

DBS60E-S4EC00S79

DBS60



Illustration may differ

Ordering information

Туре	part no.
DBS60E-S4EC00S79	1088412

Other models and accessories → www.sick.com/DBS60



Detailed technical data

Features

Special device	✓
Specialty	Customer-specific pin assignment
Standard reference device	DBS60E-S4EC00500

Safety-related parameters

MTTF _D (mean time to dangerous failure) 500 years (EN ISO 13849-1) 1)
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¹⁾ This product is a standard product and does not constitute a safety component as defined in the Machinery Directive. Calculation based on nominal load of components, average ambient temperature 40°C, frequency of use 8760 h/a. All electronic failures are considered hazardous. For more information, see document no. 8015532.

Performance

Pulses per revolution	500
Measuring step	≤ 90°, electric/pulses per revolution
Measuring step deviation	± 18° / pulses per revolution
Error limits	Measuring step deviation x 3
Duty cycle	≤ 0.5 ± 5 %

Interfaces

Communication interface	Incremental
Communication Interface detail	HTL / Push pull
Number of signal channels	6-channel
Initialization time	< 5 ms ¹⁾
Output frequency	+ 300 kHz ²⁾
Load current	≤ 30 mA, per channel
Power consumption	≤ 1 W (without load)

 $^{^{1)}\,\}mathrm{Valid}$ signals can be read once this time has elapsed.

Electronics

Connection type	Male connector, M12, 8-pin, radial, Customer-specific pin assignment
Supply voltage	10 27 V

 $^{^{1)}\,\}mbox{Short-circuit}$ opposite to another channel, US or GND permissable for maximum 30 s.

 $^{^{2)}}$ Up to 450 kHz on request.

Reference signal, number	1
Reference signal, position	90°, electric, logically gated with A and B
Reverse polarity protection	√
Short-circuit protection of the outputs	✓ ¹)

 $^{^{1)}}$ Short-circuit opposite to another channel, US or GND permissable for maximum 30 s.

Mechanics

Mechanical design	Solid shaft, face mount flange
Shaft diameter	10 mm With flat
Shaft length	19 mm
Flange type / stator coupling	Flange with 3 x M3 and 3 x M4
Weight	$+ 0.3 \text{ kg}^{1)}$
Shaft material	Stainless steel
Flange material	Aluminum
Housing material	Aluminum
Start up torque	+ 1.2 Ncm (+20 °C)
Operating torque	1.1 Ncm (+20 °C)
Permissible shaft loading	100 N (radial) ²⁾ 50 N (axial) ²⁾
Operating speed	6,000 min ^{-1 3)}
Maximum operating speed	9,000 min ⁻¹ ⁴⁾
Moment of inertia of the rotor	33 gcm ²
Bearing lifetime	3.6 x 10 ⁹ revolutions
Angular acceleration	≤ 500,000 rad/s²

 $^{^{1)}}$ Based on encoder with male connector or cable with male connector.

Ambient data

EMC	According to EN 61000-6-2 and EN 61000-6-3
Enclosure rating	IP67, housing side (IEC 60529) ¹⁾ IP65, shaft side (IEC 60529)
Permissible relative humidity	90 % (Condensation not permitted)
Operating temperature range	-20 °C +85 °C ²⁾
Storage temperature range	-40 °C +100 °C, without package
Resistance to shocks	250 g, 3 ms (EN 60068-2-27)
Resistance to vibration	30 g, 10 Hz 2,000 Hz (EN 60068-2-6)

¹⁾ With mating connector fitted.

Certificates

EU declaration of conformity	1
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²⁾ Higher values are possible using limited bearing life.

 $^{^{\}rm 3)}$ Allow for self-heating of 3.2 K per 1,000 rpm when designing the operating temperature range.

⁴⁾ Maximum speed which does not cause mechanical damage to the encoder. Impact on the service life and signal quality is possible. Please note the maximum output frequency.

²⁾ These values relate to all mechanical versions including recommended accessories unless otherwise noted.

