Rexroth
Bosch Group

Differential pressure control, electrically adjustable

RE 92 709/05.04 1/8

open circuit

A10V(S)O...EFx.../31

A10VO...EFx.../53

for variable pump
A10V(S)O series 31
A10VO series 53

Contents

Features

- Electro-proportional differential pressure control, current dependent
- High control accuracy
- Fail safe behaviour, e.g. for operation of brake or steering functions
- Use of standard amplifiers possible
- Compact design

Applications

- More resolution in fine metering range
- Provides easy control of max. flow
- Enables speed sensing power control
- Damping-end of cylinder travel

Further information:

Variable pump A10VSO/31	size 18...140	RE 92 711
Variable pump A10V(S)O/31	size 18...140	RE 92 701
Variable pump A10VO/53	size 10...85	in preparation

Ordering code - standard range, series 31

A10V(S)O...EFx series 31

A10V(S)	O		/31	-					

see RE 92 711
RE 92 701

Axial piston unit

Swashplate design, variable, nom. pressure 280 bar, peak pressure 350 bar	**A10V(S)**

Mode of operation

Pump, open circuit	**O**

Size, resp. displacement V_{gmax} [cm³]

A10VO series 31	**–**	**28**	**45**	**71**	**100**	**140**		
A10VSO series 31	**18**	**28**	**45**	**71**	**100**	**140**		

Control devices

Pressure-flow control														
12V	EF	1	D		F			o	●	●	●	●	–	**EF1DF**
24V	EF	2	D		F			o	●	●	●	●	–	**EF2DF**
Pressure-flow control, no connection between X-T														
12V	EF	1	D		S			o	●	●	●	●	–	**EF1DS**
24	EF	2	D		S			o	●	●	●	●	–	**EF2DS**

Series

	31

Connector design

Deutsch-connector, permanently moulded	●	●	●	●	●	●	**P**

● available

o in preparation

- not available

Ordering code - standard range, series 53

A10VO...EFx(LAx) series 53

A10V	O			/53	-					

Data sheet in preparation

Axial piston unit

Swashplate design, variable, nom. pressure 250 bar, peak pressure 315 bar	**A10V**

Mode of operation

Pump, open circuit	**O**

Size, resp. displacement V_{gmax} [cm³]

A10VO series 53									**28**	**45**	**63**	**85**

Control devices

Pressure-flow control													
12V	EF	1	D		F				●	○	●	●	**EF1DF**
24V	EF	2	D		F				●	○	●	●	**EF2DF**
Pressure-flow control, no connection between X-T													
12V	EF	1	D		S				●	○	●	●	**EF1DS**
24	EF	2	D		S				●	○	●	●	**EF2DS**
Pressure-flow-torque control, no connection between X-T													
12V beginning of control at 10...35 bar	LA	5			S		1		○	○	○	○	**LA5S1**
36...70 bar	LA	6			S		1		○	○	○	○	**LA6S1**
71...105 bar	LA	7			S		1		○	○	○	○	**LA7S1**
106...140 bar	LA	8			S		1		○	○	○	○	**LA8S1**
141...230 bar	LA	9			S		1		○	○	○	○	**LA9S1**
24V beginning of control at 10...35 bar	LA	5			S		2		○	○	○	○	**LA5S2**
36...70 bar	LA	6			S		2		○	○	○	○	**LA6S2**
71...105 bar	LA	7			S		2		○	○	○	○	**LA7S2**
106...140 bar	LA	8			S		2		○	○	○	○	**LA8S2**
141...230 bar	LA	9			S		2		○	○	○	○	**LA9S2**

Series

	53

Connector design

Deutsch-connector, permanently moulded	●	●	●	●	**P**

- ● available
- ○ in preparation
- \- not available

Differential pressure control, electrically adjustable

This control is based on a pressure-flow controller (see RE 92 701 or RE 92 711 for series 31, data sheet for series 53 in preperation).

In addition to the pressure control, the flow control function enables an adjustment of the pump output flow to match the actual required flow of the hydraulic user through a controlled differential pressure over an orifice (e.g. valve opening) between pump and hydraulic user.

With the differential pressure control it is possible to reduce the pressure difference by 10 bar via a solenoid onto the pump control valve. To control the solenoid force a PWM signal is used (pulse width modulation).

