

- 24-hour Telephone Number: (937) 847-3200
- Use for urgent or emergency needs for technical support, service and/or replacement parts
- Routine Technical Inquiries: [techsupport@motoman.com](mailto:techsupport@motoman.com)
- Allow up to 36 hours for response

## MOTOMAN-GP50,GP35L SUPPLEMENTAL INSTRUCTIONS

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**TYPE:****YR-1-06VX50-C00 (Drip-proof Specification)****YR-1-06VXL35-C00 (Drip-proof Specification)**

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Upon receipt of the product and prior to initial operation, read these instructions thoroughly, and retain for future reference.

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### MOTOMAN INSTRUCTIONS

MOTOMAN-GP50,GP35L INSTRUCTIONS  
MOTOMAN-GP50,GP35L SUPPLEMENTAL INSTRUCTIONS  
YRC1000 INSTRUCTIONS  
YRC1000 OPERATOR'S MANUAL (GENERAL) (SUBJECT SPECIFIC)  
YRC1000 MAINTENANCE MANUAL  
YRC1000 ALARM CODES (MAJOR ALARMS) (MINOR ALARMS)

Please have the following information available when contacting Yaskawa Customer Support:

- System
- Primary Application
- Software Version (*Located on Programming Pendant by selecting: {Main Menu} - {System Info} - {Version}*)  
Robot Serial Number (*Located on robot data plate*)  
Robot Sales Order Number (*Located on controller data plate*)

Part Number: 186434-1CD  
Revision: 0

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## Introduction

This supplemental instruction manual describes MOTOMAN-GP50 for drip proof specifications (YR-1-06VX50-C00) and MOTOMAN-GP35L for drip proof specifications (YR-1-06VXL35-C00).

## Point of Difference

The YR-1-06VX50-C00 and YR-1-06VXL35-C00 differ from the YR-1-06VX50-A00 and YR-1-06VXL35-A00 in the following points:

- Grease for gear and each axis speed reducer
- IP65 for the IEC protection class of the manipulator

This manual differs from “MOTOMAN-GP50,GP35L INSTRUCTIONS” (Manual No. HW1484659) in the following points.

- 3.4 Location
- 3.5 Notes on Dust-Poof/Water-Proof Specifications
- 5.1 Basic Specifications
- 9.1 Inspection Schedule
- 9.4 Notes on Grease Replenishment/Exchange Procedures
- 10 Recommended Spare Parts

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### 3.4 Location

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### 3.4 Location

When installing a manipulator, it is necessary to satisfy the following environmental conditions:

- Ambient temperature: 0 to + 45°C
- Humidity: 20 to 80%RH
- Free from dust, soot, or oil
- Free from corrosive gas or liquid, or explosive gas or liquid
- Free from excessive vibration (Vibration acceleration:  $4.9 \text{ m/s}^2$  [0.5 G] or less)
- Free from large electrical noise (plasma)
- Free from the strong magnetic field
- Altitude: 1000 m or less
- Flatness for installation: 0.5 mm or less



When the operation is started after the manipulator has been out of operation and left in the low temperature (almost 0°C) for a long period, the alarm may occur since the friction torque of the drive unit is large. If the alarm occurs, perform the break-in for few minutes.

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### 3.5 Notes on Dust-Poof/Water-Proof Specifications

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## 3.5 Notes on Dust-Poof/Water-Proof Specifications

The YR-1-06VX50-C00 and YR-1-06VXL35-C00 conform to:

- IP67 for the wrist part
- IP65 for the main part of the manipulator



< Definition of IP (protection class) >

- Definition of IP67

IP6□: Protection from the entry of dust

IP□7: Protection from immersion in water with being submerged for a specified duration and pressure

- Definition of IP65

IP6□: Protection from the entry of dust

IP□5: Protection from water that is directly sprayed from any direction

However, the following precautions must be observed:

- Do not use the following liquids, because the rubber parts of the manipulator (gasket, oil seal, O-ring, etc.) may be deteriorated or corroded:
  - Organic solvent
  - Chlorine-based cutting fluid
  - Amine-based cleaning fluid
  - Corrosive substances such as acids, alkalis, or liquids/solutions causing rust
  - Other liquids/solutions to which nitrile-butadiene rubber (NBR) is not resistant
- After removing a gasket for parts replacement or maintenance/inspection, make sure to replace the gasket with a new one.
- Do not use cutting fluid or cleaning fluid which contains unknown chemical substances.

