



## Contamination indicator

BCI 24-Dx

# Installation and Operation Instructions

Original instructions





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Read this instruction carefully prior to installation and/or use. Pay attention particularly to all advises and safety instructions to prevent injuries. Bühler Technologies can not be held responsible for misusing the product or unreliable function due to unauthorised modifications.

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Document information

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# 1 Introduction

## 1.1 Intended Use

The contamination indicator BCI 24 is used to monitor the filter capacity in oil circuits. A microprocessor-controlled pressure transmitter monitors the pressure drop above the filter element which increases as the filter contamination increases.

### WARNING



All device models are solely intended for industrial applications. They are **not safety components**. The devices must not be used if failure or malfunction thereof jeopardises the safety and health of persons.  
Use in explosive areas is **prohibited**.

## 1.2 Model key

BCI 24 - D  3   -     - 4

### Type designation

BCI contamination indicator

### Process connection

compatible with third-party products

H Hydac/Stauff G1/2  
M Filtration Group/Hengst M20x1.5  
F MP-Filtri G1/2  
C Eaton G1/2

### Options/outputs

7 - 1D1A 1x analog / IO-Link  
7 - 1D1S 1x switching output / IO-Link

### Pressure drop range

3 max. 3 bar  
6 max. 6 bar

## 1.3 Item numbers

1331237740	BCI24-DH337-1D1S-4	Hydac / Stauff G1/2	3 bar	1D1S
1331267740	BCI24-DH367-1D1S-4		6 bar	
1331237840	BCI24-DH337-1D1A-4		3 bar	1D1A
1331267840	BCI24-DH367-1D1A-4		6 bar	
1331137740	BCI24-DM337-1D1S-4	Filtration Group / Hengst M20x1.5	3 bar	1D1S
1331167740	BCI24-DM367-1D1S-4		6 bar	
1331137840	BCI24-DM337-1D1A-4		3 bar	1D1A
1331167840	BCI24-DM367-1D1A-4		6 bar	
1331437740	BCI24-DF337-1D1S-4	MP-Filtri G1/2	3 bar	1D1S
1331467740	BCI24-DF367-1D1S-4		6 bar	
1331437840	BCI24-DF337-1D1A-4		3 bar	1D1A
1331467840	BCI24-DF367-1D1A-4		6 bar	
1331637740	BCI24-DC337-1D1S-4	Eaton G1/2	3 bar	1D1S
1331667740	BCI24-DC367-1D1S-4		6 bar	
1331637840	BCI24-DC337-1D1A-4		3 bar	1D1A
1331667840	BCI24-DC367-1D1A-4		6 bar	

## 1.4 Contents

- Contamination indicator BCI 24
- Product Documentation

## 2 Safety instructions

### 2.1 Important advice

Operation of the device is only permitted if:

- the product is used under the conditions described in the installation- and operation instruction, the intended application according to the type plate and the intended use. In case of unauthorized modifications done by the user Bühler Technologies GmbH can not be held responsible for any damage,
- when complying with the specifications and markings on the nameplates.
- the performance limits given in the datasheets and in the installation- and operation instruction are obeyed,
- monitoring devices and safety devices are installed properly,
- service and repair is carried out by Bühler Technologies GmbH,
- only original spare parts are used.






This manual is part of the equipment. The manufacturer keeps the right to modify specifications without advanced notice. Keep this manual for later use.

### Signal words for warnings

<b>DANGER</b>	Signal word for an imminent danger with high risk, resulting in severe injuries or death if not avoided.
<b>WARNING</b>	Signal word for a hazardous situation with medium risk, possibly resulting in severe injuries or death if not avoided.
<b>CAUTION</b>	Signal word for a hazardous situation with low risk, resulting in damaged to the device or the property or minor or medium injuries if not avoided.
<b>NOTICE</b>	Signal word for important information to the product.

### Warning signs

These instructions include the following warnings:

	General warning sign		General mandatory sign
	Voltage warning		Unplug from mains
	High pressure warning		

### 2.2 General hazard warnings

The equipment must be installed by a professional familiar with the safety requirements and risks.

