

Frese OPTIMA Compact actuators DN10-DN32

Application

Proportional 0-10 V, 4-20 mA or 3-position modulating or On/Off control of Frese OPTIMA Compact valves in heating, ventilating and air conditioning systems.

The actuator can be mounted on the valve by hand and without the need of a specific tool.

Due to the compact design of the actuator, it is particularly suitable for installations where space is limited.



Features motoric actuators

- Nominal stroke on proportional 0-10 V or 4-20 mA actuator up to 5.5 mm. Presetting from factory 2.5 or 5.5 mm
- Auto calibration to all valve strokes for version with feedback signal (53-1184)
- 3-position, 0-10 V DC or 4-20 mA control signal. Other control signals can be selected by use of dip switches
- Direct assembly with union nut to the neck of the valve. No tools required
- Bi-color LED for status and diagnostic
- Linear or EQ% characterization available on the same actuator
- The actuator is short-circuit-proof and protected against polarity reversal
- Plug-in cable for supply voltage and control signal
- Small outer dimensions
- Removable cable
- Auto zero detection
- IP 43 for standard actuator versions. IP 54 protection for version with feedback signal (53-1184)
- Voltage and Current analog inputs

Features thermic actuators

- Auto calibration to all valve strokes for proportional 0-10V actuator
- On/Off or 0-10 V DC control signal
- Simple snap-on installation
- Small outer dimensions
- Cable included
- First-Open function
- IP 54 protection
- Power consumption 1-2 W
- 0-10 V feedback signal
- Auxiliary switch to control external devices

Approval

- Conforms to: EMC directive 2004/108/EC
- Low voltage directive 2006/95/EC



Frese OPTIMA Compact actuators DN10-DN32

Technical data motoric actuators

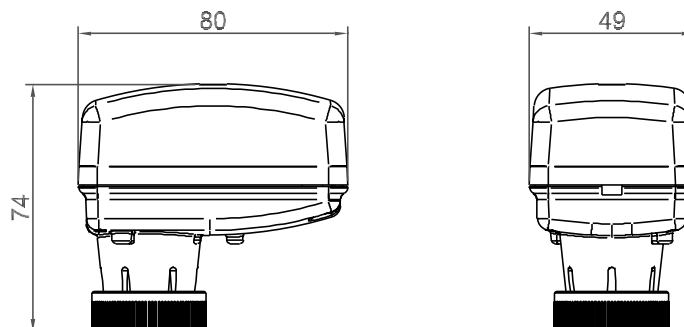
Supply voltage:	See "Types and Operation Data"
Protection class:	See "Types and Operation Data"
Frequency:	50/60 Hz
Input impedance:	> 100 k Ohm (DC 0-10 V)
Parallel operation:	Max 4 actuators
Force:	>120N
Stroke:	See "Types and Operation Data"
Ambient conditions:	Temperature 0°C-50°C Humidity 10-90% r.F.
Cable length:	1.5 m
Weight:	215 g



Types and Operation Data

Types	Valve Dim.	Control signal	Feedback signal	Running time (50 Hz)	Supply voltage	Power Consumption	Protection Class (For valve stroke)
53-1180	DN10-DN32	DC 0-10 V 4-20 mA	-	8 s/mm	AC/DC 24 V +/- 15%	2.5 VA	IP 43 (5.0 & 5.5mm)
53-1181	DN10-DN32	3-position/ On/Off	-	13 s/mm	AC 24 V +/- 15%	2.5 VA	IP 43 (All valve strokes)
53-1182	DN10-DN32	3-position/ On/Off	-	13 s/mm	AC 230 V +/- 10%	6.5 VA	IP 43 (All valve strokes)
53-1183	DN10-DN32	DC 0-10 V 4-20 mA	-	8 s/mm	AC/DC 24 V +/- 15%	2.5 VA	IP 43 (2.5 mm)
53-1184	DN10-DN32	DC 0-10 V 4-20 mA	0-10V	8 s/mm	AC/DC 24 V +/- 15%	2.5 VA	IP 54 (All valve strokes)

