

meteocontrol Control Cabinets

User manual



Version 20230301

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Contact information

The manufacturer of the device described in this documentation is:

meteocontrol GmbH

Pröllstraße 28

D-86157 Augsburg

Tel.: +49 (0) 821 / 3 46 66-0

Web: www.meteocontrol.com

Technical support:

Tel.: +49 (0) 821 3 46 66-44

Fax: +49 (0) 821 / 3 46 66-11

E-mail: technik@meteocontrol.de

Details regarding the user manual

The original user manual is written in German. All other language versions are translations of the original user manual and are hereby identified as such.

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All information in this user manual has been compiled and checked with the greatest care and diligence. Nevertheless, the possibility of errors cannot be entirely excluded. meteocontrol GmbH therefore cannot accept any liability for errors or any circumstances resulting from errors.

Subject to technical alterations.

Release notes

Date	Changes
20230301	Updated format and safety instructions Updated cable and wire types. Updated care and maintenance.

Contents

1. General notes	3
1.1 Safety instructions.....	3
1.2 Warning notices.....	3
1.3 Additional information.....	3
2. Notes on this user manual	4
2.1 Purpose of this user manual.....	4
2.2 Target group and qualification.....	4
2.3 Warranty and liability.....	5
2.4 Additional documentation.....	5
3. Product description	6
4. Transportation	7
5. Safety	9
5.1 Intended use.....	9
5.2 Personnel.....	9
5.3 General precautionary measures.....	9
6. Mounting and installation	11
6.1 Safety instructions for installation.....	11
6.2 Workflow for mounting, installation, and commissioning.....	13
6.3 Mounting the control cabinet.....	14
6.4 Installation.....	16
6.4.1 Cables and wires.....	16
6.4.2 Shielding.....	16
7. Commissioning	17
8. Care and maintenance	18
8.1 Cleaning the control cabinet cooling unit.....	18
9. Technical data	19
10. Dimensional drawings	19
11. Environmental protection and disposal	19
12. Appendix	19
12.1 CE certificate.....	20
12.2 RoHS declaration.....	22

1. General notes

1.1 Safety instructions

Safety instructions warn of dangers when using the devices and explain how they can be avoided.

The safety instructions are classified according to the severity of the risk and are subdivided into four groups:

DANGER



Imminent danger

Failure to comply with the warning notice will lead to an imminent risk of death or serious physical injury!

WARNING



Possible danger

Failure to comply with the warning notice may lead to a risk of death or serious physical injury!

CAUTION



Hazard with low risk

Failure to comply with the warning notice may lead to minor injuries!

NOTICE

Hazard with a risk of material damage

Failure to comply with the warning notice will lead to material damage!

1.2 Warning notices

Particular dangers are highlighted using warning symbols.

RISK OF ELECTRIC SHOCK



Electric shock hazard! Danger to life and limb!

Danger to life and limb! Failure to comply with the warning notice will lead to an imminent risk of serious injury or death.

1.3 Additional information



This symbol can be found next to notices, additional information and tips.

2. Notes on this user manual

2.1 Purpose of this user manual

This user manual is a key aid in ensuring the proper operation of meteocontrol Stations (referred to as "control cabinets" in the following) . It will help to avoid dangers, to reduce repair costs and downtimes, and to increase the reliability and operating life of the control cabinets and their built-in components.

Read this user manual carefully and attentively before you start work on the control cabinets.

The user manual is continuously updated. The current version can be found on our website: www.meteocontrol.com

2.2 Target group and qualification

This user manual is intended for persons who are responsible for installation planning, installing, commissioning, operating, and maintaining the control cabinets.

It is assumed that the reader has basic knowledge of electrical engineering, cabling, electrical components, and the use of symbols in circuit diagrams.

DANGER



Danger due to improper handling

- The staff responsible for the installation, operation and maintenance of the system must have read and understood this user manual before the control cabinets can be used safely!
- The description and documents must be available at all times.

meteocontrol GmbH accepts no liability for personal injury, damage to property, or system malfunctions and their consequences, insofar as these result from non-observance of this user manual.

