

**CONTROL<sup>TM</sup>  
TECHNIQUES**

# DFS SERIES

HIGH POWER FREESTANDING DRIVES



Ready to use  
Fast turnaround

55 kW to 540 kW  
400 V | 690 V

**Nidec**  
All for dreams

## Efficient System Build

For many drive users, designing and building a high power drive cubicle requires extensive in house engineering expertise that they do not have...

**The DFS Drive is a pre-assembled, ready to install drive cubicle system** designed for use in high power applications where energy saving and high ingress protection are key. With fast, easy installation, plant availability is maximised with virtually zero requirement from your engineering resource.





# Key Highlights

## Ready to use: Easy set-up

- Industry standard cubicles which integrate with your existing installation (for sizes see page 10)
- Includes power disconnect and fuses
- Pre-installed options available include:
  - EMC filter
  - Energy monitoring
  - 24V back-up supply wiring
  - Empty sections can be integrated for customer equipment and installation cables
- See page 11 for full list of options
- Water cooling is available on request

### Fast turnaround

Control Techniques Drive Centres and Partners have all the tools required to generate fast quotations to minimise delays in the ordering process.

- For emergency breakdowns where a replacement drive is needed quickly, DFS can be shipped in as little as one week.
- Standard lead-times are six weeks.

### Easy set-up

- Door-mounted multi-language HMI for easy commissioning
- Real time clock for enhanced diagnostics
- Connect PC tool for optimised commissioning
  - Full parameter management features including cloning
  - Real time visualisation and manipulation of drive control system with dynamic logic diagrams



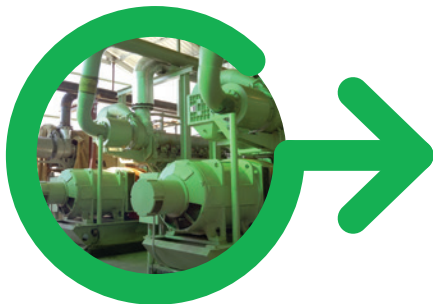
# DFS Series Freestanding Drives, the perfect solution across industry.





## Fans & pumps

- Fan & pump macros, plus onboard logic functions
- Water hammer control, and catch a spinning motor
- On-board Fire Mode
- Improved energy efficiency during low demand



## Compressors

- On board PLC & PID functionalities for advanced control without the cost and footprint of an external controller
- Energy efficiency and optimal control for increased Coefficient of Performance (CoP)



## General Automation

- Maximum control for conveyors with S-ramp acceleration/deceleration profiling and RFC-A automated load control
- Efficient control of mixer applications and up to 200% overload
- Closed-loop control for cranes and hoists for precision accuracy
- Reliability and control for crushers
- Precision and repeatability for extruder applications
- High energy efficiency and torque control for tunneling and drilling applications and up to 200% overload

