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**VOLUME CONTROL DAMPERS**

**Frame**
- 1.2 mm thick Galvanized steel with welding / clinching corners
- 0.9 mm (optional)

**Blades**
- Extruded Aluminium profile aero foil blades, 1mm thick
- 75, 100 & 150 mm blade width to suit different sizes

**Bushings**
- Plastic self oiling type

**Control shaft**
- 6” long plated steel, 1/2” square bar

**Quadrant**
- From stamped GI

---

**Ordering System**

**Pattern**
- VCD-Flange type
- VCD-Slip & Clip type
- VCD-Box type
- VCD with gear mechanism

**Options**
- W x H: WIDTH x HEIGHT
- MIN SIZE: 100 x 100 MM
- MAX SIZE: 1000 x 1000 MM

**Sizes above this size will be made in multiple section as per sketch page no.3**

**Fixing**
- F=FLANGED
- SC=SLP & CLIP
- B=BOX

**Blade Movement**
- O=OPPOSED (STD)
- A=PARALLEL

**Mechanism**
- L=LINK (STD)
- G=GEAR

**VCD: VOLUME CONTROL DAMPER**

---

*ALL DETAILS SUBJECT TO CHANGE WITHOUT PRIOR NOTICE*
STAINLESS STEEL VCD

Frame: S. Steel sheet 1.2mm thickness
Blade: S. Steel sheet 0.9mm thickness
Bearing: Round Brass/S. Steel
Shaft: S. Steel Round section
Handle: S.Steel

Ordering System

<table>
<thead>
<tr>
<th>PATTERN</th>
<th>OPTIONS</th>
<th>SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

W x H: WIDTH x HEIGHT
MIN SIZE: 100 x 100 MM
MAX SIZE: 1000 x 1000 MM

SIZES ABOVE THIS SIZE WILL BE MADE IN MULTIPLE SECTION AS PER SKETCH PAGE NO.3

FIXING | BLADE MOVEMENT | MECHANISM
-------|----------------|---------
F=FLANGED | O=OPPOSED (STD) | L=LINK (STD)
SC=SLP & CLIP | A=PARALLEL | G=GEAR
B=BOX

SSVCD: STAINLESS STEEL VOLUME CONTROL DAMPER

ROUND VOLUME CONTROL DAMPER - VDR

The frame and blade in Round Volume Control Damper are made of 0.9 mm galvanized steel and unit is fixed with hand quadrant for manual operation.

The finishing is mill galvanized.

Axle: 1/2” square aluminium hollow tube riveted to blade
L = DIA + 60 mm

TYPE | SIZE
-----|------

Ø: DIAMETER

VDR: ROUND VOLUME CONTROL DAMPER

ALL DETAILS SUBJECT TO CHANGE WITHOUT PRIOR NOTICE
**MOTORIZED VOLUME CONTROL DAMPER**

Frame: GI 1.2 mm with welded corner  
Blades: Aluminium aerofoil type - 1mm thick  
Mechanism of movement: plastic gear of 100mm Dia.  
The control shaft: 10" long plated steel 1/2 inch square bar.  
Motorized VCD can be supplied without motor with provision to fix motor.

**MOTORS:** As a standard: Belimo models used with our product.  
Other models can be used on request.  

**TYPE OF MOTORS:**  
1) Open / Close type without spring return function.  
2) Open / Close type with spring return function.  

Motor Model according to damper size as per following pages.  

**ORDERING SYSTEM:** MVCD - Motorized Volume Control Damper  
+Motor details as applicable.

---

**SQUARE SHAFT**  
**MOTOR**  
**GEAR MECHANISM**
Non spring-return actuators

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Nm</td>
<td>5 Nm</td>
<td>5 Nm</td>
<td>10 Nm</td>
<td>20 Nm</td>
<td>40 Nm</td>
<td></td>
</tr>
<tr>
<td>0.4 m²</td>
<td>1 m²</td>
<td>1 m²</td>
<td>2 m²</td>
<td>4 m²</td>
<td>8 m²</td>
<td></td>
</tr>
</tbody>
</table>

**Open/Close**
- AC / DC 24 V
- Auxiliary switch add-on 1 x SPDT, 1 mA...3 (0.5) A

**Modulating**
- AC / DC 24 V
- Positioning signal Y: DC 2 ... 10 V, 100 kOhm
- Position feedback: DC 2 ... 10 V, max. 1 mA

