JOHNSON CONTROLS

M100C Series Actuator with Digital Control Signal Input and R81CAA-2 Interface Board

The M100C actuator is used in damper and valve applications where proportional control from a digital controller is required.

The M100C has the capability of communicating with Air Handling Unit and Unitary controllers depending on the position of the 8-pin DIP switch. Other functions that are user programmable include: master or slave configuration, Direct Acting (DA) or Reverse Acting (RA) mode, the address to which the actuator will respond, and the linear or S-curve response characteristic.

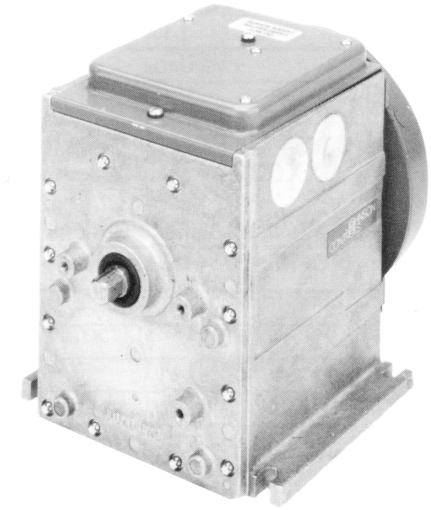

Figure 1: M100C Series Spring Return Actuator

Features and Benefits	
❑ **Auxiliary Output Shaft**	Allows use of accessories and limited linkage connections for dampers
❑ **Load Versatility**	Available in torques of 25, 35, 50, 75, and 150 lb·in (2.8, 4.0, 5.7, 8.5, and 17 N·m)
❑ **Travel Adjustment Located in Top Wiring Compartment**	Makes adjustment easy and reduces installation time
❑ **Drive and Gear Train Sealed in a Die Cast Case with a Special Oil Mixture**	Requires no maintenance and provides the longest life cycle cost/benefits in the industry

Operation

IMPORTANT:	All M100C actuators are intended to control equipment under normal operating conditions. Where failure or malfunction of M100C actuators could lead to an abnormal operating condition that could cause personal injury or damage to the equipment or other property, other devices (limit or safety controls) or systems (alarm or supervisory) intended to warn of, or protect against, failure or malfunction of M100C actuators must be incorporated into and maintained as part of the control system.

M100C Series actuators receive and interpret digital commands from a controller for accurate positioning of the output shaft.

Dimensions

Dimensions for a CVR83A-600R are shown in Figure 2, an actuator and a switch kit in Figure 3, and a standard actuator in Figure 4.

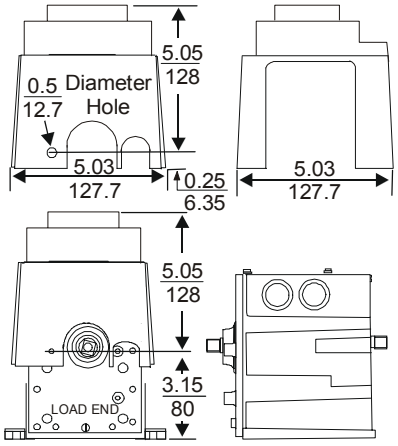

Figure 2: CVR83A-600R Dimensions, in. (mm)

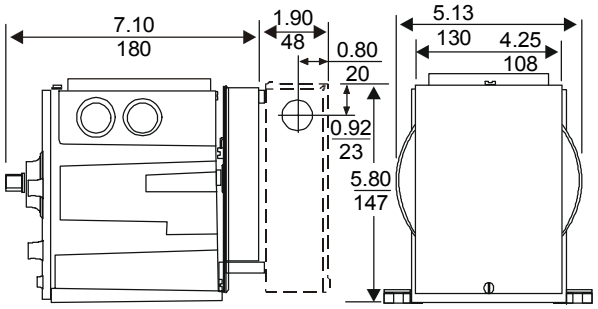

Figure 3: Spring Return with Switch Kit Dimensions, in. (mm)

