
Maxon ACTIONAIR® Valves



4" Series 1220



1-1/2" Series 2010



1-1/4" Series 3320

- **Air actuated valves shut off gas or oil lines** in less than one second
- **FM (Factory Mutual) approved** for General Purpose and Hazardous Duty locations
- **CGA (Canadian Gas Association) certified** for General Purpose and Hazardous Duty locations – Series 1000 and Series 2000 valves only
- **Powerful spring-loaded air operators permit much higher differential pressure ratings** than are possible with listed electro-mechanical operators
- **Gain application flexibility** with 1/2" through 6" diameter line sizes, C_v factors up to 1230, and line pressures up to 700 PSIG
- **Internal trim options provided** for special service lines
- **Handle flowing fluid temperatures** from -40°F (-40°C) to +550°F (+288°C) with ambient temperatures from -40°F (-40°C) to +140°F (+60°C)
- **Bodies designed to ASME/ANSI standards** (ISO standards also available)

Maxon Valves with Air Actuators

For quick opening or closing action

Design Features and Operating Concepts



1-1/2" Series 1210

Normally-closed shut-off valves use 65 - 100 PSIG instrument air to open in approximately four seconds, release of control air through 3-way solenoid valve gives closure in less than one second.

Normally-open vent valves use 70 - 100 PSIG instrument air to close in approximately four seconds after introduction of control air and will open in less than one second upon release of control air.

ACTIONAIR® valve enclosures meet NEMA 1, 2, 3, 3R, 4 & 12; and CSA 2, 4 & 5.

All ACTIONAIR® Valves meet:
Class I, Div. 2, Groups A, B, C, & D
Class II, Div. 2, Groups E, F, & G
Class III, Div. 2, ID #T3B

Hazardous Duty ACTIONAIR® Valves meet:
Class I, Div. 1, Groups C & D
Class II, Div. 1, Groups E, F, & G
Class III, Div. 2, ID #T3B

ACTIONAIR® valve electrical components and accessories comply with UL (Underwriters Laboratories) and CSA (Canadian Standards Association) standards.

Rotatable top assembly for field piping convenience and lubrication-free body design means minimal field maintenance.

Cast iron or cast steel bodies feature metal-to-metal seating that wears in, not out. Straight-through flow path minimizes pressure drop through full open swinging gate or rising-stem guillotine action bodies.

Large two-color open/shut indicator provides positive visual indication of valve's body position.

Series Designations and Available Sizes

Series 1000 – 3/4" to 6" rising stem bodies with normally-closed actuators are CGA (Canadian Gas Association) certified and have FM (Factory Mutual) approval for use with air, natural gas, LP gases, #1 and #2 fuel oils.

Series 2000 – 3/4" to 4" rising stem bodies with normally-open actuators are CGA (Canadian Gas Association) certified and have FM (Factory Mutual) approval listings for use with air, natural gas, LP gases, #1 and #2 fuel oils.

Series 3000 – 1/2" to 1-1/4" swinging gate bodies with normally-closed actuators have FM (Factory Mutual) approval for use with #1, #2, #4, and preheated #5 and #6 fuel oils.

All ACTIONAIR® valves have special service trim options available.

Valve Body Capacities/Specifications

Table 1: Normally-closed valve bodies

Body Material	End Connections	Pipe Size in Inches	Cv Factor	Body Type [1]
Gray Iron	Threaded	1/2	3.4	SG
		3/4	9.6	SG
			20	RS
		1	12	SG
			20	RS
		1-1/4	17	SG
			45	RS
		1-1/2	53	RS
		2	86	RS
	2-1/2	304	RS	
	3	432	RS	
	Flanged	2	86	RS
		2-1/2	304	RS
		3	432	RS
		4	551	RS
			903	RS
6		1230	RS	
Cast Steel	Threaded	1/2	3.4	SG
		3/4	9.6	SG
		1	12	SG
			20	RS
		1-1/4	17	SG
			45	SG
		1-1/2	53	RS
		2	86	RS
		Flanged	1-1/2	123
	2		218	SG
	2-1/2		304	RS
	3		432	RS
	4		551	RS
			903	RS
	6		1230	RS

[1] RS = Rising stem body; SG = Swinging gate body
See catalog page 6313 for construction details