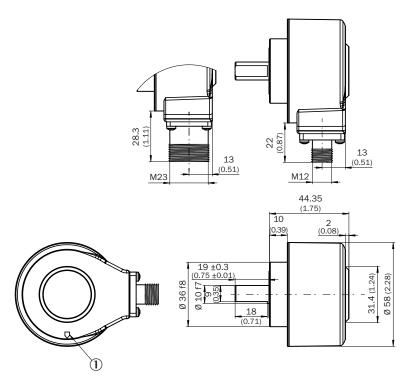
DBS60E-S4EC00S79 | DBS60 INCREMENTAL ENCODERS

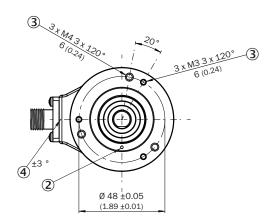
UK declaration of conformity	✓
ACMA declaration of conformity	✓
China RoHS	✓
cULus certificate	✓
Information according to Art. 3 of Data Act (Regulation EU 2023/2854)	✓

Classifications

ECLASS 5.0 27270501 ECLASS 5.1.4 27270501 ECLASS 6.0 27270590
ECLASS 6.0 27270590
ECLASS 6.2 27270590
ECLASS 7.0 27270501
ECLASS 8.0 27270501
ECLASS 8.1 27270501
ECLASS 9.0 27270501
ECLASS 10.0 27270501
ECLASS 11.0 27270501
ECLASS 12.0 27270501
ETIM 5.0 EC001486
ETIM 6.0 EC001486
ETIM 7.0 EC001486
ETIM 8.0 EC001486
UNSPSC 16.0901 41112113

Dimensional drawing



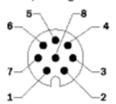


Dimensions in mm (inch)

- ① Zero pulse mark on housing
- 2 Zero pulse mark on flange
- 3 depth
- ④ male connector tolerance in relation to hole pattern

PIN assignment

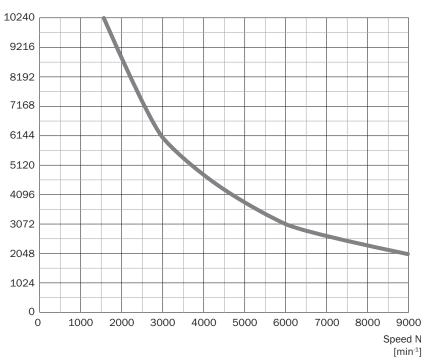
View of M12 device connector on cable/housing



Pin, 8-pin in M12	Signal TTL, HTL	Explanation
1	GND	Ground connecion of the encoder
2	+U _s	Versorgungsspannung
3	A+	Signal line
4	A-	Signal line
5	B+	Signal line
6	B-	Signal line
7	R+	Signal line
8	R-	Signal line
-		
-		
-		
-		
Screen		