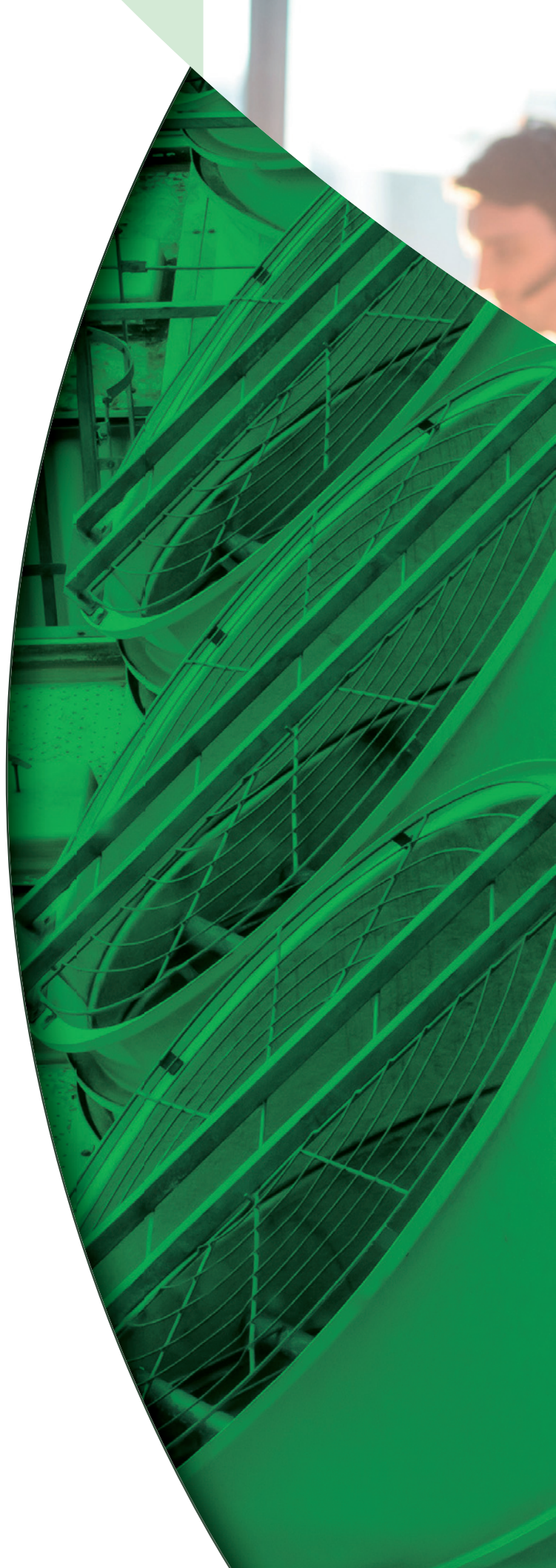
# Maintain plant uptime with high reliability, easy maintenance and fast service support

## Rugged, reliable drive systems

- Highly robust cabinets with ingress protection options to meet the needs of the application
  - IP23 as standard
  - IP54 as selectable option
  - IP55 water-cooled on request
- Cabinet temperature control via intelligent fan system
- Built with stringent quality controls with full traceability and rigorous testing gives our plant ISO-9001 accreditation
- High quality auxiliary components sourced from leading automation industry vendors

## Optimum local service support to minimise downtime

- Control Techniques is active in 70 countries and offers global support from local Drive Centers or Partners
- Rapid on-site support, in your language, from highly qualified and experienced service and application engineers
- Efficient service with replacement parts available locally
- Comprehensive online support including: Drive set-up, diagnostic tool and online support







## Drive set-up

Quickly find everything you need for quick and easy installation of your drives **Visit: [www.drive-setup.com](http://www.drive-setup.com)**



## Diagnostics tool

Quickly solve any error codes that the drive may show

**You can download our Diagnostics Tool app at:**  
**[www.controltechniques.com/mobile-applications](http://www.controltechniques.com/mobile-applications)**



## Download support

Comprehensive collection of manuals available for download from  
**[www.controltechniques.com](http://www.controltechniques.com)** or **scan the QR code**



## Certification

Each cubicle is CE marked



## Warranty

For peace of mind, all components are covered by our  
**2 year warranty as standard**

# Maximum versatility variants for every application

DFS is available with a control stage to suit any application:

- Industrial automation systems based upon induction or servo motors, where control dynamics are key.
- HVAC/R systems where dedicated drive features provide overall system control.
- DFS supports the latest high-efficiency motors to maximise return on investment and minimise impact on the environment.

