

# LMX24-LON

LonWorks®, Non-Spring Return, 24 V



Technical Data	LMX24-LON
Power supply	24 VAC ± 20% 50/60 Hz 24 VDC ± 10%
Power consumption	2.5 W (1.2 W)
Transformer Sizing	5 VA (Class 2 power source)
Electrical connection	18 GA plenum rated cable 1/2" conduit connector protected NEMA 2 (IP54) 3 ft [1m]
Overload protection	electronic throughout 0 to 95° rotation
Angle of rotation	max. 95°, adjustable with mechanical stop electronically variable
Torque	45 in-lb [5 Nm]
Direction of rotation	reversible with  switch
Position indication	reflective visual indicator (snap-on)
Manual override	external push button
Running time	150 seconds (default)
Humidity	5 to 95% RH non condensing (EN 60730-1)
Ambient temperature	-22°F to 122°F [-30°C to 50°C]
Storage temperature	-40°F to 176°F [-40°C to 80°C]
Housing	NEMA 2, IP54, UL enclosure type 2
Housing material	UL94-5VA
Agency listings	cULus acc. to UL 60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2004/108/EEC and 2006/95/EC
Noise level	<35dB(A)
Servicing	maintenance free
Quality standard	ISO 9001
Weight	1.5 lbs [0.7 kg]
<b>LonWorks®</b>	
Certified	according to LonMARK® 3.3
Processor	Neuron 3120
Transceiver	FTT-10A, compatible with LPT-10
Functional profile	according to LonMARK® Damper actuator object #8110 open loop sensor object #1
LNS plug-in for actuator/sensor	can be run with any LNS based integration tool (min. for LNS 3.x)
Service button and status LED	according to LonMARK® guidelines
Conductors, cables	conductor lengths, cable specifications and topology of the LonWorks® network according to the Echelon® directives

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**Torque min. 45 in-lb for control of damper surfaces up to 11 sq ft.**

## Application

Direct coupled actuators for direct link to LonWorks network. Actuators are easily installed by direct shaft mounting on air dampers in ventilation and air conditioning systems. Actuator can be controlled by any compatible LON controller or automation system.

For proportional modulation of dampers in HVAC systems. Actuator sizing should be done in accordance with the damper manufacturer's specifications.

The actuator is mounted directly to a damper shaft from 1/4" up to 5/8" in diameter by means of its universal clamp. Shafts up to 3/4" diameter can be accommodated by an accessory clamp.

## Operation

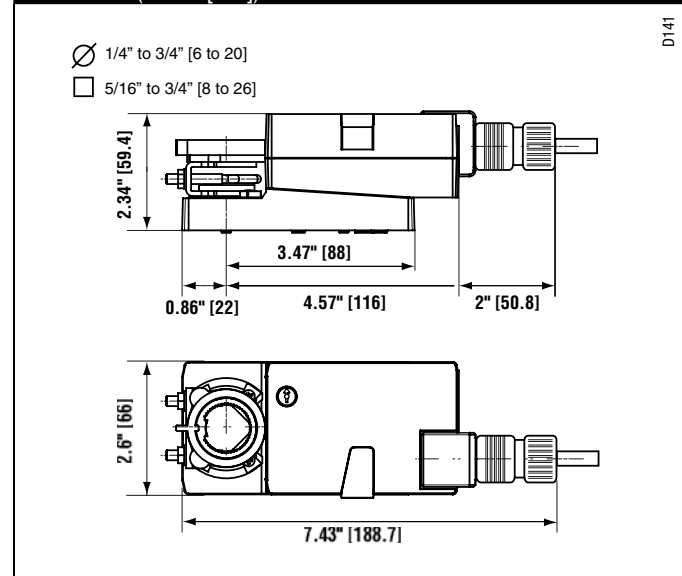
The actuator is not provided with and does not require any limit switches, but is electronically protected against overload. The anti-rotation strap supplied with the actuator will prevent lateral movement.

The LMX24-LON series provides 95° of rotation and a visual indicator indicates position of the actuator. When reaching the damper or actuator end position, the actuator automatically stops. The gears can be manually disengaged with a button on the actuator cover.

The LMX24-LON actuators use a brushless DC motor, which is controlled by an Application Specific Integrated Circuit (ASIC). The ASIC monitors and controls the actuator's rotation and provides a digital rotation sensing (DRS) function to prevent damage to the actuator in a stall condition. Power consumption is reduced in holding mode.

