

## SM-1000 Series Rotary Actuators

### General Description

The SM-1000 Series are multi-turn, rotary actuators, designed to meet the exacting requirements for closed-loop modulating positioning control. Designed for low to medium torque rotary applications, these actuators are capable of accepting analog current and voltage command signals. The brushless stepper motor design provides smooth, highly accurate positioning, with positive position-lock when not in motion and powered. The SM-1000 Series is ideally suited for regulators, pilot valves, small quarter-turn valves, choke valves and dampers. All SM-1000 Series actuators come with a standard digital internal amplifier. These amplifiers are all full featured devices designed to work seamlessly with the actuator for closed loop control.

### Features

- Permanently lubricated for any position mounting.
- Amplifier supplies current to hold last position and prevent backdriving, up to torque rating under power.
- AC or DC input power versions.
- 4 to 20 mA position, loop-powered, feedback signal.
- Field selectable adjustments for:
  - speed
  - deadband
  - zero and span
  - command signal type
  - standard or reverse acting
  - manual-auto operation
  - output shaft position on loss of signal.
- Wide ambient temperature range.
- Full one year warranty.

### Base Model Includes

- Motor (stepper).
- Manual override.
- Drive shaft.
- Split range command input.
- Amplifier.
- Electronic torque limiting.
- Cast aluminum NEMA 4 (IP65) & dust and hazardous gas ignition-proof enclosure.
- Four adjustable position switches (40 mA at 40 VDC).
- Internal spur gear train.
- 4-20 mA transmitter for customer use.



### Popular Options *(See Pages 109-118)*

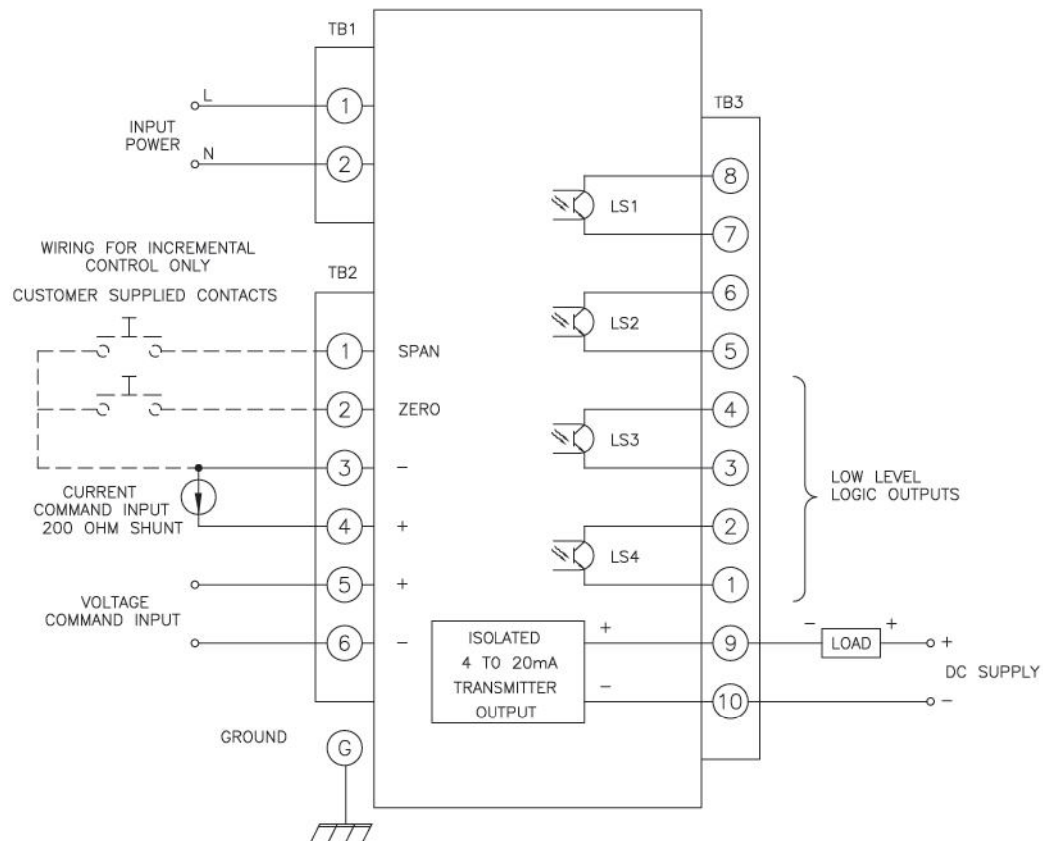
- Signal Conversion Module: Convert 40 mA, 40 VDC low level to 5 Amp, 120/240 VAC current rated position limit switches.
- Low current at null (24 VDC only).
- Switching input powered AC or DC positioning for positioning actuator using AC or DC remote voltage control.
- Process Variable Controller to control one process. variable - 120/240 VAC only.
- Custom mounting and interface hardware.
- Local Auto/Manual and INC/OFF/DEC toggle switches (Close-coupled, NEMA 4).
- Various enclosure coatings.
- CSA Exd IIB (Hydrogen) enclosure (up to 85 in. lbs.).
- Battery backup to position actuator on loss of AC power.
- ATEX Approval.

