

Control unit

For pointer instruments with inductive contacts

Model 904

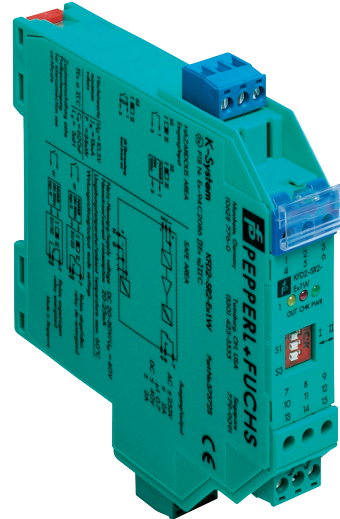
WIKA data sheet AC 08.04

Applications

- Control and regulation of industrial processes
- Monitoring of plants and switching of circuits
- Machine building, general plant construction, chemical industry, petrochemical industry, power plants, mining, on-/offshore and environmental technology

Special features

- Versions for Ex areas available
- 1 or 2 potential-free change-over contacts
- Case for DIN-rail mounting



Control unit model 904.28

Description

The model 904 control unit is used in combination with model 831 inductive contacts. The control unit consists of a power supply unit, a control element, a switching amplifier and a relay output. Certain versions are approved for the operation of inductive contacts in Ex areas.

Non-Ex areas

The direction of action is fixed for this design. The relay output is de-energised when the flag passes through the air gap. Cable break monitoring is included. In addition to the relay outputs for operating the contacts, an additional voltage output with DC 24 V (max. 20 mA) is available. With this, for example, control lamps or sensors can be supplied.

Ex areas

These intrinsically safe control units are type tested. With them, inductive contacts can be used in zone 1 or 2 Ex areas. The switch behaviour of the control unit can be manipulated by inserting wire bridges or through slide switches. In this way, a reversal of the direction of action can be achieved: e.g. the output relay is either de-energised or energised by the flag in the slot sensor. Cable break monitoring can be switched on, as required.

Non-Ex versions

Model	For connection to instruments	Relay output	Pin assignment
904.25 (MSR 010 I)	With 1 contact Model 831	1 change-over contact	L 42 11 14 Control unit MSR 010-I Isol.-Kl. C / 250 V ~ VDE 0110 IP 20 42 L 41 43 N 82 81 14 11 Voltage output: DC 24 V 41 43 82 81 N
904.26 (MSR 020 I)	With 2 contacts Model 831	2 change-over contacts	L 42 52 11 14 21 24 Control unit MSR 020-I Isol.-Kl. C / 250 V ~ VDE 0110 IP 20 42 52 L 41 43 53 N 82 81 24 14 11 21 Voltage output: DC 24 V 41 43 51 53 82 81 N
905.27 (MSR 011 I)	With 2 contacts Model 831	1 bistable change-over contact, can be used as a two-point controller (e.g. for interval switching with pump control)	L 42 11 14 12 Control unit MSR 011-I Isol.-Kl. C / 250 V ~ VDE 0110 IP 20 42 L 41 43 N 82 81 12 14 11 Voltage output: DC 24 V 41 43 82 81 N

Pointer instruments with 3 switch contacts can be operated by interconnecting the control units described above (e.g. 3 contacts with model 904.25 + model 904.26).

Specifications for models 904.25, 904.26 and 904.27

Basic information	
Case	
Mounting	DIN rail per EN 60715, TH 35
Material	Polyamide 6.6, red/black
Voltage supply	AC 230 V, -10 ... +6 %, 50 ... 60 Hz AC 115 V, -10 ... +6 %, 50 ... 60 Hz AC 24 V, -10 ... +6 %, 50 ... 60 Hz DC 24 V, -10 ... +15 %
Power consumption	
AC 115 V or AC 115 V	Approx. 6 VA
AC 24 V or DC 24 V	Approx. 1.5 VA/W

Output signal		
Relay output		
Model 904.25	1 x SPDT (single pole double throw)	
Model 904.26	2 x SPDT (single pole double throw)	
Model 904.27	1 x SPDT (single pole double throw), bistable	
Switching power in accordance with utilization category	AC1	250 V / 8 A
	AC13	250 V / 3 A
	DC1	250 V / 0.3 A
	DC13	250 V / 0.1 A
Pick-up delay	Approx. 10 ms	
Drop-out delay	Approx. 0.5 s	
Contact material	AgCdO or AgNi+Au	
Voltage output		
Supply voltage	DC 24 V, ± 10 %	
Current-carrying capacity	≤ 20 mA	

