

UFHR – URANOS FUME HOOD REGULATOR

SYSTEM **URANOS**

NETAVENT®

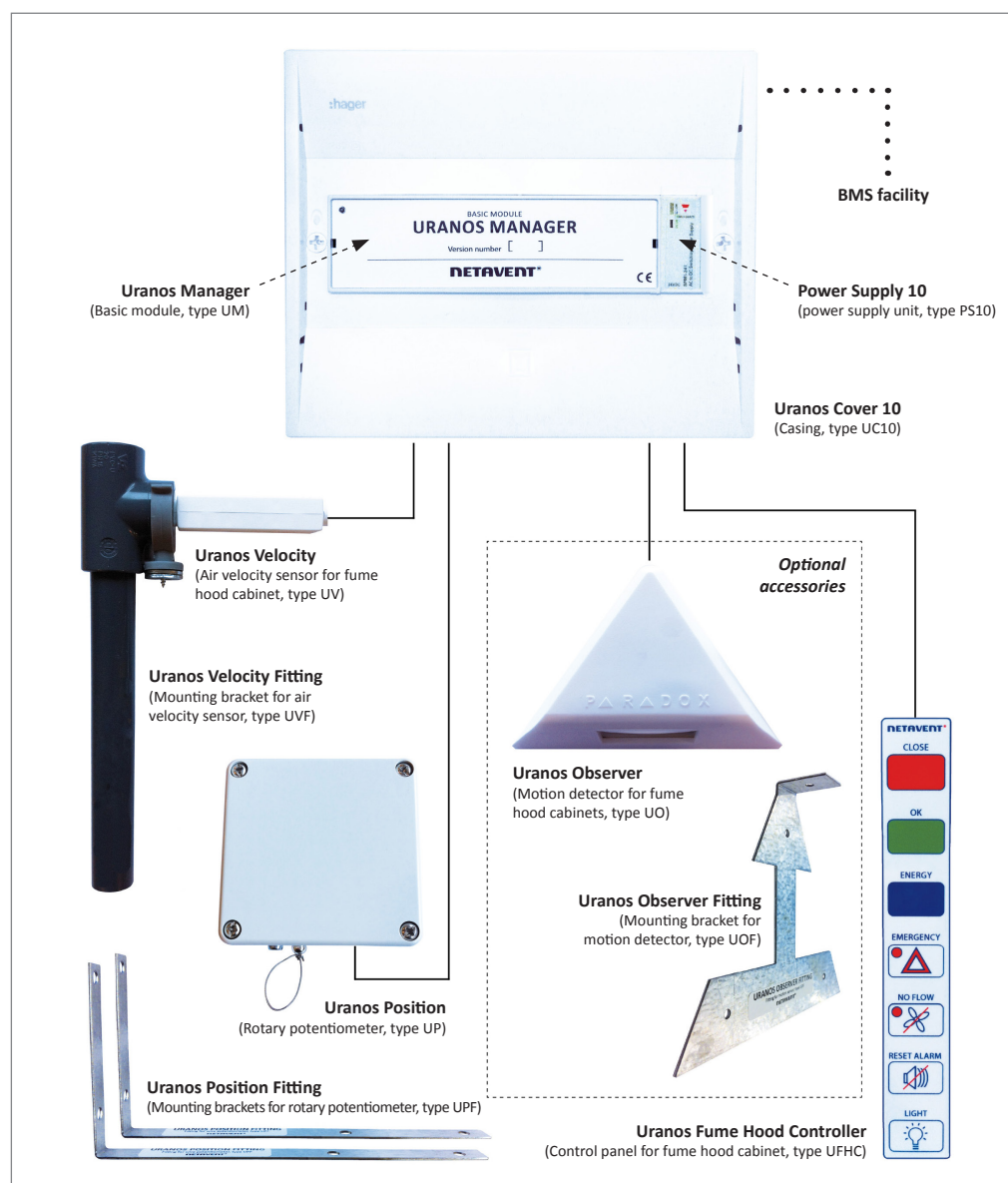
Extraction control in fume hood cabinets

The regulation system, Uranos Fume Hood Regulator, is used for fume hood cabinets in laboratory and hospital environments. This solution helps to provide a high level of security and significant operational savings. The Uranos Fume Hood Regulator adjusts the extraction in the fume hood as needed. Control is performed quickly and precisely via an actuator controlled damper.

