5 Nm, 10 Nm Series
NON-SPRING RETURN DIRECT-COUPLED DAMPER ACTUATORS FOR MODULATING AND FLOATING CONTROL

GENERAL

This non-spring return direct-coupled damper actuator provides modulating and floating/2-position control for:
• air dampers,
• VAV units,
• air handlers,
• ventilation flaps,
• louvers, and
• reliable control for air damper applications with up to 10 sq ft (0.9 sq m) / 44 lb-in. (5 N·m) and 20 sq ft (1.9 sq m) / 88 lb-in. (10 N·m) (seal-less damper blades; air friction-dependent).

FEATURES

• Declutch for manual adjustment.
• Adjustable mechanical end limits.
• Removable access cover for direct wiring.
• Mountable in any orientation.
• Function selection switch for selecting modulating or floating/2-position control.
• Available with cable on select models.

SPECIFICATIONS

Supply voltage: 24 Vac/dc -15%/+20%, 50/60 Hz.
Nominal voltage: 24 Vac/dc, 50/60 Hz.
All values stated hereinafter apply to operation under nominal voltage conditions.

Power consumption:
MN7505: 5 VA / 2 W.
MN7510: 5 VA / 2 W.

Control signal:
Modulating: 0)2...10 Vdc.
Floating/2-Position: 24 Vac/dc.

Ambient limits:
Ambient operating limits: -5...+140° F (-20...+60° C).
Ambient storage limits: -22...+176° F (-30...+80° C).
Relative humidity: 5...95%, non-condensing.

Safety:
Protection standard: IP54.
Protection class: II as per EN 60730-1.
Overvoltage category: II.

Lifetime:
Full strokes: 60000.
Repositions: 1.5 million.

Mounting:
Round damper shaft: 3/8 in…5/8 in. (9.5...15.9 mm).
Square damper shaft: 1/4 in…1/2 in. (6.4...12.7 mm); 45° steps.
Shaft length: min. 1-5/8 in. (41.3 mm).

End switches (when included):
Rating: Class II.
Triggering points: 5° / 85°.

Torque rating: 44 lb-in. (5 N·m) / 88 lb-in. (10 N·m).

Runtime for 90°:
mod. (dc / 50/60 Hz ac) 90 sec.
floating (dc / 60 Hz ac) 90 sec.
floating (50 Hz ac) 110 sec.

Rotation stroke: 95° ± 3°.
5 NM, 10 NM SERIES

Dimensions: See Dimensions (Fig. 14).

Weight (without cables): 1.0 lbs (0.45 kg).

Noise rating: 35 dB(A) max. at 39 in. (1 m).

Cable Specification:
300 V, 75° C, Plenum Rated, 3 ft length from end of access cover, 18 AWG

PRODUCT IDENTIFICATION SYSTEM

| M | Electrical Motor |
| N | Fail Safe Function (Non-Spring Return) |
| 61 | 24 Vac Floating, Two-Position Control; Reversible Mount |
| 75 | 24 Vac Modulating |
| 05 | 44 lb-in. (5 Nm) |
| A | Standard U.S. Model |
| W | Standard U.S. Model with Cable* |
| 1 | No Feedback |
| 2 | Voltage Feedback Signal |
| 0 | No End Switches |
| 2 | Two End Switches |
| XX | System Controlled Numbers |

*Cables available on MN7505W2001 or MN6105W1011 only.

BASIC FEATURES

Fig. 1. Setting Units and Control Elements.

Legend for Fig. 1:
1. Universal shaft adapter.
2. Mechanical end limits (manually adjustable).
3. Declutch button.
5. Removable access cover.
6. Anti-rotation bracket.

Contents of Package

The delivery package includes the actuator, parts 1 through 6 (see Fig. 1), plus two cable grommets and a spare cable grommet.

RUN MODES

The function selection switch (see Fig. 2) can be used to place the actuator into any one of two different modes:
- Service/Off;
- the floating/2-position run mode (“Dir” for CCW-closing dampers or “Rev” for CW-closing dampers); and
- the modulating run mode.

ORDERING INFORMATION

When purchasing replacement and modernization products from your TRADELINE® wholesaler or distributor, refer to the TRADELINE® Catalog or price sheets for complete ordering number.

If you have additional questions, need further information, or would like to comment on our products or services, please write or phone:
1. Your local Honeywell Automation and Control Products Sales Office (check white pages of your phone directory).
2. Honeywell Customer Care
   1885 Douglas Drive North
   Minneapolis, Minnesota 55422-4386
In Canada—Honeywell Limited/Honeywell Limitée, 35 Dynamic Drive, Toronto, Ontario M1V 4Z9.
International Sales and Service Offices in all principal cities of the world. Manufacturing in Australia, Canada, Finland, France, Germany, Japan, Mexico, Netherlands, Spain, Taiwan, United Kingdom, U.S.A.
Power-Off Behavior
If power is removed, the shaft adapter remains in position.