2.3 Warranty and liability

Details of the scope and form of the warranty as well as the warranty period are given in the meteocontrol GmbH General Terms and Conditions.

meteocontrol rejects any liability for damage arising from the non-observance of the user manual.

This applies, in particular to damage from:

- Unintended use
- Faulty operation
- Wrongly chosen materials and tools
- Faulty or non-executed maintenance and repairs

In cases of control and regulation ("power control"), meteocontrol GmbH accepts no liability for events and occurrences outside of its control, such as:

- The correctness of control commands given by an energy supply company or failure to implement control commands
- Hardware and/or software failures on the part of the system operator
- Switching operations at the end consumer's site.
- Any liability for damage caused by such events and occurrences, including lost production, grid instability, damage to parts of the customer's system (for example an inverter), shall remain expressly excluded.

2.4 Additional documentation

Observance of the information contained in this user manual does not release the user from observance of the technical documentation regarding the component parts of the control cabinets! Please read the following documentation:

- Documentation included in the scope of delivery of the control cabinet that describes the installed components, such as user manuals, data sheets, safety instructions, circuit diagrams, etc.
- If relevant, documents regarding the inverter and sensors that will be connected to the control cabinet,
- If relevant, the user manuals for blue'Log and MX-add-on modules

3. Product description

The meteocontrol control cabinets contain measuring equipment for the central measurement and processing of all system data (“Data Stations”) and, depending on the model, for implementing grid feed-in management (“Power Control Stations”) in photovoltaic power plants. Depending on the model, the control cabinets can be used indoors or outdoors. Outdoor control cabinets feature a low-maintenance control cabinet cooling unit. The pre-wired components allow for fast installation and commissioning.



Fig. 1: Example of a control cabinet interior. Cabinet interior will differ depending on the model.

4. Transportation

Every product leaves our factory in perfect electrical and mechanical condition. On delivery, unpack the control cabinet and all the accessories and check them for any damage.

WARNING



A damaged control cabinet must not be put into operation!

Transport the control cabinet using a forklift or pallet truck. During transport, ensure the control cabinet is sufficiently secured in place in order to prevent overturning or movement. Do not put weight on top of the control cabinet

NOTICE

Do not transport the control cabinet using a crane
Transporting by crane can damage the control cabinet.

NOTICE

Do not transport control cabinets upright
Transporting the control cabinet upright can cause damage to the cable feed-throughs.

NOTICE

Do not transport control cabinets lying on the front panel
Transporting the control cabinet lying on the front panel can cause damage to the cabinet.

NOTICE

Do not transport outdoor control cabinets lying on the cooling unit
Never transport outdoor control cabinets lying on the cooling unit! This can damage the cooling unit.

The following illustrations show possible options for transport of the control cabinet.