Add-on auxiliary switches or feedback potentiometers are easily fastened directly onto the actuator body for signaling and switching functions.

## Dimensions (Inches [mm])



IM40024 - 05/10 - Subject to change. © Belimo Aircontrols (USA), Inc.

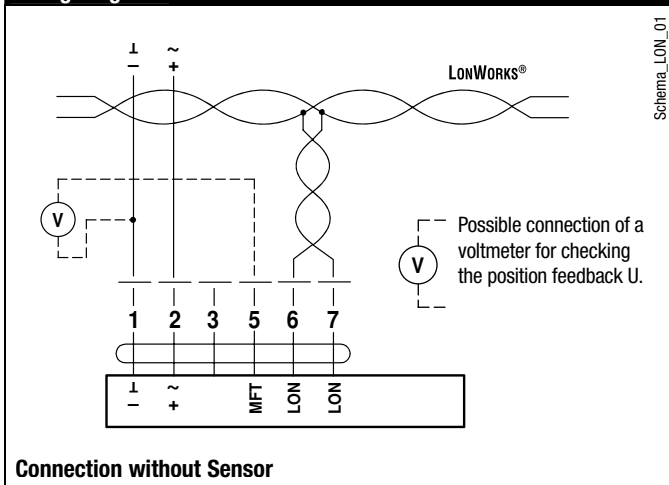
Accessories	
K-LM20	3/4" [20 mm] Shaft Clamp
AV6-20	Shaft Extension
ZG-LMSA	Shaft Adaptor for 1/2" Diameter Shafts
ZG-LMSA-1	Shaft Adaptor for 3/8" Diameter Shafts
ZS-100	Weather Shield - Steel
ZS-150	Weather Shield - Polycarbonate
Tool-06	8 mm & 10 mm Wrench
S1A, S2A	Auxiliary Switch(es)
P370	Shaft Mount Auxiliary Switch
P...A	Feedback Potentiometers
SGA24	Min positioners in NEMA 4 housing
SGF24	Min positioners for flush panel mounting
ADS-100	Analog to Digital Switch
NSV24 US	Battery Back-Up Module
ZG-X40	Transformer

**NOTE:** When using LMX24-LON actuators, only use accessories listed on this page.

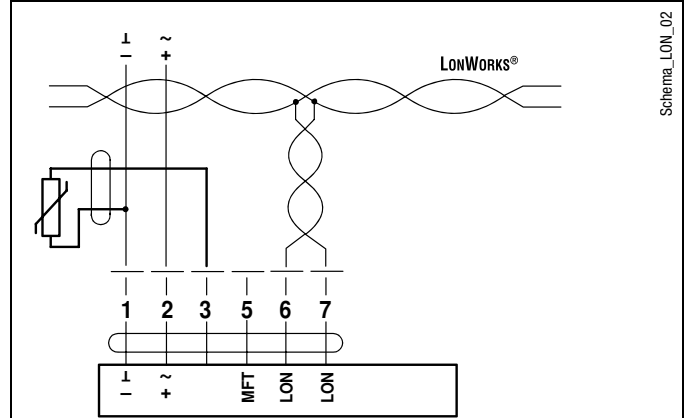
### Typical Specification

Proportional control damper actuators shall be electronic direct-coupled type, which require no crank arm and linkage and be capable of direct mounting to a shaft from 1/4" to 5/8". Actuators must provide control in response to a control input from an electronic controller or positioner. Actuators shall have brushless DC motor technology and be protected from overload at all angles of rotation. Actuators shall have reversing switch and manual override on the cover. Run time shall be constant and independent of torque. Actuators shall be cULus listed, have a 5-year warranty, and be manufactured under ISO 9001 International Quality Control Standards. Actuators shall be as manufactured by Belimo.

