English

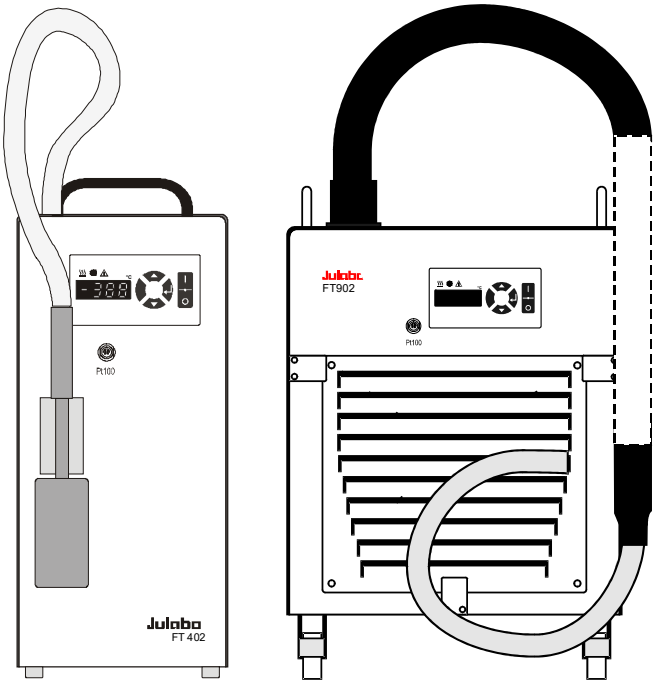
OPERATING MANUAL

Immersion Coolers

FT402

FT902

FT903



Julabo
THE TEMPERATURE CONTROL COMPANY

JULABO GmbH
77960 Seelbach / Germany
Tel. +49 7823 51-0
Fax +49 7823 2491
info.de@julabo.com
www.julabo.com

1.950.4620.en.V08 06/22

Congratulations!

You have made an excellent choice.
JULABO thanks you for the trust you have placed in us.
This operating manual has been designed to help you gain an understanding of the operation and possible applications of our immersion coolers. For optimal utilization of all functions, we recommend that you thoroughly study this manual prior to beginning operation.

Unpacking and inspecting

Unpack the immersion cooler and accessories and inspect them for possible transport damage. Damage should be reported to the responsible carrier, railway, or postal authority, and a damage report should be requested. These instructions must be followed fully for us to guarantee our full support of your claim for protecting against loss from concealed damage. The form required for filing such a claim will be provided by the carrier.

Important: keep operating manual for future use

TABLE OF CONTENTS

1. Intended use

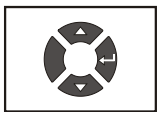
JULABO immersion coolers have been designed for temperature application to specific fluids in a bath tank.

For example: Dewar vessels, beakers, or other containers in conjunction with heating circulators for continuous countercooling or for dry-ice substitution.

JULABO immersion coolers are not suitable for direct temperature control of foods, semi-luxury foods and tobacco, or pharmaceutical and medical products. Direct temperature control means unprotected contact of the object with the bath medium (bath fluid).

1.1. Description

☑ The immersion coolers are operated via the keypad. The implemented microprocessor technology allows to set and to store the setpoint that can be indicated on the LED temperature display.



☑ The PID temperature control adapts the cooling supply to the thermal requirements of the bath.

☑ Electrical connection:
Connection for Pt100 external sensor for temperature measurement and control.

☑ Model FT402 is provided with a handle for portable use.
Models FT902, FT903 are equipped with four castors. Two of the castors include locking levers that should be pressed down after setting up the unit to prevent it from moving.

☑ The immersion probe is connected to the instrument with a flexible, specially insulated tube. On models FT902, FT903 the immersion probe is also flexible and may be adjusted precisely to different positions within the vessel.

2. Operator responsibility – Safety instructions

The products of JULABO ensure safe operation when installed, operated, and maintained according to common safety regulations. This section explains the potential dangers that may arise when operating the circulator and also specifies the most important safety precautions to preclude these dangers as far as possible.

The operator is responsible for the qualification of the personnel operating the units.

- The personnel operating the units should be regularly instructed about the dangers involved with their job activities as well as measures to avert these dangers.
- Make sure all persons tasked with operating, installing, and maintaining the unit have read and understand the safety information and operating instructions.
- When using hazardous materials or materials that could become hazardous, the circulator may be operated only by persons who are absolutely familiar with these materials and the circulator. These persons must be fully aware of possible risks.

If you have any questions concerning the operation of your unit or the information in this manual, please contact us!

Contact JULABO GmbH
Gerhard-Juchheim-Strasse 1
77960 Seelbach / Germany

☎ +49 7823 51-0
+49 7823 2491
info.de@julabo.com
www.julabo.com

Safety instructions for the operator:

- Avoid strikes to the housing, vibrations, damage to the operating-element panel (keypad, display), and contamination.
- Make sure the product is checked for proper condition regularly (depending on the conditions of use). Regularly check (at least every 2 years) the proper condition of the mandatory, warning, prohibition and safety labels.
- Make sure that the mains power supply has low impedance to avoid any negative effects on the instruments being operated on the same mains.
- This unit is designed for operation in a controlled electromagnetic environment. This means that transmitting devices (e.g., cellular phones) should not be used in the immediate vicinity.
- Magnetic radiation may affect other devices with components sensitive to magnetic fields (e.g., monitors). We recommend maintaining a minimum distance of 1 m.
- Permissible ambient temperature: max. 40 °C, min. 5 °C.
- Permissible relative humidity: 50% (40 °C).
- Do not store the unit in an aggressive atmosphere. Protect the unit from contamination.
- Do not expose the unit to sunlight.

Appropriate operation

Only qualified personnel is authorized to configure, install, maintain, or repair the circulator. Persons who operate the circulator must be trained in the particular tasks by qualified personnel. The summarized user guidance (short manual) and the specification table with information on individual parameters are sufficient for this.

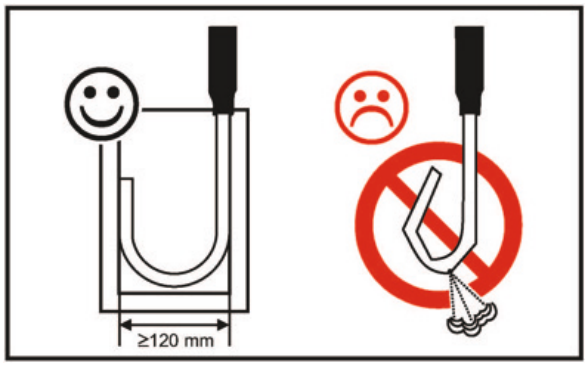
Use

The bath can be filled with flammable materials. Fire hazard!
There might be chemical dangers depending on the bath medium used.
Observe all warnings for the used materials (bath fluids) and the respective instructions (safety data sheets).
Insufficient ventilation may result in the formation of explosive mixtures. Only use the unit in well ventilated areas.
Only use recommended materials (bath fluids). Only use non-acid and non corroding materials.

When using hazardous materials or materials that could become hazardous, the operator must affix the enclosed safety labels (1 + 2) to the front of the unit so they are highly visible:

1		Danger area. Attention! Observe instructions. (operating manual, safety data sheet)
2		Carefully read the user information prior to beginning operation.

Particular care and attention is necessary because of the wide operating range. There are thermal dangers: Touchable parts of the probe can be very cold. The user must attach the enclosed safety labels to the unit so they are easily visible.



Attention:
- Note a minimum bending radius of the probe.
- Do not touch cold probe.

2.1. Disposal

The product may be used with oil as bath fluid. These oils fully or partially consist of mineral oil or synthetic oil. For disposal, follow the instructions in the material safety data sheets.

This unit contains refrigerants, which at this time are not considered harmful to the ozone layer. However, over the long operating period of the unit, disposal rules may change. Therefore, only qualified personnel should handle the disposal.