Safety within the front face zone of the cabinet hatch is dependent of the extract air velocity in the hood. Air velocity is indicated on a control panel via LED indicators. The system maintains a constant inlet velocity to the cabinet regardless of:

- Position (opening degree) of the hatch.
- Setups in the cabinet.
- Partial obstacles facing the hatch, i.e. a person shielding the opening.

The basic module, Uranos Manager, which is the unit that regulates cabinet functions, also has a built-in battery back-up that sets off a sound alarm in case of a power failure.



*Uranos Fume Hood Regulator consists of several components – see order specification at the end of the brochure.
In addition, there are 2 different mounting brackets for the control panel, these are not displayed above.*

UFHR – URANOS FUME HOOD REGULATOR

SYSTEM **URANOS**



The base module is equipped with RS485 as physical interface and all communication to occurring components uses Modbus RTU as a communication protocol.

The controller can operate independently of a BMS as a stand-alone unit but is prepared for communication via a superior BMS which allows:

- Troubleshooting the system.
- Reading of operational status.
- Control of selected parameters.

The products and components included in the system are easily mounted and commissioned. Uranos Fume Hood Regulator is suitable for all types of fume hood cabinets.

Maintenance of the fume hood cabinet can be done via one or several service plugs/connectors installed in the room. A single service plug/connection point can maintain multiple fume hood cabinets.

Energy saving features

Uranos Fume Hood Regulator has a number of features to help lowering the energy consumption.

Cabinet front face motion/occupancy detector

With the Uranos Observer detector built into the cabinet and no movement is detected in front of the cabinet, the following occurs:

- Air velocity is lowered.
- The light in the cabinet turns off automatically. Following an automatic shutoff, the light must be lit manually.

Cabinet hatch opening detector (hatch alarm)

A hatch alert awares the user that the fume cabinet hatch is open. This is done via a flashing blue LED combined with a sound alarm.

The acoustic alarm can be switched off from the control panel, but the LED will continue to flash if the user does not override it. The hatch alarm is deactivated when the door is closed.

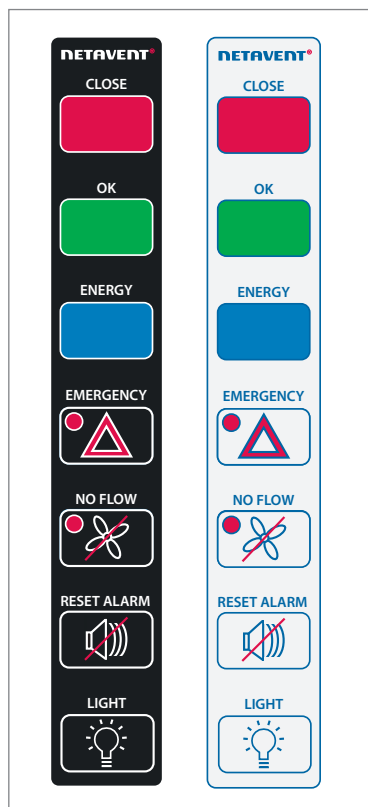
Optional accessories

Automatic closing of the hatch in the fume hood cabinet.

For ordering, please see ***Uranos Sash Closing*** in the order specification section, in the end of this brochure.

UFHR – URANOS FUME HOOD REGULATOR

SYSTEM **URANOS**



Control Pane, Uranos Fume Hood Controller, available in several designs.



Mounting brackets for control panel, Uranos Fume Hood Controller 1 + 2.

Control panel

Uranos Fume Hood Controller allows users to override and monitor the operation of the fume hood cabinet. Usage of the panel is simple and intuitive. The panel continuously informs users of the operating status via light and sound signals.