### Wiring Diagrams



Connection without Sensor

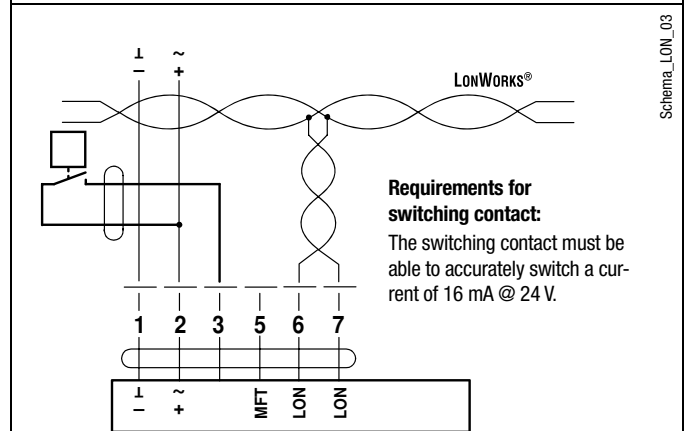


### Sensor scaling:

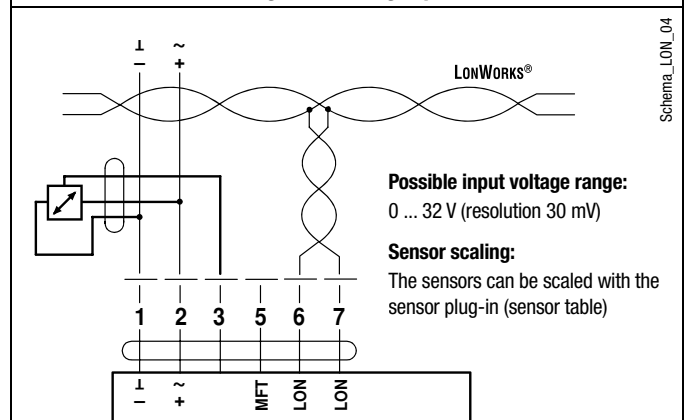
The sensors can be scaled with the sensor plug-in (sensor table).

Sensor	Temperature range	Resistance range	Resolution
Ni1000	-28 ... +98°C	850 ... 1600 Ω	1 Ω
PT1000	-35 ... +155°C	850 ... 1600 Ω	1 Ω
NTC	-10 ... +160°C (depending on type)	200 ... 60 kΩ	1 Ω