Be sure to observe the safety regulations and generally applicable rules of technology relevant for the installation site. Prevent malfunctions and avoid personal injuries and property damage.

#### The operator of the system must ensure:

- Safety notices and operating instructions are available and observed,
- The respective national accident prevention regulations are observed,
- The permissible data and operational conditions are maintained,
- Safety guards are used and mandatory maintenance is performed,
- Legal regulations are observed during disposal,
- compliance with national installation regulations.

## **Maintenance, Repair**

Please note during maintenance and repairs:

- Repairs to the unit must be performed by Bühler authorised personnel.
- Only perform conversion-, maintenance or installation work described in these operating and installation instructions.
- Always use genuine spare parts.
- Do not install damaged or defective spare part. If necessary, visually inspect prior to installation to determine any obvious damage to the spare parts.

Always observe the applicable safety and operating regulations in the respective country of use when performing any type of maintenance.

## 3 Transport and storage

Only transport the product inside the original packaging or a suitable alternative.

The equipment must be protected from moisture and heat when not in use. It must be stored in a covered, dry, dust-free room at room temperature.

## 4 Installation and connection

**DANGER**
**Electric voltage**


Risk of electric shock

- a) De-energise the system.
- b) The equipment may only be installed, maintained and put into operation by instructed, competent personnel.
- c) Always observe the applicable safety regulations for the operating site.


**DANGER**
**Toxic, acidic gases/liquids**


Protect yourself from toxic, corrosive gasses/liquids when performing any type of work. Wear appropriate protective equipment.



### 4.1 Installation

The equipment must be installed by a professional who is familiar with the safety requirements and risks.

**DANGER**
**Electric voltage**

**Risk of electric shock**

When connecting devices, please note the maximum voltages and currents (see technical data) and use the correct wire cross-sections and circuit breakers. When selecting the connection lines, also note the maximum operating temperatures of the devices.


**WARNING**
**System pressurised**


De-pressurize the system prior to assembly.

The contamination indicator BCI 24 screws directly into the line filter. Tighten the BCI 24 to a torque of approx. 50 Nm. Ensure that the seal (profile gasket or USIT sealing ring, depending on the version) is in perfect condition.



## 4.2 Electrical connections

The BCI contamination indicator is powered with +18-30 V direct voltage. The sensor connects with a cable and standard M12 plug-in connectors.

### 4.2.1 Pin assignment

Version	1D1A	1D1S
Plug	M12 4-pin	M12 4-pin
Connection schematic		
<b>Pin</b>		
1	+24 V DC	+24 V DC
2	OUT2, 4...20 mA	S2 (PNP), max. 200 mA
3	GND	GND
4	C/Q (IO-Link)/S1	C/Q (IO-Link)/S1
	S1 = HnC 75% → 2.0 bar or 4.1 bar OUT2 = 4...20 mA → 0...3 / 6 bar adjustable via IO-Link	S1 = HnC 75% → 2.0 bar or 4.1 bar S2 = HnC 100% → 2.8 bar or 5.5 bar adjustable via IO-Link

## 5 Operation and Control

### NOTICE



The device must not be operated beyond its specifications.

### 5.1 Version with IO-Link interface (1D1A)

This unit is equipped with an IO-Link interface and an analogue output.

An IO-Link master is required to use the IO-Link interface.

The IO-Link interface allows direct access to process and diagnostics data, as well as configuration of the unit during operation.

The IODDs required to configure the unit is available at <https://ioddfinder.io-link.com>.

If the IO-Link interface is not in use (no master or only used to parameterise), the BCI 24 functions as a regular pressure drop switch with 1 switching output and an analogue output.

In the event of increasing pressure drop, switching output 1 is configured as an NC contact as standard. This switching output opens at 75% of the set pressure drop measuring range.

To ensure that the switching output responds, the relevant threshold must be exceeded for at least 4 seconds. This will prevent the system responding too soon in the event of brief pressure peaks.

The switching output resets automatically.

However, it can be parameterised via IO-Link master.