## Select from:

**Unidrive M700, M701, M702 or Powerdrive F300 control**



<b>M700</b>	<b>Ethernet</b>	<ul style="list-style-type: none"> <li>■ Onboard real-time multi-protocol Ethernet</li> <li>■ 1 x Safe Torque Off (STO) certified to SIL3/PLe</li> <li>■ Analog and digital I/O</li> </ul>
<b>M701</b>	Unidrive SP replacement	<p>Designed to match Control Techniques' highly popular Unidrive SP feature-set.</p> <ul style="list-style-type: none"> <li>■ Modbus RTU over RS485 communications</li> <li>■ 1 x STO certified to SIL3/PLe</li> <li>■ Analog and digital I/O</li> </ul>
<b>M702</b>	Safety enhanced	<ul style="list-style-type: none"> <li>■ Onboard real-time multi-protocol Ethernet</li> <li>■ 2 x STO certified to SIL3/ PLe</li> <li>■ Digital I/O - If analog I/O is required, this can be provided by an SI-I/O option module.</li> </ul>
<b>F300</b>	Process	<p>Optimum energy efficiency for fan, pump and compressor applications. Powerdrive F300 works with permanent magnet or induction motors to deliver the most efficient performance and highest energy savings for fan, pump and compressor applications.</p>

Please refer to the individual product brochures for full information

## Output frequency

DFS drives have a maximum output frequency of 599Hz and are, therefore, not subject to special export controls.





# DFS1

Door-mounted  
HMI

AC input  
disconnect  
operator

Optional  
cylinder lock  
with key

Door  
air  
filters

Fuse holder

Energy  
meter  
(Optional)