Diagrams

Pulses per revolution



Recommended accessories

Other models and accessories → www.sick.com/DBS60

	Brief description	Туре	part no.
connectors ar	nd cables		
	Connection type head A: Female connector, M12, 8-pin, straight Connection type head B: Flying leads Signal type: Incremental, SSI Cable: 2 m, 8-wire, PUR, halogen-free Description: Incremental, shielded, SSI Connection systems: Flying leads	DOL-1208-G02MAC1	6032866
	Connection type head A: Female connector, M12, 8-pin, straight Connection type head B: Flying leads Signal type: Incremental, SSI Cable: 5 m, 8-wire, PUR, halogen-free Description: Incremental, shielded, SSI Connection systems: Flying leads	DOL-1208-G05MAC1	6032867
	Connection type head A: Female connector, M12, 8-pin, straight Connection type head B: Flying leads Signal type: Incremental, SSI Cable: 10 m, 8-wire, PUR, halogen-free Description: Incremental, shielded, SSI Connection systems: Flying leads	DOL-1208-G10MAC1	6032868
	Connection type head A: Female connector, M12, 8-pin, straight Connection type head B: Flying leads Signal type: Incremental, SSI Cable: 20 m, 8-wire, PUR, halogen-free Description: Incremental, shielded, SSI Connection systems: Flying leads	DOL-1208-G20MAC1	6032869
	Connection type head A: Female connector, M12, 8-pin, straight Connection type head B: Flying leads Signal type: Incremental, SSI Cable: 25 m, 8-wire, PUR, halogen-free Description: Incremental, shielded, SSI Connection systems: Flying leads	DOL-1208-G25MAC1	6067859
	Connection type head A: Female connector, M12, 8-pin, straight, A-coded Signal type: Incremental, SSI Cable: CAT5, CAT5e Description: Incremental, shieldedSSI Connection systems: IDC quick connection Permitted cross-section: 0.14 mm² 0.34 mm²	DOS-1208-GA01	6045001
1000	Connection type head A: Female connector, M12, 8-pin, straight, A-coded Connection type head B: Male connector, M12, 8-pin, straight, A-coded Cable: 2 m, 8-wire, PUR, halogen-free Description: Shielded Permitted cross-section: ≤ 0.25 mm² Note: Drag chain use Application: Drag chain operation	YF2AA8-020S01M- KA18	2099207
100	Connection type head A: Female connector, M12, 8-pin, straight, A-coded Connection type head B: Male connector, M12, 8-pin, straight, A-coded Cable: 5 m, 8-wire, PUR, halogen-free Description: Shielded Permitted cross-section: ≤ 0.25 mm² Note: Drag chain use Application: Drag chain operation	YF2AA8-050S01M- KA18	2099209
1000	Connection type head A: Female connector, M12, 8-pin, straight, A-coded Connection type head B: Male connector, M12, 8-pin, straight, A-coded Cable: 10 m, 8-wire, PUR, halogen-free Description: Shielded Permitted cross-section: ≤ 0.25 mm² Note: Drag chain use Application: Drag chain operation	YF2AA8-100S01M- KA18	2099210
1	• Connection type head A: Female connector, M12, 8-pin, straight, A-coded • Connection type head B: Male connector, M12, 8-pin, straight, A-coded • Cable: 20 m, 8-wire, PUR, halogen-free • Description: Shielded • Permitted cross-section: ≤ 0.25 mm² • Note: Drag chain use	YF2AA8-200S01M- KA18	2099208

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	Brief description	Туре	part no.
	Application: Drag chain operation		
	Connection type head A: Flying leads Connection type head B: Flying leads Signal type: SSI, Incremental, HIPERFACE® Items supplied: By the meter Cable: 8-wire, PUR, halogen-free Description: SSI, shielded, Incremental, HIPERFACE®	LTG-2308-MWENC	6027529
	Connection type head A: Flying leads Connection type head B: Flying leads Signal type: SSI, Incremental Items supplied: By the meter Cable: 11-wire, PUR Description: SSI, shielded, Incremental	LTG-2411-MW	6027530
	Connection type head A: Flying leads Connection type head B: Flying leads Signal type: SSI, Incremental Items supplied: By the meter Cable: 12-wire, PUR, halogen-free Description: SSI, shielded, Incremental	LTG-2512-MW	6027531
\	Connection type head A: Flying leads Connection type head B: Flying leads Signal type: SSI, TTL, HTL, Incremental Items supplied: By the meter Cable: 12-wire, UV and saltwater-resistant, PUR, halogen-free Description: SSI, shielded, TTL, HTL, Incremental	LTG-2612-MW	6028516