Electrical connection	
Connection type	Screw terminals
Wire cross-section	0.5 ... 2.5 mm ² (20 ... 14 AWG)
Pin assignment	→ See page 2

Operating conditions	
Rated insulation voltage	AC 250 V
Overvoltage category	III
Operating temperature range	0 ... 70 °C [32 ... 158 °F]
Ingress protection per IEC/EN 60529	IP20
Weight	
Model 904.25	Approx. 0.24 kg [0.53 lb]
Model 904.26	Approx. 0.27 kg [0.60 lb]
Model 904.27	Approx. 0.24 kg [0.53 lb]

Ex versions

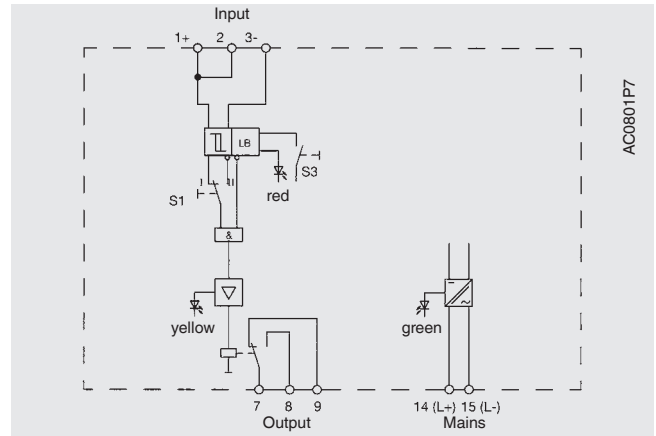
Control unit, model 904.28 KFU8-SR-Ex1.W

- For operating one measuring instrument with one inductive contact
- Intrinsically safe control circuit in accordance with NAMUR
- 1 relay output with change-over contact
- LED status display for mains (green), relay output (yellow) and cable break (red)

Note

Direction of action can be set with the slide switch, S1:

- | | |
|------------------------|--------------------------|
| Operating current: | Switch S1 in position I |
| Quiescent current: | Switch S1 in position II |
| Cable break detection: | Switch S3 in position I |



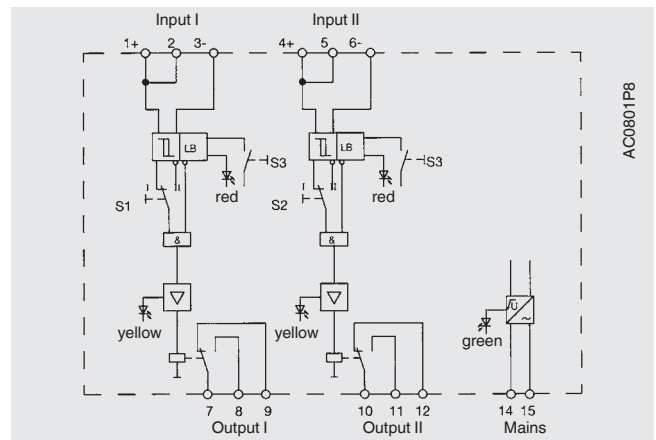
Control unit, model 904.29 KFU8-SR-Ex2.W

- To operate one measuring instrument with two inductive contacts or for two measuring instruments with only one inductive contact
- Intrinsically safe control circuit in accordance with NAMUR
- 2 relay outputs with 1 change-over contact each
- LED status display for mains (green), 2 x relay output (yellow) and 2 x cable break (red)

Note

Direction of action can be set with the slide switches, S1 & S2:

- | | |
|------------------------|---------------------------------|
| Operating current: | Switch S1 and S2 in position I |
| Quiescent current: | Switch S1 and S2 in position II |
| Cable break detection: | Switch S3 in position I |