AC input  
disconnect

Motor  
connections &  
brake terminal

Drive control  
terminals

Roof fan  
supply  
transformer

IP54  
roof fan

Plinth: 100 mm standard  
200 mm optional

# DFS2

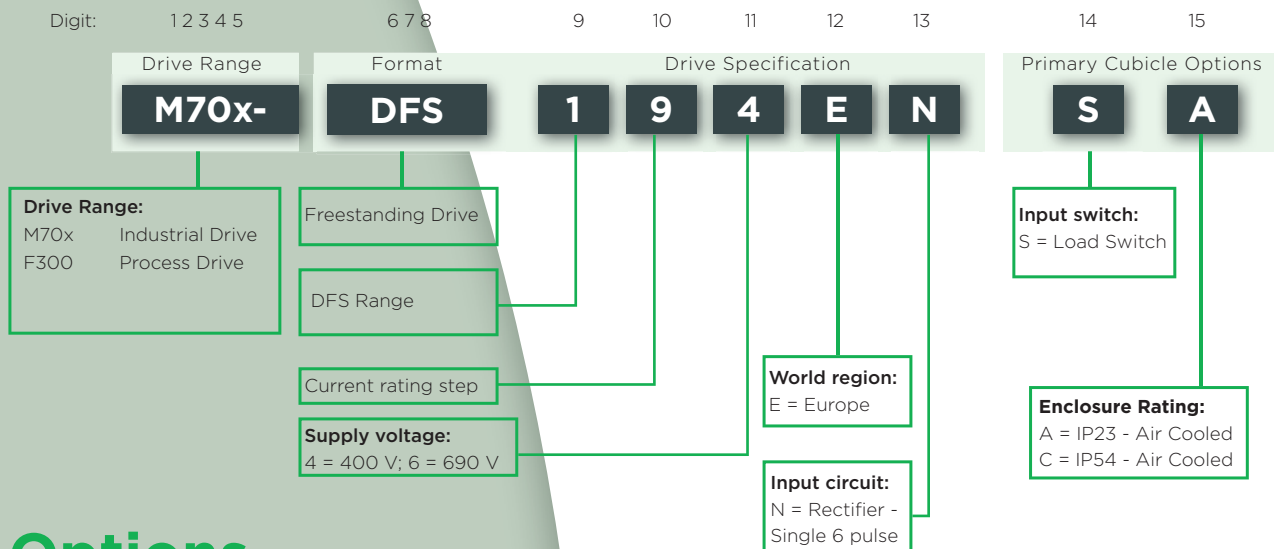


## DFS DIMENSIONS





# Order Code



## Options

Feature	Description
Enclosure rating	A = IP23 (Standard) C = IP54 - Air inlet grill filters
Electrical environment	EMC filter to meet generic emission IEC 61000-6-4 or operate in the First Environment
	Remove internal EMC filter for use on un earthed supplies
	Remove MOV protection for use on un earthed supplies
AC Input Disconnect	A - Main switch with undervoltage release coil 230 VAC (MN) B - Main switch with undervoltage release coil 24 VAC (MN) C - Main switch with shunt trip voltage release coil 230 VAC (MX) D - Main switch with shunt trip voltage release coil 24 VAC (MX) 2 x auxiliary contacts on main switch - supply and wiring
Emergency stop push button door mounted	For integration in your control system
Cubicle Options	Cabinet temperature-controlled roof fan Plinth 200mm. Standard plinth is 100mm Alternative 180 ° door hinges for improved access Cylinder lock with key for extra cubicle security
Energy Monitoring	A - kWh meter Conventional (IP54) with current transducers (non MID) B - kWh meter Modbus RTU with current transducers (non MID) C - kWh meter Profibus (400 V SUPPLY ONLY) with current transducers (non MID) D - kWh meter Ethernet with current transducers (non MID) kWh meter pulse contacts in combination with A, B, C OR D kWh meters
24 V back-up power	Supply wiring installed for external 24V backup power supply
Additional Cubicles	A - Integrated 400 mm empty cubicle with plinth, cable plates INCLUDING mounting plate For your system equipment B - Integrated 400 mm empty cubicle with plinth, cable plates and WITHOUT mounting plate For your installation cable management
Packaging	Packaging for land freight as standard Packaging for air freight available at extra cost

# Drive selection for 380/480 VAC

*load switch, fuses and IP23 protection as standard*

35°C Ambient   IP23 and IP54					40°C Ambient   IP23 and IP54				
380/480 VAC ±10%   50 Hz					380/480 VAC ±10%   50 Hz				
Order Code (Short)	Normal Duty 110 %		Heavy Duty Open Loop = 150 % RFC = 175 %		Order Code (Short)	Normal Duty 110 %		Heavy Duty Open Loop = 150 % RFC = 175 %	
	xxxx = F300, M700, M701, M702		xxxx = M700, M701, M702			xxxx = F300, M700, M701, M702		xxxx = M700, M701, M702	
	Max Cont. Current	Motor Shaft Power	Max Cont. Current	Motor Shaft Power		Max Cont. Current	Motor Shaft Power	Max Cont. Current	Motor Shaft Power
	(A)	(kW)	(A)	(kW)		(A)	(kW)	(A)	(kW)
xxxx-DFSIG4EN	155	75	134	55	xxxx-DFSIG4EN	155	75	134	55
xxxx-DFSIH4EN	184	90	157	75	xxxx-DFSIH4EN	184	90	152	75
xxxx-DFSIJ4EN	221	110	180	90	xxxx-DFSIJ4EN	221	110	180	90
			200 (2 kHz)					200 (2 kHz)	
xxxx-DFSIK4EN	255	132	211	110	xxxx-DFSIK4EN	221	132	180	110
	266 (2 kHz)	132 (2 kHz)	224 (2 kHz)	110 (2 kHz)		221 (2 kHz)		200 (2 kHz)	
xxxx-DFSIL4EN	320	160	270	132	xxxx-DFSIL4EN	320	160	270	132
xxxx-DFSIM4EN	361	200	307	160	xxxx-DFSIM4EN	341	200	295	160
			320 (2 kHz)	160 (2 kHz)				314 (2 kHz)	
xxxx-DFSIN4EN	437	225	377	200	xxxx-DFSIN4EN	426	225	377	200
xxxx-DFSIP4EN	460	250	417	225	xxxx-DFSIP4EN	438	250	398	225
	487 (2 kHz)	250 (2 kHz)				475 (2 kHz)		416 (2 kHz)	
xxxx-DFSIQ4EN	460	250	415	225	xxxx-DFSIQ4EN	438	250	398	225
	507 (2 kHz)	280 (2 kHz)	464 (2 kHz)	250 (2 kHz)		485 (2 kHz)	280 (2 kHz)	441 (2 kHz)	250 (2 kHz)
xxxx-DFS2L4EN	608	315	513	270	xxxx-DFS2L4EN	608	315	513	270
xxxx-DFS2M4EN	686	370	583	315	xxxx-DFS2M4EN	648	370	560	315
			608 (2 kHz)	315 (2 kHz)		669 (2 kHz)		596 (2 kHz)	
xxxx-DFS2N4EN	830	450	716	380	xxxx-DFS2N4EN	809	450	716	380
						830 (2 kHz)			
xxxx-DFS2P4EN	874	470	792	420	xxxx-DFS2P4EN	831	470	755	420
	925 (2 kHz)	500 (2 kHz)				902 (2 kHz)	500 (2 kHz)	790 (2 kHz)	
xxxx-DFS2Q4EN	874	470	789	420	xxxx-DFS2Q4EN	831	470	755	420
	963 (2 kHz)	520 (2 kHz)	882 (2 kHz)	470 (2 kHz)		921 (2 kHz)	520 (2 kHz)	838 (2 kHz)	470 (2 kHz)