Table 2: Normally-open valve bodies

Body Material	End Connections	Pipe Size in Inches	Cv Factor	Body Type [1]
Gray Iron	Threaded	3/4	20	RS
		1	20	RS
		1-1/2	53	RS
		2	86	RS
		2-1/2	304	RS
		3	432	RS
	Flanged	2	86	RS
		2-1/2	304	RS
		3	432	RS
		4	551	RS
Cast Steel	Threaded	1	20	RS
		1-1/2	53	RS
		2	86	RS
	Flanged	2-1/2	304	RS
		3	432	RS
		4	551	RS
			551	RS

[1] RS = Rising stem body

Each complete valve assembly must include one of these valve bodies, regardless of ultimate series designation.

Flows through the valve body and resulting pressure drops may be estimated by inserting your specific conditions into following formula and using C_v flow factors given for each valve body.

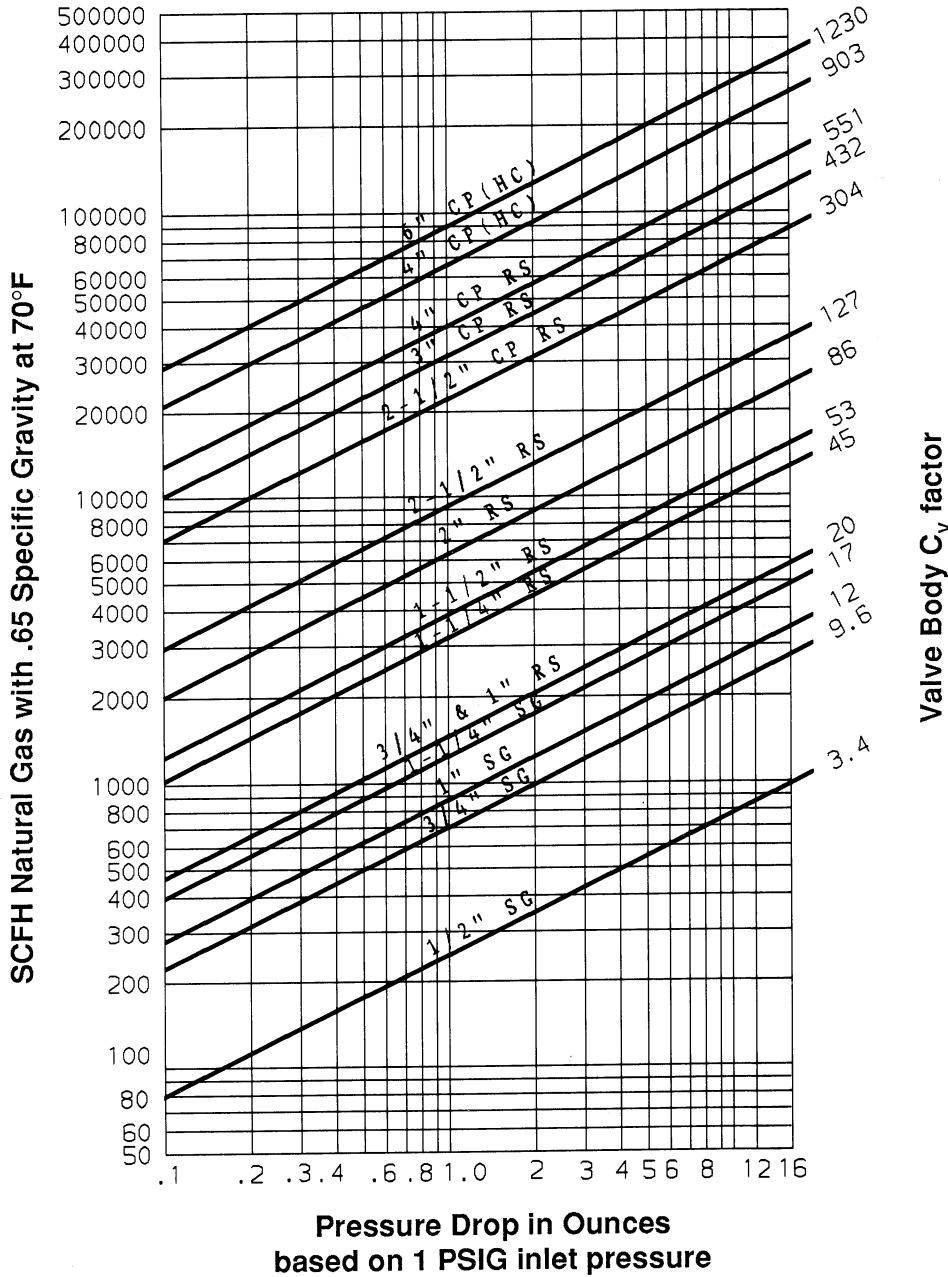
$$\text{Gases: } Q = (1360) \times C_v \times \left(\sqrt{\frac{(P_1 + P_2)}{G T_f}} \right) \times \left(\sqrt{\frac{(P_1 - P_2)}{2}} \right)$$

