bürkert
FLUID CONTROL SYSTEMS

Flow injection analysis (FIA) sensor cube for iron content

- Fully automated water sampling with adjustable analysis interval
- Miniaturised for a compact system design
- Economical consumption of reagents
- Fully compatible with büS systems and a wide range of further analysis sensor cubes

Product variants described in the data sheet may differ from the product presentation and description.

Can be combined with

Type MZ30 ▸
Reagent unit

Type 8906 ▸
Online water analysis system

Type ME61 ▸
EDIP process display

Type ME43 ▸
Fieldbus gateway

Type ME63 ▸
Industrial Ethernet gateway, IP65/ IP67/ IP69k

Type ME44 ▸
I/O module, IP 20

Type ME66 ▸
büS distribution box, IP65/ IP67/ IP69k

Type description

Bürkert has developed an FIA (flow injection analysis) module for the measure of dissolved iron (Fe^{2+}/Fe^{3+}) for use in the online analysis system which combines all necessary components including control in a minimum of space.

The special feature of Bürkert's FIA module is its consequent miniaturisation using microfluidic components. FIA has been used in laboratories for quantitative analyses for many years. With the FIA module, the method can now be used for the first time as a field device and continuously monitor the iron content of a measurement point.

In the flow injection analysis, the reagent is added to a water sample via a pump. The microfluidic mixing section after injection ensures uniform and complete mixing. The measurement liquid then passes through a photometer which measures the absorption over time. From the detected peak-shaped signal, the iron content can be determined photometrically and is then available for the control, monitoring and documentation of the water treatment.

Miniaturisation of the measurement unit and compatibility to all EDIP modules enable use in the Online Analysis System Type 8905. By plugging it into the fluidic backplane slot, the electrical and fluidic connections are made via the connection panel of the system. The measuring module communicates with the system via büS, allowing fully automatic login to the online analysis system. If the iron measuring module is plugged into the system, it is included in the list of büS members and further adaptations to customer requirements can be made.

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Visit product website ▸

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1. General technical data

1.1. About the device

The Type MS06 sensor is designed to measure dissolved iron (Fe^{2+}/Fe^{3+}) in water using a photometric method after the injection of a reagent. Chemical solutions are handled by the Type MZ30 reagent unit which manages the injection of the reagent, as well as cleaning and calibration solutions. Measurements are performed intermittently by sampling, typically once per hour, but the interval can be freely configured according to process requirements.

1.2. General data

Product properties	
Material	
Make sure the device materials are compatible with the fluid you are using. Further information can be found in chapter "3.1. Bürkert resistApp" on page 5.	
Non-wetted parts	
Backplane	Anodized aluminium
Housing	Polycarbonate
Lever	Stainless steel
Wetted parts	
Seal	EPDM, FKM or NBR
Valve	FFKM
Others	EPDM, FKM, NBR, PMMA, PEEK
Compatibility	With the reagent unit Type MZ30 and the online water analysis system Type 8905 Further information can be found in the data sheet of the reagent unit and of the online water analysis system, see **data sheet Type MZ30** ▶ and **data sheet Type 8905** ▶.
Dimensions	Further information can be found in chapter "4. Dimensions" on page 5.
Weight	1.05 kg
Measurement principle	Flow injection analysis (dissolved iron) with photometric detection
Temperature sensor	Pt1000
Measuring range	0.02...2 mg/l, higher range on request (max. 10 mg/l)
Maintenance	
Calibration period	Automatic or manual
Waste	Monitoring of the fill level of the waste container • at 80 % full: warning message, • at 95 % full: error message
Reagents replacement	Depends on the analysis measurement interval and the expiration date of the solutions.
Pump replacement	After 10 000 measurements
Performance data	
Measurement deviation	± 0.05 mg/l or 5 % of the measured value (the greater value applies)
Measuring range resolution	0.01 mg/l
Linearity	± 3 % of full scale
Repeatability	± 3 % of full scale
Measurement cycle time	Minimum 30 min[1)]
Electrical data	
Operating voltage	24 V DC via the backplane of the system Type 8905 (via büS)
Power consumption	2.2 (standby)...12.7 W
Medium data	
Fluid	Water without particles: drinking water, industrial water for example
Fluid pH range	pH 4...pH 9
Temperature of the fluid sample	+ 10...+ 40 °C (+ 50...+ 104 °F)
Pressure of the fluid sample	1 bar max.
Flow rate of the fluid sample	> 6 l/h
Filter of the fluid sample	≤ 100 µm