Valid in EU countries
See the current official journal of the European Union – WEEE directive.
Directive of the European Parliament and of the Council on waste electrical and electronic equipment (WEEE).
This directive requires electrical and electronic equipment marked with a crossed-out trash can to be disposed of separately in an environmentally friendly manner.
Contact an authorized waste management company in your country.
Disposal with household waste (unsorted waste) or similar collections of municipal waste is not permitted!

2.2. EC Declaration of Conformity

EG-Konformitätserklärung nach EG Maschinenrichtlinie 2006/42/EG, Anhang II A
EC-Declaration of Conformity to EC Machinery Directive 2006/42/EC, Annex II A

Hersteller / *Manufacturer*:

JULABO GmbH
Gerhard-Juchheim-Strasse 1
77960 Seelbach / Germany
Tel: +49 7823 51-0

CE

Hiermit erklären wir, dass das nachfolgend bezeichnete Produkt
We hereby declare, that the following product

Produkt / *Product*: Eintauchkühler / *Immersion Cooler*

Typ / *Type*: FT400, FT402 **Serien-Nr. / *Serial-No.*:** siehe Typenschild / *see type label*

aufgrund seiner Konzipierung und Bauart in der von uns in Verkehr gebrachten Ausführung den grundlegenden Sicherheits- und Gesundheitsanforderungen der nachfolgend aufgeführten EG-Richtlinien entspricht.
due to the design and construction, as assembled and marketed by our Company – complies with fundamental safety and health requirements according to the following EC-Directives.

Maschinenrichtlinie 2006/42/EG; Machinery Directive 2006/42/EC
EMV-Richtlinie 2014/30/EU; EMC-Directive 2014/30/EU
RoHS-Richtlinie 2011/65/EU; RoHS-Directive 2011/65/EU

Angewandte harmonisierte Normen und techn. Spezifikationen:
Applied following harmonized standards and technical specifications:

EN IEC 63000:2018
Technische Dokumentation zur Beurteilung von Elektro- und Elektronikgeräten hinsichtlich der Beschränkung gefährlicher Stoffe
Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

EN ISO 12100 : 2010
Sicherheit von Maschinen - Allgemeine Gestaltungsleitsätze - Risikobeurteilung und Risikominderung (ISO 12100:2010)
Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)

EN 61010-1 : 2010 / A1 : 2019 / AC : 2019-04, EN 61010-1 : 2010 / A1:2019
Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und Laborgeräte, Teil 1: Allgemeine Anforderungen
Safety requirements for electrical equiment for measurement, control, and laboratory use, Part 1: General requirements

EN 61010-2-011 : 2017
Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und Laborgeräte – Teil 2-011: Besondere Anforderungen für Kühlgeräte
Safety requirements for electrical equipment for measurement, control, and laboratory use –Part 2-011: Particular requirements for refrigerating equipment

EN 61326-1 : 2013
Elektrische Mess-, Steuer-, Regel- und Laborgeräte- EMV-Anforderungen- Teil 1: Allgemeine Anforderungen
Electrical equipment for measurement, control, and laboratory use - EMC requirements - Part 1: General requirements

EN 378-1:2016 + A1:2020
Kälteanlagen und Wärmepumpen – Sicherheitstechnische und umweltrelevante Anforderungen – Teil 1: Grundlegende Anforderungen, Begriffe, Klassifikationen und Auswahlkriterien
Refrigerating systems and heat pumps - Safety and environmental requirements - Part 1: Basics requirements, definitions, classification and selection criteria

EN 378-2 : 2016
Kälteanlagen und Wärmepumpen – Sicherheitstechnische und umweltrelevante Anforderungen – Teil 2: Konstruktion, Herstellung, Prüfung, Kennzeichnung und Dokumentation
Refrigerating systems and heat pumps - Safety and environmental requirements - Part 2: Design, construction, testing, marking and documentation

EN 378-3:2016 + A1:2020
Kälteanlagen und Wärmepumpen – Sicherheitstechnische und umweltrelevante Anforderungen – Teil 3: Aufstellungsort und Schutz von Personen
Refrigerating systems and heat pumps - Safety and environmental requirements - Part 3: Installation site and personal protection

EN 378-4:2016 + A1:2019
Kälteanlagen und Wärmepumpen – Sicherheitstechnische und umweltrelevante Anforderungen – Teil 4: Betrieb, Instandhaltung, Instandsetzung und Rückgewinnung
Refrigerating systems and heat pumps - Safety and environmental requirements - Part 4: Operation, maintenance, repair and recovery

Bevollmächtigter für die Zusammenstellung der technischen Unterlagen:
Authorized representative in charge of administering technical documentation:
Hr. Torsten Kauschke, im Haus / *on the manufacturer's premises as defined above*

Die Konformitätserklärung wurde ausgestellt
The declaration of conformity was issued and valid of

Seelbach, 19.11.2021

i.V. Bernd Rother, Senior Expert Products & Innovation

2021_054_FT400_FT402-Eintauchkühler_d_e.docx

EG-Konformitätserklärung nach EG Maschinenrichtlinie 2006/42/EG, Anhang II A
EC-Declaration of Conformity to EC Machinery Directive 2006/42/EC, Annex II A

Hersteller / *Manufacturer*:

JULABO GmbH
Gerhard-Juchheim-Strasse 1
77960 Seelbach / Germany
Tel: +49 7823 51-0

CE

Hiermit erklären wir, dass das nachfolgend bezeichnete Produkt
We hereby declare, that the following product

Produkt / *Product*: Eintauchkühler / *Immersion Cooler*

Typ / *Type*: FT900, FT902 **Serien-Nr. / *Serial-No.*:** siehe Typenschild / *see type label*

aufgrund seiner Konzipierung und Bauart in der von uns in Verkehr gebrachten Ausführung den grundlegenden Sicherheits- und Gesundheitsanforderungen der nachfolgend aufgeführten EG-Richtlinien entspricht.
due to the design and construction, as assembled and marketed by our Company – complies with fundamental safety and health requirements according to the following EC-Directives.

Maschinenrichtlinie 2006/42/EG; Machinery Directive 2006/42/EC
EMV-Richtlinie 2014/30/EU; EMC-Directive 2014/30/EU
RoHS-Richtlinie 2011/65/EU; RoHS-Directive 2011/65/EU

Angewandte harmonisierte Normen und techn. Spezifikationen:
Applied following harmonized standards and technical specifications:

EN IEC 63000:2018
Technische Dokumentation zur Beurteilung von Elektro- und Elektronikgeräten hinsichtlich der Beschränkung gefährlicher Stoffe
Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

EN ISO 12100 : 2010
Sicherheit von Maschinen - Allgemeine Gestaltungsleitsätze - Risikobeurteilung und Risikominderung (ISO 12100:2010)
Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)

EN 61010-1 : 2010 / A1 : 2019 / AC : 2019-04, EN 61010-1 : 2010 / A1:2019
Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und Laborgeräte, Teil 1: Allgemeine Anforderungen
Safety requirements for electrical equiment for measurement, control, and laboratory use, Part 1: General requirements

EN 61010-2-011 : 2017
Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und Laborgeräte – Teil 2-011: Besondere Anforderungen für Kühlgeräte
Safety requirements for electrical equipment for measurement, control, and laboratory use –Part 2-011: Particular requirements for refrigerating equipment

EN 61326-1 : 2013
Elektrische Mess-, Steuer-, Regel- und Laborgeräte- EMV-Anforderungen- Teil 1: Allgemeine Anforderungen
Electrical equipment for measurement, control, and laboratory use - EMC requirements - Part 1: General requirements