The electrically adjustable differential pressure control enables the following functions:

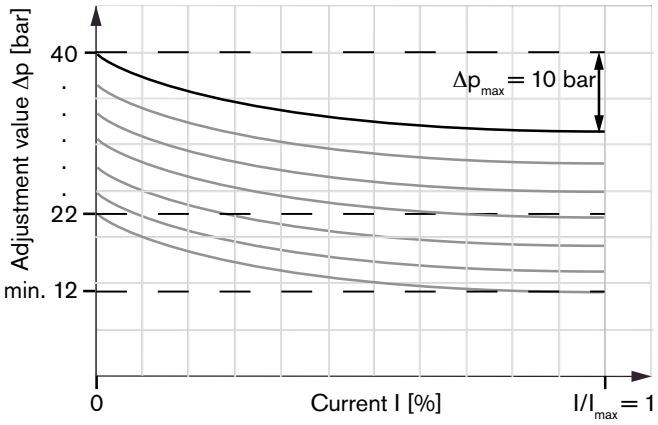
– Wider range of fine control for delicate movements

– Adaptation of max. flow for each user

– Use as speed sensing power control

– Damping at end of cylinder travel

Characteristic of differential pressure control



On delivery the Δp value is set at 35 bar. If another setting is required please state in clear text.

With the valve in the pump outlet closed, the X-port connected to the tank, and the solenoid de-energized the pump outlet will show a standby pressure value dependent on the Δp-setting. This standby pressure will be approx. 3 bar higher than the Δp-setting.

Example:

With a Δp-setting of 25 bar, the standby pressure level will be around 28 ± 2 bar.

Important:

With max. current to the solenoid the differential pressure Δp may not fall below 12 bar.

Technical data - electrical

Version	EF1.../LA...1	EF2.../LA...2
Operating voltage	12V – 20%	24V – 20%
Control range	0–1200 mA	0–600 mA
Nominal resistance at 20°C (R_{20})	5,5Ω	22,7Ω
Limit current at U_{max}	1,54 A	0,77A
Max. duty cycle	100 %	
Operating temperature range (valve)	-20°C to + 115°C	
Ditherfrequency for PWM signal	100 – 200 Hz	
Solenoid class of material	H (Tmax = 180°C)	

Calculation formula for resistance

at T > 20 °C

$$R_W = \frac{R_{20} \cdot (235 + T)}{255}$$

Warning - avoid being burned:

The pump and especially the valve will be extremely hot during and after operation!

Wear appropriate protection.

Differential pressure control, electrically adjustable

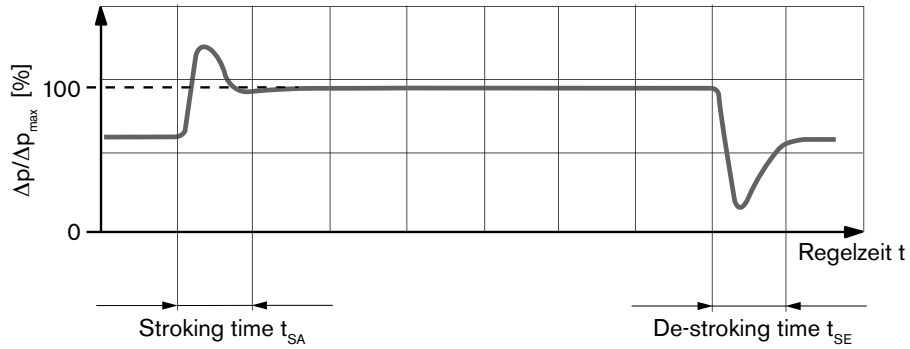
Basic controller A10V(S)O...EFx series 31

The controller is based on a pressure-flow control (see also RE 92 701 or RE 92 711).