## SM-1000 Series Specifications

### Specifications

- **Demand:**  
**SM-1015:** Up to 45 in. lbs. (5 Nm)  
**SM-1020:** Up to 85 in. lbs. (10 Nm)  
**SM-1020:** with optional gearbox:  
 Up to 350 in. lbs. (40 Nm). Only available up to 4.25 turns rotation.
- **Speed:** See selection chart on next page.
- **Input Voltage:** See selection chart on next page.
- **Rotation:** 10° to 20 turns standard; 90° to 4.25 turns with gearbox
- **Environmental Ratings:**  
 Explosion-proof for Class I, Division 1, Groups C and D; dust-ignition-proof for Class II, Division 1, Groups E, F, G. Also rated NEMA 4 (IP65) indoor/outdoor. (Optional CSA Exd IIB enclosure).
- **Command Input:**  
**Full Range:** 4-20 mA into 200 ohms.  
**Split Range:** 4-12 and 12-20 mA into 200 ohms.  
**Voltage:** 0-5 VDC or 0-10 VDC into 100,000 ohms.  
**Switch:** Dry contact closures.
- **Temperature Limits:** -40 to +150 °F (-40 to +65 °C)  
 For greater temperature ranges, consult factory.
- **Field Wiring:** Barrier terminal blocks.
- **Torque Limiting:** Current sensing PWM.
- **Positioning Accuracy:** 1.5% of full range.
- **Feedback:** 4-20 mA, customer supplied (loop power).
- **Loss of Signal:** Lock-in-place or run to preset.
- **Loss of Power:** Lock-in-place or run to preset with battery backup option.
- **Direction:** CW or CCW.
- **Modulation Rate:** Unrestricted modulating duty.
- **Backdrive:** Self-locking up to torque rating.
- **Approximate Weight:**  
**SM-1015:** 12 lbs. (5.4 kg)  
**SM-1020:** 16 lbs. (7.3 kg)  
**SM-1020:** with gearbox: 19 lbs. (8.6 kg)
- **Approvals:** See page 119.
- **Position Switch Rating:** 40 mA at 40 VDC.

### Typical Wiring Diagram



*These dimensions and specifications are subject to change without notice. Current drawings and specifications are available upon request.*

## SM-1000 Series Selection Chart

SM-1000							
1	Basic Model	SM-1015		SM-1020		Note Ref.	Selection
2	Speed, rpm <div></div> Torque in. lbs. (Nm)	12.5/15 (1.7)	7/25 (2.8)				
		3/37 (4.2)	1/45 (5.1)				
				10/20 (2.3)	8/40 (4.5)		
				5.5/60 (6.7)	1/85 (9.6)		
				2.1/100 (11.2)	1.5/200 (22.6)	1	
				1/300 (33.9)	0.7/350 (39.5)	1	
3	Input Voltage	SM-1015-D SM-1020-D	1: 115 VAC, 1-Phase, 50/60 Hz				
			2: 230 VAC, 1-Phase, 50/60 Hz				
			6: 24-36 VDC (All Models)				
			12: 12-36 VDC (SM-1020-D), max. output torque is limited - consult factory				
			13: 24 VAC (All Models)				
4	Amplifier	D	with built in digital amplifier				
5	Rotation	Select rotation between 10° to 20 turns (Up to 4.25 turns for units exceeding 85 in. lbs. torque)				1	

Technical Notes:

1. Maximum number of turns for the SM-1020 at 100in-lb to 350 in-lb is 4.25.

To convert RPM to sec./90°:

$$X = \text{RPM} \quad Y = \text{Sec. for } 90^\circ \quad \frac{1}{X} \times 15 = Y$$