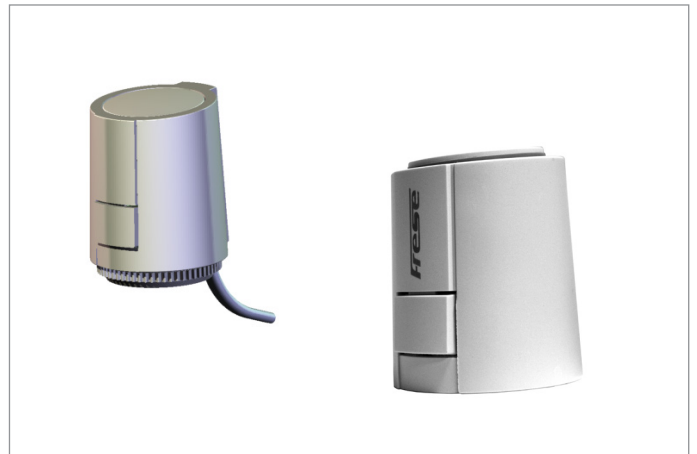
Dimensions [mm]



Frese OPTIMA Compact actuators DN10-DN32

Technical data thermic actuators

Characteristics:	Thermic actuators, NC or NO
Protection class:	IP 54 to EN 60529
Frequency:	50/60 Hz or DC
Control signal:	0-10V DC or On/Off
Force:	100 N
Stroke:	2.5 - 5.0 - 5.5 mm
Running time:	120 s 0-10V/180 s On/Off
Ambient conditions:	0°C-60°C
Cable length:	1.0 m
Weight:	100 g



Types and Operation Data: Normally Closed (NC) versions

Types	Valve Dim.	Control signal	Feedback signal/ AUX-switch	Running time (50 Hz)	Supply voltage	Power Consumption	For valve stroke
48-5525	DN10-DN20	On/Off	-	180 s	AC/DC 24 V	1 W / 300 mA*	2.5 mm
48-5526	DN10-DN20	On/Off	-	180 s	AC 230 V	1 W / 300 mA*	2.5 mm
48-5527	DN10-DN32	On/Off	-	180 s	AC/DC 24 V	1.2 W / 300 mA*	5.0-5.5 mm
48-5528	DN10-DN32	On/Off	-	180 s	AC 230 V	1.2 W / 550 mA*	5.0-5.5 mm
48-5529	DN10-DN32	DC 0-10 V	-	30 s/mm	AC 24 V	1.2 W / 320 mA*	2.5-5.0-5.5 mm
48-5529-1	DN10-DN32	DC 0-10 V	-	30 s/mm	DC 24 V	1.2 W / 320 mA*	2.5-5.0-5.5 mm
48-5542	DN10-DN32	DC 0-10 V	DC 0-10V	30 s/mm	AC/DC 24 V	1.2 W / 320 mA*	2.5-5.0-5.5 mm
48-5532	DN10-DN20	On/Off	-	180 s	AC/DC 24 V	2 W / 250 mA*	2.5 mm
48-5533	DN10-DN20	On/Off	-	180 s	AC 230 V	2 W / 350 mA*	2.5 mm
48-5539	DN10-DN32	On/Off	AUX-switch	240 s	AC 230 V	1 W / 300 mA*	2.5-5.0-5.5 mm**
48-5540	DN10-DN32	On/Off	AUX-switch	240 s	AC/DC 24 V	1 W / 300 mA*	2.5-5.0-5.5 mm**

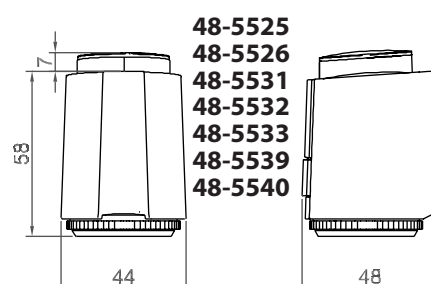
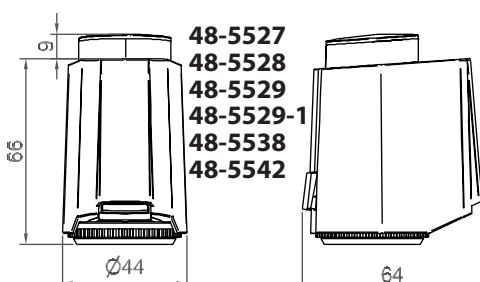
Types and Operation Data: Normally Open (NO) versions