	Brief description	Туре	part no.
Mounting sys	tems		
V	Description: Mounting bracket for encoder with spigot 36 mm for face mount flange Items supplied: Mounting kit included	BEF-WF-36	2029164
	 Description: Mounting angle spring-loaded, for flange with centerring collar 36 mm, working temperature range -40° +120°C Material: Aluminum Details: Aluminum 	BEF-WF36F	4084775
	Description: Flange adapter, adaptation of face mount flange with 36 mm centering hub to 50 mm servo flange, aluminum, including 3 flat head screws M4 x 10 Material: Aluminum Details: Aluminum Items supplied: Including 3 countersunk screws M3 x 10	BEF-FA-036-050	2029160
(B) C	Description: Flange adapter, adaptation of face mount flange with 36 mm centering hub to 60 mm square mounting plate, aluminum, including 3 flat head screws M4 x 8 Material: Aluminum Details: Aluminum Items supplied: Including 3 countersunk screws M4 x 8	BEF-FA-036-060REC	2029162
	 Description: Flange adapter, adaptation of face mount flange with 36 mm centering hub to 58 mm square mounting plate with shock absorbers, aluminum Material: Aluminum Details: Aluminum 	BEF-FA-036-060RSA	2029163
	Description: Flange adapter, adaptation of face mount flange with 36 mm centering hub to 63 mm square mounting plate, aluminum, including 3 flat head screws M4 x 8 Material: Aluminum Details: Aluminum Items supplied: Including 3 countersunk screws M4 x 8	BEF-FA-036-063REC	2034225
	Description: Flange adapter, adaptation of face mount flange with 36 mm centering hub to 100 mm servo flange with 60 mm centering hub, aluminum Material: Aluminum Details: Aluminum	BEF-FA-036-100	2029161
	Description: Bearing block for servo and face mount flange encoder. The heavy-duty bearing block is used to absorb very large radial and axial shaft loads. Particularly when using belt pulleys, chain sprockets, friction wheels. Operating speed max. 4,000 rpm^-1, axial shaft load 150 N, radial shaft load 250 N, bearing service life 3.6 x 10^9 revolutions	BEF-FA-LB1210	2044591
	Description: Flange adapter (adapts size 60 face mount flange encoder to bearing block with part. no. 2044591)	BEF-FA-036-050-019	2063378
	Description: Mounting kit for servo flange encoder on the bearing block, 1 bar coupling SKPS	BEF-MK-LB	5320872

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Brief description	Туре	part no.
 Items supplied: 1 bar coupling SKPS 1520 06/06 1 hexagon socket wrench SW1.5 DIN 911, 3 mounting eccentric BEMN 1242 49 3 screws M4 x 10 DIN 912, 1 hexagon socket wrench SW3 DIN 911 		