CLOSE (RED LED)

- Flashing LED + sound alarm indicates that the extract air flow is too low.
—> This is resolved by the user closing the hatch of the cabinet.
- In case of a large decrease in air velocity, the red LED emits and after 5 seconds a sound alarm is activated. The sound alarm can be temporarily cancelled by pressing **RESET ALARM**, which silences the sound alarm for approx. 10 minutes.
- Default setting for alarm activation is when the extract air velocity falls below 40% of the desired air velocity operating value.

OK (GREEN LED)

- Constantly lit LED = Operational air velocity is correct/matches the value desired.
- Default setting is while extraction velocity exceeds 80% of the value desired.

ENERGY (BLUE LED)

- Constantly lit LED = The cabinet runs in energy-saving mode.
—> Front face air velocity is hereby set to a default of 0,3 m/s.
- Flashing LED + sound alarm = hatch alarm.
Front face motion detector is deactivated and the hatch is open.
—> This is resolved by the user closing the hatch of the cabinet.
- The sound alarm can be cancelled by pressing RESET ALARM, while the flashing LED continues while the hatch remains open.

EMERGENCY (Warning triangle symbol with emitted small red diode)

- The function is activated by pressing the button in case of an accident in connection with the operation of the cabinet.
—> CLOSE starts flashing. —> Extract air flow increases to maximum.
- Deactivation is done by an additional button press.
- NOTE!:** EMERGENCY overrides all other functions.

NO FLOW (Crossed fan symbol with emitted small red diode)

- The function is activated by pressing the button when no extraction is desired.
- Deactivation is done by an additional button press.
- Can be used to protect the user from draft, e.g. during complex or time consuming set-ups in the cabinet.

RESET ALARM (Crossed speaker symbol)

- Activated by pressing the button. —> Silences the sound alarm approx. 10 min.

LIGHT (Bulb symbol)

- Pressing the button switches the lighting in the cabinet on and off.

Control panel – assembly and mounting

The control panel is adhesively attached directly onto the cabinets front edge profile onto either predrilled holes for the underlying components or by drilling holes in a suitable diameter during assembly.

For those cases regular mounting is not possible, Netavent provides control panel mounting brackets, designed to allow simple installation options. The brackets are supplied in two different designs, dependent on the type of surface on which they are to be mounted. Bracket UFHCF1 has a flat back, while bracket type UFHCF2 has a rounded back design. The brackets are easily mounted with two self-tapping screws whereupon the control panel is adhesively attached.