## SM-1000 Standard Options

Code		Description	Selection	
Identification/Certifications				
J001	CE Marking			
J006	ATEX/CE Approval		2	
Valve Mounting				
L001	Mounting of actuator to valve by customer. Compatible hardware supplied by Rotork Process Controls per customer specifications		3	
L002	Valve provided by customer for mounting and set-up with actuator by Rotork Process Controls		3	
Painting/Coating				
W001	JCI Standard Polyurethane Blue.			
W002	Two Part Epoxy			
Special Electrical Options				
X012	Signal conversion module, installed in a close coupled, NEMA 4 enclosure		4	
X013	2 wire incremental DC input			
X014	3 wire incremental 120/240 VAC input			
X015	Battery Backup, only for 120/240 VAC, installed in a close-coupled, NEMA 4 enclosure		5	

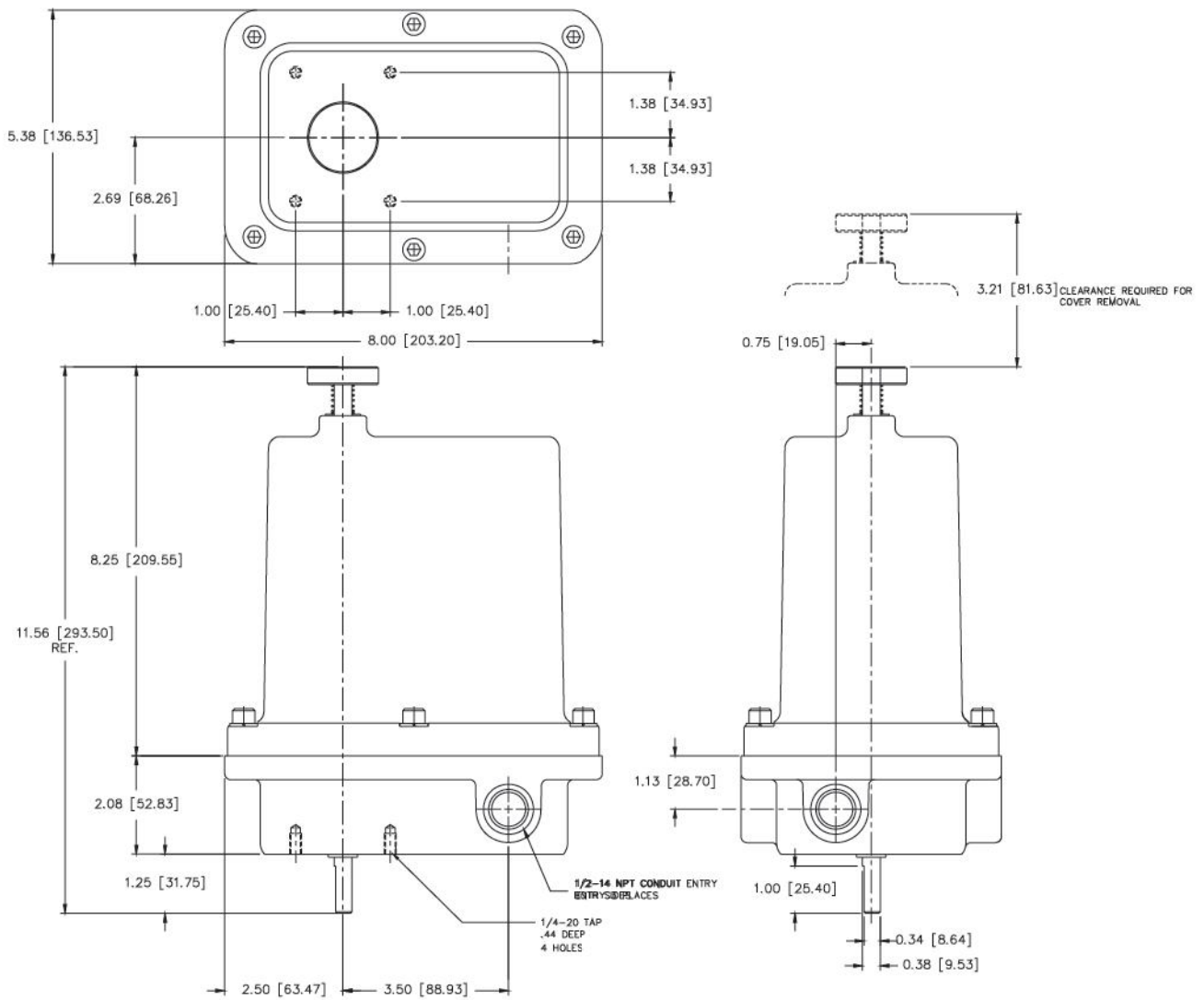
Technical Notes:

- Consult factory for compatibility of ATEX approval with other options.
- Complete, certified valve drawings showing topworks detail must be submitted with order.
- Signal Conversion Module cannot be used with the Battery Backup and cannot be CSA or ATEX certified.
- Battery Backup is only available with 120 or 240 VAC 1ph, cannot be used with the Signal Conversion Module and cannot be CSA or ATEX certified.