EN 378-1:2016 + A1:2020
Kälteanlagen und Wärmepumpen – Sicherheitstechnische und umweltrelevante Anforderungen – Teil 1: Grundlegende Anforderungen, Begriffe, Klassifikationen und Auswahlkriterien
Refrigerating systems and heat pumps - Safety and environmental requirements - Part 1: Basics requirements, definitions, classification and selection criteria

EN 378-2 : 2016
Kälteanlagen und Wärmepumpen – Sicherheitstechnische und umweltrelevante Anforderungen – Teil 2: Konstruktion, Herstellung, Prüfung, Kennzeichnung und Dokumentation
Refrigerating systems and heat pumps - Safety and environmental requirements - Part 2: Design, construction, testing, marking and documentation

EN 378-3:2016 + A1:2020
Kälteanlagen und Wärmepumpen – Sicherheitstechnische und umweltrelevante Anforderungen – Teil 3: Aufstellungsort und Schutz von Personen
Refrigerating systems and heat pumps - Safety and environmental requirements - Part 3: Installation site and personal protection

EN 378-4:2016 + A1:2019
Kälteanlagen und Wärmepumpen – Sicherheitstechnische und umweltrelevante Anforderungen – Teil 4: Betrieb, Instandhaltung, Instandsetzung und Rückgewinnung
Refrigerating systems and heat pumps - Safety and environmental requirements - Part 4: Operation, maintenance, repair and recovery

Bevollmächtigter für die Zusammenstellung der technischen Unterlagen:
Authorized representative in charge of administering technical documentation:
Hr. Torsten Kauschke, im Haus / *on the manufacturer's premises as defined above*

Die Konformitätserklärung wurde ausgestellt
The declaration of conformity was issued and valid of

Seelbach, 19.11.2021

i.V. Bernd Rother, Senior Expert Products & Innovation

2021_055_FT900_FT902-Eintauchkühler_d_e.docx

EG-Konformitätserklärung nach EG Maschinenrichtlinie 2006/42/EG, Anhang II A

EC-Declaration of Conformity to EC Machinery Directive 2006/42/EC, Annex II A

Hersteller / *Manufacturer*:

JULABO GmbH
Gerhard-Juchheim-Strasse 1
77960 Seelbach / Germany
Tel: +49 7823 51-0

CE

Hiermit erklären wir, dass das nachfolgend bezeichnete Produkt
We hereby declare, that the following product

Produkt / *Product*: Eintauchkühler / *Immersion Cooler*

Typ / *Type*: FT903 **Serien-Nr. / *Serial-No.*:** siehe Typenschild / *see type label*

aufgrund seiner Konzipierung und Bauart in der von uns in Verkehr gebrachten Ausführung den grundlegenden Sicherheits- und Gesundheitsanforderungen der nachfolgend aufgeführten EG-Richtlinien entspricht.
due to the design and construction, as assembled and marketed by our Company – complies with fundamental safety and health requirements according to the following EC-Directives.

Maschinenrichtlinie 2006/42/EG; Machinery Directive 2006/42/EC
EMV-Richtlinie 2014/30/EU; EMC-Directive 2014/30/EU
RoHS-Richtlinie 2011/65/EU; RoHS-Directive 2011/65/EU

Angewandte harmonisierte Normen und techn. Spezifikationen:
Applied following harmonized standards and technical specifications:

EN IEC 63000:2018
Technische Dokumentation zur Beurteilung von Elektro- und Elektronikgeräten hinsichtlich der Beschränkung gefährlicher Stoffe
Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

EN ISO 12100 : 2010
Sicherheit von Maschinen - Allgemeine Gestaltungsleitsätze - Risikobeurteilung und Risikominderung (ISO 12100:2010)
Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)

EN 61010-1 : 2010 / A1 : 2019 / AC : 2019-04, EN 61010-1 : 2010 / A1:2019
Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und Laborgeräte, Teil 1: Allgemeine Anforderungen
Safety requirements for electrical equiment for measurement, control, and laboratory use, Part 1: General requirements

EN 61010-2-011 : 2017
Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und Laborgeräte – Teil 2-011: Besondere Anforderungen für Kühlgeräte
Safety requirements for electrical equipment for measurement, control, and laboratory use –Part 2-011: Particular requirements for refrigerating equipment

EN 61326-1 : 2013
Elektrische Mess-, Steuer-, Regel- und Laborgeräte- EMV-Anforderungen- Teil 1: Allgemeine Anforderungen
Electrical equipment for measurement, control, and laboratory use - EMC requirements - Part 1: General requirements

EN 378-1:2016 + A1:2020
Kälteanlagen und Wärmepumpen – Sicherheitstechnische und umweltrelevante Anforderungen – Teil 1: Grundlegende Anforderungen, Begriffe, Klassifikationen und Auswahlkriterien
Refrigerating systems and heat pumps - Safety and environmental requirements - Part 1: Basics requirements, definitions, classification and selection criteria

EN 378-2 : 2016
Kälteanlagen und Wärmepumpen – Sicherheitstechnische und umweltrelevante Anforderungen – Teil 2: Konstruktion, Herstellung, Prüfung, Kennzeichnung und Dokumentation
Refrigerating systems and heat pumps - Safety and environmental requirements - Part 2: Design, construction, testing, marking and documentation

EN 378-3:2016 + A1:2020
Kälteanlagen und Wärmepumpen – Sicherheitstechnische und umweltrelevante Anforderungen – Teil 3: Aufstellungsort und Schutz von Personen
Refrigerating systems and heat pumps - Safety and environmental requirements - Part 3: Installation site and personal protection

EN 378-4:2016 + A1:2019
Kälteanlagen und Wärmepumpen – Sicherheitstechnische und umweltrelevante Anforderungen – Teil 4: Betrieb, Instandhaltung, Instandsetzung und Rückgewinnung
Refrigerating systems and heat pumps - Safety and environmental requirements - Part 4: Operation, maintenance, repair and recovery

Bevollmächtigter für die Zusammenstellung der technischen Unterlagen:
Authorized representative in charge of administering technical documentation:
Hr. Torsten Kauschke, im Haus / *on the manufacturer's premises as defined above*

Die Konformitätserklärung wurde ausgestellt
The declaration of conformity was issued and valid of

Seelbach, 19.11.2021

i.V. Bernd Rother, Senior Expert Products & Innovation

2021_162_FT903-Eintauchkühler_d_e.docx

2.3. UKCA Declaration of Conformity

UK Office: JULABO UK Ltd., Unit 7, Casterton Road Business Park, Old Great North Road, Little Casterton, Stamford, PE9 4EJ, United Kingdom, Tel.: +44 1733 265892

UKCA-Declaration of Conformity

Manufacturer:

JULABO GmbH
Gerhard-Juchheim-Strasse 1
77960 Seelbach / Germany
Tel: +49 7823 51-0

This declaration is issued under the sole responsibility of the product manufacturer

Product: Immersion Cooler

Type: FT400, FT402 **Serial-No.:** see type label

The object of the declaration described above is in conformity with the relevant UK Statutory Instruments and their amendments:

Supply of Machinery (Safety) Regulations 2008
Electromagnetic Compatibility Regulations 2016
The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

Applied following harmonized standards and technical specifications:

EN IEC 63000:2018
Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

EN ISO 12100 : 2010
Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)

EN 61010-1 : 2010 / A1 : 2019 / AC : 2019-04, EN 61010-1 : 2010 / A1:2019
Safety requirements for electrical equiment for measurement, control, and laboratory use, Part 1: General requirements

EN 61010-2-011 : 2017
Safety requirements for electrical equipment for measurement, control, and laboratory use –Part 2-011: Particular requirements for refrigerating equipment

EN 61326-1 : 2013
Electrical equipment for measurement, control, and laboratory use - EMC requirements - Part 1: General requirements

EN 378-1:2016 + A1:2020
Refrigerating systems and heat pumps - Safety and environmental requirements - Part 1: Basics requirements, definitions, classification and selection criteria