Types	Valve Dim.	Control signal	Feedback signal	Running time (50 Hz)	Supply voltage	Power Consumption	For valve stroke
48-5531	DN10-DN20	On/Off	-	180 s	AC/DC 24 V	1 W / 300 mA*	2.5 mm
48-5538	DN10-DN32	On/Off	-	180 s	AC/DC 24 V	1.2 W / 300 mA*	5.0-5.5 mm

*) Inrush current

***) When mounted on valves with 5.0 and 5.5 mm stroke, the flow will be reduced by 20%

Dimensions [mm]



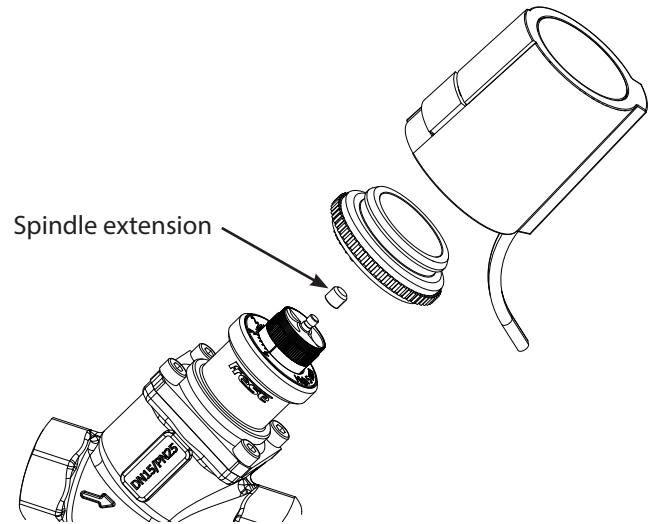
Frese OPTIMA Compact actuators DN10-DN32

Mounting of thermic actuators with AUX-switch

When actuators with AUX-switch are mounted on valves with 5.0 and 5.5 mm stroke, the spindle extension delivered with the actuator must be mounted (clicked on) to the spindle of the OPTIMA Compact valve.

Please note: The flow will be reduced by 20%



Valves with 2.5 mm stroke shall not be mounted with the spindle extension and the flow will remain unchanged.



Combination matrix: Frese OPTIMA Compact DN10-32 / Actuators

Frese OPTIMA Compact can be combined with both thermic actuators and motoric actuators.

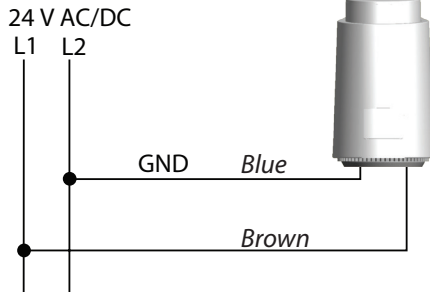
The design of the valve, combined with the Frese actuator, produces a perfect control characteristic that utilises the full control range of the system.

					Thermic Actuators					Motoric Actuators			
					On/Off		0-10V			0-10V, 4-20 mA		3-pos	
					24V 2.5mm	230V 2.5mm	24V 5.0 - 5.5mm	230V 5.0 - 5.5mm	24V 2.5 - 5.0 - 5.5 mm	24V 2.5 mm	24V 5.0 - 5.5mm	24V	230V
	Type	Stroke mm	Flow l/h	Dim									
	DN10 M/M LOW 2.5	2.5	30-200	DN10	●	●			●	●		●	●
	DN10 M/M LOW 5.0	5.0	65-370	DN10			●	●	●		●	●	●
	DN15 M/M LOW 2.5	2.5	30-200	DN15	●	●			●	●		●	●
	DN15 M/M LOW 5.0	5.0	65-370	DN15			●	●	●		●	●	●
	DN15 M/M HIGH 2.5	2.5	100-575	DN15	●	●			●	●		●	●
	DN20 M/M HIGH 2.5	2.5	100-575	DN20	●	●			●	●		●	●
	DN20 M/M HIGH 5.0	5.0	220-1330	DN20			●	●	●		●	●	●
DN25 M/M 5.5	5.5	600-3609	DN25			●	●	●		●	●	●	
DN32 M/M 5.5	5.5	550-4001	DN32			●	●	●		●	●	●	
	Type	Stroke mm	Flow l/h	Dim									
	DN15 F/F LOW 2.5	2.5	30-200	DN15	●	●			●	●		●	●
	DN15 F/F LOW 5.0	5.0	65-370	DN15			●	●	●		●	●	●
	DN15 F/F HIGH 2.5	2.5	100-575	DN15	●	●			●	●		●	●
	DN20 F/F HIGH 2.5	2.5	100-575	DN20	●	●			●	●		●	●
	DN20 F/F HIGH 5.0	5.0	220-1330	DN20			●	●	●		●	●	●
	DN25 F/F 5.5	5.5	600-3609	DN25			●	●	●		●	●	●
	DN32 F/F 5.5	5.5	550-4001	DN32			●	●	●		●	●	●