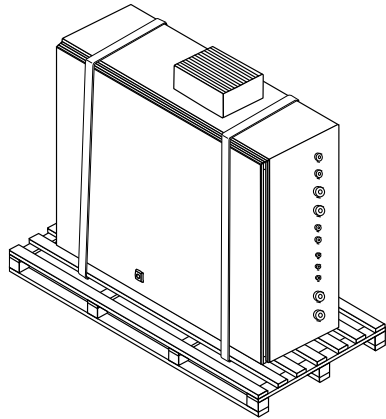


Fig. 2: Transportation lying on the side

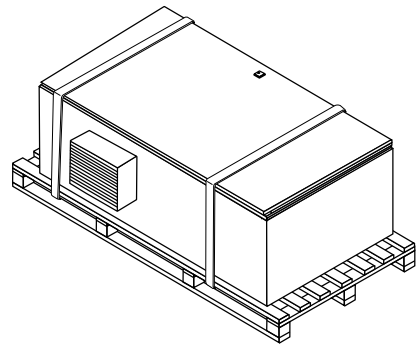


Fig. 3: Transportation lying on the rear panel

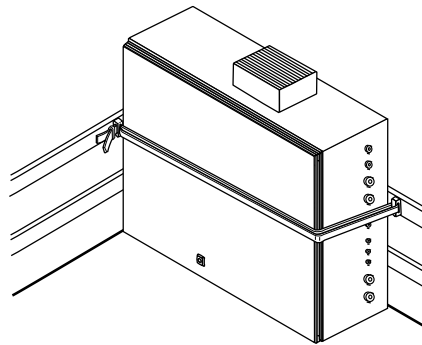


Fig. 4: Transportation without a pallet

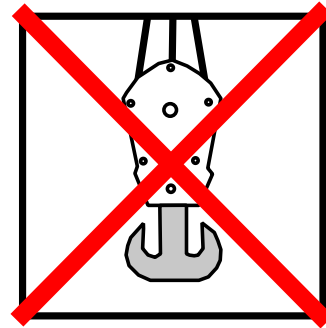


Fig. 5: Do not transport by crane

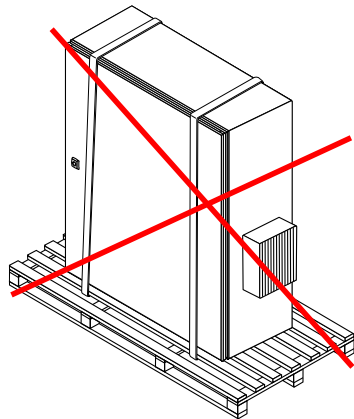


Fig. 6: Do not transport upright

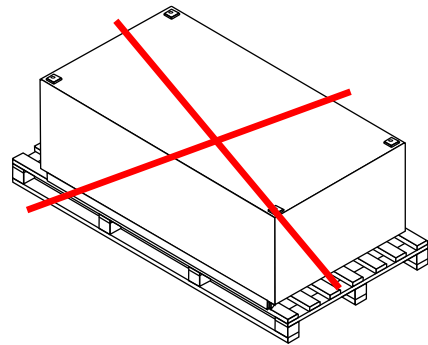


Fig. 7: Do not transport lying on the front panel

5. Safety

This chapter contains general safety regulations that must be followed during installation, operation, and maintenance of the control cabinet. Failure to do so can result in injury or death and/or damage the control cabinet. Read these safety regulations carefully before you start work on the control cabinet.

5.1 Intended use

The connections for the control cabinets and modules used here may only be loaded with the signals and signal strengths permitted for this purpose. Customary national regulations apply.

Indoor control cabinets may only be installed indoors. Outdoor control cabinets are suitable for installation outdoors. For specific information regarding the individual control cabinets, please refer to the data sheet for the control cabinet.

5.2 Personnel

Installation, commissioning, and maintenance of the control cabinet may only be performed by a qualified electrician.

Given their specialist training, knowledge, experience and familiarity with the relevant standards and regulations, a qualified electrician is in a position not only to carry out work on electrical systems, but also to recognize and avoid potential danger unaided.

The qualified electrician must comply with the respective occupational health and safety laws in force. In particular, all national regulations for the commissioning of electrical control cabinets must be observed as a matter of priority.

Please note in particular:

- The national installation and assembly regulations (e.g. VDE in Germany)
- The generally accepted codes of practice
- The information on transport, installation, operation, service and maintenance and disposal given in this user manual
- Specific values, limit values and information relating to operating and ambient conditions on identification plates and in data sheets.

RISK OF ELECTRIC SHOCK



Electric shock hazard! Danger to life and limb!

- Never work on the control cabinet or its input and output cables and wires while the control cabinet is still connected to the grid.
- The control cabinet must be disconnected from the power supply before you start work on it or its components. This applies in particular to the uninterrupted power supply (UPS)! Pay particular attention to possible sources of external voltage and potential-free wiring of the control cabinet!