UFHR – URANOS FUME HOOD REGULATOR

SYSTEM **URANOS**

Functionality

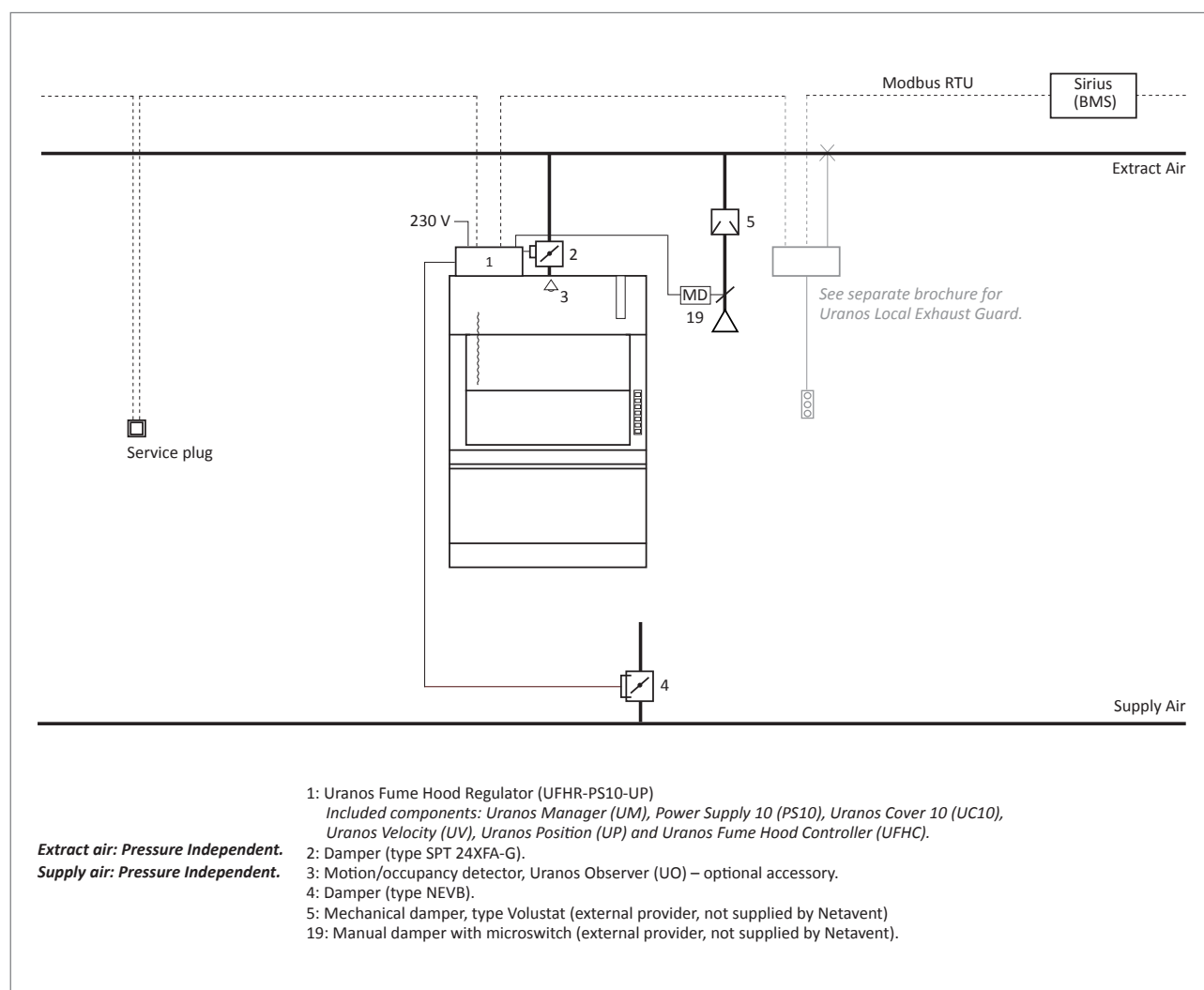
Uranos Fume Hood Regulator makes it possible to:

- Control the supply air.
- Handle 1 local extraction point.
- Force airflow in case of accident in connection to the cabinet.
- Discontinue extraxtion from the cabinet, e.g. during complex or time consuming set-ups in the cabinet.
- Communicate with superior BMS.
- Control the cabinet's lighting function.
- Start and stop fan functions (requires a transfer relay).

Components - function and interaction

For control of the cabinet functions, certain operating principles apply. These operating principles are exemplified in the following illustrations (no. 100-101).

Motion detector, rotary potentiometer, air velocity detector and control panel are all connected to the basic module, Uranos Manager, which is connected to a power supply. In addition, both supply and extract dampers are connected to the basic module. In addition, 1 local extraction point can be connected.