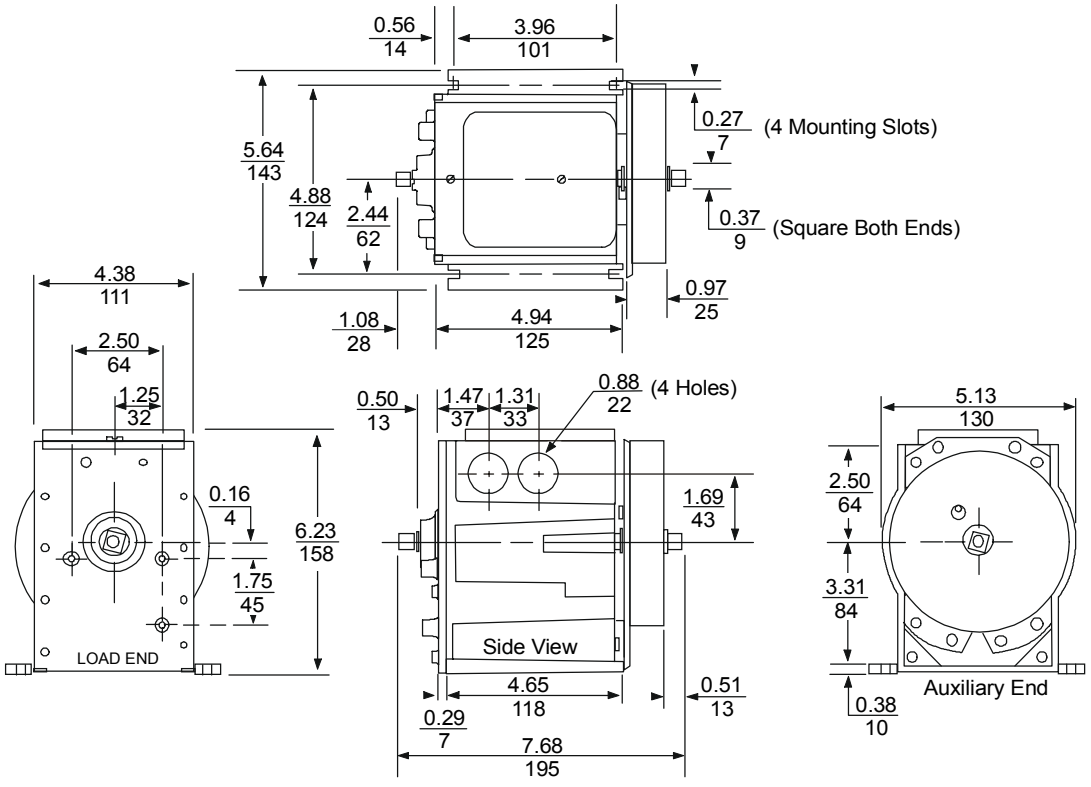

Figure 4: M100C with Spring Return Dimensions, in. (mm)

Repair and Replacement

The drive motor and gear train are immersed in oil and sealed in a die cast case, so maintenance is not necessary.

Make no field repairs, except for replacement of the R81C electronics kit. Refer to the *Ordering Information* section for the desired product code number for the actuator and any accessories, and contact the nearest Johnson Controls representative.

Ordering Information

Table 1: Actuators

Code Number	Actuator Description
M110CGA-2	25 lb·in (2.8 N·m) Torque, Spring Return
M120CGA-2	35 lb·in (4.0 N·m) Torque, Non-spring Return
M130CGA-2	50 lb·in (5.6 N·m) Torque, Spring Return
M140CGA-2	75 lb·in (8.5 N·m) Torque, Non-spring Return
M150CGA-2	150 lb·in (17.0 N·m) Torque, Non-spring Return
M110XGA-1*	25 lb·in (2.8 N·m) Torque, Spring Return
M120XGA-1*	35 lb·in (4.0 N·m) Torque, Non-spring Return
M130XGA-1*	50 lb·in (5.6 N·m) Torque, Spring Return
M140XGA-1*	75 lb·in (8.5 N·m) Torque, Non-spring Return
M150XGA-1*	150 lb·in (17 N·m) Torque, Non-spring Return

* Requires the R81C electronics kit.