5.3 General precautionary measures

- Read the safety regulations for the operating range and components installed in the control cabinet you are working on. Read the specific user manuals for the individual components!

- Turn off all possible power sources.
- All other possible live parts must be protected against accidental contact.
- Special precautionary measures are required when working close to bare conductors.
- Ensure that the control cabinet is disconnected from the power supply. Always perform measurements to ensure the control cabinet is in a de-energized state.
- Depending on the model, different components are installed in the control cabinets, such as power supply units, DC/DC converters, power storage, etc. A complete list of all the components installed in your control cabinet can be found in the circuit diagram of the control cabinet included in the scope of delivery. Be sure to also observe the user manuals and safety instructions for the installed components.

6. Mounting and installation

6.1 Safety instructions for installation

DANGER



Electric shock hazard!

Danger to life and limb! Fatal injuries or death from contact with cables, wires, and terminals.

- Only connect or disconnect cables and wires while they are de-energized. Take measures to prevent the power from being reactivated.

CAUTION



Hazard with a risk of personal injury

- Be careful of hot surfaces. Some parts within the control cabinet, such as the power supply cooling unit, remain hot for some time after the power supply has been switched off.
- Ensure no drilling or grinding dust can penetrate the control cabinet during installation. Electrically conductive dust inside the control cabinet can cause damage or malfunction.
- Do not mount the cabinet using riveting.
- If possible, route all wires into the control cabinet directly from below via the cable glands provided.
- Properly seal unused cable glands with dummy plugs. Tighten the glands using the appropriate tools to seal them.

NOTICE

Damage due to improperly connected cables and wires!

Improperly connected cables and wires can lead to damage or destruction of the measuring inputs and devices.

- Connect cables and wires only to the allocated sockets.
- Observe the polarity while connecting cables and wires.

NOTICE

Damage due to overvoltage!

Overvoltage or voltage peaks damage or destroy the device.

- Protect the power supply against electrical surges.

Voltages of more than 10 V DC and currents of more than 50 mA on the analog inputs can destroy the respective measuring inputs.

- Ensure that voltages only up to 10 V DC and currents up to 20 mA are applied. Voltages of more than 60 V DC and currents of more than 50 mA on the digital inputs can destroy the respective measuring inputs.
- Ensure that voltages only up to 60 V DC and only currents up to 50 mA are applied.

6.2 Workflow for mounting, installation, and commissioning

Step	Action	Comment
1.	Unpack the control cabinet and check it for damage.	For further information, refer to 4 Transportation.
2.	Check whether all necessary modules and devices are provided and in perfect condition.	Only devices in perfect condition may be put into operation.
3.	Verify that the control cabinet has been mounted correctly.	For further information, refer to 6.3 Mounting the control cabinet .
4.	Lay the cables and wires.	For further information, refer to 6.4.1 Cables and .
5.	Connect the power supply.	For further information about terminal assignment, refer to the circuit diagram of the control cabinet. For further information on the blue'Log and MX add-on modules, refer to the respective user manuals.
6.	Connect the bus cabling, sensor cable and network cables.	
7.	Commission the control cabinet.	For further information, refer to 7 Commissioning.

6.3 Mounting the control cabinet

The control cabinet is generally suitable for installation in indoor and outdoor areas, depending on the model. Observe the following instructions for wall installation:

- Ensure that the mounting surface is horizontal and as level as possible to prevent leakage due to warping of the housing.
- To mount the control cabinet on the wall, use the supplied mounting material and attach the control cabinet using the distances indicated in the relevant diagram.
- Ensure that the mounting brackets, screws and dowels (if needed) are dimensioned properly, such that they can carry the weight of the control cabinet.
- Mount outdoor control cabinets at a minimum distance of 40 cm from the ground.
- Ensure that the cabinet door(s) can be freely accessed.
- For further information on dimensions and details on mounting the control cabinet, refer to the manufacturer's documentation.