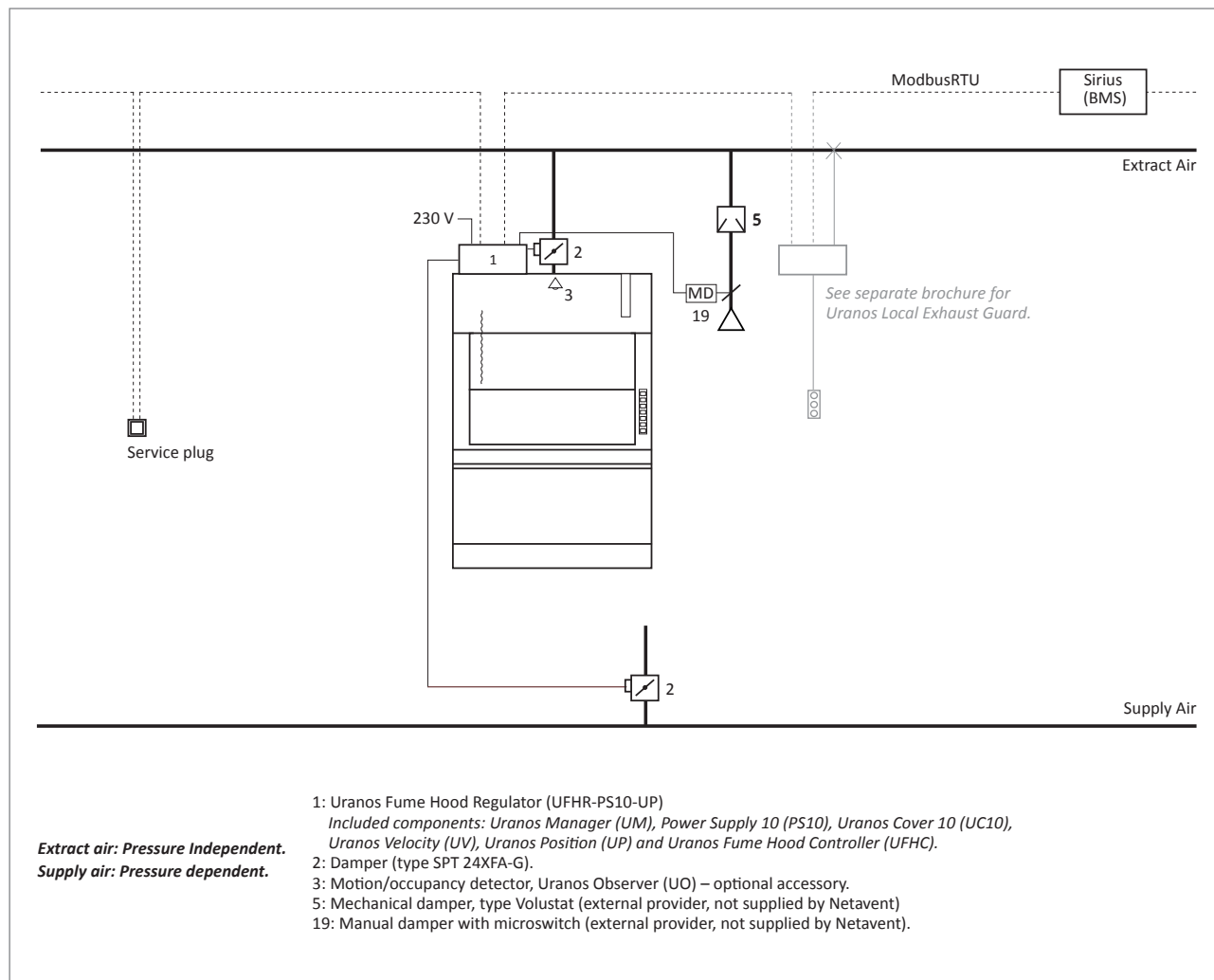


Function principle for Uranos Fume Regulator, no. 100.

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Function principle for Uranos Fume Regulator, no. 101.

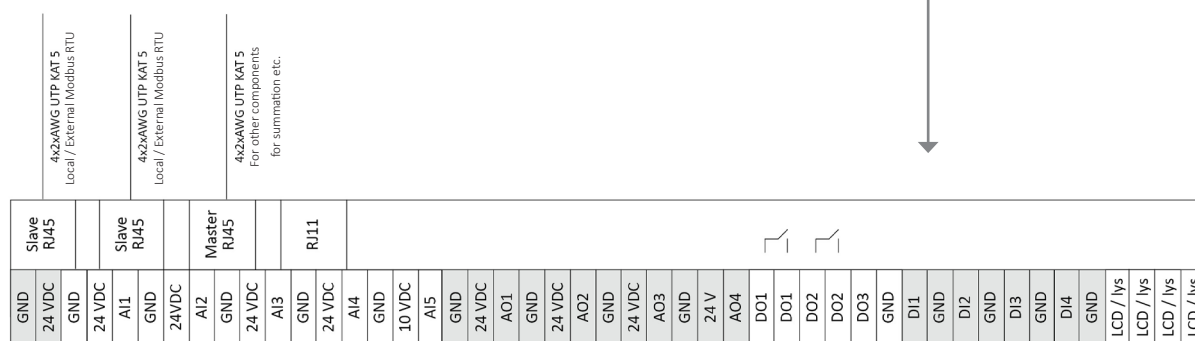
UFHR – URANOS FUME HOOD REGULATOR

SYSTEM **URANOS**


Wiring connections

All components of the fume hood controller are connected to the basic module, Uranos Manager. The illustration shows the wiring layout for the basic module.