EN 378-2 : 2016
Refrigerating systems and heat pumps - Safety and environmental requirements - Part 2: Design, construction, testing, marking and documentation

EN 378-3:2016 + A1:2020
Refrigerating systems and heat pumps - Safety and environmental requirements - Part 3: Installation site and personal protection

EN 378-4:2016 + A1:2019
Refrigerating systems and heat pumps - Safety and environmental requirements - Part 4: Operation, maintenance, repair and recovery

Authorized representative in charge of administering technical documentation:

JULABO UK Ltd., Mr. Gary Etherington, Unit 7, Casterton Road Business Park, Little Casterton, Stamford PE9 4EJ United Kingdom, Telephone: +44 1733 265892

The declaration of conformity was issued and valid of

Seelbach, 24.03.2022

i.V. Bernd Rother, Senior Expert Products & Innovation

2022_054_FT400_FT402_Immersion-Cooler_UKCA.docx

UKCA-Declaration of Conformity

Manufacturer:

JULABO GmbH
Gerhard-Juchheim-Strasse 1
77960 Seelbach / Germany
Tel: +49 7823 51-0

This declaration is issued under the sole responsibility of the product manufacturer

Product: Immersion Cooler

Type: FT900, FT902 **Serial-No.:** see type label

The object of the declaration described above is in conformity with the relevant UK Statutory Instruments and their amendments:

Supply of Machinery (Safety) Regulations 2008
Electromagnetic Compatibility Regulations 2016
The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

Applied following harmonized standards and technical specifications:

EN IEC 63000:2018
Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

EN ISO 12100 : 2010
Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)

EN 61010-1 : 2010 / A1 : 2019 / AC : 2019-04, EN 61010-1 : 2010 / A1:2019
Safety requirements for electrical equiment for measurement, control, and laboratory use, Part 1: General requirements

EN 61010-2-011 : 2017
Safety requirements for electrical equipment for measurement, control, and laboratory use –Part 2-011: Particular requirements for refrigerating equipment

EN 61326-1 : 2013
Electrical equipment for measurement, control, and laboratory use - EMC requirements - Part 1: General requirements

EN 378-1:2016 + A1:2020
Refrigerating systems and heat pumps - Safety and environmental requirements - Part 1: Basics requirements, definitions, classification and selection criteria

EN 378-2 : 2016
Refrigerating systems and heat pumps - Safety and environmental requirements - Part 2: Design, construction, testing, marking and documentation

EN 378-3:2016 + A1:2020
Refrigerating systems and heat pumps - Safety and environmental requirements - Part 3: Installation site and personal protection

EN 378-4:2016 + A1:2019
Refrigerating systems and heat pumps - Safety and environmental requirements - Part 4: Operation, maintenance, repair and recovery

Authorized representative in charge of administering technical documentation:

JULABO UK Ltd., Mr. Gary Etherington, Unit 7, Casterton Road Business Park, Little Casterton, Stamford PE9 4EJ United Kingdom, Telephone: +44 1733 265892

The declaration of conformity was issued and valid of

Seelbach, 24.03.2022

i.V. Bernd Rother, Senior Expert Products & Innovation

2022_055_FT900_FT902_Immersion-Cooler_UKCA.docx

UKCA-Declaration of Conformity

Manufacturer:

JULABO GmbH
Gerhard-Juchheim-Strasse 1
77960 Seelbach / Germany
Tel: +49 7823 51-0

This declaration is issued under the sole responsibility of the product manufacturer

Product: Immersion Cooler
Type: FT903 **Serial-No.:** see type label

The object of the declaration described above is in conformity with the relevant UK Statutory Instruments and their amendments:

Supply of Machinery (Safety) Regulations 2008
Electromagnetic Compatibility Regulations 2016
The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

Applied following harmonized standards and technical specifications:

EN IEC 63000:2018
Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

EN ISO 12100 : 2010
Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)

EN 61010-1 : 2010 / A1 : 2019 / AC : 2019-04, EN 61010-1 : 2010 / A1:2019
Safety requirements for electrical equiment for measurement, control, and laboratory use, Part 1: General requirements

EN 61010-2-011 : 2017
Safety requirements for electrical equipment for measurement, control, and laboratory use –Part 2-011: Particular requirements for refrigerating equipment

EN 61326-1 : 2013
Electrical equipment for measurement, control, and laboratory use - EMC requirements - Part 1: General requirements

EN 378-1:2016 + A1:2020
Refrigerating systems and heat pumps - Safety and environmental requirements - Part 1: Basics requirements, definitions, classification and selection criteria

EN 378-2 : 2016
Refrigerating systems and heat pumps - Safety and environmental requirements - Part 2: Design, construction, testing, marking and documentation

EN 378-3:2016 + A1:2020
Refrigerating systems and heat pumps - Safety and environmental requirements - Part 3: Installation site and personal protection

EN 378-4:2016 + A1:2019
Refrigerating systems and heat pumps - Safety and environmental requirements - Part 4: Operation, maintenance, repair and recovery

Authorized representative in charge of administering technical documentation:

JULABO UK Ltd., Mr. Gary Etherington, Unit 7, Casterton Road Business Park, Little Casterton, Stamford PE9 4EJ United Kingdom, Telephone: +44 1733 265892

The declaration of conformity was issued and valid of

Seelbach, 24.03.2022

i.V. Bernd Rother, Senior Expert Products & Innovation

2022_162_FT903_Immersion-Cooler_UKCA.docx

2.3.1. Warranty conditions

JULABO GmbH warrants its products against defects in material or in workmanship, when used under appropriate conditions and in accordance with appropriate operating instructions

for a period of ONE YEAR.

Extension of the warranty period – free of charge

With the 1PLUS warranty, the warranty can be extended to two years free of charge. The 1PLUS warranty gives the user a free extended warranty to 24 months, limit to a maximum of 10,000 hours of service.

A prerequisite for this is that the user registers the device at www.julabo.com, quoting its serial number, within four weeks of initial operation. The warranty applies from the date of JULABO GmbH's original invoice.

JULABO GmbH reserves the right to decide the validity of any warranty claim. In case of faults arising either due to faulty materials or workmanship, parts will be repaired or replaced free of charge, or a new replacement unit will be supplied.

Any other compensation claims are excluded from this guarantee.

2.4. Technical specifications

Immersion cooler			FT402
Working temperature range		°C	-40 ... 30
Temperature stability		°C	±0.5
Temperature selection			digital
Temperature indication			LED
Resolution		°C	0.1
Temperature control			PID1
Cooling capacity		°C	+20 10 -20 -40
Medium ethanol		kW	0.45 0.36 0.14 0.03
Cooling compressor			1-stage
Refrigerant	230 V / 50 Hz		R452A
	115 V / 60 Hz		R404a
Electrical connections:			
Pt100 external sensor			Pt100
Overall dimensions (WxDxH)		cm	20x30x43
Immersion probe (Lxdia.)		cm	12x5
Immersion probe, flexible (Lxdia.)		cm	-------
Connection tubing (L)		cm	120
Noise level, distance 1 m		dBA	61
Weight		kg	24
Ambient temperature		°C	5 ... 35 (32 with R452A)
Mains power connection		V/Hz	230/50/60
Current input	(at 230 V)	A	3
Mains power connection		V/Hz	115/60
Current input	(at 115 V)	A	4

All measurements have been carried out at: rated voltage and frequency. Ambient temperature 20 °C.