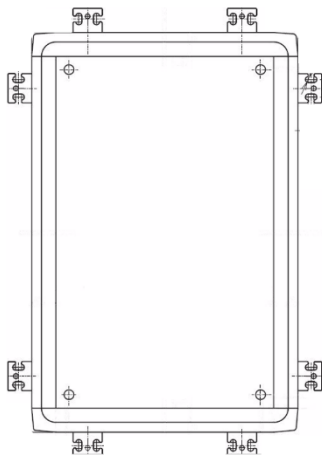


Fig. 8: Diagram of a control cabinet (example, may vary according to the model)

CAUTION



Hazard due to improper mounting

Improperly mounted control cabinets can result in personal injury!

NOTICE



Hazard due to overheating and moisture

Direct sunlight may cause the components in the control cabinet to overheat. The build-up of moisture due to precipitation or proximity to the ground can also damage the components in the control cabinet.

- Outdoor control cabinets must not be exposed to direct weathering. Cabinets which are mounted on a roof or outdoors must be protected from sun and rain by means of separate rain roofs.
- Outdoor control cabinets must be mounted at a minimum distance of 40 cm from the ground. This does not apply to control cabinets mounted on an earthing base.

Installing the network cable

To install a network cable in the control cabinet, there are two cable glands with a split sealing insert.

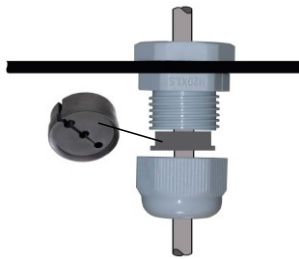


Fig. 8: Cable gland with split sealing insert

Step	Action
1.	To lay the network cable, first remove the cable gland from the control cabinet.
2.	Remove the dummy plug from the cable gland of the control cabinet.
3.	Loosen the cap nut and remove the sealing insert.
4.	Place the cap nut around the network cable before the sealing insert. While positioning of the sealing insert, allow for sufficient length of cables and wires within the control cabinet.
5.	Then feed the network cable with the sealing insert back into the cable gland of the control cabinet.
6.	Finally, fasten the network cable by tightening the cap nut.

NOTICE

Hazard due to open cable glands

- Always keep the sealing plugs in unused screw connections.

6.4 Installation

6.4.1 Cables and wires

The table below provides recommendations as to which types of cables and wires are particularly suited for wiring the individual system components. The table also lists the limitations in a wiring scenario.

Type	Product designation	Item number	Max. permissible length
Bus cable (inverter) <ul style="list-style-type: none"> Recommended: Data cable (twisted and shielded) Data cable RS485 	UNITRONIC Li2YCYv (TP) data cable 2x2x0.5 mm ² 2) 1)	200.116	1200 m ^{2) 3)}
	UNITRONIC Li2YCYv (TP) data cable 3x2x0.50 mm ² 2) 1)	200.117	
	UNITRONIC Li2YCYv (TP) data cable 4x2x0.50 mm ² 2) 1)	200.118	
Analog signals (irradiance sensor, temperature sensor) <ul style="list-style-type: none"> Sensor cable Voltage signal 0 V – 10 V 	UNITRONIC Li2YCYv (TP) data cable 2x2x0.5 mm ² 2) 1)	200.116	100 m
	UNITRONIC Li2YCYv (TP) data cable 3x2x0.50 mm ² 2) 1)	200.117	
	UNITRONIC Li2YCYv (TP) data cable 4x2x0.50 mm ² 2) 1)	200.118	
Digital signals (energy meter, telecontrol systems) <ul style="list-style-type: none"> Sensor cable Current signal 4 mA – 20 mA) 	UNITRONIC Li2YCYv (TP) data cable 2x2x0.5 mm ² 2) 1)	200.116	600 m ⁴⁾
	UNITRONIC Li2YCYv (TP) data cable 3x2x0.50 mm ² 2) 1)	200.117	
	UNITRONIC Li2YCYv (TP) data cable 4x2x0.50 mm ² 2) 1)	200.118	
Temperature sensor (PT 1000) Meter with S0 (digital pulse) signal	UNITRONIC Li2YCYv (TP) data cable 2x2x0.5 mm ² 2) 1)	200.116	30 m
Ethernet network <ul style="list-style-type: none"> Network (shielded) 	At least CAT 5 /6 S/FTP	n/a	100 m ³⁾

¹⁾ This cable is suitable for laying in the ground.