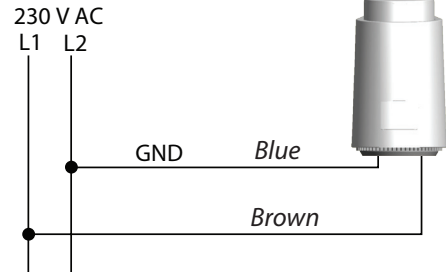
Frese OPTIMA Compact actuators DN10-DN32

Connection diagrams thermic actuators

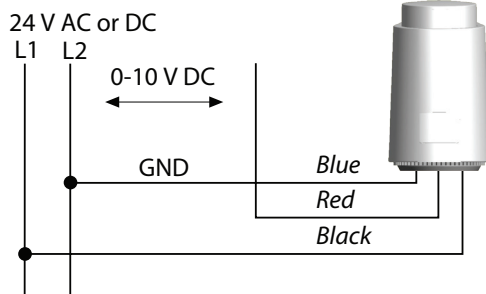
48-5525
48-5527
48-5531
48-5532
48-5538
On/Off 24V



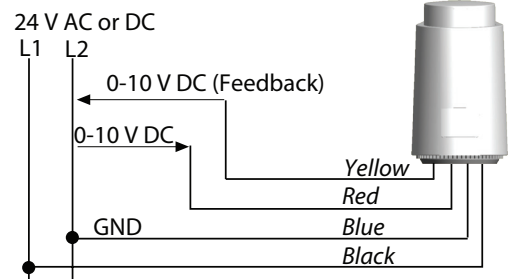
48-5526
48-5528
48-5533
On/Off
230V



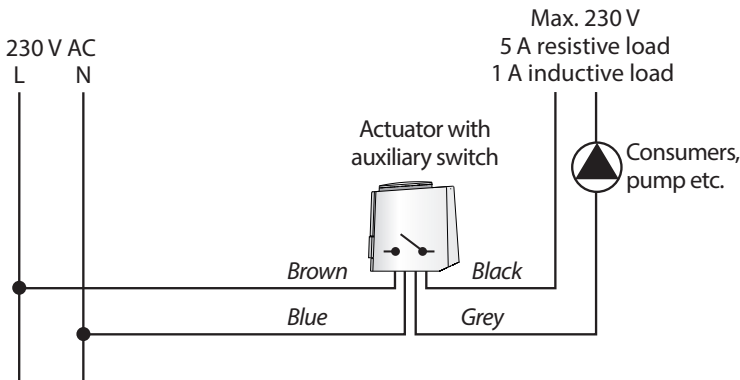
48-5529
48-5529-1
0-10V 24V



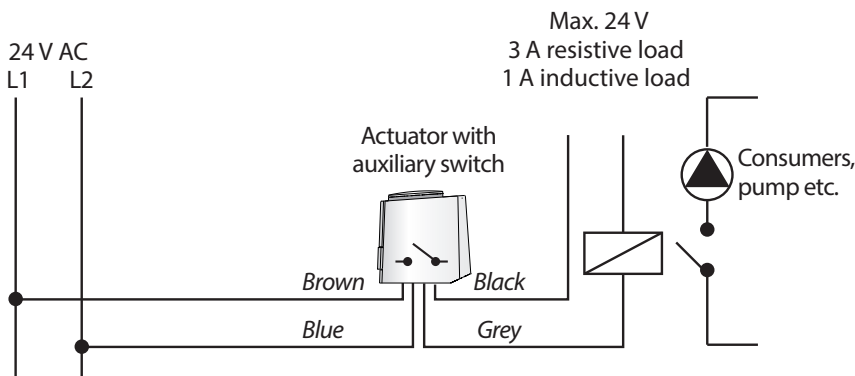
48-5542
0-10V 24V
Feedback



48-5539
On/Off 230V
AUX-switch



48-5540
On/Off 24V
AUX-switch

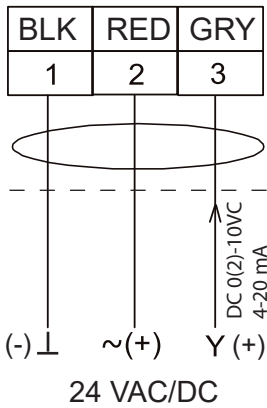


Frese OPTIMA Compact actuators DN10-DN32

Connection diagrams motoric actuators

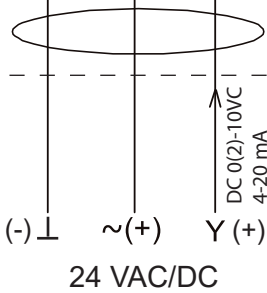
53-1180

0-10V & 4-20 mA,
24V, 5.5 mm