For more information on connecting components, please refer to separate document, with wiring diagrams for the fume hood controller.



Connection layout for Uranos Manager.

Dimensions

The following dimensions apply for the overall components which can be included in a fume hood cabinet controller solution.

URANOS COVER 10	Casing/cover box for the basic module	180 x 218 x 82 mm (HxWxD)
POWER SUPPLY 10	Power supply	91 x 18 x 55,6 mm (HxWxD)
URANOS MANAGER	Basic module / control unit	81 x 156 x 58 mm (HxWxD)
URANOS VELOCITY	Air velocity detector	105 x 15 x 21 mm (HxWxD)
URANOS VELOCITY FITTING	Mounting bracket for the velocity detector	230 x 20 mm (Hx $\varnothing_{\text{sensor tube}}$)
URANOS POSITION	Rotary potentiometer	80 x 82 x 54 mm (HxWxD)
URANOS FUME HOOD CONTROLLER	Control panel	124 x 19 mm (HxW)
URANOS FUME HOOD CONTROLLER FITTING 1	Mounting bracket control panel, flat	123,5 x 18,5 x 6 mm (HxWxD)
URANOS FUME HOOD CONTROLLER FITTING 2	Mounting bracket control panel, rounded	123,5 x 18,5 x 10 mm (HxWxD)
URANOS OBSERVER	Motion/occupancy detector	117 x 33 mm (L _{sides} xD)

In addition, there are separate technical sheets on all components, including related types of fittings and brackets.

UFHR – URANOS FUME HOOD REGULATOR

SYSTEM **URANOS**


Technical specifications

Supply voltage	24VDC +/- 10%.
Power consumption	
Type	0,1A.
Max.	1,6A.
Analog Input	
AI1	0 - 10VDC, Ri > 100kΩ.
AI2	0 - 10VDC, Ri > 100kΩ.
AI3	0 - 10VDC, Ri > 100kΩ.
AI4	0 - 10VDC, Ri > 100kΩ.
AI5	0 - 10VDC, Ri > 100kΩ.
Vout AI5	10 VDC, max. 5 mA.
Analog Output	
AO1	0 - 10VDC, max. 5mA.
AO2	0 - 10VDC, max. 5mA.
AO3	0 - 10VDC, max. 5mA.
AO4	0 - 10VDC, max. 5mA, galvanically separated.
Digital Input	
DI1	15V disconnected (pull up), 2mA connected.
DI2	15V disconnected (pull up), 2mA connected.
DI3	15V disconnected (pull up), 2mA connected.
DI4	15V disconnected (pull up), 2mA connected.
Digital Output	
DO1	Relay NC, 30 VDC, 0,2A.
DO2	Relay (wolfram) NO, 230VAC, 2A.
DO3	"Open Collector" 24VDC on/off, max. 100mA.
Max. Alarm	Activated when the hatch is opened exceeding the permitted height.
Gas Alarm	Damper opens 100% and max. extraction is activated.

Panel RS485	
Protocol	Modbus RTU.
A	Data+.
B	Data-.
Baud rate	19,2k.
Parity	Even.
Data bits	8 bit.
Stop bits	1.
Power out	15VDC (9VDC during backup), max. 0,1mA.
Master RS485	
Protocol	Modbus RTU.
A	Data+.
B	Data-.
Baud rate	115,2k / 19,2K / 9,6k.
Parity	Non / Even / Odd.
Data bits	8 bit.
Stop bits	1 or 2 bit (always 1 bit on Even / Odd parity).
Power out	24VDC, max. 1,2A.
Slave RS485	
Protocol	Modbus RTU.
A	Data+.
B	Data-.
Baud rate	115,2k / 19,2k / 9,6k.
Parity	Non / Even / Odd.
Data bits	8 bit.
Stop bits	1 or 2 bit (always 1 bit on Even / Odd parity).
Request Time (*)	< 20mS.
Poll Time (**)	> 1mS.