Immersion cooler		FT902	FT903
Working temperature range	°C	-90 ... 30	
Temperature stability	°C	±1	
Temperature selection		digital	
Temperature indication		LED	
Resolution	°C	0.1	
Temperature control		PID1	

Cooling capacity FT903	°C	20	10	0	-10	-20	-30
(Medium ethanol)	kW	0.3	0.29	0.27	0.26	0.25	0.24
Cooling capacity FT903	°C	-40	-50	-60	-70	-80	
(Medium ethanol)	kW	0.23	0.21	0.18	0.13	0.05	

Cooling capacity FT902	°C	20	10	-20	-40	-80
(Medium ethanol)	kW	0.3	0.27	0.24	0.2	0.07

Cooling compressor		2-stage	
Refrigerant 230 V / 50 Hz 115 V / 60 Hz		R404A/R23 R404A/R23	
Electrical connections:			
Pt100 external sensor		Pt100	
Overall dimensions (WxDxH)	cm	38x55x60	
Immersion probe (Lxdia.)	cm	-------	see dimensions page 18
Immersion probe, flexible (Lxdia.)	cm	65x1.5	
Connection tubing (L)	cm	160	
Noise level, distance 1 m	dBA	60	
Weight	kg	50	50
Ambient temperature	°C	5 ... 35	5 ... 40

Mains power connection	V/Hz	230/50/60	
Current input	A	6	6
Mains power connection	V/Hz	115/60	-
Current input	A	12	-

All measurements have been carried out a: rated voltage and frequency. Ambient temperature 20 °C.

Safety installations according to IEC 61010-2-010:

Alarm message	optical + audible (permanent)

Environmental conditions according to IEC 61 010-1:

Use indoors only.
Altitude up to 2000 m - normal zero.
Ambient temperature: see Technical specifications

Humidity:
Max. relative humidity 80 % for temperatures up to +31 °C,
linear decrease down to 50 % relative humidity at a temperature of +40 °C

Max. mains voltage fluctuations of ±10 % are permissible.

Protection class according to IEC 60 529	IP21
The unit corresponds to Class	I
Overvoltage category	II
Pollution degree	2

Caution:
The unit is not for use in explosive environment.

EMC requirements

The device is an ISM device of group 1 per CISPR 11 (uses HF for internal purposes) and is classified in class A (industrial and commercial sector).

Notice!

- Devices of class A are intended for the use in an industrial electromagnetic environment.
- When operating in other electromagnetic environments, their electromagnetic compatibility may be impacted.
- This device is not intended for the use in living areas and cannot guarantee adequate protection of the radio reception in such environments.

Information about the used refrigerants

The **Regulation (EU) No. 517/2014 on fluorinated greenhouse gases** applies to all systems which contain fluorinated refrigerants and replaces (EC) 842/2006.
The aim of the Regulation is to protect the environment by reducing emissions of fluorinated greenhouse gases.
Among other things it regulates the emission limits, use and recovery of these substances. It also contains requirements for operators of systems which require / contain these substances to function.

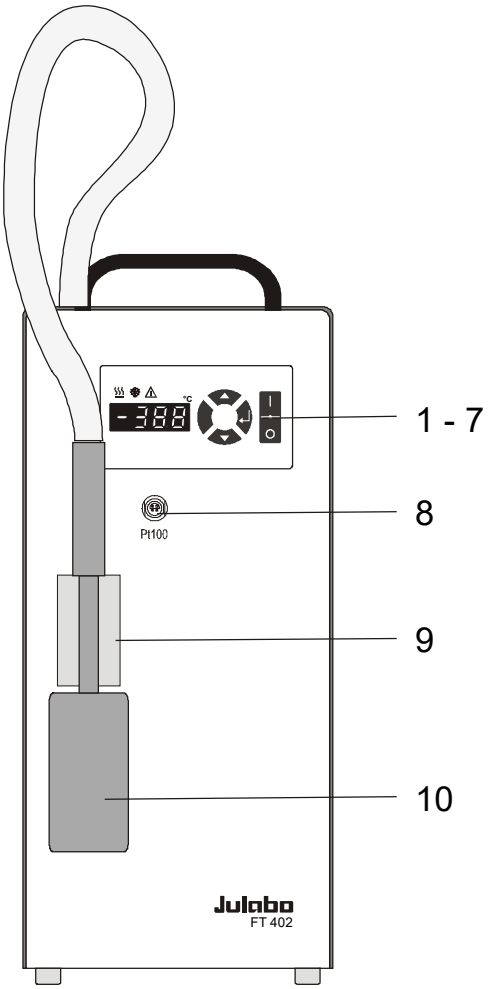
Under Regulation 517/2014, the operator of a system of this nature has the following duties:

- The operator must ensure that the equipment is checked at regular intervals for leaks.
- These intervals depend on the CO_2 equivalent of the system. This is calculated from the refrigerant fill volume and type of refrigerant. The CO_2 equivalent of your system is shown on the model plate.
- The operator undertakes to have maintenance, repair, service, recovery and recycling work carried out by certified personnel who have been authorized by JULABO.
- All such work must be documented. The operator must keep records and archive them for at least five years. The records must be submitted to the relevant authority on request.

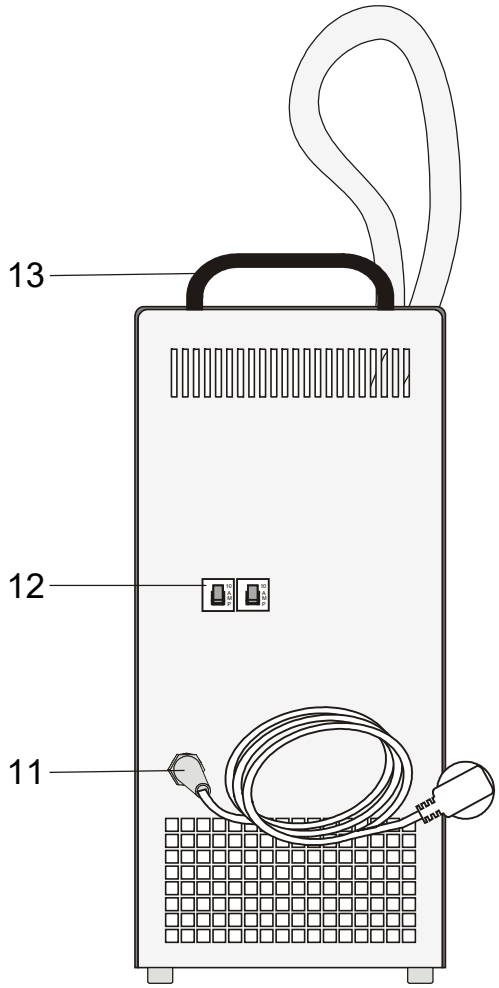
Refer to the text of the Regulation for further information.