For more information, please visit: [www.io-link.com](http://www.io-link.com)



The analogue output supplies a 4–20 mA current signal proportional to the set pressure drop measuring range.

### 5.2 Version with IO-Link interface (1D1S)

This unit is equipped with an IO-Link interface, which requires an IO-Link master.

The IO-Link interface allows direct access to process and diagnostics data, as well as configuration of the unit during operation.

The IODDs required to configure the unit is available at <https://ioddfinder.io-link.com>.

If the IO-Link interface is not being used (no master or only used to parameterise), the BCI 24 functions as a regular pressure drop switch with 2 switching outputs.

In the event of increasing pressure drop, switching output 1 is configured as an NC contact as standard. This switching output opens at 75% of the set pressure drop measuring range.

In the event of increasing pressure drop, switching output 2 is configured as an NC contact as standard. It opens at 100% of the set pressure drop measuring range.

To ensure that the switching outputs respond, the relevant threshold must be exceeded for at least 4 seconds. This will prevent the system responding too soon in the event of brief pressure peaks.

The switching outputs reset automatically.

However, it can be parameterised via IO-Link master.

For more information, please visit: [www.io-link.com](http://www.io-link.com)



## 6 Cleaning and Maintenance

Regularly check sealing screw connections for leaks, particularly if vibration may occur. Apart from this the device is maintenance-free.

The method for cleaning the devices must be adapted to the IP protection class of the devices. Do not use cleaners which could damage the device materials.

## 7 Service and repair

This chapter contains information on troubleshooting and correction should an error occur during operation.

Repairs to the unit must be performed by Bühler authorised personnel.

Please contact our Service Department with any questions:

**Tel.: +49-(0)2102-498955** or your agent

For further information about our services and customised maintenance visit <http://www.buehler-technologies.com/service>.

If the equipment is not functioning properly after correcting any malfunctions and switching on the power, it must be inspected by the manufacturer. Please send the equipment inside suitable packaging to:

**Bühler Technologies GmbH**

**- Reparatur/Service -**

**Harkortstraße 29**

**40880 Ratingen**

**Germany**

Please also attach the completed and signed RMA decontamination statement to the packaging. We will otherwise be unable to process your repair order.

You will find the form in the appendix of these instructions, or simply request it by e-mail:

**[service@buehler-technologies.com](mailto:service@buehler-technologies.com)**.

### 7.1 Removal information

The housing temperature depends on the process temperature, therefore remember when working on the device:

Allow the device to cool down before performing maintenance or repairs.

Before remove the device, ensure the system is depressurised to prevent liquid from escaping. If necessary, use a collection container.

Please observe the safety notices in chapter Setup and connection.

### 7.2 Accessories

Item no.	Type
9144050031	M12x1 4-pin.LED* 5.0 m connection
9144050047	M12x1 4-pin 5.0 m connection
9144050010	M12x1 4-pin 1.5 m connection
9146100158	Straight cable socket M12x1 5-pin

\*LED cable not compatible with active IO-Link communication or 4...20 mA signal. Only use in SIO mode.

## 8 Disposal

The applicable national laws must be observed when disposing of the products. Disposal must not result in a danger to health and environment.

The crossed out wheelie bin symbol on Bühler Technologies GmbH electrical and electronic products indicates special disposal notices within the European Union (EU).



The crossed out wheelie bin symbol indicates the electric and electronic products bearing the symbol must be disposed of separate from household waste. They must be properly disposed of as waste electrical and electronic equipment.

Bühler Technologies GmbH will gladly dispose of your device bearing this mark. Please send your device to the address below for this purpose.

We are obligated by law to protect our employees from hazards posed by contaminated devices. Therefore please understand that we can only dispose of your waste equipment if the device is free from any aggressive, corrosive or other operating fluids dangerous to health or environment. **Please complete the "RMA Form and Decontamination Statement", available on our website, for every waste electrical and electronic equipment. The form must be applied to the packaging so it is visible from the outside.**

Please return waste electrical and electronic equipment to the following address:

Bühler Technologies GmbH  
WEEE  
Harkortstr. 29  
40880 Ratingen  
Germany

Please also observe data protection regulations and remember you are personally responsible for the returned waste equipment not bearing any personal data. Therefore please be sure to delete your personal data before returning your waste equipment.