	Brief description	Туре	part no.	
shaft adaptation				
	 Product segment: Shaft adaptation Product: Shaft couplings Description: Bellows coupling, shaft diameter 6 mm / 10 mm, maximum shaft offset: radial ± 0.25 mm, axial ± 0.4 mm, angular +/- 4°; max. speed 10,000 rpm, -30 °C to +120 °C, max. torque 120 Ncm; material: stainless steel bellows, aluminum hub 	KUP-0610-B	5312982	
10	 Product segment: Shaft adaptation Product: Shaft couplings Description: Double loop coupling, shaft diameter 6 mm / 10 mm, max. shaft offset: radially +/-2,5 mm, axially +/-3 mm, angle +/- 10 degrees;max. speed 3.000 rpm, -30 to +80 degrees Celsius, torsional spring stiffness of 25 Nm/rad 	KUP-0610-D	5326697	
	 Product segment: Shaft adaptation Product: Shaft couplings Description: Spring washer coupling, shaft diameter 6 mm / 10 mm, Maximum shaft offset: radial +/- 0.3 mm, axial +/- 0.4 mm, angular +/- 2.5°; max. speed 12,000 rpm, -10° to +80 °C, max. torque 60 Ncm; material: aluminum flange, glass fiber-reinforced polyamide membrane and hardened steel coupling pin 	KUP-0610-F	5312985	
	 Product segment: Shaft adaptation Product: Shaft couplings Description: Bar coupling, shaft diameter 6 mm / 10 mm, max. shaft offset: radial ± 0,3 mm, axial ± 0,3 mm, angular ± 3°; max. speed 10.000 rpm, -10° to +80 °C, max. torque: 80 Ncm, material: fiber-glass reinforced polyamide, aluminum hub 	KUP-0610-S	2056407	
10	 Product segment: Shaft adaptation Product: Shaft couplings Description: Double loop coupling, shaft diameter 8 mm / 10 mm, max. shaft offset: radially +/-0,25 mm, axially +/-0,4 mm, angle +/- 4 degrees;max. speed 10.000 rpm, -30 to +120 degrees Celsius, torsional spring stiffness of 150 Nm/rad 	KUP-0810-D	5326704	
0	 Product segment: Shaft adaptation Product: Shaft couplings Description: Bar coupling, shaft diameter 8 mm / 10 mm, max. shaft offset: radial ± 0,3 mm, axial ± 0,3 mm, angular ± 3°; max. speed 10.000 rpm, -10° to +80 °C, max. torque: 80 Ncm, material: fiber-glass reinforced polyamide, aluminum hub 	KUP-0810-S	5314178	
	 Product segment: Shaft adaptation Product: Shaft couplings Description: Bellows coupling, shaft diameter 10 mm/10 mm; maximum shaft offset: radial +/-0.25 mm, axial +/-0.4 mm, angular +/-4°; max. revolutions 10,000 rpm, -30° to +120°C, max. torque 120 Ncm; material: stainless steel bellows, aluminum clamping hubs 	KUP-1010-B	5312983	
10	 Product segment: Shaft adaptation Product: Shaft couplings Description: Double loop coupling, shaft diameter 10 mm / 10 mm, Maximum shaft offset: radial +/- 2.5 mm, axial +/- 3 mm, angular +/- 10°; max. speed 3,000 rpm, -30° to +80°C, max. torque 1.5 Nm; material: polyurethane, galvanized steel flange 	KUP-1010-D	5326703	
(i	 Product segment: Shaft adaptation Product: Shaft couplings Description: Spring washer coupling, shaft diameter 10 mm / 10 mm, maximum shaft offset, radial ± 0.3 mm, axial ± 0.4 mm, angle ± 2.5°, torsion spring stiffness 30 Nm/rad; material: aluminum flange, glass-fiber reinforced polyamide membrane and hardened steel coupling pin 	KUP-1010-F	5312986	
0	 Product segment: Shaft adaptation Product: Shaft couplings Description: Bar coupling, shaft diameter 10 mm / 10 mm; maximum shaft offset: radial ± 0.3 mm, axial ± 0.2 mm, angular ± 3°; speed 10,000 rpm, -10° to +80° Celsius, max. torque 80 Ncm; material: glass fiber-reinforced polyamide, aluminum hub 	KUP-1010-S	2056408	
	 Product segment: Shaft adaptation Product: Shaft couplings Description: Spring coupling, shaft diameter 10 mm / 10 mm, maximum shaft offset: radial ± 1.5 mm, axial ± 1.0 mm, angular ± 5°, max. speed 3,000 rpm, -30° to +120 °Celsius, nominal torque 150 Ncm, rotational angle at half nominal torque, direction of rotation right viewed on driving shaft 40°, left viewed on driving shaft 60°, material: spring steel 1.0600 nickel plated, zinc die cast hubs 	KUP-1010-W	5319914	
	 Product segment: Shaft adaptation Product: Shaft couplings 	KUP-1012-B	5312984	

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	Brief description	Туре	part no.
	• Description: 10 mm / 12 mm; maximum shaft offset: radial +/- 0.25 mm, axial +/- 0.4 mm, angular +/- 4° ; max. revolutions 10,000 rpm, -30 $^\circ$ to +120 $^\circ$ C, max. torque 120 Ncm; material: stainless steel bellows, aluminum clamping hubs		
10	 Product segment: Shaft adaptation Product: Shaft couplings Description: Claw coupling, shaft diameter 8 mm / 10 mm, damping element 80 shore blue, maximum shaft offset: radial ± 0.22 mm, axial ± 1 mm angular ± 1.3°, max. speed 19,000 rpm, angle of twist max. 10°, -30 °C to +80 °C, max. torque 800 Ncm, tightening torque of screws: ISO 4029 150 Ncm, material: aluminum flange, damping element: polyurethane 	KUP-0810-J	2128267
10	 Product segment: Shaft adaptation Product: Shaft couplings Description: Claw coupling, shaft diameter 10 mm / 10 mm, damping element 80 shore blue, maximum shaft offset: radial ± 0.22 mm, axial ± 1 mm angular ± 1.3°, max. speed 19,000 rpm, angle of twist max. 10°, -30 °C to +80 °C, max. torque 800 Ncm, tightening torque of screws: ISO 4029 150 Ncm, material: aluminum flange, damping element: polyurethane 	KUP-1010-J	2127054