²⁾ Repeaters must be used for longer cable lengths.

³⁾ A hub is required if multiple separate cables of this length are used.

⁴⁾ Power supply of 24 V DC is required.



Data cables must be separated from live cables by means of a metal cable support system in accordance with DIN EN 50174-2: 2018-10.

6.4.2 Shielding

The cable shielding may only be grounded at one end of the connection.

7. Commissioning

This chapter describes the commissioning procedure for the control cabinet.

Installation, commissioning, and maintenance of the control cabinet may only be performed by a qualified electrician.

RISK OF ELECTRIC SHOCK



Electric shock hazard! Danger to life and limb!

- Observe the safety instructions during installation and commissioning! Refer to 5 Safety.

Step	Action
1.	Check that the control cabinet is properly mounted.
2.	Check that all cables and wires are connected correctly. For this, refer to the circuit diagram and, if relevant, the user manuals for blue'Log and MX add-on modules that were included in the scope of delivery.
3.	Check that the temperature for commissioning is within the limits
4.	Check the set switching points on the thermostat and, if necessary, adapt them to the requirements of your location. For factory settings, refer to the circuit diagram for the control cabinet included in the scope of delivery.
5.	Switch on the power supply for all components
6.	If relevant: Wait until the blue'Log has completed the start-up phase (Power LED and Status LED light up)
7.	If relevant: Configure and operate the blue'Log and MX add-on modules in accordance with the respective user manuals. For terminal assignment, refer to the wiring diagram for the control cabinet included in the scope of delivery.



If the control cabinet is brought from a cold environment into the operating environment, condensation can form. For this reason, wait two hours before commissioning to ensure that the control cabinet has reached the ambient temperature and is completely dry.



For outdoor control cabinets, depending on the prevailing ambient temperature, it may be necessary to run the cooling unit continuously for a longer period of time prior to commissioning. This will regulate the internal temperature of the control cabinet to the required values.



By setting the cooling switching point, you significantly affect the power consumption of the control cabinet and the service life of the UPS battery module. Increasing the cooling switching point (higher temperature) lowers the power consumption, but also reduces the battery service life. Reducing the cooling switching point (lower temperature) increases power consumption, but also increases battery service life.

8. Care and maintenance

The control cabinet only requires minimal maintenance when installed in a proper environment. meteocontrol recommends an annual check of the control cabinet to ensure optimal operation.

Furthermore, a periodic verification must be carried out in accordance with IEC 60364-6 – "Low voltage electrical installations – Part 6: Verification".

If necessary, the cabinet interior can be cleaned using a soft brush and a vacuum cleaner. For this, observe the safety instructions in 5 Safety!

8.1 Cleaning the control cabinet cooling unit

In environments with normal levels of soiling and low levels of dust, the exterior of the control cabinet cooling unit only needs to be cleaned every 6 months. For this, remove dust from the fins of the cooling unit and the fan.

When used in rooms with high levels of soiling or dust, this interval must be shortened accordingly. If the control cabinet is not dustproof, the interior of the control cabinet cooling unit must also occasionally be checked for soiling.

Follow the procedure below for cleaning the control cabinet cooling unit:

Step	Action
1.	Disconnect the control cabinet cooling unit from the power supply.
2.	Secure the fan in place by mechanically blocking the fan wheel.
3.	Remove coarse soiling using a brush.
4.	Remove fine dust using compressed air or a compressed air spray.
5.	Remove the blockage from the fan wheel.
6.	Reconnect the control cabinet cooling unit to the power supply.