3. Operating controls and functional elements

FT402 Front view

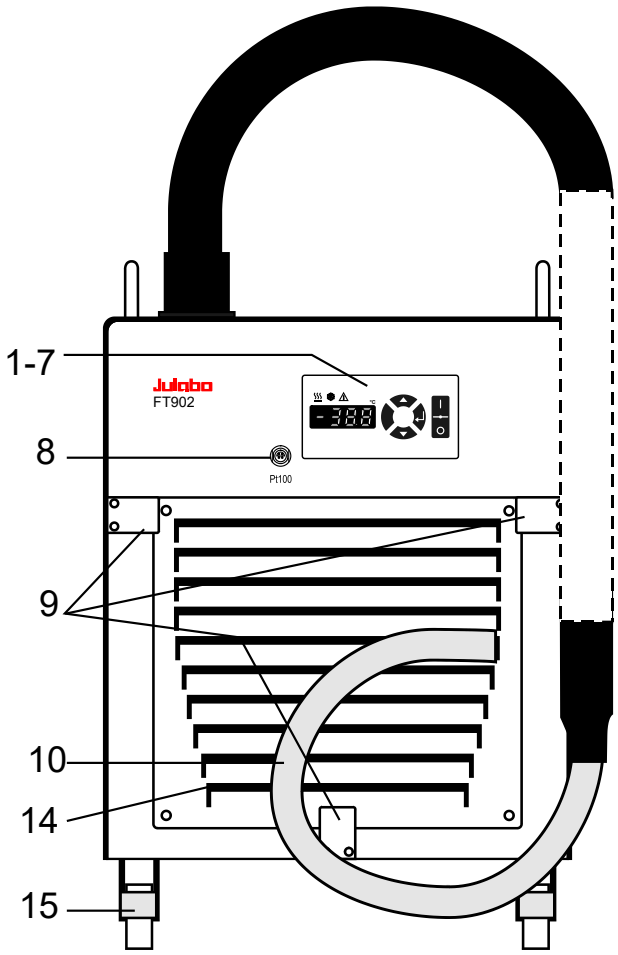


Rear view

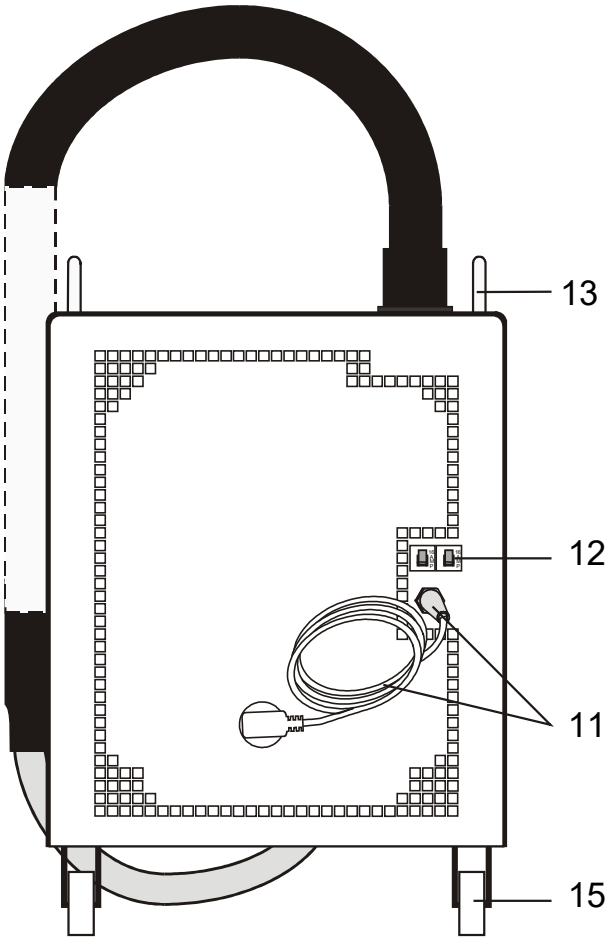


1		Mains power switch, illuminated I on O off
2		Edit keys (increase/decrease setting)
3		Enter key (store)
4		LED temperature display
5		Control indicator –Heating (without function)
6		Control indicator – Cooling
7		Control indicator – Alarm

FT902, FT903 Front view

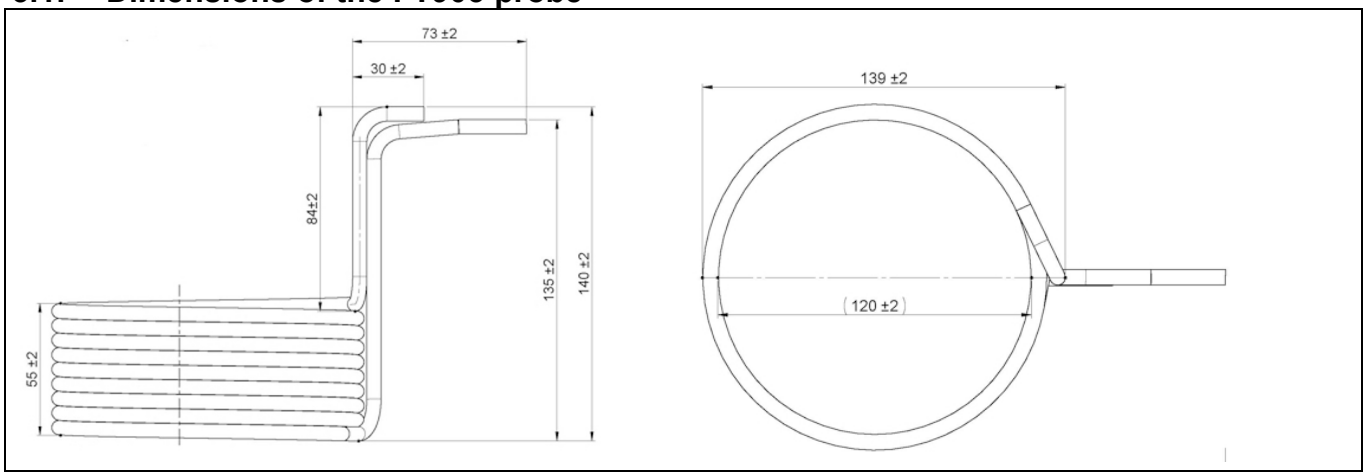


Rear view



8	 Pt100	External Pt100 sensor connector Included with each unit: Order No. 8 981 003 Pt100 sensor, 200x6 mm dia., stainless steel
9		Clamp for immersion probe
10		Immersion probe
11		Mains power cable with plug
12		Mains circuit breakers (resettable) FT402 10 A FT902, FT903 15 A
13		Carrying handle
14		Venting grid, removable (only FT902, FT903)
15		Castor with brake (at the front) Castor without brake (at the back)

3.1. Dimensions of the FT903 probe



4. Safety notes for the user

4.1. Explanation of safety notes

The manual contains warnings to increase safety when using the device. Warnings must always be observed. A warning sign displayed in signal color precedes the signal word. The signal word, highlighted in color, specifies the severity of the hazard.

	***CAUTION*** This signal word designates a danger with a low level of risk which, if it not prevented, may result in minor to moderate injuries.
	***WARNING*** This signal word designates a danger with a medium level of risk which, if it not prevented, may result in death or serious injuries.
	***DANGER*** This signal word designates a danger with a high level of risk which, if it not prevented, will result in death or serious injuries.
	***NOTE*** This signal word designates a possibly harmful situation. If it is not avoided, the system or objects in its vicinity may be damaged.

4.2. Explanation of other notes

	**Note!** Draws attention to something special.
	**Important!** Indicates usage tips and other useful information.

4.3. Safety instructions

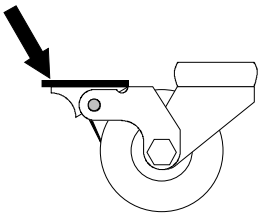
Follow the safety instructions to avoid personal injury and property damage. Also, the valid safety instructions for workplaces must be followed.

- Only connect the unit to a power socket with an earthing contact (PE – protective earth)!
- The power supply plug serves as a safe disconnecting device from the line and must always be easily accessible.
- Place the unit on an even surface on a base made of nonflammable material.
- Do not stay in the area below the unit.
- Make sure you read and understand all instructions and safety precautions listed in this manual before installing or operating your unit.
- Do not touch the immersion probe if it is frosted.
- Do not bend the tube connection of the immersion probe
- Keep the air intake and exhaust grids free of obstructions. (Maintain a sufficient distance from all surrounding surfaces!)
- Do not move the unit from the position where it was set up during operation.
- Always turn off the unit and disconnect the mains cable from the power source before performing any service or maintenance procedures, or before moving the unit.
- Always turn off the unit and disconnect the mains cable from the power source before cleaning the unit.
- Transport the unit with care.
- Sudden jolts or drops may cause damage in the interior of the unit.
- Observe all warning labels.
- Never remove warning labels.
- Never operate units with damaged mains power cables.
- Repairs are to be carried out only by qualified service personnel.

- There are thermal dangers: Touchable parts of the probe can be very cold. Therefore, exercise particular caution when touching these parts. Use gloves.