Basic controller A10VO...EFx series 53

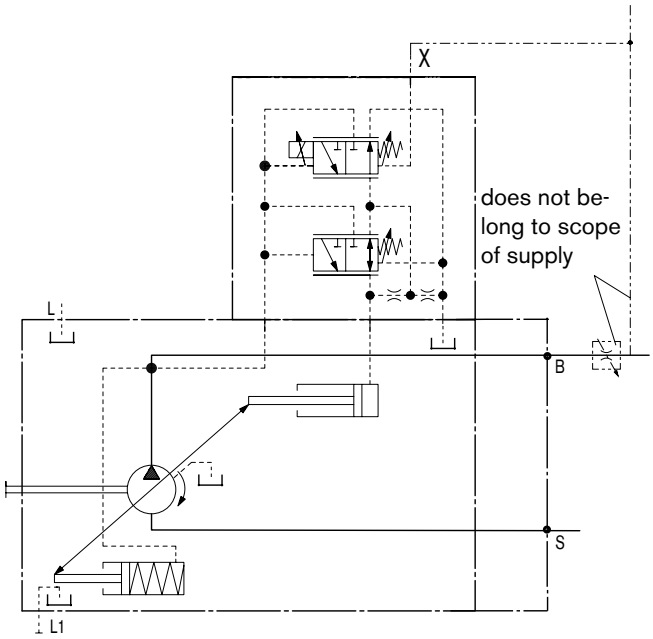
The controller is based on a pressure-flow control (see also data sheet A10VO/53, in preparatiom).

Dynamic characteristic — change in solenoid current (command value)

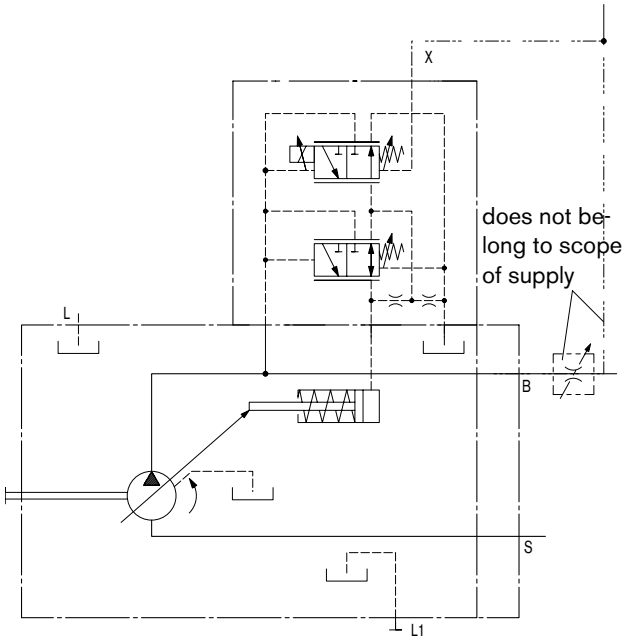


Measured values to this characteristic are available upon request.

Circuit drawing A10V(S)O...EFx series 31



Circuit drawing A10VO...EFx series 53



Connetions

B	Pressure port
S	Inlet port
L, L_1	Case drain port (L_1 plugged)
X	Pilot pressure port