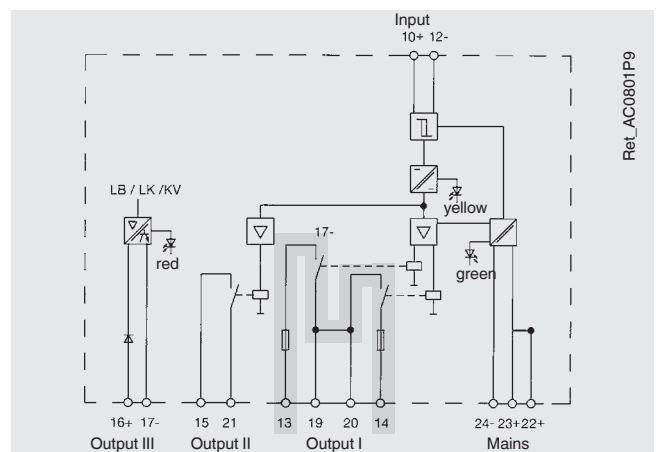


Fail-safe control unit

For safety-relevant circuits, type-tested parts are mandatory. Such approvals are provided by the **model 831 SN and 831 S1N safety inductive contacts**; → See Technical information IN 00.48. If these inductive contacts are operated **together** with the model **904.33** fail-safe control unit, this arrangement corresponds to the TÜV safety requirements for important circuits and is self-monitoring. If an error occurs (mechanical damage, power failure, component failure, short-circuit, cable break) within the circuit, the safe state is always established at the output.

Model 904.33 KFD2-SH-Ex1

- Fail-safe control unit
- For operating one measuring instrument with one SN or S1N fail-safe inductive contact
- Control circuit intrinsically safe [EEx ia] IIC
- 1 safety-related relay output, 1 incrementing output and 1 passive electronic output
- LED status display for mains (green), relay output (yellow) and cable break and short-circuit (red)