### Connection with Passive Sensor, e.g. Pt1000, Ni1000, NTC

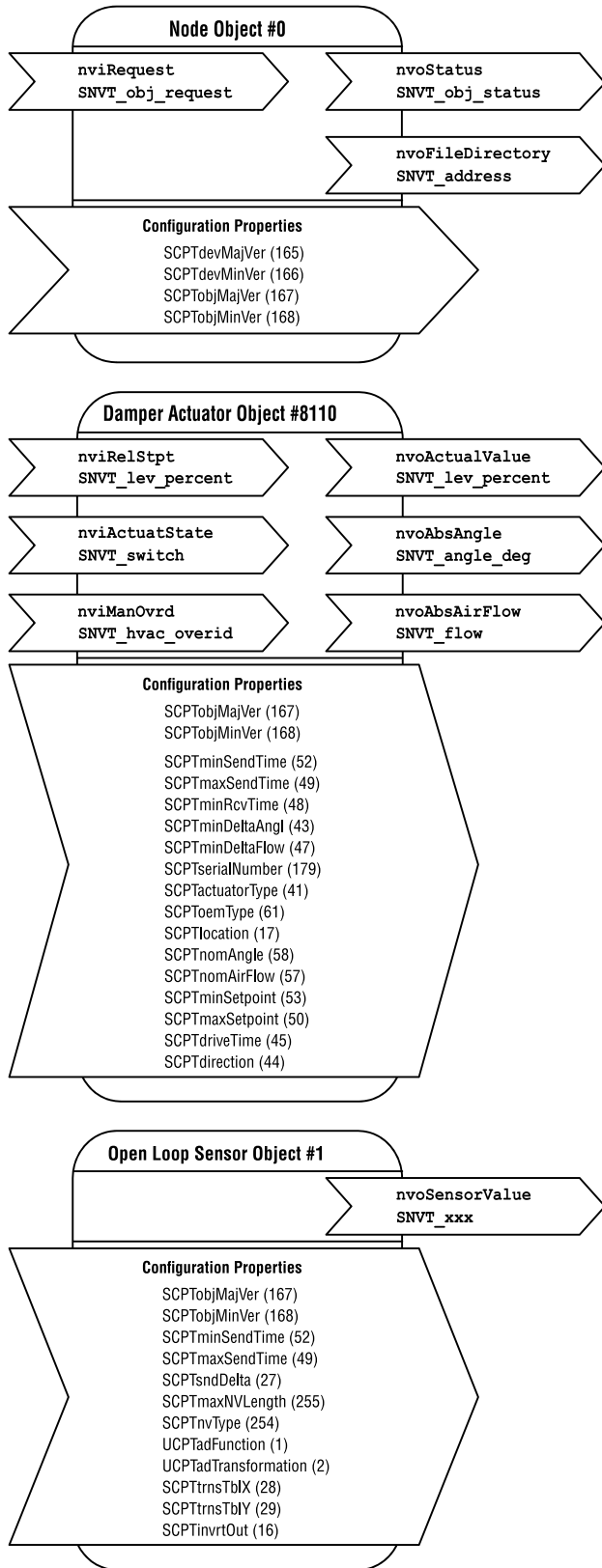


### Connection with Switching Contact, e.g. Δp-monitor



Connection with Active Sensor, e.g. 0...10 V @ 0...50° C

The LON-capable damper actuator is certified by LonMARK®. The actuator functions are supplied with the LonWorks® network as standardized network variables according to LonMARK®. The Node Object #0, the Damper Actuator Object #8110 and the Open Loop SensorObject #1 are implemented in the actuator.



**Node object #0**

The node object contains the object status and object request functions.

**nviRequest**      **SNVT\_obj\_request**  
Input variable for requesting the status of a particular object in the node.

**nvoStatus**      **SNVT\_obj\_status**  
Output variable that outputs the current status of a particular object in the node.

**nvoFileDirectory**      **SNVT\_address**  
Output variable that shows information in the address range of the Neuron chip.

**Damper actuator object #8110**

The actuator object is used to map the functions of the MP actuators to the LONWORKS® network.

**nviRelStpt**      **SNVT\_lev\_percent**  
The nominal position is assigned to the actuator via this input variable. This variable is normally linked to the output variable of an HVAC controller.

**nviActuateState**      **SNVT\_switch**  
A preset position is assigned to the actuator via this input variable. Note on priority: The last variable that was active, either nviActuatorState or nviRelStpt, has priority.

**nviManOvrd**      **SNVT\_hvac\_overid**  
These input variables can be used to manually override the actuator into a particular position.

**nvoActualValue**      **SNVT\_lev\_percent**  
This output variable shows the current actual position of the actuator and can be used for control circuit feedback or for displaying positions.

**nvoAbsAngle**      **SNVT\_angle\_deg**  
This output variable shows the current angle of rotation of the actuator or the valve and can be used to display the position or for service purposes.

**nvoAbsAirFlow**      **SNVT\_flow**  
This output variable is inactive with the SR24ALON-5 rotary actuator and shows a constant value of 65535 (this variable is only active in conjunction with LON-capable VAV controllers).

**Open loop sensor object #1**

A sensor can be connected to the rotary actuator. A passive resistance sensor (e.g. Ni1000), an active sensor (output 0 ... 32 V) or a switch (on/off) can be connected. The open loop sensor object transfers the measured sensor values to the LONWORKS® network.

**nvoSensorValue**      **SNVT\_xxx**  
This output variable shows the current sensor value. Depending on the connected sensor, the output variable can be configured via the sensor plug-in and specifically adapted to the system.

**The SNVT\_... can be configured as:**

SNVT_temp_p	SNVT_lev_percent	SNVT_lux
SNVT_temp	SNVT_abs_humid	SNVT_press_p
SNVT_switch	SNVT_enthalpy	SNVT_smo_obscur
SNVT_flow	SNVT_ppm	SNVT_power
SNVT_flow_p	SNVT_rpm	SNVT_elec_kwh

**Notes**

Detailed information on the functional profiles can be found on the website of LonMARK® ([www.lonmark.org](http://www.lonmark.org)).



<b>1 Direction of rotation switch</b>	
Switching over	Direction of rotation changes
<b>2 Pushbutton and green LED display</b>	
Off	No voltage supply or malfunction
Green, on	Operation
Press button	Switches on angle of rotation adaption followed by standard operation
<b>3 Service button for commissioning LONWORKS® and yellow LED display for the LON status</b>	
Off	The SR24ALON-5 rotary actuator is connected and ready for operation in the LONWORKS®network.
Yellow, on	No application software is loaded in the SR24ALON-5.
Yellow, flashing (flashing interval 2 seconds)	The SR24ALON-5 is ready for operation but not integrated in the LONWORKS® network (unconfigured).
Other flashing codes	A fault is present in the SR24ALON-5.
Press button	Service Pin Message is sent to the LONWORKS®network.
<b>4 Gear disengagement switch</b>	
Press button	Gear disengaged, motor stops, manual operation possible
Release button	Gear engaged, synchronisation starts, followed by standard operation
<b>5 Service plug</b>	
For connecting MFT parameterizing and service tools	