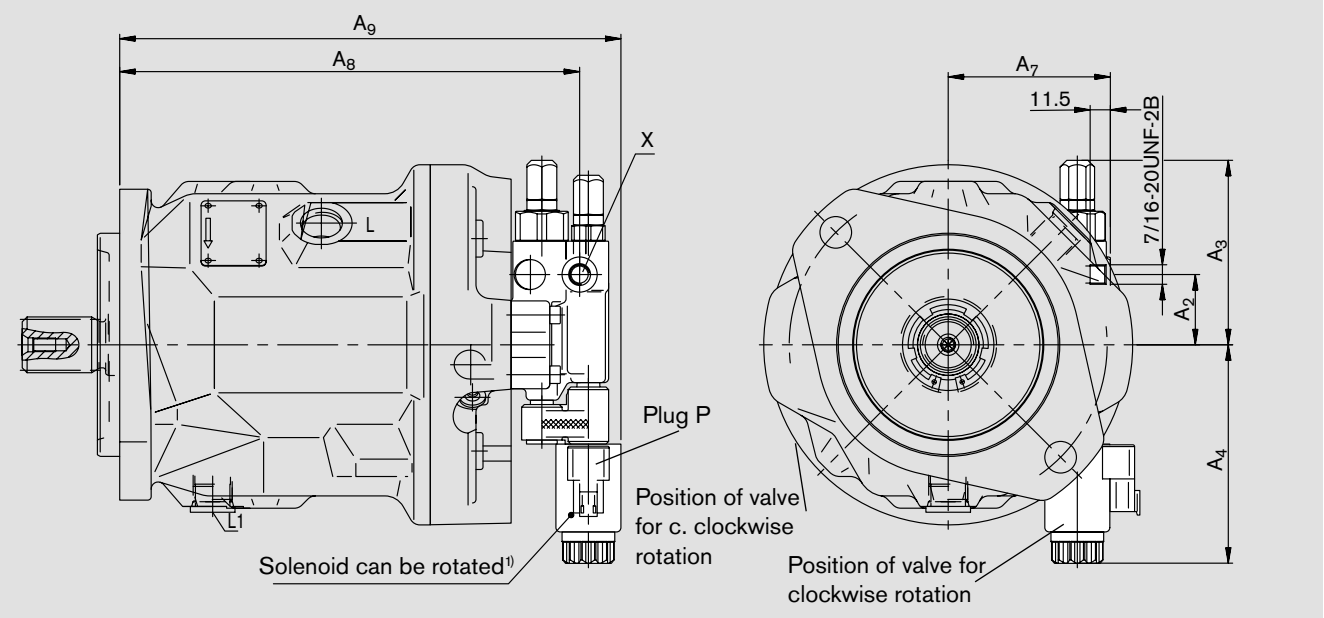
Control data

See RE 92 701 or RE 92 711 for A10V(S)O series 31 . Data sheet for A10VO series 53 in preparation.

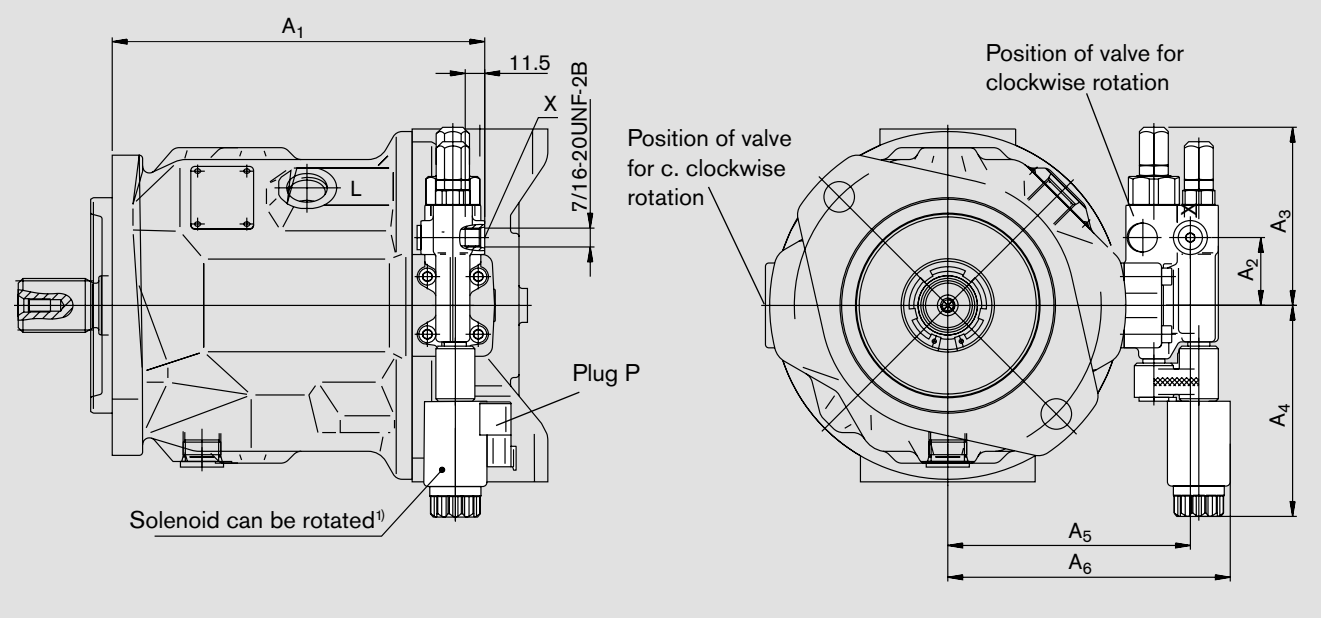
Unit dimensions, series 31

Before finalising your design please request a certified installation drawing.