Specifications for models 904.28, 904.29 and 904.33

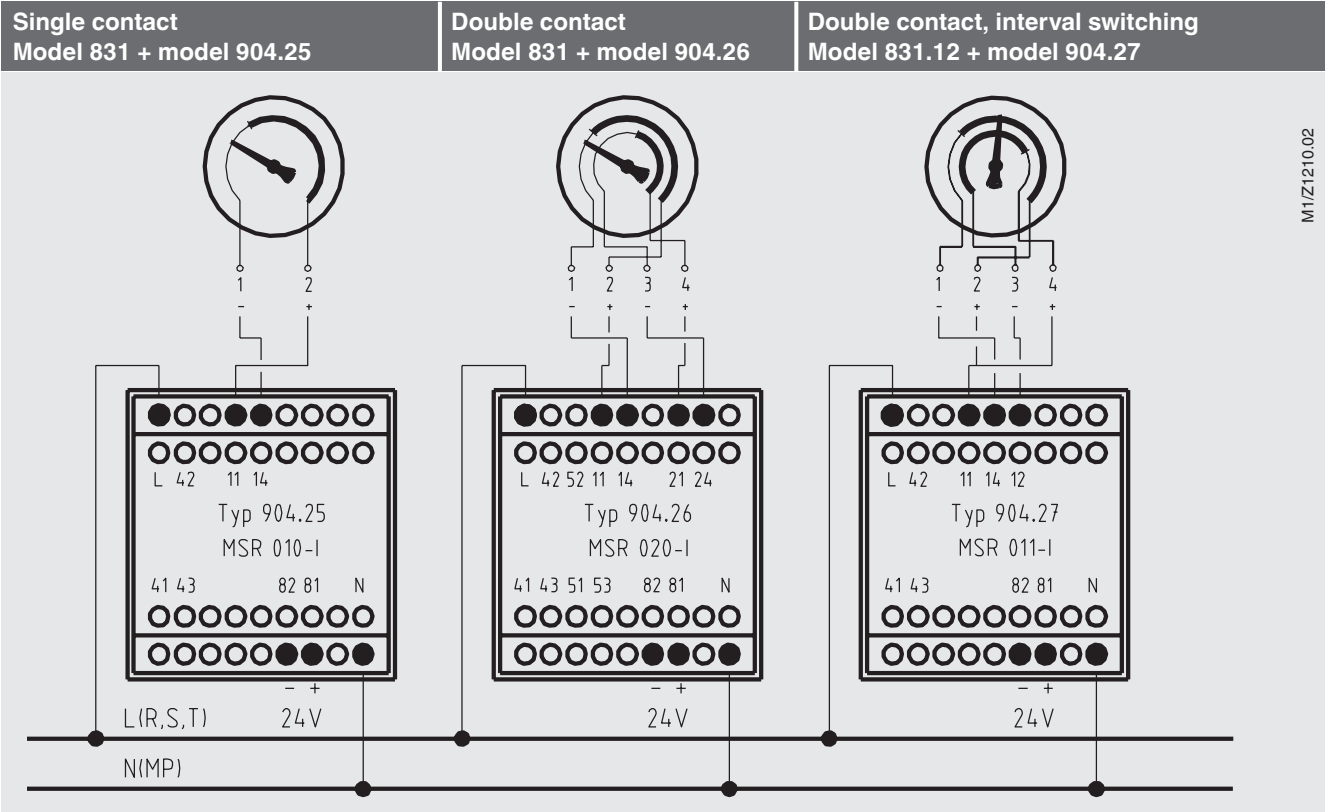
Specifications	Model 904.28 KFU8-SR-Ex1.W	Model 904.29 KFU8-SR-Ex2.W	Model 904.33, safety equipment KFD2-SH-Ex1
Voltage supply	DC 19 ... 30 V or AC 90 ... 253 V, 50 ... 60 Hz	DC 19 ... 30 V or AC 90 ... 253 V, 50 ... 60 Hz	DC 20 ... 35 V
Power consumption	DC: ≤ 1 W or AC: 3 VA	DC: ≤ 1 W or AC: 3 VA	2.3 VA
Input			
Quantity	1	2	1
Open-circuit voltage	DC 8 V	DC 8 V	DC 8.4 V
Short-circuit current	8 mA	8 mA	11.7 mA
Switch point	$1.2 \text{ mA} \leq I_s \leq 2.1 \text{ mA}$	$1.2 \text{ mA} \leq I_s \leq 2.1 \text{ mA}$	$2.1 \text{ mA} \leq I_s \leq 5.9 \text{ mA}$
Switch hysteresis	Approx. 0.2 mA	Approx. 0.2 mA	Approx. 0.6 mA
Control line resistance	100 Ω	100 Ω	≤ 50 Ω
Safety-related characteristic values (Ex)			
Max. voltage U_0	DC 10.5 V	DC 10.5 V	DC 9.56 V
Max. current I_0	13 mA	13 mA	16.8 mA
Max. power P_0	34 mW	34 mW	41 mW
Perm. external capacitance	2.41 μF	2.41 μF	650 nF
Perm. external inductance	210 mH	210 mH	5 mH
Ex marking	I (M1) II (1) D II (1) G	I (M1) II (1) D II (1) G	I (M1) II (1) D II (1) G
Output signal			
Relay output	1 x SPDT (single pole double throw)	2 x SPDT (single pole double throw)	1 safety-related relay output
Load capacity AC	250 V, 2 A, 500 VA, $\cos \varphi > 0.75$	250 V, 2 A, 500 VA, $\cos \varphi > 0.75$	50 V, 1 A, $\cos \varphi > 0.7$
Load capacity DC	40 V, 2 A; resistive load	40 V, 2 A; resistive load	24 V, 1 A; resistive load
Pick-up delay	Approx. 20 ms	Approx. 20 ms	≤ 1 ms
Drop-out delay	Approx. 20 ms	Approx. 20 ms	≤ 1 ms
Max. switching frequency	10 Hz	10 Hz	5 Hz
Ambient conditions			
Operating temperature range	-40 ... 60 °C [-4 ... 140 °F]	-40 ... 60 °C [-4 ... 140 °F]	-20 ... 60 °C [-4 ... 140 °F]
Perm. relative humidity	≤ 95 %, non-condensing	≤ 95 %, non-condensing	≤ 95 %, non-condensing
Ingress protection per IEC/EN 60529	IP20	IP20	IP20
Case			
Design	Suitable for DIN rail per EN 60715, TH 35		
Material	Polycarbonate (PC)	Polycarbonate (PC)	Polycarbonate (PC)
Dimensions	Form D, see page 7	Form F, see page 7	Form E, see page 7
Weight	Approx. 0.15 kg [0.33 lb]	Approx. 0.15 kg [0.33 lb]	Approx. 0.28 kg [0.62 lb]
Order number	14692440	14692453	2307618

Further control units are available for operation with a voltage supply of DC 20 ... 30 V:

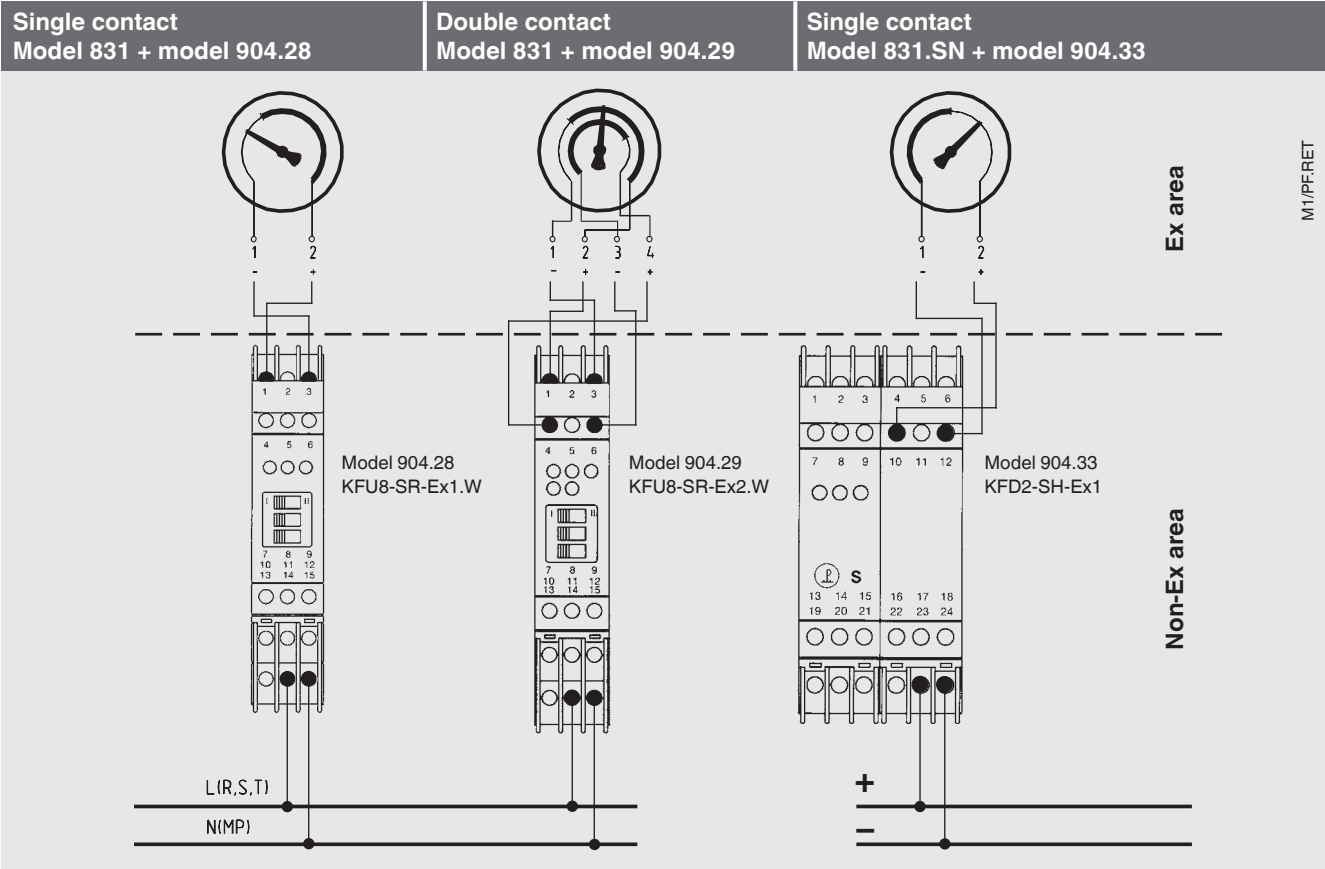
- Model 904.31 (KFD2-SR2-Ex1.W) - 1 relay output
Order number: 2114003
- Model 904.32 (KFD2-SR2-Ex2.W) - 2 relay outputs
Order number: 2143569