## SM-1000 Major Dimensions

(Up to 85 in. lbs. torque)

Inches  
(Millimeters)



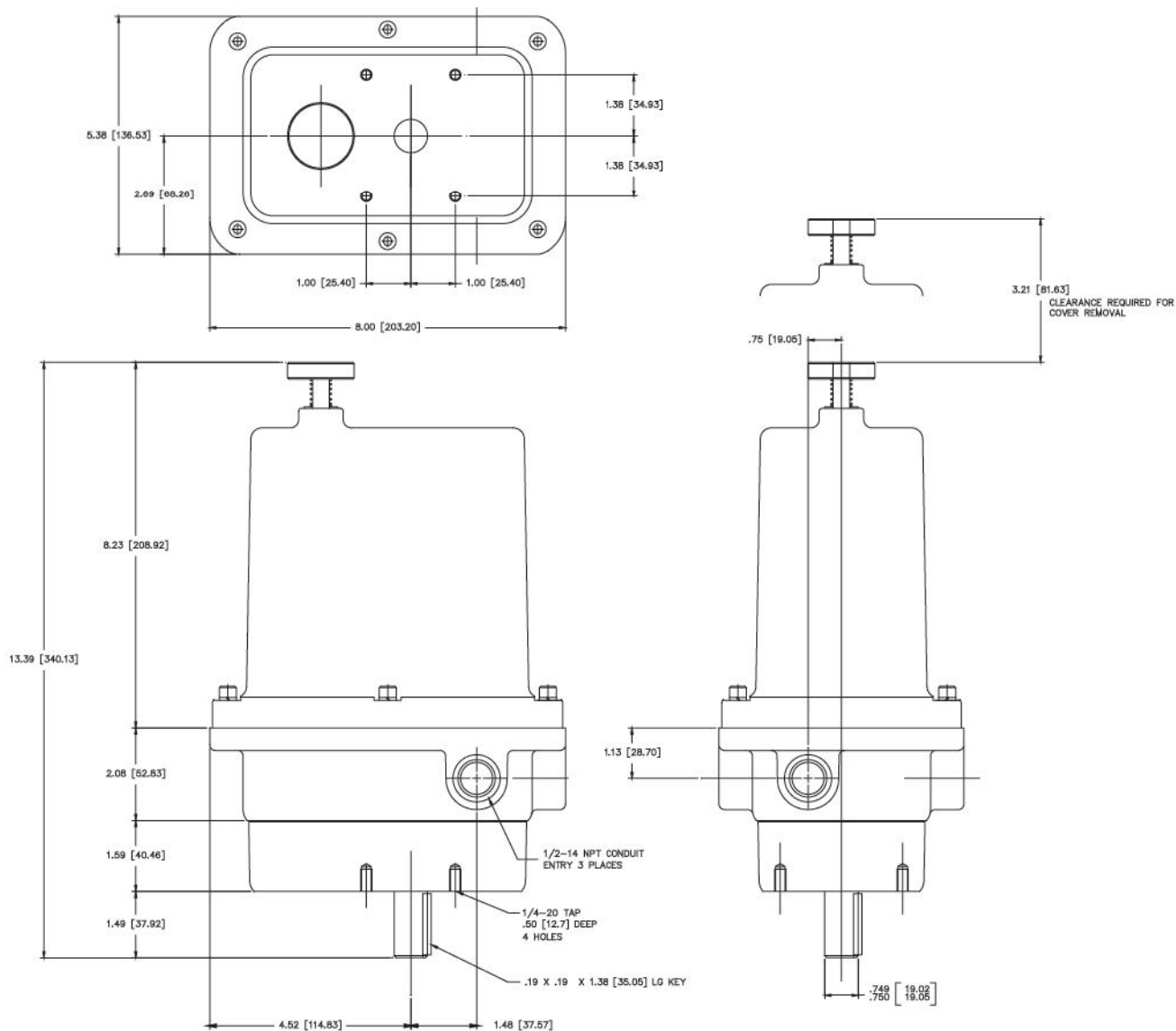
These dimensions are subject to change without notice and should not be used for preparation of drawings or fabrication of installation mounting. For current installation manuals and other product information, see [www.rotork.com](http://www.rotork.com).