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Fluid consumption	
Typical cycle numbers per 250 ml bottle (depending on analysis settings)	• Reagent solution: 4500 • Cleaning solution: 1000 (option, using a bottle of 1 l cleaning solution: 4000) • Calibration standard solution: 8000
Sample volume per analysis	Approx. 5 ml
Supply	Reagent, cleaning and calibration standard solution Further information can be found in chapter "8.4. Ordering chart accessories" on page 9 and in the data sheet of the reagent unit, see **data sheet Type MZ30** ▶.
Product connections	
Process connection	Via pinch valve in the fluidic backplane of the Type 8905 Further information can be found in the data sheet of the online water analysis system, see **data sheet Type 8905** ▶.
Electrical connection	Spring contacts in the fluidic backplane of Type 8905 which is connected to a büS system. Further information can be found in the data sheet of the online water analysis system, see **data sheet Type 8905** ▶.
Data transfer	
Internal communication	Via büS (Bürkert system bus,CANopen-based) or CANopen
External communication via status LED	According to NAMUR NE 107
Approvals and conformities	
Directives	
CE directive	Further information on the CE directive can be found in chapter "2.2. Standards" on page 5.
Environment and installation	
Ambient temperature	• Operation: + 10...+ 40 °C (+ 50...+ 104 °F), 20 °C (+ 68 °F) recommended • Storage and transport: – Used iron measuring module: + 10...+ 40 °C (+ 50...+ 104 °F) – For empty/purged sensor cube: - 10...+ 60 °C (+ 14...+ 140 °F)
Relative air humidity	≤ 90 %, without condensation
Height above sea level	Max. 2000 m
Operating condition	Continuous
Equipment mobility	Fixed
Application range	Indoor and outdoor Protect the device against electromagnetic interference, ultraviolet rays and, when installed outdoors, against the effects of climatic conditions.
Degree of protection according to IEC/EN 60529	• IP65, when plugged in the fluidic backplane • IP20, as standalone product
Installation category	Category I according to UL/EN 61010-1
Pollution degree	Degree 2 according to UL/EN 61010-1

1.) Short measurement cycles increase pump duty cycles which can shorten its service life.

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2. Approvals and conformities

2.1. Conformity

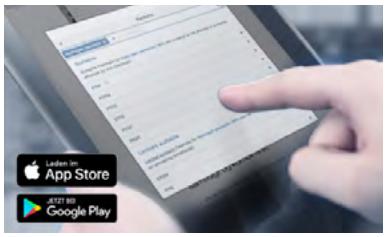
In accordance with the Declaration of Conformity, the product is compliant with the EU Directives.

2.2. Standards

The applied standards which are used to demonstrate compliance with the EU Directives are listed in the EU-Type Examination Certificate and/or the EU Declaration of Conformity.