**Multi-functional**
- Parameterisable 1)

**Dampers**
- Damper shaft: 6 ... 20 mm
- Running time: 35 s
- Manual override: Disengaging the gearing latch by means of pushbutton, self-resetting
- Connection: Cable 1 m, 3 x 0.75 mm²
- Direction of rotation: Can be selected with switch
- Angle of rotation: max. 95°; can be limited at both ends with mechanical adjustable end stops
- Degree of protection: IP 54 in all mounting positions
- Position indication: Mechanical, plug-on
- Sound power level: max. 35 dB(A) / max. 45 dB(A)
- EMC: CE according to 89/336/EEC
- Ambient temperature range: -30 ... +50°C
- Non-operating temperature: -40 ... +80°C
- Ambient humidity range: 95% r.H., non-condensing (to EN 60730-1)

1) Control, operating range, running time and further functions are parameterisable with PC-Tool or with the parameterising device MFT-H

Further versions ex. fast running or form-fit types on request.

**Electrical installation**

- Open/Close
- 3-point modulating
- Y = DC 0...10 V
- U = DC 2...10 V
- Y = Control signal
- U = Measuring voltage

**Direction of rotation**
- 0...100%
- 0...100%
- Y
- U

**ALL DETAILS SUBJECT TO CHANGE WITHOUT PRIOR NOTICE**
Spring-return actuators

<table>
<thead>
<tr>
<th></th>
<th>TF</th>
<th>LF</th>
<th>AF</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Nm</td>
<td>4 Nm</td>
<td>15 Nm</td>
<td></td>
</tr>
</tbody>
</table>

Air damper size up to approx.

<table>
<thead>
<tr>
<th></th>
<th>0.4 m²</th>
<th>0.8 m²</th>
<th>3 m²</th>
</tr>
</thead>
</table>

Open/Close
- AC / DC 24 V
- Auxiliary switch add-on 1 x SPDT, (AF24-S : 2 x SPDT)
- AC 230 V
- Auxiliary switch add-on 1 x SPDT, (AF230-S : 2 x SPDT)

Modulating
- AC / DC 24 V
  Positioning signal Y: DC 2 .. 10 V, 100 kOhm
  Position feedback: DC 2 .. 10 V, max. 1 mA

Multi-functional
- Parameterisable 1)

<table>
<thead>
<tr>
<th>Damper shaft</th>
<th>6 ... 12mm</th>
<th>8 ... 16mm</th>
<th>10 ... 20mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Running time</td>
<td>&lt;75 s⁻¹</td>
<td>&lt;20 s</td>
<td>&lt;150 s</td>
</tr>
<tr>
<td>Manual override</td>
<td>Motor</td>
<td>Spring return</td>
<td>Crank handle</td>
</tr>
<tr>
<td>Connection</td>
<td>Cable 1 m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direction of rotation</td>
<td>selected by mounting L/R</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Angle of rotation</td>
<td>max. 95°</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Angle of rotation limiting</td>
<td>yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Position indication</td>
<td>yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP 42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sound power level</td>
<td>max. 50 db(A)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EMC</td>
<td>CE according to 89/336/EEC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient temperature range</td>
<td>-30 ... +50°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-operating temperature</td>
<td>-40 ... +80°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient humidity range</td>
<td>95% r.H., non-condensating (to EN 60730-1)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Control, operating range, running time and further functions are parameterisable with PC-Tool or with the parameterising device MFT-H

Further versions ex. fast running or form-fit types on request.
**Mechanical flow-rate controller MRP-1 (Circular)**

**Description:**
With the circular air flow controllers with automated action, the air flow rate is controlled via an asymmetrical control flap pivoting on a smoothly running bearing, so as to provide highly sensitive response and control even with low flow rates. Manual flow rate setting is also available, by adjusting the tension of the drawing spring according to a scale denoting the desired flow rate. In selecting the controller and sizing of the ducting, the minimum air flow velocity of 2.7 m/s should be ensured.

**Application:**
These controllers are designed to control air flow rate in circular duct systems.

**Material:**
Mechanical flow rate controllers MRP-1 are made of galvanised steel sheet. They are laser butt-welded to eliminate sharp seams both inside and outside. The joining ends are calibration pressed in conformance with DIN 24147 to provide their extreme stability and accurate fitting. Cushioned control flap: a piston damper prevents vibrations and oscillations of the control flap. On order, mechanical air flow rate controllers are also available with 25 or 50 mm acoustic or thermal insulation.