	Brief description	Туре	part no.	
measuring wheels and measuring wheel mechanics				
3-11-15	Product segment: Measuring wheels and measuring wheel mechanics Product: Measuring wheel mechanics Description: SICK modular measuring wheel system for face mount flange encoder with S4 mechanical design (10 mm x 19 mm solid shaft), e.g., DFS60-S4: with 0-ring measuring wheel, circumference 200 mm Suitable for: Face mount flange encoder DFS60, DBS60, AFM60, AFS60, mechanical design S4 (solid shaft 10 mm x 19 mm)	BEF-MRS-10-U	2085714	
	 Product segment: Measuring wheels and measuring wheel mechanics Product: Measuring wheels Description: Aluminium measuring wheel with 0-ring (NBR70) for 10 mm solid shaft, circumference 200 mm 	BEF-MR010020R	2055224	
	Product segment: Measuring wheels and measuring wheel mechanics Product: Measuring wheels Description: Aluminium measuring wheel with O-ring (NBR70) for 10 mm solid shaft, circumference 300 mm	BEF-MR010030R	2049278	
	 Product segment: Measuring wheels and measuring wheel mechanics Product: Measuring wheels Description: Measuring wheel with O-ring (NBR70) for 10 mm solid shaft, circumference 500 mm 	BEF-MR010050R	2055227	
	 Product segment: Measuring wheels and measuring wheel mechanics Product: Measuring wheels Description: Aluminum measuring wheel with cross-knurled surface for 10 mm solid shaft, circumference 200 mm 	BEF-MR10200AK	4084737	
9	Product segment: Measuring wheels and measuring wheel mechanics Product: Measuring wheels Description: Aluminum measuring wheel with smooth polyurethane surface for 10 mm solid shaft, circumference 200 mm	BEF-MR10200AP	4084738	
	Product segment: Measuring wheels and measuring wheel mechanics Product: Measuring wheels Description: Aluminum measuring wheel with ridged polyurethane surface for 10 mm solid shaft, circumference 200 mm	BEF-MR10200APG	4084740	
	Product segment: Measuring wheels and measuring wheel mechanics Product: Measuring wheels	BEF-MR10200APN	4084739	

Brief description	Туре	part no.
Description: Aluminum measuring wheel with studded polyurethane surface for 10 mm solid shaft, circumference 200 mm		
Product segment: Measuring wheels and measuring wheel mechanics Product: Measuring wheels Description: Aluminum measuring wheel with cross-knurled surface for 10 mm solid shaft, circumference 500 mm	BEF-MR10500AK	4084733
Product segment: Measuring wheels and measuring wheel mechanics Product: Measuring wheels Description: Aluminum measuring wheel with smooth polyurethane surface for 10 mm solid shaft, circumference 500 mm	BEF-MR10500AP	4084734
Product segment: Measuring wheels and measuring wheel mechanics Product: Measuring wheels Description: Aluminum measuring wheel with ridged polyurethane surface for 10 mm solid shaft, circumference 500 mm	BEF-MR10500APG	4084736
Product segment: Measuring wheels and measuring wheel mechanics Product: Measuring wheels Description: Aluminum measuring wheel with studded polyurethane surface for 10 mm solid shaft, circumference 500 mm	BEF-MR10500APN	4084735
 Product segment: Measuring wheels and measuring wheel mechanics Product: Measuring wheel mechanics Description: O-ring for measuring wheels (circumference 200 mm) 	BEF-OR-053-040	2064061
 Product segment: Measuring wheels and measuring wheel mechanics Product: Measuring wheel mechanics Description: O-ring for measuring wheels (circumference 300 mm) Items supplied: 2x O-ring 	BEF-OR-083-050	2064076
 Product segment: Measuring wheels and measuring wheel mechanics Product: Measuring wheel mechanics Description: O-ring for measuring wheels (circumference 500 mm) 	BEF-OR-145-050	2064074

SICK AT A GLANCE

SICK is one of the leading manufacturers of intelligent sensors and sensor solutions for industrial applications. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in a wide range of industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

Comprehensive services complete our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

For us, that is "Sensor Intelligence."

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