3. Materials

3.1. Bürkert resistApp



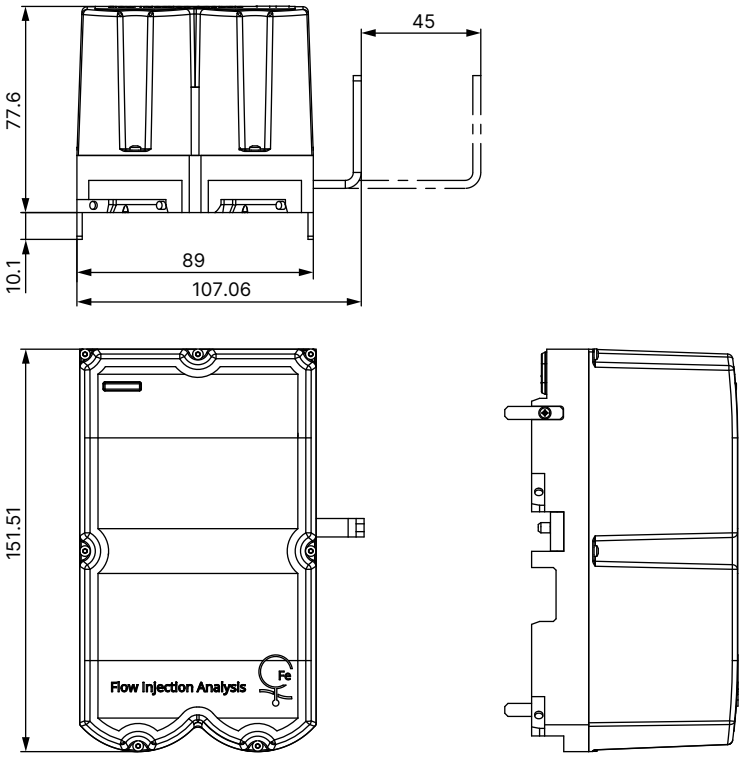
Bürkert resistApp – Chemical resistance chart

You want to ensure the reliability and durability of the materials in your individual application case? Verify your combination of media and materials on our website or in our resistApp.

Start chemical resistance check

4. Dimensions

Note:
Dimensions in mm, unless otherwise stated



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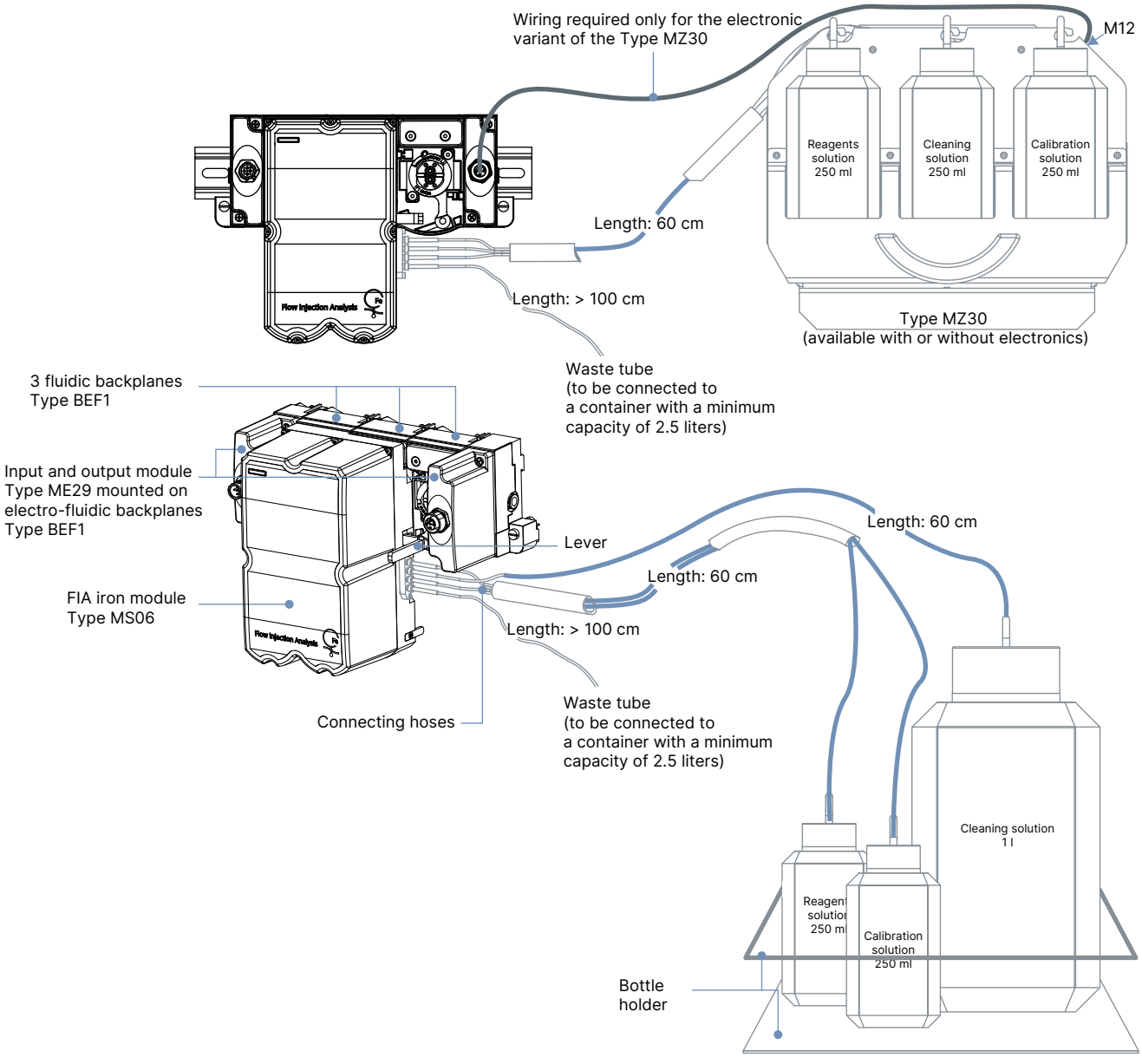
5. Product installation