Higher powers can be quoted on request

#### NOTES

- 3 kHz Switching Frequency except where stated otherwise
- "kW" are motor dependant and for indication only
- A braking transistor is included in all drives
- Remaining digits of order code generated automatically for customer selected cubicle options



# Drive selection for 500/690 VAC

load switch, fuses and IP23 protection as standard

35°C Ambient   IP23 and IP54					40°C Ambient   IP23 and IP54				
500/690 VAC   ±10%   50 Hz					500/690 VAC   ±10%   50 Hz				
Order Code (Short)	Normal Duty 110 %		Heavy Duty Open Loop = 150 % RFC = 175 %		Order Code (Short)	Normal Duty 110 %		Heavy Duty Open Loop = 150 % RFC = 175 %	
	xxxx = F300, M700, M701, M702		xxxx = M700, M701, M702			xxxx = F300, M700, M701, M702		xxxx = M700, M701, M702	
	Max Cont. Current	Motor Shaft Power	Max Cont. Current	Motor Shaft Power		Max Cont. Current	Motor Shaft Power	Max Cont. Current	Motor Shaft Power
	(A)	(kW)	(A)	(kW)		(A)	(kW)	(A)	(kW)
xxxx-DFS166EN	86	75	63	55	xxxx-DFS166EN	86	75	63	55
xxxx-DFS176EN	108	90	86	75	xxxx-DFS176EN	103 106 (2 kHz)	90	86	75
xxxx-DFS186EN	125	110	104	90	xxxx-DFS186EN	125	110	104	90
xxxx-DFS196EN	155	132	131	110	xxxx-DFS196EN	155	132	131	110
xxxx-DFS1A6EN	172	160	150	132	xxxx-DFS1A6EN	172	160	150	132
xxxx-DFS1B6EN	197	185	178	160	xxxx-DFS1B6EN	197	185	178	160
xxxx-DFS1C6EN	225	200	210	185	xxxx-DFS1C6EN	215	200	205 210 (2 kHz)	185
xxxx-DFS1D6EN	265	235	221	185	xxxx-DFS1D6EN	253	235	211	185
	275 (2 kHz)	250 (2 kHz)	238 (2 kHz)	200 (2 kHz)		263 (2 kHz)	250 (2 kHz)	238 (2 kHz)	200 (2 kHz)
xxxx-DFS1E6EN	265	235	221	185	xxxx-DFS1E6EN	253	235	211	185
	305 (2 kHz)	280 (2 kHz)	263 (2 kHz)	250 (2 kHz)		301 (2 kHz)	280 (2 kHz)	254 (2 kHz)	250 (2 kHz)
xxxx-DFS2A6EN	327	300	285	260	xxxx-DFS2A6EN	327	300	285	260
xxxx-DFS2B6EN	374	355	338	315	xxxx-DFS2B6EN	374	355	338	315
xxxx-DFS2C6EN	428	400	399	370	xxxx-DFS2C6EN	409	400	390 399 (2 kHz)	370
xxxx-DFS2D6EN	504	440	420	370	xxxx-DFS2D6EN	481	440	400	370
	523 (2 kHz)	490 (2 kHz)	452 (2 kHz)	420 (2 kHz)		499 (2 kHz)	490 (2 kHz)	452 (2 kHz)	420 (2 kHz)
xxxx-DFS2E6EN	504	440	420	370	xxxx-DFS2E6EN	481	440	400	370
	580 (2 kHz)	540 (2 kHz)	500 (2 kHz)	460 (2 kHz)		571 (2 kHz)	540 (2 kHz)	483 (2 kHz)	460 (2 kHz)