## 9 Appendices

### 9.1 Technical Data

#### Technical Data BCI 24-Dx

Operating pressure:	max. 400 bar
Ambient temperature:	-20 °C to +70 °C
Medium temperature*:	-40 °C to +85 °C
Measuring range:	0.3...3 bar/0.6...6 bar, depending on the version
<b>Material/version</b>	
Housing material:	Anodised aluminium (3.2315)
Material in contact with media:	Anodised aluminium (3.2315), spring steel, bright steel, NBR
Weight:	70 g
<b>Electrical data</b>	
Input value:	Pressure drop
Measuring principle:	Differential pressure piston with magnet and hall sensor
Operating voltage:	18–30 V DC
Power input:	< 100 mA
IP rating (with plug top):	IP67
Output:	IO-Link (in SIO mode - switching output) Additional: Switching output for version 1D1S or analog signal 4...20 mA for version 1D1A
Measuring accuracy:	5% of the final value (type)
Repeatability:	0.5% of the final value
Switching point accuracy**:	1% of the final value

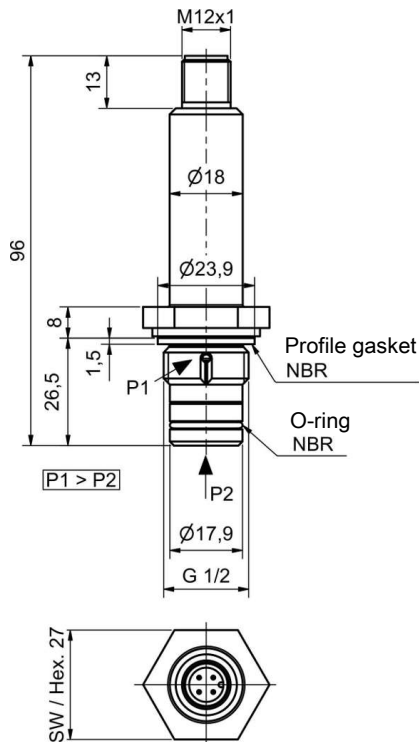
\*Other temperatures available upon request.

\*\*with factory setting.

## 9.2 Dimensions

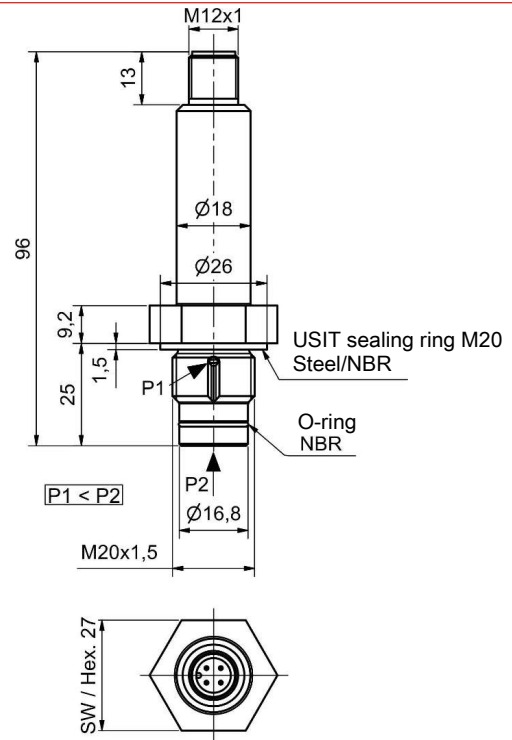
Connecting flange compatible with  
third-party product Hydac / Stauff