5.1. Installation notes

- The iron measuring module Type MS06 is designed for use with the Type 8095 online water analysis system. The module is mounted onto a combination of Type 8905 backplanes (at least 3 positions in series, leaving one position empty for handling the locking lever) which is installed on a standard DIN rail (TS35).
  To install the Type MS06 on the backplanes, the lever is first moved to the right. The device is then mounted onto the fluidic backplanes, and finally, the lever is pushed to the left. This operation establishes both the electrical and fluidic connections, and mechanically locks the iron measuring sensor module onto the backplanes.
- The product is supplied without housing.
- The device can be supplied with the required solutions (reagents, cleaning and calibration) in two ways:
  - Using the Type MZ30 reagent unit, equipped with three 250 ml bottles, serving as containers for the different solutions. The connection of the iron measuring module to the reagent bottles is made using connecting hoses with an appropriately preassembled connector.
  - Using two 250 ml bottles for the reagent and calibration solutions, and a 1 l bottle for the cleaning solution. These bottles are placed on a specific holder and connected to the iron measuring module using specific connecting hoses (see chapter **"8.4. Ordering chart accessories" on page 9** for more information).

See **data sheet Type 8905** ▸ online water analysis system, **data sheet Type MZ30** ▸ reagent unit for more information.



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6. Product operation

6.1. Measurement principle

The Type MS06 iron measuring module takes a small sample from the main stream in the Type 8905 fluidic backplane at user-defined time intervals. This sample is processed outside the main stream in the measuring module. A reagent is then injected that changes colour upon contact with the dissolved iron. Optical absorption is used to determine the iron concentration in the sample. After the analysis, the sample is discarded and the Type MS06 fluidic module is cleaned before the next measurement cycle begins at the user-defined interval.

Operation can be performed via the 7"-Display (Process Control Display, Type ME61) or without a display using the Bürkert Communicator software, Type 8920.

The pump of the Type MS06 has an estimated lifetime of 10 000 measurements (for example, one measurement per hour corresponds to a lifetime of approximately one year). After this usage period, replacement is recommended at the Bürkert factory or on-site by qualified personnel only, to ensure system reliability.

The supply of operating solutions (reagent, cleaning and calibration) can be ensured in two ways, see chapter "5.1. Installation notes" on page 6. The expiration date of each reagent is indicated on the bottle label.
Only if the supply is carried out and monitored via the Type MZ30 reagent unit **with electronics** does the unit issue messages and warnings regarding the solutions:

- when the expiration date is approaching (barcode reading system).
- when the fill level is low (weighing system),

to allow the replacement of the bottle.