5. Preparations

5.1. Installation



- Place the unit on an even surface on a pad made of non-flammable material.
- Press down the castor levers on model FT902, FT903.
- The place of installation should be large enough and provide sufficient air ventilation to ensure the room does not warm up excessively because of the heat the instrument rejects to the environment.
  For a fault (leakage) in the refrigeration system, the standard EN 378 prescribes a certain room space to be available for each kg of refrigerant.
  > For 0.52 kg of refrigerant R404A, 1 m^3 of space is required.
  > For 0.423 kg of refrigerant R452A, 1 m^3 of space is required.
  > For 0.68 kg of refrigerant R23, 1 m^3 of space is required.
- The instrument should be set up at a frost-proof and dry location.
- The ambient temperature must not exceed 35 °C (32 °C at units with R452A).
- Keep at least 20 cm of open space on the front and rear venting grids.
- Do not set up the unit in the immediate vicinity of heat sources and do not expose to sun light.
- Before operating the unit after transport, **wait about one hour after setting it up.** This will allow any oil that has accumulated laterally during transport to flow back down thus ensuring maximum cooling performance of the compressor.

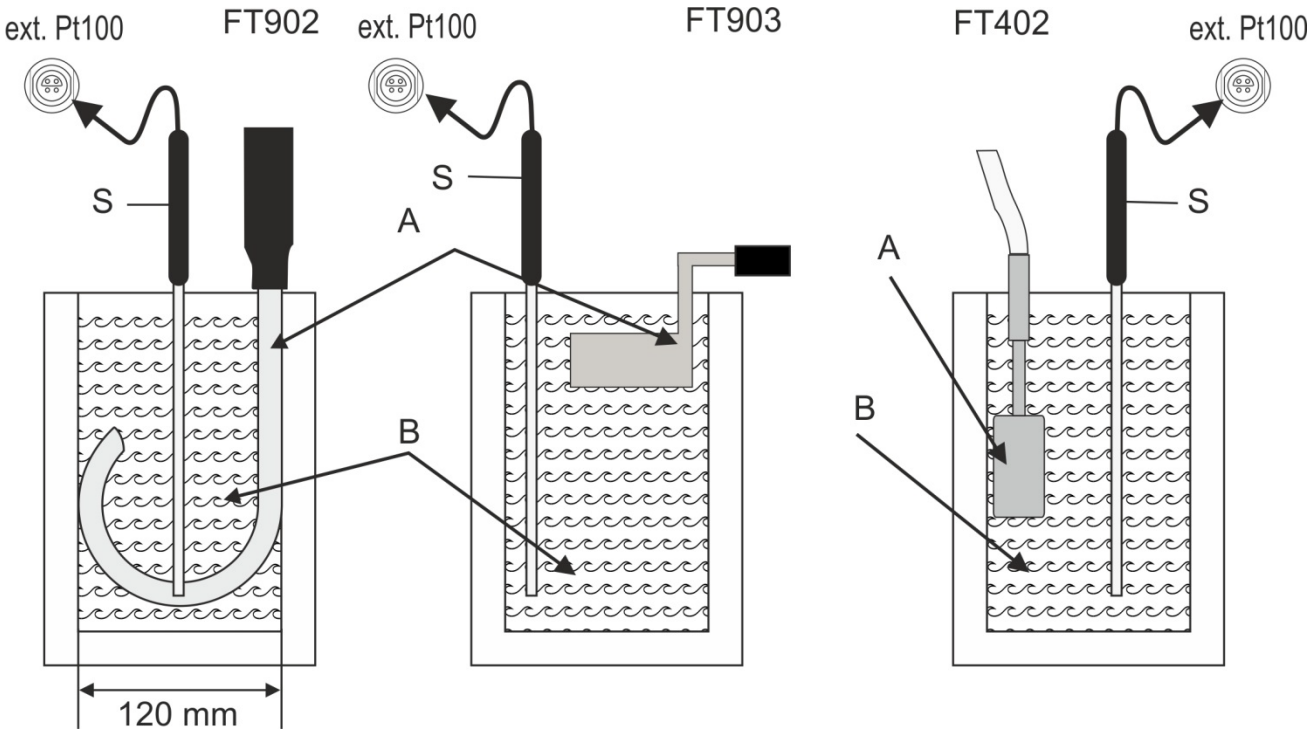
5.2. Immersion probe / Sensor connection - Pt100

Caution:
Avoid touching the immersion probe if it is frosted.
DANGER OF INJURY. Use gloves.
Switch the unit on only if the probe is immersed into the bath fluid.


Pt100

The immersion coolers are provided with a Pt100 sensor 200x6 mm dia., stainless steel - Order No. 8 981 003

- Connect the Pt100 sensor to the connector (Pt100) .
- To prevent the immersion probe (A) from icing, it should be completely immersed into the bath liquid (B).



Important:

ⓘ Place the external sensor (S) into the bath medium and securely fix the sensor.

ⓘ FT902: The diameter of the bent probe should not be less than 120 mm.

Accessories:

Order No.	Description
8 981 005	Pt100 sensor 200x6 mm dia., glass, 1.5 m cable
8 981 010	Pt100 Fühler 300x6 mm dia., stainless steel, 1.5 m cable
8 970 400	Clamp for cooler probe FT402

6. Operating procedures

6.1. Power connection

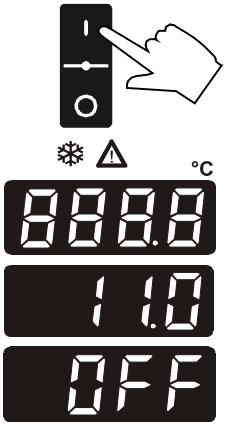
Caution:

- Only connect the unit to a power socket with earthing contact (PE – protective earth)!
- The power supply plug serves as safe disconnecting device from the line and must be always easily accessible.
- Never operate equipment with damaged mains power cables.
- Regularly check the mains power cables for material defects (e.g. for cracks).

We disclaim all liability for damage caused by incorrect line voltages!

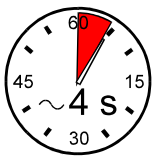
Make sure that the line voltage and frequency match the supply voltage specified on the type plate.
Deviations of ±10 % are permissible.

6.2. Switching on / Start - Stop



- **Switching on:**
  The immersion cooler is turned on and off with the mains switch. (1).

ⓘ The unit performs a self-test. All segments of the 4-digit LED temperature DISPLAY and all indicator lights will illuminate (as illustrated on the left).
Then the software version (example: 11.0) appears.
The display "**OFF**" indicates the unit is ready to operate (standby mode).



Start / Stop:

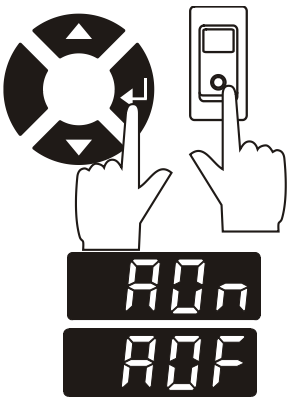
- Press enter ↵ **for about 4 seconds.**

ⓘ **Start:** The LED temperature DISPLAY indicates the actual bath temperature.
The cooling control indicator ❄ signals the cooling condition – on/off.

ⓘ **Stop**: The LED temperature DISPLAY indicates "**OFF**".

- **Switching off:**
  Turn the unit off with the mains power switch.

6.3. Automatic / non-automatic start mode



❶ Keep depressed enter ↵ and

❷ turn on the immersion cooler with the mains power switch.

For a short while the LED temperature DISPLAY indicates the effective start mode:

⇨ AUTOSTART on.

⇨ AUTOSTART off.

NOTE:

The immersion cooler has been configured and delivered by JULABO according to N.A.M.U.R. recommendations. This means for the start mode, that the unit must enter a safe operating state after a power failure (non-automatic start mode). This safe operating state is indicated by „OFF“ on the LED temperature display. A complete shutdown of the main functional elements is effected simultaneously. The values set on the immersion cooler remain stored, and the unit is returned to operation by pressing the start/stop key.

