authorized service personnel (see [Tables 2, 3 and 4](#)).

4.2.1.4 The monitoring device shall show whether the milk cooling and storage conditions are as intended, or an alarm has been activated.

Alarms shall be clearly indicated in form of a visual signal (for example green, orange, red). Additional information can be shown on a display. In case of abbreviations or codes, the meaning shall be explained by information located next to the monitoring device. In case of textual information, this information shall be provided in the language used most commonly in the country/region. The alarm information shall be available even in case of power supply failure (see [4.2.1.6](#)).

The alarm can also be sent to a remote system (e.g. the central control unit of the milking and cooling installation, farm's PC, and/or the mobile communication device of the person responsible for the operation of the installation).

4.2.1.5 Data (see [Table 1](#)) and alarms (see [4.3](#) and [4.4](#)) to be recorded shall be provided with a date and time and stored for at least 60 days. It shall not be possible to change recorded data manually. A backup system shall be provided to ensure that data are not lost as a result of a breakdown or power failure.

Data export shall be provided [for example Comma-Separated-Values (CSV), Java Script Object Notation (JSON) or others].

4.2.1.6 The monitoring device shall be provided with sufficient backup power so that, in the event of power failure, the system is able to generate and send the appropriate alarm message(s).

4.2.1.7 The monitoring device shall provide critical and informative alarms (see [4.3](#) and [4.4](#)).

4.2.1.8 The temperature recording shall start as soon as milk is detected entering the tank. The recording interval shall not be more than 15 min during milk cooling and storage and not more than 1 min during cleaning.

4.2.1.9 The monitoring device shall record at least the events shown in [Table 1](#).

Table 1 — Events to be recorded

Event with date and time in h:min:sec	Explanation
First milk in the tank	Recording of arrival of the first milk into the tank after the tank has been emptied and cleaned
Agitation started	Recording of start of agitation
Agitation stopped	Recording of stop or breakdown of the system
Cleaning started	Recording of start of cleaning unit /CIP system
Cleaning completion	Recording of completion of cleaning process
Monitoring device operational	Recording of working of monitoring device
Monitoring device not operational	Recording of interruption of monitoring device or power supply failure
Application of cleaning agents	The application of the cleaning agent shall be monitored at appropriate times. ^a
^a Measuring the detergent volume is not required.	