Higher powers can be quoted on request

## NOTES

- 3 kHz Switching Frequency except where stated otherwise
- "kW" are motor dependant and for indication only
- A braking transistor is included in all drives
- Remaining digits of order code generated automatically for customer selected cubicle options

DFS SERIES

# Nidec

All for dreams

## #1 for advanced motor and drive technology

Nidec Corporation is a global manufacturer of electric motors and drives. Founded in 1973, Nidec has worldwide operations and a workforce of more than 110,000 who develop, manufacture and install motors, drives and control systems in industrial plants, automobiles, home appliances, office equipment and information technology.



**110,000**  
EMPLOYEES  
WORLDWIDE



**\$11B**  
GROUP  
TURNOVER



**70+**  
COUNTRIES



**230+**  
COMPANIES



# CONTROL<sup>TM</sup> TECHNIQUES

## DRIVE SPECIALISTS SINCE 1973

Drives: they're what we do. Whether you're designing a new machine or installing a replacement, we know you need quick delivery and an easy set up, with the confidence that your drive's going to keep on performing with accurate control.

So leave it to the specialists. We've dedicated ourselves to designing and manufacturing variable speed drives since 1973. This means quick set up, high reliability, maximum motor control and fast, efficient service.



**1,000+**  
OEM  
CUSTOMERS



**5M+**  
INSTALLED  
DRIVES



**1,500+**  
EMPLOYEES  
WORLDWIDE



**70**  
COUNTRIES



### Global reach, local support

Highly experienced, locally based Application Engineers design and support drive technology to provide maximum value, wherever you are in the world.

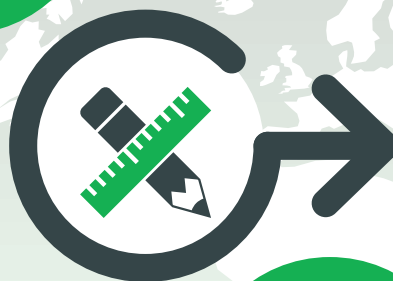
### Outstanding performance

The outstanding performance of our drives is the fruit of over 45 years of engineering experience in drive design.



### Technology you can rely on

Robust design and the highest build quality ensure the enduring reliability of the millions of drives installed around the world.



### Open design architecture

Based on open design architecture, our drives integrate with all primary communication protocols.



### Embedded intelligence

Precision motor control is combined with the highest embedded intelligence, ensuring maximum productivity and efficiency of your machinery.

A part of the Nidec Group

Connect with us at:



[www.controltechniques.com](http://www.controltechniques.com)



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**Control Techniques is your global drives specialist.**

With operations in over 70 countries, we're open for business wherever you are in the world.

For more information, or to find your local drive centre representatives, visit

[www.controltechniques.com](http://www.controltechniques.com)



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