$$\text{Liquids: } V = C_v \times \left(\sqrt{\frac{(P_1 - P_2)}{G_f}} \right)$$

Where:

- G = Gas specific gravity (air = 1.0)
- G_f = Specific gravity @ flowing temperature °F
- P₁ = Inlet pressure PSIA (14.7 psi + psi gauge)
- P₂ = Outlet pressure PSIA (14.7 psi + psi gauge)
- Q = Cubic feet per hour @ 14.7 PSIA and 60°F
- T_f = Flowing temperature absolute (460° + °F)
- V = Flow in U.S. gallons/minute

Valve Body Capacities with Natural Gas at 1 PSIG inlet pressures



Approximate pressure drops for various valve sizes and flows may be determined by using this graph.

Typically, pressure drop for fuel flows should not exceed 10% of inlet pressure; however, for 2" and smaller valves, the drop should not exceed 5 PSIG, and for 2-1/2" and larger size valves, must not exceed 2.5 PSIG.

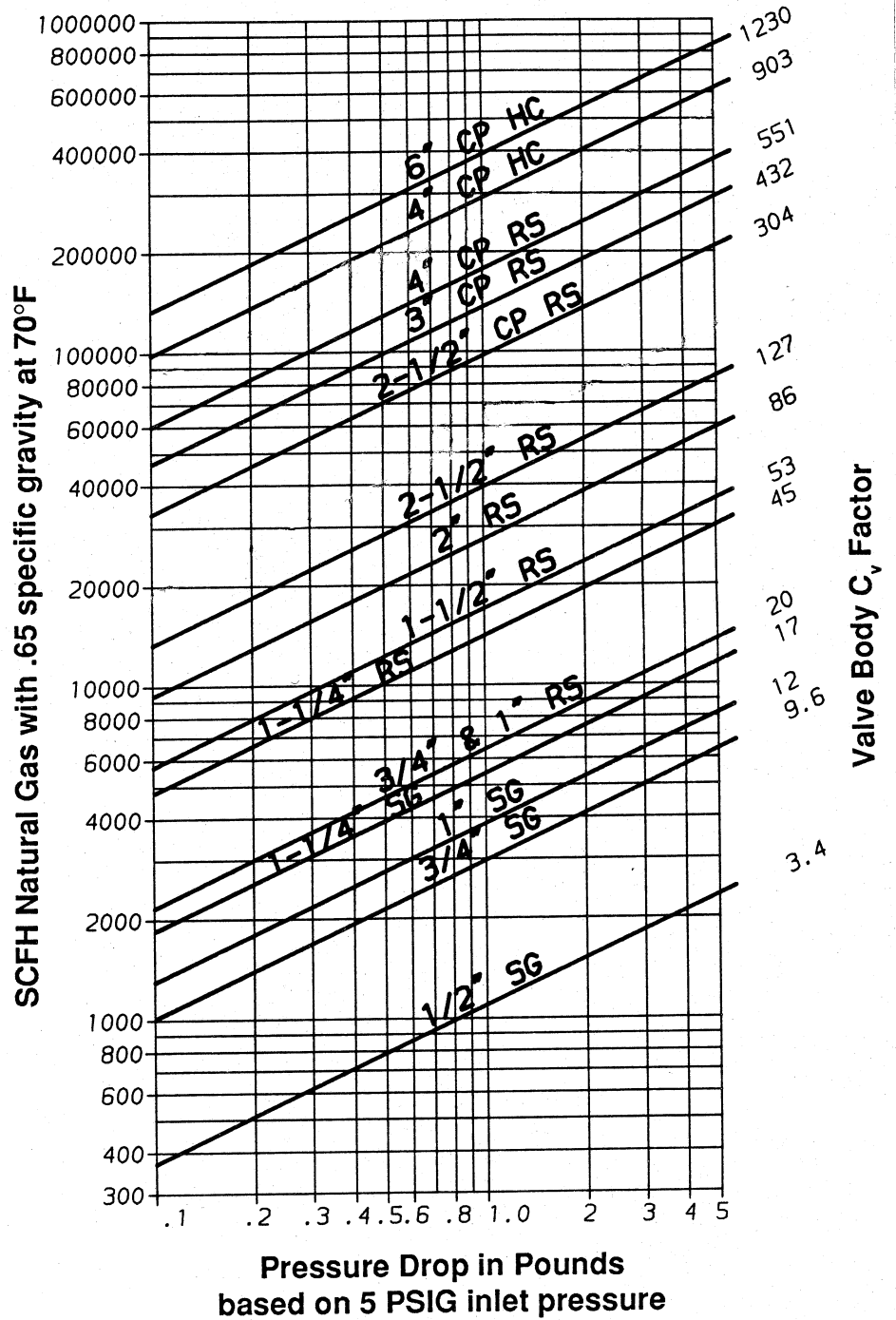
Select valve size on basis of the **lower** of these parameters to avoid critical flow conditions.