CAUTION



Hazard due to moving rotors

There is a risk of injury if the fan wheel of the control cabinet moves during maintenance!

- Secure the fan by mechanically blocking the rotors. For this, the fan must be secured by means of a pencil or similar tool; this is to prevent the fan from being set in motion at a high rotational speed by compressed air or water.

9. Technical data

For technical data, please refer to the circuit diagram for the control cabinet included in the scope of delivery.

10. Dimensional drawings

For dimensional drawings, refer to the circuit control diagram for the control cabinet included in the scope of delivery.

11. Environmental protection and disposal

Older control cabinets that are no longer in a serviceable condition must be disposed of in accordance with national and local regulations for environmental protection and raw material recovery. Electronic components may not be disposed of along with household waste.

12. Appendix



EG - KONFORMITÄTSERKLÄRUNG
EC DECLARATION OF CONFORMITY



Hersteller: <i>Manufacturer:</i>	meteocontrol GmbH
Anschrift: <i>Address:</i>	Spichererstrasse 48 D – 86157 Augsburg Germany
Produkt: <i>Product:</i>	Data Station X-Series Outdoor Data Station X-Series Indoor Data Station X-Series Commercial Power Control Station X-Series Outdoor Power Control Station X-Series Indoor Power Control Station X-Series Commercial

Wir erklären, dass die genannten Produkte folgenden Dokumenten und Normen entsprechen:
We declare that the products described above are in compliance with following documents and norms:

Low Voltage Directive (LVD)
 Directive 2014/35/EU

Electromagnetic Compatibility (EMC)
 Directive 2014/30/EU

Low-voltage switchgear and controlgear assemblies
 IEC 61439-2: (2011-08)

Environmental testing
 Only Data Station X-Series Indoor / Outdoor and Power Control Station X-Series Indoor / Outdoor

IEC 60068-2-1:	(2007-03)
IEC 60068-2-2:	(2007-07)
IEC 60068-2-14:	(2009-01)
IEC 60068-2-30:	(2005-08)
IEC 60068-2-78:	(2012-10)

Für die Geräte "blue'Log X-Serie" und „MX Erweiterungsmodule“, welche in den oben aufgeführten Produkten verbaut sein kann, verweisen wir hiermit auf die entsprechende EU-Konformitätserklärung der einzelnen Produkte.

For the devices "blue'Log X-Series" and "MX extension modules", which can be included in the products listed above, we refer to the corresponding EC Declaration of Conformity of the individual product.

Augsburg, 22.07.2019
Place, date
place, date


Jens Wening
Technical Director
Technical director



**KONFORMITÄTSERKLÄRUNG
DECLARATION OF CONFORMITY**

2011/65/EU (ROHS)

meteocontrol GmbH declares that all manufactured products are RoHS compliant according to the Directive 2011/65/EU of the European Parliament and the Council from 8 June 2011 on restriction of the use of certain hazardous substances in electrical and electronic appliances. This concerns the following substances whose concentrations must not be exceeded:

Lead	0.1%
Mercury	0.1%
Cadmium	0.01%
Hexavalent chromium	0.1%
Polybrominated biphenyls (PBB)	0.1%
Polybrominated diphenyl ethers (PBDE)	0.1%

Since we are guaranteed RoHS compliance by our suppliers, we, **meteocontrol GmbH**, can confirm with a clear conscience that all our products comply with the above-mentioned Directive.

Augsburg, 18.10.2018

Place, date



Jens Wening
Technical Director

Energy&Weather¹Services

meteocontrol GmbH | Spicherer Straße 48 | 86157 Augsburg
Geschäftsführung | Martin Schneider | Robert Pfatischer | Jing Nealis
Amtsgericht Augsburg | HRB 16 415 | DE 19 45 56 368
Stadtsparkasse Augsburg |
IBAN DE66720500000250925583 BIC/SWIFT: AUGSDE77



Further information: www.meteocontrol.com

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Item number: 832070 • Version 20230301