Service/Off
If the function selection switch is set to the “Service/Off” position, then all rotary movement is cancelled, and all control signals are ignored, thus allowing the actuator to be manually operated safely.

Floating/2-Position Run Mode
Without Feedback Signal
If, however, the function selection switch has been set to one of the two floating/2-position control settings - but the actuator has not been wired for a feedback signal (see Figures 12 and 13) - then as soon as operating power is applied, the shaft adapter will run according to the control signals applied.

With Feedback Signal
If the function selection switch has been set to one of the two floating/2-position control settings - and if the actuator has been wired for a feedback signal (see Figures 12 and 13) - then as soon as operating power is applied, the shaft adapter will likewise run first completely counterclockwise and then completely clockwise (see also section “Adaption”), after which it will run according to the control signals applied.

Modulating Run Mode
If the function selection switch has been set to one of the four modulating control settings - and if the actuator is wired correspondingly (see Fig. 10) - then as soon as operating power is applied, the shaft adapter will run first completely counterclockwise and then completely clockwise (see also section “Adaption”), after which it will run according to the control signals applied.

Table 1 describes, for the floating mode, the shaft adapter behavior (“stops,” rotates “CCW,” or rotates “CW”) in dependence upon the control signals applied to terminals 3 and 4 and upon the function selection switch setting.

Table 2 describes, for the 2-position mode, the shaft adapter behavior (“stops,” rotates “CCW,” or rotates “CW”) in dependence upon the control signals applied to terminals 3 and 4 and upon the function selection switch setting.

Table 3 describes, for the modulating mode, the shaft adapter behavior (“stops,” rotates “totally CCW,” rotates “totally CW,” runs to “proportional” position, or runs to “50%” of max. stroke) in dependence upon the control signals applied to terminals 3 and 4 and upon the function selection switch setting.

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Table 1. Shaft Adapter Behavior in the Floating Mode.

<table>
<thead>
<tr>
<th>Control Signal at:</th>
<th>Switch Settings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal 3</td>
<td>Terminal 4</td>
</tr>
<tr>
<td>Open</td>
<td>Open</td>
</tr>
<tr>
<td>Open</td>
<td>24 Vac/Vdc</td>
</tr>
<tr>
<td>24 Vac</td>
<td>Open</td>
</tr>
</tbody>
</table>

Table 2. Shaft Adapter Behavior in the 2-Position Mode.

<table>
<thead>
<tr>
<th>Control Signal at:</th>
<th>Switch Settings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal 3</td>
<td>Terminal 4</td>
</tr>
<tr>
<td>24 Vac</td>
<td>Open</td>
</tr>
<tr>
<td>24 Vac</td>
<td>24 Vac/Vdc</td>
</tr>
</tbody>
</table>

Table 3. Shaft Adapter Behavior in the Modulating Mode.

<table>
<thead>
<tr>
<th>Control Signal at:</th>
<th>Switch Settings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal 3</td>
<td>Terminal 4</td>
</tr>
<tr>
<td>Open</td>
<td>Open</td>
</tr>
<tr>
<td>24 Vac/Vdc</td>
<td>50%</td>
</tr>
<tr>
<td>&lt; min. control signal plus 0.24 V</td>
<td>Open</td>
</tr>
<tr>
<td>24 Vac/Vdc</td>
<td>50%</td>
</tr>
<tr>
<td>between min. control signal plus 0.24 V and max. control signal minus 0.24</td>
<td>Open</td>
</tr>
<tr>
<td>24 Vac/Vdc</td>
<td>50%</td>
</tr>
<tr>
<td>&gt; max. control signal minus 0.24 V</td>
<td>Open</td>
</tr>
<tr>
<td>24 Vac/Vdc</td>
<td>50%</td>
</tr>
</tbody>
</table>
Adaption

Adaption is a function in which the actuator re-maps its feedback signal and control signal in accordance with repositioned mechanical end limits (see Fig. 6) and thus recognizes their new positions.

Adaption will be carried out whenever the actuator is in the modulating mode or the floating plus feedback mode or the 2-position plus feedback mode and:
- the user powers up (from a totally powerless condition) the actuator; or
- the user sets the function selection switch to the “Service/Off” setting for at least 2 seconds and then back to its previous setting; or
- the control signal’s value rises up into the upper dead band (i.e. to more than the maximum control signal minus 0.24 V) or drops down into the lower dead band (i.e. to less than the minimum control signal plus 0.24 V), after which the shaft adapter must then remain at the respective (upper or lower) mechanical end limit for at least 3 seconds. However, in this case, the actuator will then recognize the position of only the respective (upper or lower) mechanical end limit.

NOTE: When using declutch, return to minimum mechanical stop.

Overriding

An override is a condition in which a 24 V signal is applied to terminal 4 of an actuator in the modulating mode, thus causing the actuator to ignore the control signal at terminal 3, whereupon it will instead move to a position of 50% of its maximum stroke (see Table 3).