Should such a safety standard not be required, the AUTOSTART function (automatic start mode) may be activated, thus allowing the unit to be started directly by pressing the mains power switch or using a timer.

Warning:
For supervised or unsupervised operation with the AUTOSTART function, avoid any hazardous situation to persons or property.
The instrument no longer conforms to N.A.M.U.R. recommendations.

6.4. Setting the temperatures

This function is used to set the lowest desired temperature value.

ⓘ Setting can be carried out in the start/stop condition.

1. Press one of the keys ▼ ▲ for a short moment. The setpoint value instead of the actual value is indicated on the display for about 8 seconds. The value can now be changed.
2. Change value:
   Press ▲ to set a higher value.
   Press ▼ to set a lower value.
   Keep the keys depressed for the value to change fast.
3. Press enter ↵ to store the value.

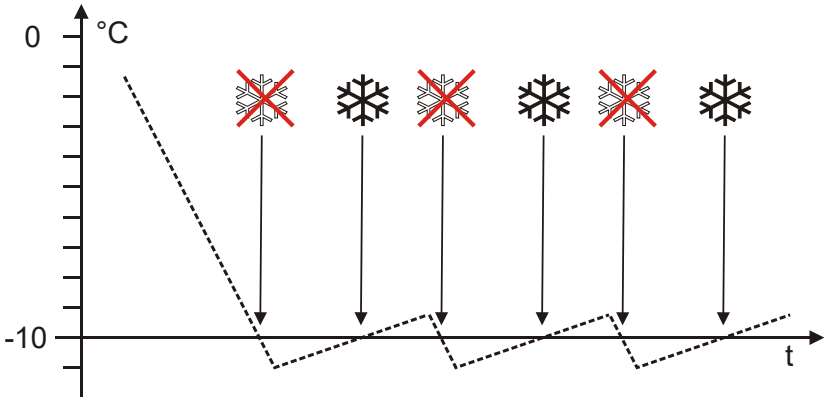
6.5. Temperature control

The immersion cooler can only control the temperature if both - the Pt100 sensor and immersion probe - are immersed into the same bath fluid.

Application: Cooling a fluid in a vessel

If the actual temperature falls below the setpoint temperature, the compressor is switched off (on FT902, FT903: only one of the two compressors).

The cooling control indicator goes out. If cooling is required again, the compressor switches on automatically.



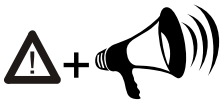
Example: Setpoint temperature –10 °C

The temperature curve resembles a two-point control (on-off). Response time and amplitude of the temperature curve are depending on the volume of the bath fluid (amongst others).

ⓘ According to manufacturer's instructions, there is an off-period of minimum 4 minutes to protect the compressor.

Caution:
The immersion probe – as part of the cooling circuit – should not be exposed to bath temperatures above the working temperature of the immersion cooler.
This would cause damage to the compressor.
Do not immerse a frosted immersion probe into hot bath oil.
DANGER OF INJURY!

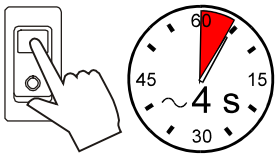
7. Troubleshooting guide / Error messages



Whenever the microprocessor electronics registers a failure, a complete shutdown of the compressor is performed.
The alarm light "⚠" illuminates and a continuous signal tone sounds.
The LED temperature display indicates the cause for the alarm in form of a code.

Press enter ↵ to quit the audible signal.

- Cable of the working temperature sensor interrupted or short-circuited.
- The temperature inside the bath is outside the working temperature range.



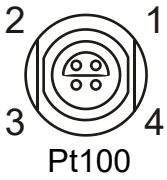
After eliminating the malfunction, press the mains power switch off and on again to cancel the alarm state.
If the unit cannot be returned to operation, contact an authorized JULABO service station.

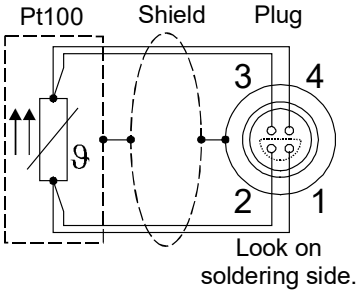
Mains circuit breakers (resettable)
FT402 10 A
FT902, FT903 15 A

8. Electrical connection

Notice:

Use shielded cables only.
The shield of the connecting cable is electrically connected to the plug housing.





Connector for external Pt100 sensor

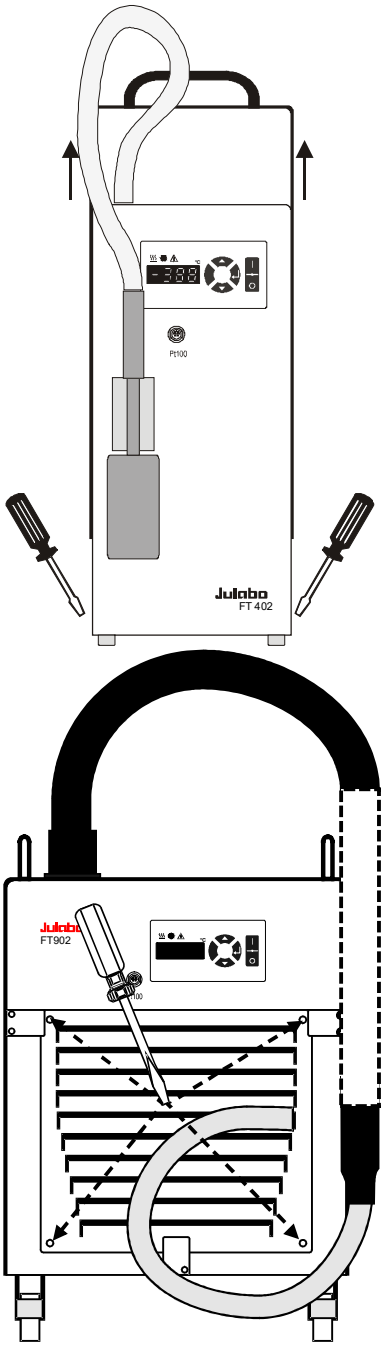
Pin assignment:

Pin	Signal
1	I+
2	U+
3	U-
4	I-

The shield of the connecting cable is electrically connected to the plug housing and the sensor tube.

9. Cleaning / repairing the unit

Caution:
Before cleaning the unit, disconnect the power plug from the mains socket!
Always turn off the unit and disconnect the mains cable from the power source before performing any service or maintenance procedures.
Service and repair work may be performed only by authorized electricians.
Prevent humidity from entering into the immersion cooler.



The immersion cooler is designed for continuous operation under normal conditions.
Periodic maintenance is not required.

- Clean the outside of the unit using a wet cloth and low surface tension water.

Regularly check the condensor for dirt contamination. Clean the ribbed condensor, because dust and dirt will reduce cooling performance of the unit.

Cleaning the Cooling Compressor:

- Switch off the unit, disconnect mains power cable.
- Model FT402: Remove the hood.
- Model FT902, FT903: The ventilation grid is detached by unscrewing the four mouting screws
- Clean the ribbed condensor with a vacuum cleaner.
- Replace the hood or the ventilation grid.
- Switch on the unit.

Repairs

Before asking for a service technician or returning a JULABO instrument for repair, please contact an authorized JULABO service station.

JULABO Technical Service
Tel.: +49 7823 51-66
Fax: +49 7823 51-99
Service.de@julabo.com

When returning the unit:

- Clean the unit in order to avoid any harm to the service personnel.
- Attach a short fault description.
- During transport the unit has to stand upright. Mark the packing correspondingly.
- When returning a unit, take care of careful and adequate packing.
- JULABO is not responsible for damages that might occur from insufficient packing.