**Installation:**
The controller can be installed at any location of the ventilation system. Access to the ducting and the controller shall be provided in conformance with DIN 1946 T2, for the purposes of actuation and maintenance. A minimum 3xL length straight duct section shall be provided on both sides of the controller; to ensure flow stabilisation and efficient controller operation. Inlet and outlet ducting sections should be of equal diameter. The indicated reference air flow velocity is approx. 4.5 m/s. Air flow velocity should be within the range of optimum flow rate. A circular rubber seal provides secure sealing, since the gap between the duct section and the joining end of the controller is thus equalised and kept constant by the weights of joining components.

**Standard Designs:**
Constant flow air flow rate controller will tight insertion seating (joint dimension only):

1. Automatic control autonomous of external energy sources, with basic factory settings or user selected settings of reference air flow rate;
2. Optional post-installation setting, by means of the setting device;
3. Maximum pressure drop across the controller 1000 Pa;
4. Special controller variants available, without the setting device, for unobtrusive installation; suitable for installation in open ducting (this design, however, does not allow flow rate setting after installation);
5. L1 = length of the insertion section, total length = L1 + 2 x L2

---

**Examples of installation**

**Recommended straight ducting sections L:**

<table>
<thead>
<tr>
<th>m²/s</th>
<th>7%</th>
<th>10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 0 D</td>
<td>≥ 0 D</td>
<td></td>
</tr>
</tbody>
</table>

| ≥ 3 D | ≥ 2 D |

| ≥ 0 D | ≥ 0 D |

---

**Hidria**

**IMP Klima**
### Dimensions - Air Flow Rate

<table>
<thead>
<tr>
<th>Nominal Dimension (mm)</th>
<th>Allowable Air Flow Range (m³/h)</th>
<th>Optimum Air Flow Range (Pa)</th>
<th>Max. Static Pressure Drop (Pa)</th>
<th>Recommended Duct Air Velocity (m/s)</th>
<th>Dimension (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>40-125</td>
<td>50-108</td>
<td>1000</td>
<td>ca. 2.7 do 6.0</td>
<td>120 40</td>
</tr>
<tr>
<td>100</td>
<td>70-260</td>
<td>75-170</td>
<td>1000</td>
<td>ca. 2.7 do 6.0</td>
<td>170 40</td>
</tr>
<tr>
<td>125</td>
<td>100-280</td>
<td>120-265</td>
<td>1000</td>
<td>ca. 2.7 do 6.0</td>
<td>170 40</td>
</tr>
<tr>
<td>140</td>
<td>140-400</td>
<td>150-330</td>
<td>1000</td>
<td>ca. 2.7 do 6.0</td>
<td>170 40</td>
</tr>
<tr>
<td>160</td>
<td>180-500</td>
<td>200-430</td>
<td>1000</td>
<td>ca. 2.7 do 6.0</td>
<td>240 40</td>
</tr>
<tr>
<td>200</td>
<td>250-900</td>
<td>300-670</td>
<td>1000</td>
<td>ca. 2.7 do 6.0</td>
<td>240 40</td>
</tr>
<tr>
<td>250</td>
<td>500-1500</td>
<td>480-1050</td>
<td>1000</td>
<td>ca. 2.7 do 6.0</td>
<td>240 40</td>
</tr>
<tr>
<td>315</td>
<td>600-2200</td>
<td>770-1900</td>
<td>1000</td>
<td>ca. 2.7 do 6.0</td>
<td>220 60</td>
</tr>
<tr>
<td>400</td>
<td>1000-3800</td>
<td>1240-2850</td>
<td>1000</td>
<td>ca. 2.7 do 6.0</td>
<td>295 60</td>
</tr>
</tbody>
</table>

**Diagram: Static Pressure Drop Resulting in the Controller Response**

In sizing the air ducting, one shall observe the minimum pressure drop to result in the controller response.