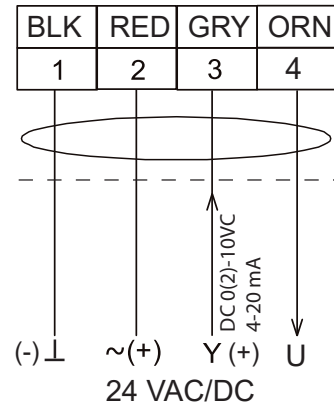
53-1183

0-10V & 4-20 mA,
24V, 2.5 mm



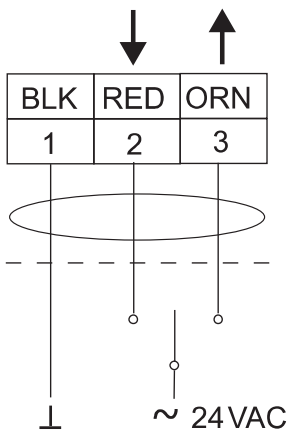
53-1184

0-10V & 4-20 mA
All valve strokes
Feedback signal



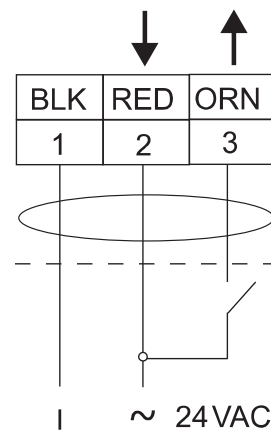
53-1181

3-position 24V*



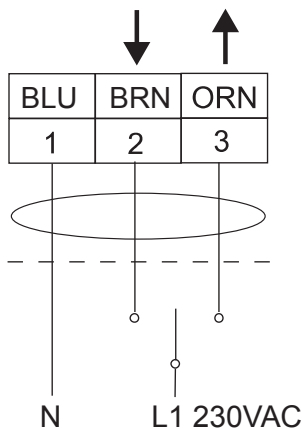
53-1181

On/Off 24V



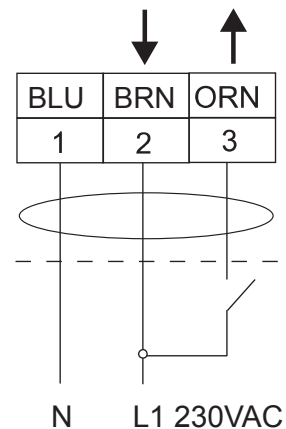
53-1182

3-position 230V*



53-1182

On/Off 230V



*The 3-position actuator can be used on Frese OPTIMA Compact with the stroke of: 2.5, 5.0 and 5.5mm. A controller chosen to operate the 3-position actuator should be programmed to match the stroke of each of the valves based on the running time of the actuator's stem which is 13.0 s/mm.