Valve Body Capacities with Natural Gas at 5 PSIG inlet pressure

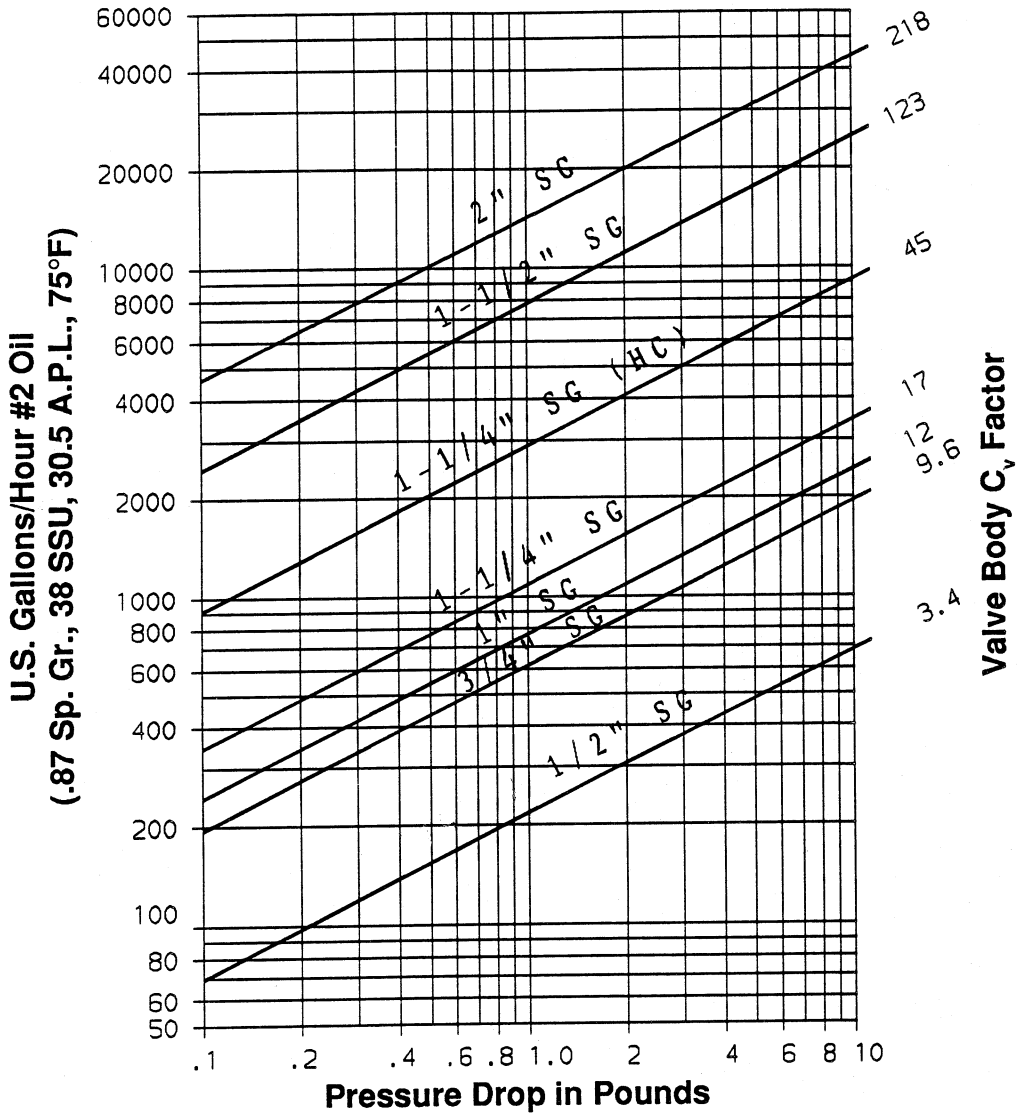
Approximate pressure drops for various valve sizes and flows may be determined by using this graph.