## SM-1000 Major Dimensions

(Up to 85 in. lbs. torque)

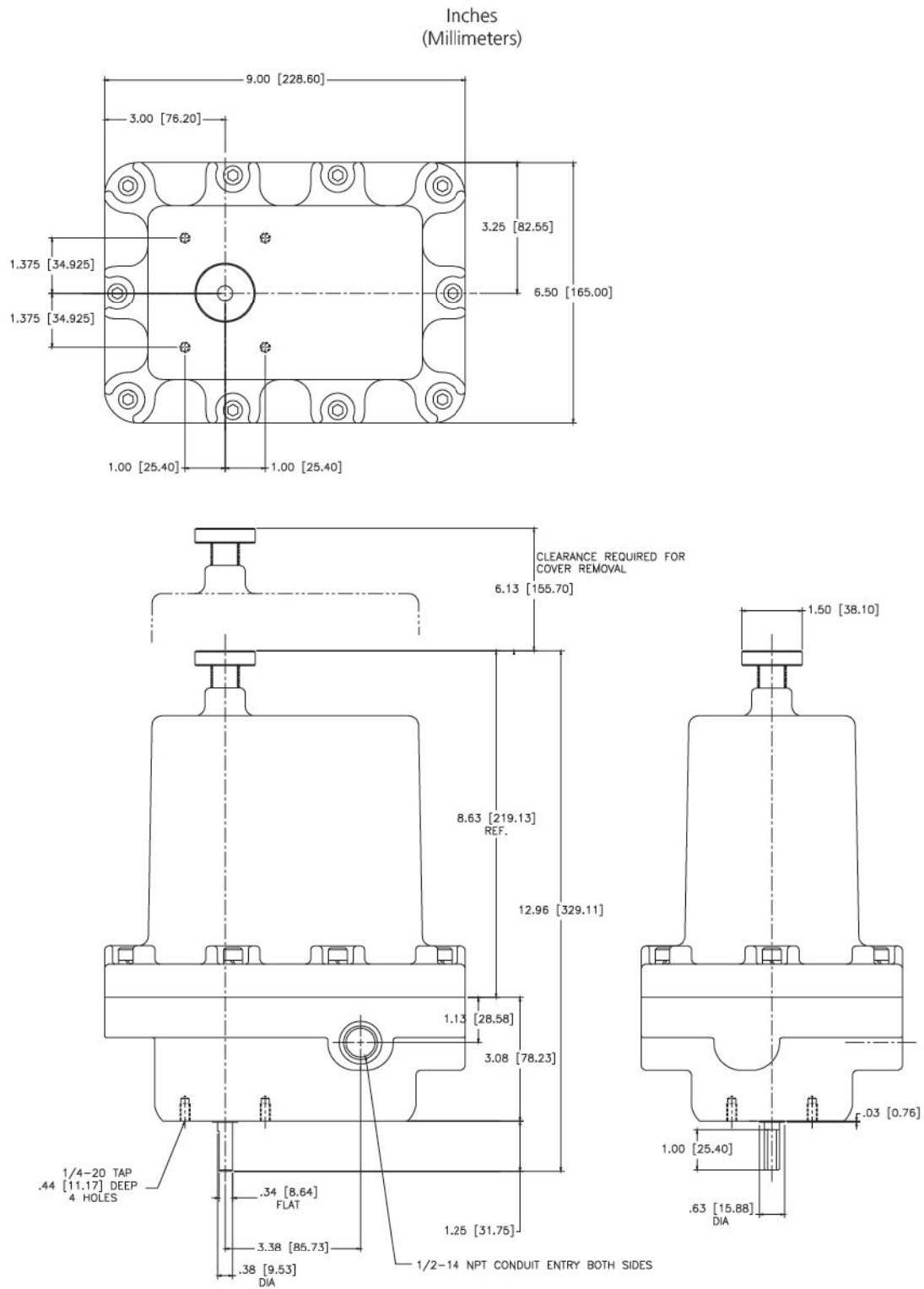
Inches  
(Millimeters)



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## SM-1000 Major Dimensions

Optional Group B Enclosure (E005)



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