Ports at rear - version 11N00



Ports on side - version 12N00



size	A_1	A_2	A_3	A_4	A_5	A_6	A_7	A_8	A_9
18	166	40	105	124	109	133	–	–	–
28	176	40	105	124	119	142	74	209	232
45	192	40	105	124	129	153	82	228	251
71	220	40	105	124	143	167	93	262	285
100	286	40	105	124	148	172	100	327	350

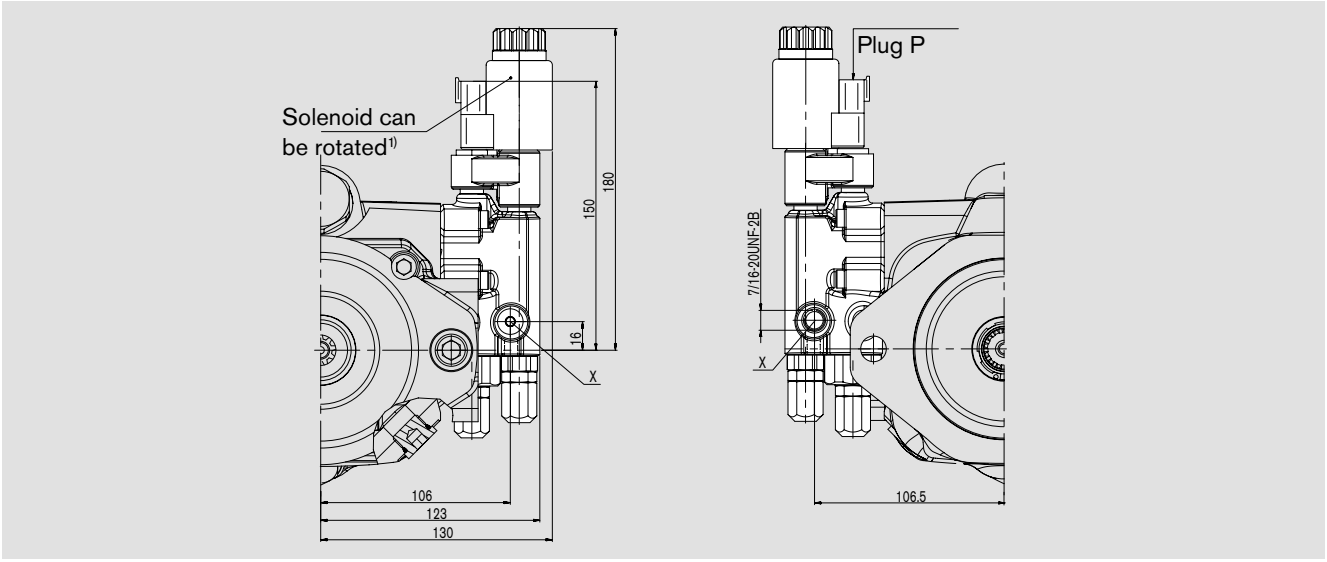
Detailed unit dimensions and technical data of the pumps can be found in the main catalogs RE 92 701 (A10VO) and RE 92 711 (A10VSO).

1) The orientation of the plug is optional by rotation of the solenoid. After rotation the plastic cap must be re-tightened again with 5^{+1} Nm torque.

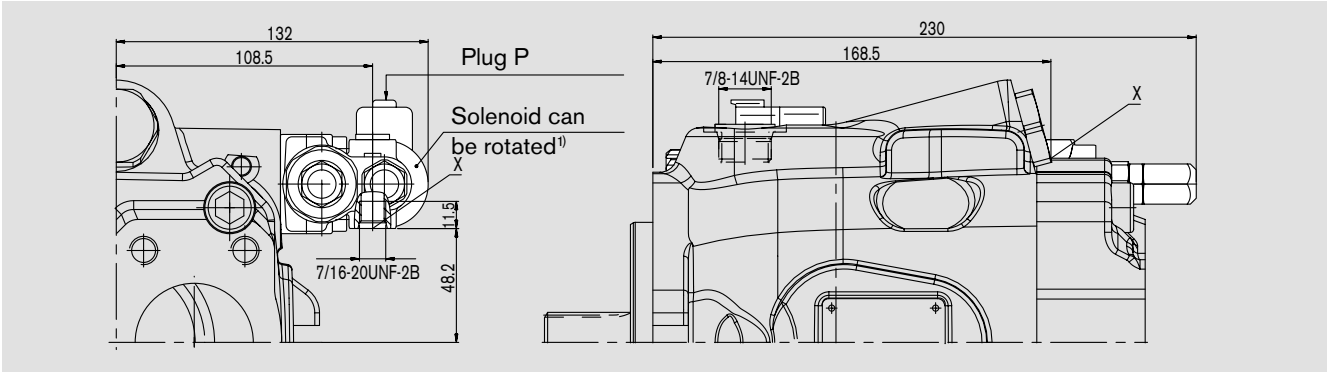
Unit dimensions, series 53

Before finalising your design please request a certified installation drawing.