BCI 24-DHxxx



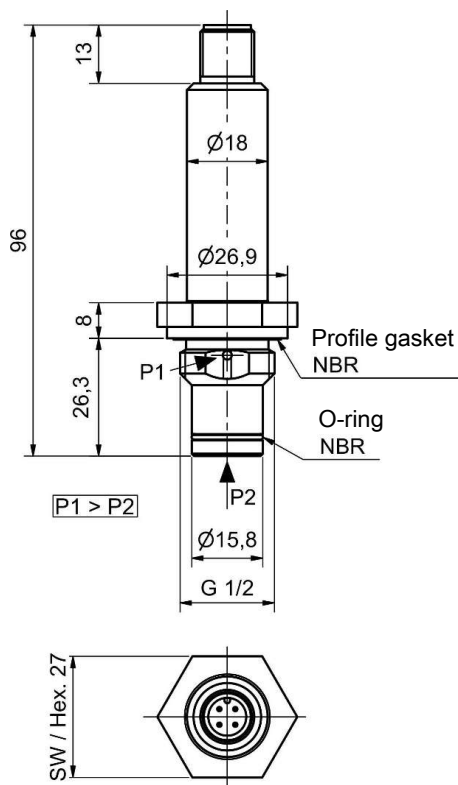
Connecting flange compatible with  
third-party product Filtration Group / Hengst

BCI 24-DMxxx



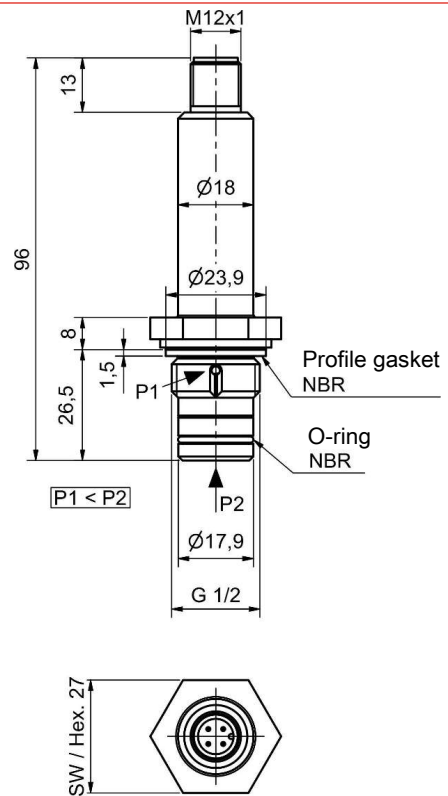
Connecting flange compatible with  
third-party product MP-Filtri

BCI 24-DFxxx



Connecting flange compatible with  
third-party product Eaton

BCI 24-DCxxx



## 10 Attached documents

- Declaration of Conformity KX130024
- RMA - Decontamination Statement



**EU-Konformitätserklärung**  
**EU Declaration of Conformity**



Hiermit erklärt Bühler Technologies GmbH,  
dass die nachfolgenden Produkte den  
wesentlichen Anforderungen der Richtlinie

*Herewith declares Bühler Technologies GmbH  
that the following products correspond to the  
essential requirements of Directive*

**2014/30/EU**  
**(Elektromagnetische Verträglichkeit / *electromagnetic compatibility*)**

in ihrer aktuellen Fassung entsprechen.

*in its actual version.*

**Produkt / products:** Verschmutzungsanzeiger / Contamination indicator  
**Typ / type:** BCI 24-Dx

Die Betriebsmittel dienen zur Überwachung der Filterkapazität in Ölkreisläufen.  
*The equipment is used to monitor the capacity of oil filters in oil-circulating systems.*

Das oben beschriebene Produkt der Erklärung erfüllt die einschlägigen  
Harmonisierungsrechtsvorschriften der Union:  
*The object of the declaration described above is in conformity with the relevant Union harmonisation  
legislation:*

**EN 61326-1:2013**

Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller.  
*This declaration of conformity is issued under the sole responsibility of the manufacturer.*

Dokumentationsverantwortlicher für diese Konformitätserklärung ist Herr Stefan Eschweiler mit  
Anschrift am Firmensitz.  
*The person authorised to compile the technical file is Mr. Stefan Eschweiler located at the company's  
address.*

Ratingen, den 08.04.2019

A handwritten signature in black ink, appearing to be 'Stefan Eschweiler', written over a horizontal line.

