

# Operating, Installation Instructions

## WRM Technical Data



## Technical data for actuators, installation

### Technical data for actuators

	M1 (LM 24A)	M2 (LM 24A)	M3 (LM 24A-MF)
Connection voltage	AC 230 V	AC/DC 24 V	AC/DC 24 V
Operating range	85 to 265 V	19.2 to 28.8 V	19.2 to 28.8 V
Torque	5 Nm	5 Nm	5 Nm
Run time for 90°	150 s	150 s	150 s
Input power supply	4 VA	2 VA	2 VA
Energy consumption	1.5 W	1 W	1 W
Degree of protection	IP 54	IP 54	IP 54
Connecting cable 0.75 mm <sup>2</sup>	approx. 1 m 3 core	approx. 1 m 3 core	approx. 1 m 4 core
Ambient temperature	-30 to +50°C	-30 to +50°C	-30 to +50°C

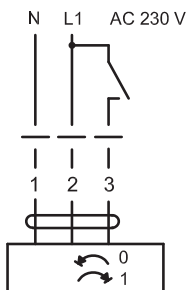
### Installation instructions

• WRM volume flow rate controllers are calibrated over the entire range of application of the product.

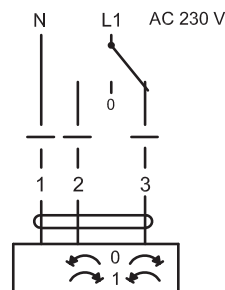
• The installation of the controller requires a straight inlet path with a minimum length of 3 times nominal diameter and a straight outlet path of at least 1.5 times nominal diameter. Installation directly before or after points that cause turbulence (bends, junctions etc.) reduces the control accuracy.

### Actuator M1

1 wire control

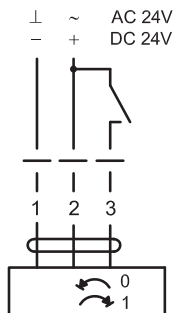


2 wire control

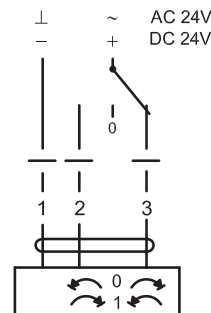


### Actuator M2

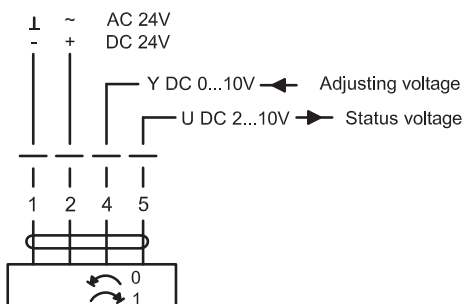
1 wire control



2 wire control



### Actuator M3



• The volume flow rate set point is adjusted on installation. This adjustment does not affect the control accuracy.

• The base model is adjusted manually by moving the pointer to the required set point on the scale and fixing this setting.

• Volume flow rate controllers with actuator-driven setting with the M1 (AC 230V) and M2 (AC/DC 24V) actuators allow a two-step operation. The associated actuator limit stoppers are positioned to set the two volume flow rates.

The two limit stoppers of the actuators with 0-running direction are factory-set to the largest possible angle of rotation. The maximum angle of rotation corresponds to the largest possible volume flow rate set point. The minimum angle of rotation is the equivalent to a "shutoff" at a residual leakage rate well below the minimum volume flow rate specified in the catalogue.

M1 actuators and M2 actuators can be connected in 1 wire or 2 wire control.

• Volume flow rate controllers driven by the M3 (AC/DC 24V) actuator allow continuous set point adjustment. The actuator is controlled with an adjusting voltage  $Y_{DC} = 0...10V$  and moves into the position specified by the control signal. The operating range starts at 2V. The volume flow rate set point change is nearly linear to the adjustment voltage.

The 0-running direction of the actuator is set in the factory, and the limit stoppers are set to give the largest possible angle of rotation, so that  $Y = 10V$  corresponds to the maximum angle of rotation and therefore the maximum volume flow rate set point, and  $0...2V$  corresponds to the minimum angle of rotation, which equates to a "shut-off" at a residual leakage rate well below the minimum volume flow rate specified in the catalogue.

The status voltage  $U_{DC} 2...10V$  serves to display the volume flow rate set point electrically and as a sequence control signal for additional actuators.

• All actuators are protected against overload, do not require a limit switch and stop automatically at the limit stopper.

• For manual operation, all actuators can be locked out by a self-resetting push button.

• The running direction of all actuators can be reversed with a change over switch on the actuator.

• If there is a power failure the actuator stays in its current setting and the controller continues to control at the corresponding set point.

• Installation instructions are included with the volume flow rate controllers and have to be followed!

# Waterloo Product Range

## Waterloo Product Range

### GRILLES

A complete range of products suitable for all wall, ceiling and floor applications. Most grilles are made from aluminium and have a range of fixed or moveable blades designed to give performance whilst remaining aesthetically pleasing to the eye. Grilles are made to customer specified sizes and colours (PPM/G); standard colour PPM9010 (20% Gloss White). The range is complemented by the Aircell range of polymer Grilles.



### DIFFUSERS

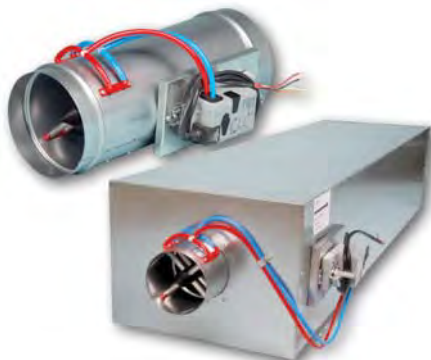
Designed to be installed in various ceiling systems, we have a complete range to suit both performance and aesthetical requirements. Most diffusers are made from aluminium and can be ordered with or without plenum boxes for easy duct work. Diffusers can be ordered in customer specified colours (PPM/G); standard colour is PPM 9010 (20% Gloss White). This range is complemented by the Aircell range of polymer Diffusers.



### ACTIVE AND PASSIVE CHILLED BEAMS

The finest quality range of high output active beams, used for ventilated heating and cooling applications. These units have 4 pipe coils to allow heating and cooling circuits to run simultaneously, giving constant and responsive control. The design allows a large optimum capacity and also allows the customer to specify the nozzle type and pitch for individual circumstances.

Active beams are made from steel to a large range of customer specified sizes and as such are suitable for various different ceiling systems. Standard finish is PPM 9010, however other (PPM/G) colours are available on request.



### AIR VOLUME CONTROL DAMPERS

Pressure independent Variable Air Volume and Constant Air Volume dampers made from zintec plate. Most volume dampers are regulated with an electronic motor and sensors and are calibrated to customer specifications before delivery.

The Constant Air Volume damper requires no power source as it is controlled via a mechanical device and calibrated before delivery. All volume dampers can be ordered with a single or double (insulation) skin.



### EXTERNAL LOUVRES

A quality range of products for external wall applications. Made from aluminium, with birdscreen or insect screen options. All louvres are made to customer specified sizes and (PPM/G) colours; standard colour is PPM 9006.



### DISPLACEMENT

A full range of recessed, semi-recessed, floor, wall and corner units providing high ventilation efficiency and excellent comfort. The very low pressure involved also offer quiet installations. Displacement units are available as wall or floor mounted, or indeed integrated within the architectural design.



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