Feedback

If correspondingly wired (see Figures 10 through 12), the actuator provides, via terminal 5, a feedback signal proportional to the actual position of the shaft adapter.
MANUAL ADJUSTMENT

IMPORTANT
To prevent equipment damage, you must remove power or set the function selection switch to the “Service/Off” position before manual adjustment.

After removing power or setting the function selection switch to the “Service/Off” position, the gear train can be disengaged using the declutch button, permitting the shaft adapter to be manually rotated to any position. If you have wired the actuator for feedback signal, then, after adaption, the feedback signal will follow the new position.

Limitation of Rotation Stroke
Two adjustable mechanical end limits are provided to limit the angle of rotation as desired (see Fig. 7). The mechanical end limits must be securely fastened in place.

INTERNAL END SWITCHES
The internal end switches “A” and “B” are changeover switches which are activated when the shaft adapter moves past a position of 5° and 85°, respectively (see Table 5).

INSTALLATION

CAUTION
To avoid personal injury (electrical shock) and to prevent equipment damage, before installation, you must remove power.

These actuators are designed for single-point mounting.

Mounting Instructions
All information and steps are included in the Installation Instructions (form no. 62-0224) supplied with each actuator.

Mounting Position
The actuators can be mounted in any position (IP54 is dependent upon orientation; see Fig. 9). Choose a mounting position permitting easy access to cables and controls

Anti-Rotation Bracket and Screws
If the actuator is to be mounted directly on a damper shaft, use the anti-rotation bracket and screws included in the delivery package. The minimum distance between the center of the damper shaft and the middle of the anti-rotation bracket is 3.35 in. (85 mm); a maximum of 4.25 in. (108 mm) is allowed (see Fig. 14).

Depending upon the specifics of your mounting site, the actuator may shift in position slightly while tightening the screws at the top of the shaft adapter. The anti-rotation bracket features a T-piece with a 5-mm-long shank to accommodate for this movement. It is important to ensure that this play is not impeded.

Universal Shaft Adapter
The universal shaft adapter can be used for shafts of various diameters and shapes (round: 3/8...5/8 in. (9.5...15.9 mm) and square: 1/4...1/2 in. (6.4...12.7 mm)).
WIRING

⚠️ CAUTION
To avoid personal injury (electrical shock) and to prevent equipment damage, before wiring, you must remove power.

Access Cover

IMPORTANT
Once the access cover has been removed, please take care to avoid damaging any of the parts now accessible.

The access cover can be unscrewed and removed in order to gain access to the terminal block(s) and perform wiring.

NOTE: If factory installed wires not included.

Typical Wiring Without Cables

Fig. 9. Access Cover.

Fig. 10. MN7505/MN7510 (Modulating Mode).

Fig. 11. MN7505/MN7510 (Floating Mode).

Fig. 12. MN7505/MN7510 (2-Position Mode).

Fig. 13. End Switches.

NOTE: Both of the internal end switches must be connected to the same power source.
Table 4 and Table 5 summarize the information presented in the preceding wiring diagrams.

### Table 4. Signals at Terminals.

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Mode</th>
<th>Modulation</th>
<th>Floating</th>
<th>2-position</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>24 V ~//+ (power)</td>
<td>Unused</td>
<td>24 V ~//+ (power)</td>
<td>Unused</td>
</tr>
<tr>
<td></td>
<td>Common ~/-</td>
<td>Common</td>
<td>~/-</td>
<td>Common ~/-</td>
</tr>
<tr>
<td>2</td>
<td>0[2]...10 V (control)</td>
<td>24 V ~/+</td>
<td>24 V ~/+</td>
<td>24 V ~/+</td>
</tr>
<tr>
<td></td>
<td>24 V ~/+ (override)</td>
<td>24 V ~/+</td>
<td>24 V ~/+</td>
<td>24 V ~/+</td>
</tr>
<tr>
<td>3</td>
<td>0[2]...10 V (feedback)</td>
<td>Unused</td>
<td>0...10 V</td>
<td>Unused</td>
</tr>
<tr>
<td></td>
<td>0...10 V</td>
<td>0...10 V</td>
<td></td>
<td>0...10 V</td>
</tr>
</tbody>
</table>

**NOTE:** All cables connected to these terminals must be equipped with spark suppression.

### Table 5. Internal End Switches.

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Type of Switch</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>Common lead for switches A and B.</td>
</tr>
<tr>
<td>S2, S3</td>
<td>Change-over switch A (S1/S2 opens and S1/S3 closes when shaft adapter moves CW past 5°; reverts to original state when shaft adapter moves CCW past 5°).</td>
</tr>
<tr>
<td>S5, S6</td>
<td>Change-over switch B (S1/S5 opens and S1/S6 closes when shaft adapter moves CW past 85°; reverts to original state when shaft adapter moves CCW past 85°).</td>
</tr>
</tbody>
</table>

### Typical Wiring With Cables

![Typical Wiring With Cables Diagram](image)

**Fig. 14. MN7505W2001 Floating/Modulating/Two Position.**
DIMENSIONS

Fig. 15. Dimensions in Inches (mm).

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