Stefan Eschweiler  
Geschäftsführer – *Managing Director*

A handwritten signature in black ink, appearing to be 'Frank Pospiech', written over a horizontal line.

Frank Pospiech  
Geschäftsführer – *Managing Director*

## UK Declaration of Conformity



The manufacturer Bühler Technologies GmbH declares, under the sole responsibility, that the product complies with the requirements of the following UK legislation:

### Electromagnetic Compatibility Regulations 2016

**Product:** Contamination indicator  
**Type:** BCI 24-Dx

The equipment is used to monitor the capacity of oil filters in oil-circulating systems.

The object of the declaration described above is in conformity with the relevant designated standards:

**EN 61326-1:2013**

Ratingen in Germany, 01.11.2022

A handwritten signature in black ink, appearing to be 'Stefan Eschweiler', written over a horizontal line.

Stefan Eschweiler  
Managing Director

A handwritten signature in blue ink, appearing to be 'Frank Pospiech', written over a horizontal line.

Frank Pospiech  
Managing Director

# RMA-Formular und Erklärung über Dekontaminierung

## RMA-Form and explanation for decontamination



RMA-Nr./ RMA-No.

Die RMA-Nr. bekommen Sie von Ihrem Ansprechpartner im Vertrieb oder Service. Bei Rücksendung eines Altgeräts zur Entsorgung tragen Sie bitte in das Feld der RMA-Nr. "WEEE" ein./ You may obtain the RMA number from your sales or service representative. When returning an old appliance for disposal, please enter "WEEE" in the RMA number box.

Zu diesem Rücksendeschein gehört eine Dekontaminierungserklärung. Die gesetzlichen Vorschriften schreiben vor, dass Sie uns diese Dekontaminierungserklärung ausgefüllt und unterschrieben zurücksenden müssen. Bitte füllen Sie auch diese im Sinne der Gesundheit unserer Mitarbeiter vollständig aus./ This return form includes a decontamination statement. The law requires you to submit this completed and signed decontamination statement to us. Please complete the entire form, also in the interest of our employee health.

### Firma/ Company

Firma/ Company

Straße/ Street

PLZ, Ort/ Zip, City

Land/ Country

Gerät/ Device

Anzahl/ Quantity

Auftragsnr./ Order No.

### Ansprechpartner/ Person in charge

Name/ Name

Abt./ Dept.

Tel./ Phone

E-Mail

Serien-Nr./ Serial No.

Artikel-Nr./ Item No.

### Grund der Rücksendung/ Reason for return

- Kalibrierung/ Calibration       Modifikation/ Modification  
 Reklamation/ Claim             Reparatur/ Repair  
 Elektroaltgerät/ Waste Electrical & Electronic Equipment (WEEE)  
 andere/ other

bitte spezifizieren/ please specify

### Ist das Gerät möglicherweise kontaminiert?/ Could the equipment be contaminated?

- Nein, da das Gerät nicht mit gesundheitsgefährdenden Stoffen betrieben wurde./ No, because the device was not operated with hazardous substances.  
 Nein, da das Gerät ordnungsgemäß gereinigt und dekontaminiert wurde./ No, because the device has been properly cleaned and decontaminated.  
 Ja, kontaminiert mit:/ Yes, contaminated with:



explosiv/  
explosive



entzündlich/  
flammable



brandfördernd/  
oxidizing



komprimierte  
Gase/  
compressed  
gases



ätzend/  
caustic



giftig,  
Lebensgefahr/  
poisonous, risk  
of death



gesundheitsge-  
fährdend/  
harmful to  
health



gesund-  
heitsschädlich/  
health hazard



umweltge-  
fährdend/  
environmental  
hazard

### Bitte Sicherheitsdatenblatt beilegen!/ Please enclose safety data sheet!

Das Gerät wurde gespült mit:/ The equipment was purged with:

*Diese Erklärung wurde korrekt und vollständig ausgefüllt und von einer dazu befugten Person unterschrieben. Der Versand der (dekontaminierten) Geräte und Komponenten erfolgt gemäß den gesetzlichen Bestimmungen.*

*This declaration has been filled out correctly and completely, and signed by an authorized person. The dispatch of the (decontaminated) devices and components takes place according to the legal regulations.*

Falls die Ware nicht gereinigt, also kontaminiert bei uns eintrifft, muss die Firma Bühler sich vorbehalten, diese durch einen externen Dienstleister reinigen zu lassen und Ihnen dies in Rechnung zu stellen.