**Calculation Example:**
- **Air Flow Rate Controller:** Type MRP-1
- **Nominal Length:** ND 160
- **Air Flow Velocity:** 4.5 m/s
- **Air Flow Rate:** 325 m³/h
- **Static Pressure Drop (Δp) in Pa, from the diagram:** 150 Pa

**Ordering Key:**
- MRP - 1/Q/size φ80, 100, 125, 140, 160, 200, 250, 315, 400
  - Example: Flow rate setting to 120 m³/h
  - 1 circular design

**ALL DETAILS SUBJECT TO CHANGE WITHOUT PRIOR NOTICE**
Rectangular or square air flow controller is an autonomous control component that maintains, within a defined range, a specified constant air flow rate. The air flow rate is controlled via a control flap pivoting on bearings on both sides, a system of levers and a setting spring. The flap geometry ensures prompt response even under low pressure drops across the controller. The appropriate selection of the spring and the lever geometry lead to a defined correlation between the pressure drop and the position of the flap, thus maintaining a constant air flow rate.

These controllers are designed to control air flow rate in rectangular duct systems. Their application temperature range is -20 to +110 °C. The controller operation starts at the minimum response pressure drop, which is a function of the air flow rate (Diagram2), and operates up to the maximum pressure drop of 1000 Pa, in a stable control range. Across this operation rate, the air flow rate deviations are limited to ±10%. The controller cross section dimensions (width and height) should be selected equal to the ducting dimensions in order to avoid mechanical deficiencies excessive pressure drops and increased operation noises; Each flow rate controller is factory set to the flow rate requested by the customer. Within a certain range, the flow rate setting can be changed, by means of the setting device.

The flow rate controller frame is made of galvanised steel sheet. The control flap is sated in special bearings made of PTFE for resistance against wear. To compensate any air flow oscillations, the controller is fitted by a damper fixed to the control flap, serving to damp any frequencies arising during fast opening or closing of the control flap. In this way, resonance vibrations are avoided. The controller frame and connection parts conform to the sealing requirements for the angular components and class C components of the prEN 1751 standard.

The controller can be easily installed in the ventilation system by means of its flange section. An important requirement is stable fixing of the ducting system to prevent oscillations of the ducting in the flexible part during fast opening or closing of the control flap. According to the general rules for the ventilation systems, DIN 1946 Part 2 (VDI rules for ventilation), access shall be provided to the system ducting, for the purposes of adjusting and maintenance.
Dimensions - air flow rate:

<table>
<thead>
<tr>
<th>Width B mm</th>
<th>Height H mm</th>
<th>Length L mm</th>
<th>Air flow velocity m/s</th>
<th>Max. static pressure drop Pa</th>
<th>Dimensions mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>150-300</td>
<td>150-200</td>
<td>365</td>
<td>3-10</td>
<td>1000</td>
<td>500</td>
</tr>
<tr>
<td>301-400</td>
<td>150-200</td>
<td>385</td>
<td>3-10</td>
<td>1000</td>
<td>501-502</td>
</tr>
<tr>
<td>200-350</td>
<td>201-250</td>
<td>420</td>
<td>3-10</td>
<td>1000</td>
<td>503-511</td>
</tr>
<tr>
<td>351-500</td>
<td>201-250</td>
<td>420</td>
<td>3-10</td>
<td>1000</td>
<td>503-511</td>
</tr>
<tr>
<td>250-400</td>
<td>251-300</td>
<td>460</td>
<td>3-10</td>
<td>1000</td>
<td>503-511</td>
</tr>
<tr>
<td>401-500</td>
<td>251-300</td>
<td>460</td>
<td>3-10</td>
<td>1000</td>
<td>503-511</td>
</tr>
<tr>
<td>501-600</td>
<td>251-300</td>
<td>460</td>
<td>3-10</td>
<td>1000</td>
<td>503-511</td>
</tr>
</tbody>
</table>

Diagram 1: fast selection of air flow rate range according to the duct cross-section:

Calculation example:
Existing system: air flow rate controller type MRP-2
Width: 400 mm, height: 200 mm
(duct cross section: 0.08 m²)
Parameter to be determined: air flow rate setting range from diagram 1:
V(3 m/s) = 865 m³/h
V(10 m/s) = 2880 m³/h

Diagram 2: Static pressure drop resulting in the controller response:

Calculation example:
Existing system: air flow rate controller type MRP-2
Width: 250 mm, height: 200 mm
Air flow rate 810 m³/h
(at air flow velocity 4.5 m/s)
Parameter to be determined: static Pressure drop Δp in Pa
From the selection diagram:
Δp = 80 Pa

Ordering Key:
MRP - 2 / Q / size B x H (example: 400 x 200)
example: flow rate setting to 120 m³/h
2 rectangular design