Connection examples

Non-Ex version, with model 904.2x control units



Ex version, with model 904.28/29/33 control units



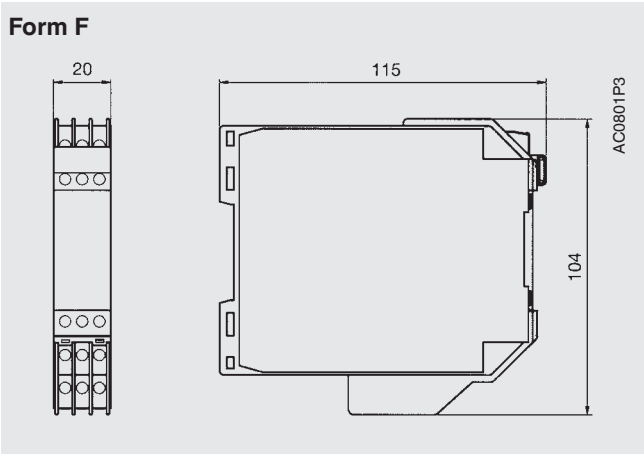
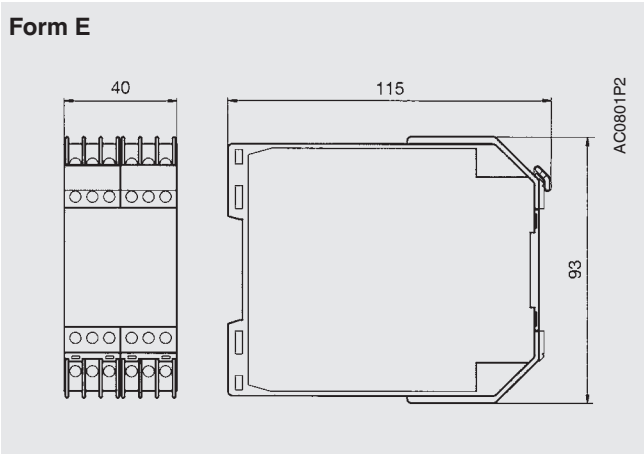
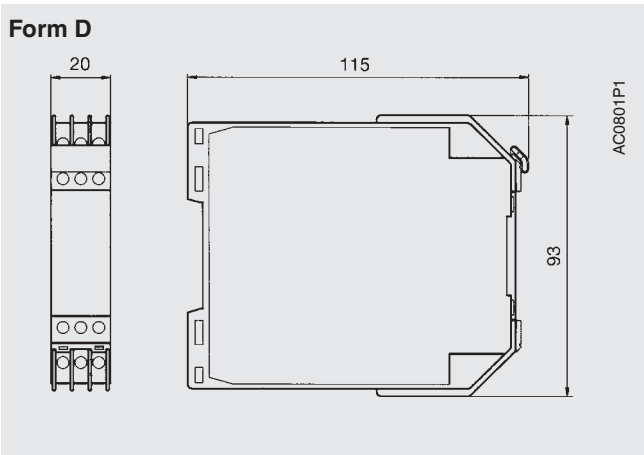
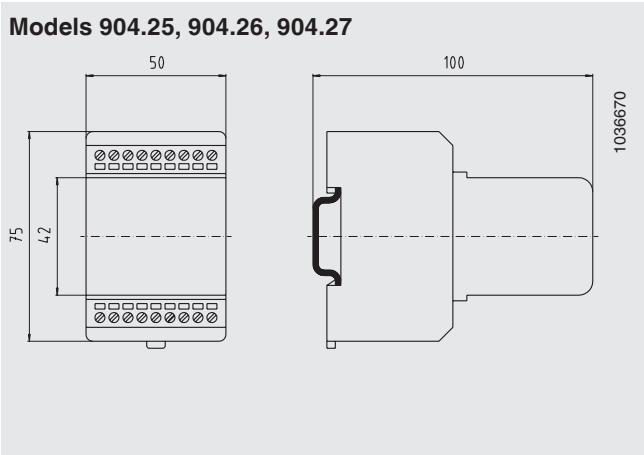
Approvals

Logo	Description	Region
CE	EU declaration of conformity	European Union
	EMC directive	
	Low voltage directive	
	RoHS directive (only models 904.28, 904.29 and 904.33)	

Approval for models 904.28, 904.29 and 904.33

Logo	Description	Region
Ex	EU declaration of conformity	European Union
	ATEX directive	
	Hazardous areas	

Dimensions in mm



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