(*) = **Request Time**, in this case, is defined as the time from the last byte of a received **Request**, to the start of the first byte of the corresponding **Response**.

(**) = **Poll Time**, in this case, is defined as the time from a **Response** received, until next **Request** is dispatched.

UFHR – URANOS FUME HOOD REGULATOR

SYSTEM **URANOS**


Order specification

Uranos Fume Hood Regulator – Fume hood controller with integrated power supply and rotary potentiometer

Type UFHR-PS10-UP (specified at order placement)

UFHR-PS10-UP consists of the following products		Type Designation
<i>Uranos Manager</i>	Basic module / control unit	UM
<i>Power Supply 10</i>	Power supply	PS10
<i>Uranos Cover 10</i>	Casing for Uranos basic module and power supply	UC10
<i>Uranos Velocity</i>	Air velocity detector	UV
<i>Uranos Velocity Fitting</i>	Mounting bracket for air velocity detector UV	UVF
<i>Uranos Fume Hood Controller</i>	Control panel	UFHC
<i>Uranos Position</i>	Rotary potentiometer	UP
<i>Uranos Position Fitting</i>	Mounting bracket for air velocity detector UV	UPF

Uranos Fume Hood Regulator – Fume hood controller with integrated power supply

Type UFHR-PS10 (specified at order placement)

UFHR-PS10 consists of the following products		Type Designation
<i>Uranos Manager</i>	Basic module / control unit	UM
<i>Power Supply 10</i>	Power supply	PS10
<i>Uranos Cover 10</i>	Casing for Uranos basic module	UC10
<i>Uranos Velocity</i>	Air velocity detector	UV
<i>Uranos Velocity Fitting</i>	Mounting bracket for air velocity detector UV	UVF
<i>Uranos Fume Hood Controller</i>	Control panel	UFHC

Uranos Fume Hood Regulator – Fume hood controller with rotary potentiometer

Type UFHR-UP (specified at order placement)

UFHR-UP consists of the following products		Type Designation
<i>Uranos Manager</i>	Basic module / control unit	UM
<i>Uranos Cover 10</i>	Casing for Uranos basic module	UC10
<i>Uranos Cover Fill</i>	Complementary filler for module casing UC10	UCF
<i>Uranos Velocity</i>	Air velocity detector	UV
<i>Uranos Velocity Fitting</i>	Mounting bracket for air velocity detector UV	UVF
<i>Uranos Fume Hood Controller</i>	Control panel	UFHC
<i>Uranos Position</i>	Rotary potentiometer	UP
<i>Uranos Position Fitting</i>	Mounting bracket for rotary potentiometer UP	UPF

UFHR – URANOS FUME HOOD REGULATOR

SYSTEM **URANOS**


Uranos Fume Hood Regulator – Fume hood cabinet controller

Type UFHR (specified at order placement)

UFHR consists of the following products		Type Designation
<i>Uranos Manager</i>	Basic module / control unit	UM
<i>Uranos Cover 10</i>	Casing for Uranos basic module	UC10
<i>Uranos Cover Fill</i>	Complementary filler for module casing UC10	UCF
<i>Uranos Velocity</i>	Air velocity detector	UV
<i>Uranos Velocity Fitting</i>	Mounting bracket for air velocity detector UV	UVF
<i>Uranos Fume Hood Controller</i>	Control panel	UFHC

Accessories and spare parts

Products		Type Designation (specified at order placement)
<i>Uranos Observer</i>	Movement/occupancy detector	UO
<i>Uranos Observer Fitting</i>	Mounting brackets for occupancy detector UO	UOF
<i>Uranos Fume Hood Controller Fitting 1</i>	Mounting bracket for Control panel (flat type)	UFHCF1
<i>Uranos Fume Hood Controller Fitting 2</i>	Mounting bracket for Control panel (rounded type)	UFHCF2
<i>Uranos Battery</i>	Rechargeable battery	UB
<i>Uranos Sash Closing</i>	Automatic hatch closing system	USC