Typically, pressure drop for fuel flows should not exceed 10% of inlet pressure; however for 2" and smaller valves, the drop should not exceed 5 PSIG, and for 2-1/2" and larger size valves, must not exceed 2.5 PSIG.

Select valve size on basis of the **lower** of these parameters to avoid critical flow conditions.



Valve Body Capacities with #2 Oil



To select a valve for YOUR application, use either C_v factor calculations, or this graph showing approximate pressure drop at various flows of #2 oil. Typically, pressure drop for fuel flows should not exceed 10% of inlet pressure.

For preheated #5 or #6 oil, multiply the required flow rate in GPH by the factor given in the table at right, then select a valve based upon that equivalent flow of #2 oil and the allowable drop.

Oil Grade	#5		#6				
	125	160	122	140	180	210	220
°F @ Inlet							
Factor	1.43	1.11	2.86	2.00	1.25	1.11	1.05

For example: To size for 5 psi drop with a 3500 GPH flow of #6 oil preheated to 140°F, the multiplier is "2". Equivalent flow of #2 oil is then 3500 x 2, or 7000 GPH. Chart shows that a 5 psi drop will require use of a valve body having a C_v factor of at least 45.

Selection Data

Series 1000

- For gas service
- Normally closed
- Rising stem body design



1-1/2" Series 1220

Available sizes and pressure ratings

Pipe Size (inches)	Body Cv	Maximum Inlet Pressure (PSIG)			
		Gray Iron Bodies		Cast Steel Bodies	
		Clean Gases	Special Service	Clean Gases	Special Service
3/4	19	200	125	---	---
1	20	200	125	255	125
1-1/4	45	200	100	---	---
1-1/2	53	200	70	255	70
2	86	200	70	255	70
2-1/2	304	175	60	175	60
3	432	135	45	135	45
4	551	135	45	135	45
4-HC	903	120	40	120	40
6-HC	1230	100	35	100	35

NOTE: Ambient and fluid temperature limits are -40°F (-40°C) to +140°F (+60°C).

Series Designation

Body Material	General Purpose (GP)				Hazardous Duty (HD)			
	Gray Iron		Cast Steel		Gray Iron		Cast Steel	
Actuator Function	Sanctioned * Service	Special Service (Non- sanctioned)	Sanctioned * Service	Special Service (Non- sanctioned)	Sanctioned * Service	Special Service (Non- sanctioned)	Sanctioned * Service	Special Service (Non- sanctioned)
Automatic	1010	1110	1210	1310	1010-HD	1110-HD	1210-HD	1310-HD
Manual	1020	1120	1220	1320	1020-HD	1120-HD	1220-HD	1320-HD
Power-to-Close	---	1130	---	1330	---	1130-HD	---	1330-HD

*Sanctioned service fuels include: air, natural gas, manufactured gas, liquified petroleum gases, #1 and #2 fuel oils.

NOTE: All standard actuators require 115v 50/60 AC electrical signal to operate the air control solenoid, which opens the valve assembly. Contact your Maxon representative for optional electrical voltages.