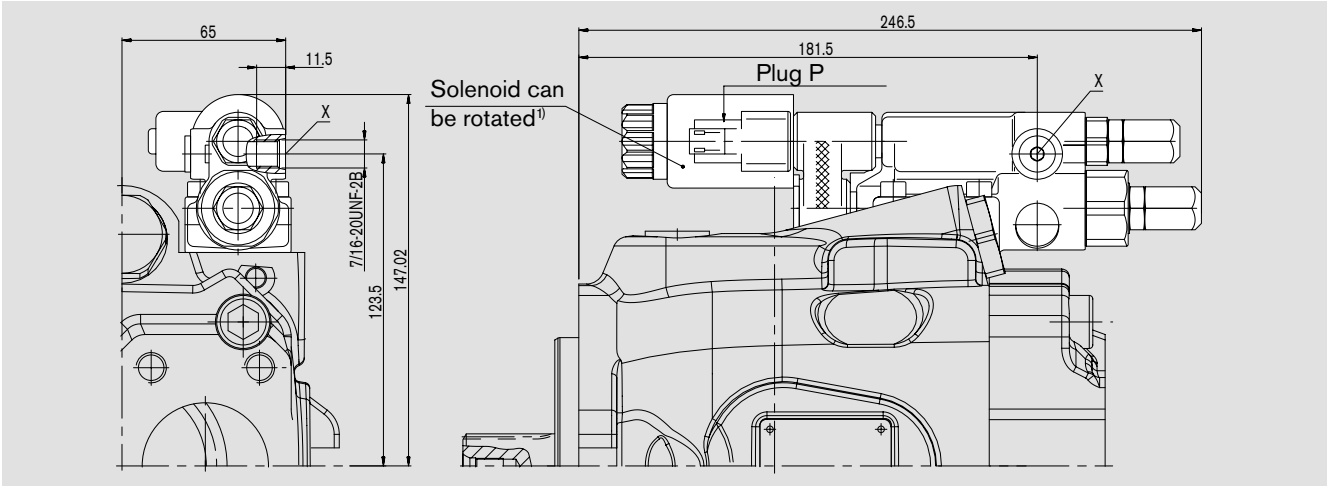
Size 28



Size 63



Size 85



Detailed unit dimensions and technical data of the pumps can be found in the main catalog (in preparation).

[1)] The orientation of the plug is optional by rotation of the solenoid. After rotation the plastic cap must be re-tightened again with 5^{+1} Nm torque.

Connector options and electronic controls

Connectors

Option P

Deutsch-connector DT 04-2P permanently moulded

Protection class IP 69K

Male plug: DT 06–2S–EP04[1)]

Rexroth material no.: 02601804

Electronic controls

Control	electronic function	Electronics		Further infromation
Electric pressure control	Regulated current output	PV	analog	RD 95 023
		VT2000	analog	RD 29 904
		RC2-2[2)]	digital	RD 95 200

[1)] Male plugs not included in scope of supply. Available upon request.
[2)] Current outputs for 2 valves, seperately controllable.

Safety information

– Pump A10V(S)O was designed for operation in open loop circuits.

– Systems design, installation and commissioning require trained technicians or tradesmen.

– All hydraulic ports can only be used for the fastening of hydraulic service lines.

– Tightening torques:
The tightening torques mentioned in this data sheet are maximum values and must not be exceeded (max. values for thread).
Manufacturers information concerning the maximum permitted tightening torques of the various fittings is to be observed!
For DIN 13 mounting bolts, we recommend that tightening torques be checked on a case by case basis in accordance with VDI 2230, published 2003.

– During and shortly after operation of a pump the housing and especially a solenoid can be extremely hot, avoid being burned!.

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