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Operating status indication

The actuators are equipped with a LED which provides the information about the operating status as follow:



53-1180 & 53-1183
0-10V & 4-20 mA,

OFF	○	No power supply
Green blinking	◐	Moving to position
Green blinking	◑	End stroke confirmation
Green steady ON	●	Position reached
Red blinking	◐	Auto-zero calibration (Duration 30 - 60 sec)
Red steady ON	●	Control signal lost

53-1184
0-10V & 4-20 mA
Feedback signal

OFF	○	No power supply
Green blinking	◐	Moving to position
Green steady ON	●	Position reached
Red blinking SLOW	◐	Auto-stroke calibration (Duration 60 - 120 sec)
Red blinking FAST	◐	Sticking Error
Red steady ON	●	Control signal lost

53-1181 & 53-1182
3-position

OFF	○	No power supply
Green blinking	◐	Moving to position
Green blinking	◑	End stroke confirmation
Green steady ON	●	End Stroke reached

Frese OPTIMA Compact actuators DN10-DN32

Configuration motoric actuators

53-1180, 53-1183 and 53-1184

Dip switch 1-2-3

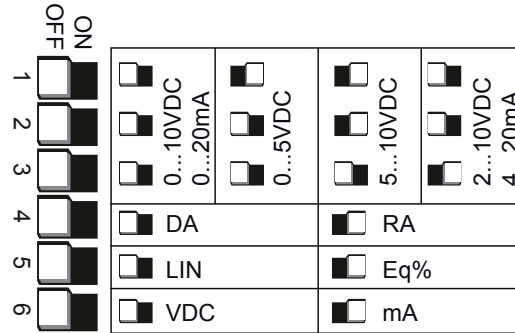
Control signal: Factory setting 0-10V

4-20 mA control signal:

- Set dip switch 6 to mA
- Set dip switch 1-2-3 as below



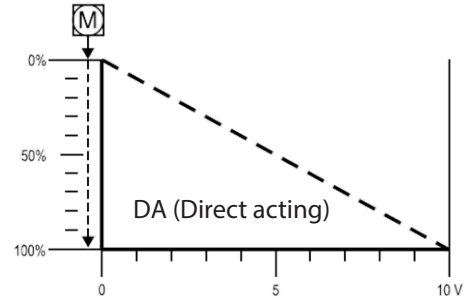
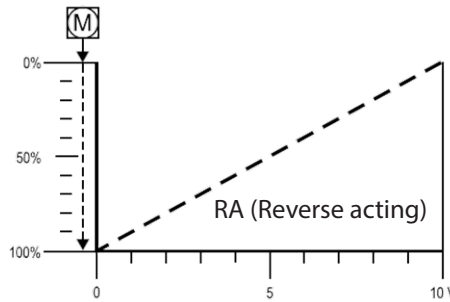
*On 53-1184 dip switches 7 and 8 are not used



Dip switch 4

Stem action

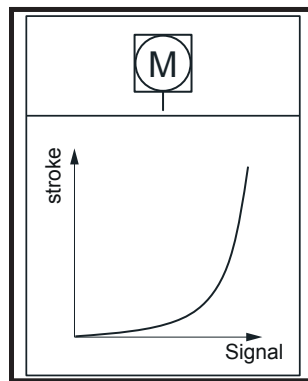
Factory setting RA (Reverse acting)



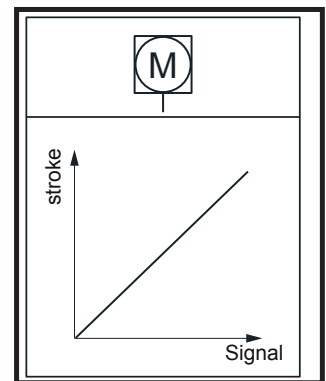
Dip switch 5

Actuator characterization

Factory setting EQ%



EQ% characterization



Linear characterization

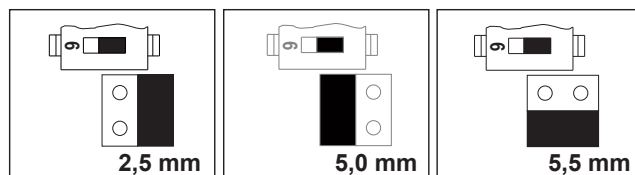
53-1180, 53-1183

The actuator stroke can be selected via the Jumper and can be set to 2.5 mm - 5.0 mm or 5.5 mm

53-1180: Factory setting 5.5 mm

53-1183: Factory setting 2.5 mm

***53-1184:** Selfcalibrating with no Jumper



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