Table 2: Accessories

Code Number	Description
Y68AA-1	Transformer, 120/24 VAC, 40 VA, 60 Hz, Class 2
Y68DA-1	Transformer, 240/24 VAC, 40 VA, 60 Hz, Class 2
Y68HA-1	Transformer, 24/24 VAC, 40 VA, 60 Hz, Class 2
S91DJ-1	Auxiliary switch kit with one Single-Pole, Double-Throw (SPDT) switch
S91EJ-1	Auxiliary switch kit with two SPDT switches
S91PT-1	Auxiliary potentiometer kit, 1000 ohm, 1/3 watt
CVR83A-600R	Weather cover kit
Y20DAA-2	Mounts the actuator to the top of a duct or any flat surface. Contains the LVR27A-602, LVR27A-600, ROD16-3, and SWL10A-603Y (2).
Y20DAB-2	Mounts the actuator to the side of a duct or wall. Contains all items in the Y20DAA-2 plus one BKT22A-602.
Y20EBA-1	Valve linkage kit for mounting Honeywell® valves with 1/4-28 stem connection to M120 or M130 actuators
Y20EBA-2	Valve linkage kit for mounting Honeywell valves with 1/4-28 stem connection to M150 actuators
Y20EBA-3	Valve linkage kit for mounting Barber-Colman® valves with 1/4-28 stem to M120 or M130 actuators
Y20EBA-4	Valve linkage kit for mounting Barber-Colman valves with 1/4 in.-28 stem connection to M150 actuators
Y20EBD-1	Linkage kit for M120 or M130 actuators and 1-1/4 in. (DN 32) valves, produces 75 lb (334 N) seating force
Y20EBD-2	Linkage kit for M140 actuators and 1-1/4 in. (DN 32) valves, produces 150 lb (607 N) seating force
Y20EBD-3	Linkage kit for M150 actuators and 1-1/4 in. (DN 32) valves, produces 270 lb (1202 N) seating force
Y20EBD-5	Linkage kit for M110 actuators and 1-1/4 in. (DN 32) valves, produces 40 lb (178 N) seating force
Y20EBD-6	Linkage kit for M120 or M130 actuators and 1-1/4 in. (DN 32) valves, produces 100 lb (449 N) seating force
Y20EBE-1	Adaptor for valves with a 5/16 in. stem and a hold down nut for pre 03/69 Johnson Controls 1/2 to 3 in. valves
Y20EBE-2	Stem adaptor and centerpiece collar to adapt VT Series valves with slotted stems. (Y20EBD-5 also required.)
Y20EBE-3	Hold down nut for cast iron, VB Series 2-1/2 to 4 in. valves; yoke nut for Barber-Colman 1/2 to 2 in. valves
Y20EBE-4*	Stem connector for Barber-Colman 2-1/2 to 4 in. valves, 5 per package. (Use with Y20EBD-3 or -6.)
Y20EBE-11	Valve Linkage Adaptor Kit for VG7000 valves. (Y20EBD Series kit also required.)
VG7000-M110	Mounting Kit for M110 actuator and 1/2 through 2 in. (DN15 through DN50) valves
VG7000-M130	Mounting Kit for M130 actuator and 1/2 through 2 in. (DN15 through DN50) valves
VG7000-M140	Mounting Kit for M140 actuator and 1/2 through 2 in. (DN15 through DN50) valves
VG7000-M150	Mounting Kit for M150 actuator and 1/2 through 2 in. (DN15 through DN50) valves
Y20DFC-1	Damper linkage kit for mounting the actuator to CD-1300 dampers only (includes a universal mounting bracket for inside or outside damper frame mounting)

Specifications

Product	M100C Series Actuator with Digital Control Signal Input R81CAA-2 Interface Board
Power Requirements	24 VAC, Class 2, (20 to 30 VAC) at 50/60 Hz; 25 VA spring return, 20 VA non-spring return
Input Signal	Digital from Johnson Controls application specific controllers or the DSC1000
Input Signal Adjustments	Direct Acting (DA) or Reverse Acting (RA), Master or Slave, L1 Bus or Zone Bus, Linear or S-curve flow characteristics, Address Selection: 10 through 27 Factory Settings: DA, Master, Linear, L1 Bus, Address 27
Mechanical Connection	3/8 in. (9.5 mm) square shaft, both ends Maximum dead weight on output shaft: 200 lb (91 kg), load end; 10 lb (4.5 kg), auxiliary end
Mechanical Output	Running Torque: / Breakaway and Stall (minimum): M110 25 lb·in (2.8 N·m) spring return / 100 lb·in (11 N·m) M120 35 lb·in (4.0 N·m) / 70 lb·in (7.9 N·m) M130 50 lb·in (5.6 N·m) spring return / 200 lb·in (23 N·m) M140 75 lb·in (8.5 N·m) / 150 lb·in (17 N·m) M150 150 lb·in (17 N·m) / 300 lb·in (34 N·m)
Rotation Range	Fixed zero, adjustable full travel 65 to 270°; factory set at 90° full travel
Rotation Timing (at Rated Load)	60 seconds for 160° travel nominal, 60 Hz 38 seconds for 90° travel nominal, 60 Hz 75 seconds for 90° spring return
Cycle Life	M110 and M130 spring return models: 150,000 cycles at rated load M120, M140 and M150 non-spring return models: 200,000 cycles at rated load
Electrical Connection	1/4 in. quick-connect spade terminals
Action	CW rotation on 0 to 100% command (DA) and CCW rotation on 0 to 100% command (RA); factory set for DA
Ambient Operating Conditions	Non-spring Return: -40 to 125°F (-40 to 52°C), 90% RH, 25% duty cycle Spring Return: -35 to 125°F (-37 to 52°C), 90% RH, 25% duty cycle
Ambient Storage Conditions	-40 to 140°F (-40 to 60°C), 90% RH
Enclosure	NEMA 2, IP32
Dimensions (H x W x D)	Spring Return: 6.23 x 5.64 x 7.68 in. (158 x 143 x 195 mm) Non-spring Return: 6.23 x 5.64 x 4.94 in. (158 x 143 x 125 mm)
Shipping Weight	Spring Return: 9 lb (4.1 kg) Non-spring Return: 6.5 lb (2.9 kg)
Agency Compliance	UL: M100C: UL 916 Listed, File E107041, CCN PAZX UL 873 Recognized, File E27734, CCN XAPX2 CSA: M100C: C22.2 No. 24 Certified, File LR948, Class 4813 02 M100X and R81: No UL Listing or CSA Certification
EU Directive Compliance	89/336/EEC (CE Mark)

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

JOHNSON CONTROLS

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