Should the goods not arrive clean, but contaminated, Bühler reserves the right, to commission an external service provider to clean the goods and invoice it to your account.

Firmenstempel/ Company Sign

Datum/ Date

rechtsverbindliche Unterschrift/ Legally binding signature



### Vermeiden von Veränderung und Beschädigung der einzusendenden Baugruppe

Die Analyse defekter Baugruppen ist ein wesentlicher Bestandteil der Qualitätssicherung der Firma Bühler Technologies GmbH. Um eine aussagekräftige Analyse zu gewährleisten muss die Ware möglichst unverändert untersucht werden. Es dürfen keine Veränderungen oder weitere Beschädigungen auftreten, die Ursachen verdecken oder eine Analyse unmöglich machen.

### Umgang mit elektrostatisch sensiblen Baugruppen

Bei elektronischen Baugruppen kann es sich um elektrostatisch sensible Baugruppen handeln. Es ist darauf zu achten, diese Baugruppen ESD-gerecht zu behandeln. Nach Möglichkeit sollten die Baugruppen an einem ESD-gerechten Arbeitsplatz getauscht werden. Ist dies nicht möglich sollten ESD-gerechte Maßnahmen beim Austausch getroffen werden. Der Transport darf nur in ESD-gerechten Behältnissen durchgeführt werden. Die Verpackung der Baugruppen muss ESD-konform sein. Verwenden Sie nach Möglichkeit die Verpackung des Ersatzteils oder wählen Sie selber eine ESD-gerechte Verpackung.

### Einbau von Ersatzteilen

Beachten Sie beim Einbau des Ersatzteils die gleichen Vorgaben wie oben beschrieben. Achten Sie auf die ordnungsgemäße Montage des Bauteils und aller Komponenten. Versetzen Sie vor der Inbetriebnahme die Verkabelung wieder in den ursprünglichen Zustand. Fragen Sie im Zweifel beim Hersteller nach weiteren Informationen.

### Einsenden von Elektroaltgeräten zur Entsorgung

Wollen Sie ein von Bühler Technologies GmbH stammendes Elektroprodukt zur fachgerechten Entsorgung einsenden, dann tragen Sie bitte in das Feld der RMA-Nr. „WEEE“ ein. Legen Sie dem Altgerät die vollständig ausgefüllte Dekontaminierungserklärung für den Transport von außen sichtbar bei. Weitere Informationen zur Entsorgung von Elektroaltgeräten finden Sie auf der Webseite unseres Unternehmens.

### Avoiding alterations and damage to the components to be returned

Analysing defective assemblies is an essential part of quality assurance at Bühler Technologies GmbH. To ensure conclusive analysis the goods must be inspected unaltered, if possible. Modifications or other damages which may hide the cause or render it impossible to analyse are prohibited.

### Handling electrostatically conductive components

Electronic assemblies may be sensitive to static electricity. Be sure to handle these assemblies in an ESD-safe manner. Where possible, the assemblies should be replaced in an ESD-safe location. If unable to do so, take ESD-safe precautions when replacing these. Must be transported in ESD-safe containers. The packaging of the assemblies must be ESD-safe. If possible, use the packaging of the spare part or use ESD-safe packaging.

### Fitting of spare parts

Observe the above specifications when installing the spare part. Ensure the part and all components are properly installed. Return the cables to the original state before putting into service. When in doubt, contact the manufacturer for additional information.

### Returning old electrical appliances for disposal

If you wish to return an electrical product from Bühler Technologies GmbH for proper disposal, please enter "WEEE" in the RMA number box. Please attach the fully completed decontamination declaration form for transport to the old appliance so that it is visible from the outside. You can find more information on the disposal of old electrical appliances on our company's website.