Selection Data

Series 2000

- For gas service
- Normally open
- Rising stem body design



1-1/2" Series 2010

Available sizes and pressure ratings

Pipe Size (inches)	Body Cv	Maximum Inlet Pressure (PSIG)			
		Gray Iron Bodies		Cast Steel Bodies	
		Clean Gases	Special Service	Clean Gases	Special Service
3/4	19	200	125	---	---
1	20	200	125	255	125
1-1/2	53	200	70	255	70
2	86	200	70	255	70
2-1/2	304	175	60	175	60
3	432	135	45	135	45
4	551	135	45	135	45

NOTE: Ambient and fluid temperature limits are -40°F (-40°C) to +140°F (+60°C).

Series Designation

Body Material	General Purpose (GP)				Hazardous Duty (HD)			
	Gray Iron		Cast Steel		Gray Iron		Cast Steel	
Actuator Function	Sanctioned * Service	Special Service (Non- sanctioned)	Sanctioned * Service	Special Service (Non- sanctioned)	Sanctioned * Service	Special Service (Non- sanctioned)	Sanctioned * Service	Special Service (Non- sanctioned)
Automatic	2010	2110	2210	2310	2010-HD	2110-HD	2210-HD	2310-HD
Manual	2020	2120	2220	2320	2020-HD	2120-HD	2220-HD	2320-HD
Power-to-Close	---	2130	---	2330	---	2130-HD	---	2330-HD

*Sanctioned service fuels include: air, natural gas, manufactured gas, liquified petroleum gases, #1 and #2 fuel oils.

NOTE: All standard actuators require 115v 50/60 AC electrical signal to operate the air control solenoid, which closes the valve assembly. Contact your Maxon representative for optional electrical voltages.

Selection Data

Series 3000

- For oil service
- Normally closed
- Swinging gate body design



1-1/4" Series 3320

Available sizes and pressure ratings

Pipe Size (inches)	Body Cv	Maximum Inlet Pressure (PSIG) [1]			
		Gray Iron Bodies		Cast Steel Bodies	
		Clean Oils	Special Service	Clean Oils	Special Service
1/2	3.4	500	150	700	500
3/4	9.6				
1	12				
1-1/4	17	400	135	550	185
1-1/4 HC	45				
1-1/2	123	350	110	400	135
2	218	225	75	225	75

[1] Note: Maximum Operating Pressure ratings indicated are for fluid temperatures in range of -40°F to +150°F with minimum cylinder air pressures of 95 PSIG. Fluid temperatures above 150°F (to a maximum of 450°F) or air cylinder pressures below 95 PSIG will lower the Maximum Operating Pressure rating. Contact your Maxon representative with specific application details.

NOTE: Minimum ambient and fluid temperature limit is -40°F (-40°C). Maximum ambient temperature limit is +140°F (+60°C). Maximum fluid temperature limit for standard body is +150°F (+66°C) at the pressure listed in the table above. Fluids up to 450°F can be used with a reduction in the maximum inlet pressure (see Product Information Sheet 6300-1 & 2), and with special high temperature body can go up to +550°F (+288°C).

Series Designation

Body Material	General Purpose (GP)				Hazardous Duty (HD)			
	Gray Iron		Cast Steel		Gray Iron		Cast Steel	
Actuator Function	Sanctioned * Service	Special Service (Non-sanctioned)	Sanctioned * Service	Special Service (Non-sanctioned)	Sanctioned * Service	Special Service (Non-sanctioned)	Sanctioned * Service	Special Service (Non-sanctioned)
Automatic	3010	3110	3210	3310	3010-HD	3110-HD	3210-HD	3310-HD
Manual	3020	3120	3220	3320	3020-HD	3120-HD	3220-HD	3320-HD
Power-to-Close	---	3130	---	3330	---	3130-HD	---	3330-HD

*Sanctioned service fuels include: light oil (i.e. #1, 2 & 4) and preheated heavy oils (i.e. #5 & 6) with maximum viscosity of 5000 SSU

NOTE: All standard actuators require 115v 50/60 AC electrical signal to operate the air control solenoid, which opens the valve assembly. Contact your Maxon representative for optional electrical voltages.



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