Availability and determination method of the solution status

Status of solutions (reagents, calibration and cleaning)	System for measuring iron content		
	Type MS06 + Type MZ30 without electronics for only 250 ml bottles	Type MS06 + Type MZ30 with electronics for only 250 ml bottles	Type MS06 + specific holder for 250 ml bottles + 1 l bottle
Values of solutions level via büS (available for gateway, display, ...)	No	Yes	No
Warning "Low solution levels" (Message + NAMUR colour)	Yes, by calculation	Yes, by weighing	Yes, by calculation
Checking "Expiration date" of solutions	No	Yes, by barcode reading	No
Warning "Solutions date exceeded"	No	Yes, by barcode reading	No

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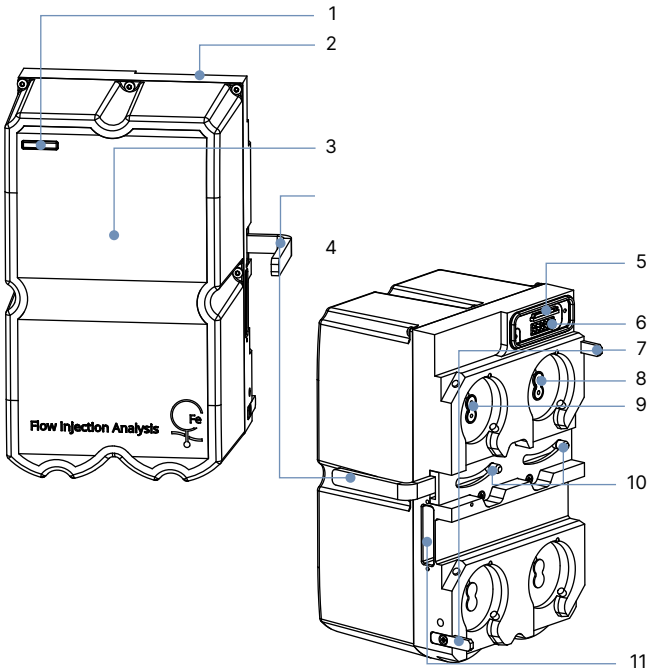
7. Product design and assembly

7.1. Product features



No.	Element
1	Product status LED
2	Base plate
3	Product housing
4	Lever
5	Slot micro-SIM card [1.] (for configuration data)
6	Electrical interface
7	Adapter pins
8	Fluid bypass
9	Fluid interface
10	Pins to engage and activate the bayonet lever on the backplane
11	Fluidic interface of reagent hoses from Type MZ30 reagent unit

1.) Micro-SIM card is included in the delivery.

8. Ordering information

8.1. Bürkert eShop

Bürkert eShop – Easy ordering and quick delivery

You want to find your desired Bürkert product or spare part quickly and order directly? Our online shop is available for you 24/7. Sign up and enjoy all the benefits.

Order online now

8.2. Bürkert product filter

Bürkert product filter – Get quickly to the right product

You want to select products comfortably based on your technical requirements?
Use the Bürkert product filter and find suitable articles for your application quickly and easily.

Try out our product filter

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8.3. Ordering chart

Note:
The product must be used with the reagent unit, Type MZ30.

See **data sheet Type MZ30** ▶ for more information.

Description	Article no.
Type MS06 combinations for use in online water analysis system, Type 8905	
Reagent unit Type MZ30 (without electronics) + dissolved iron measuring module Type MS06, for wall-mounting or control cabinet mounting	569063
Reagent unit Type MZ30 (with electronics) + dissolved iron measuring module Type MS06, for wall-mounting or control cabinet mounting	567638

8.4. Ordering chart accessories

Description	Article no.
Fe reagent solution, 250 ml See the **safety data sheet of the reagent solution** ▶ for more information.	807613
Fe cleaning solution, 250 ml See the **safety data sheet of the cleaning solution** ▶ for more information.	807614
Fe cleaning solution, 1 l See the **safety data sheet of the cleaning solution** ▶ for more information.	572223
Fe calibration standard solution, 250 ml See the **safety data sheet of the calibration standard solution** ▶ for more information.	807615
Pump and associated accessories	576053
Hoses set for connection of the iron measuring module to the 3 bottles of 250 ml (reagent, calibration and cleaning) used in the reagent unit Type MZ30, 3 × 60 cm hoses and 1 hose > 100 cm for waste	566998
Hoses set for connection of the iron measuring module to the 2 bottles of 250 ml (reagent and calibration) and to the bottle of 1 l (cleaning) to use with a specific holder, 3 × 60 cm hoses and 1 hose > 100 cm for waste	572011

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