## 5.1 Basic Specifications

## 5.1 Basic Specifications

Table 5-1: Basic Specifications (YR-1-06VX50-C00)<sup>1)</sup>

| Item   |                          | Type | YR-1-06VX50-C00   |
|--|--------------------------|------|---|
| Structure  |                          |      | Vertically articulated                                    |
| Degree of freedom  |                          |      | 6   |
| Payload  | Wrist part               |      | 50 kg   |
|  | U-arm                    |      | 10 kg   |
| Repeatability <sup>2)</sup>                              |                          |      | ±0.07 mm  |
| Range of Motion  | S-Axis (turning)         |      | -180° - +180°   |
|  | L-Axis (lower arm)       |      | -90° - +135°  |
|  | U-Axis (upper arm)       |      | -80° - +206°  |
|  | R-Axis (wrist roll)      |      | -360° - +360°   |
|  | B-Axis (wrist pitch/yaw) |      | -125° - +125°   |
|  | T-Axis (wrist twist)     |      | -360° - +360°   |
| Maximum Speed  | S-Axis                   |      | 3.14 rad/s, 180°/s  |
|  | L-Axis                   |      | 3.11 rad/s, 178°/s  |
|  | U-Axis                   |      | 3.11 rad/s, 178°/s  |
|  | R-Axis                   |      | 4.36 rad/s, 250°/s  |
|  | B-Axis                   |      | 4.36 rad/s, 250°/s  |
|  | T-Axis                   |      | 6.28 rad/s, 360°/s  |
| Allowable Moment <sup>3)</sup>                           | R-Axis                   |      | 216 N•m (22 kgf•m)  |
|  | B-Axis                   |      | 216 N•m (22 kgf•m)  |
|  | T-Axis                   |      | 147 N•m (15 kgf•m)  |
| Allowable Inertia (GD <sup>2</sup> /4) <sup>3)</sup>     | R-Axis                   |      | 28 kg•m <sup>2</sup>                                      |
|  | B-Axis                   |      | 28 kg•m <sup>2</sup>                                      |
|  | T-Axis                   |      | 11 kg•m <sup>2</sup>                                      |
| Approx. Mass   |                          |      | 585 kg  |
| Protective enclosure                                     |                          |      | Body: IP65 Wrist part: IP67                               |
| Mounting method  |                          |      | Floor-mounted tilt-mounted, wall-mounted, ceiling-mounted |
| Power Capacity   |                          |      | 4.5 kVA   |
| Equivalent continuous sound pressure level <sup>4)</sup> |                          |      | 72 dB or less   |

1 SI units are used in this table. However, gravitational unit is used in ( ).

2 Conformed to ISO9283

3 Refer to *chapter 6.1 "Allowable Wrist Load"* for details on the allowable moment and the allowable inertia.

4 Conformed to equivalent continuous A-weighted sound pressure level measured in accordance with ISO11201 (EN31201).

1, Measurement is carried out when the maximum load is mounted to the manipulator and operated in the maximum speed.

2, Measurement is carried out:

-between 1.2 m and 1.5 m above the ground.

-400 mm away from the P-point maximum envelope.

## 5.1 Basic Specifications

Table 5-2: Basic Specifications (YR-1-06VXL35-C00)<sup>1)</sup>

| Item   |                          | Type | YR-1-06VXL35-C00  |
|--|--------------------------|------|---|
| Structure  |                          |      | Vertically articulated                                    |
| Degree of freedom  |                          |      | 6   |
| Payload  | Wrist part               |      | 35 kg   |
|  | U-arm                    |      | 10 kg   |
| Repeatability <sup>2)</sup>                              |                          |      | ±0.07 mm  |
| Range of Motion  | S-Axis (turning)         |      | -180° - +180°   |
|  | L-Axis (lower arm)       |      | -90° - +135°  |
|  | U-Axis (upper arm)       |      | -80° - +206°  |
|  | R-Axis (wrist roll)      |      | -360° - +360°   |
|  | B-Axis (wrist pitch/yaw) |      | -125° - +125°   |
|  | T-Axis (wrist twist)     |      | -360° - +360°   |
| Maximum Speed  | S-Axis                   |      | 3.14 rad/s, 180°/s  |
|  | L-Axis                   |      | 2.44 rad/s, 140°/s  |
|  | U-Axis                   |      | 3.11 rad/s, 178°/s  |
|  | R-Axis                   |      | 4.36 rad/s, 250°/s  |
|  | B-Axis                   |      | 4.36 rad/s, 250°/s  |
|  | T-Axis                   |      | 6.28 rad/s, 360°/s  |
| Allowable Moment <sup>3)</sup>                           | R-Axis                   |      | 147 N•m (15 kgf•m)  |
|  | B-Axis                   |      | 147 N•m (15 kgf•m)  |
|  | T-Axis                   |      | 78 N•m (8 kgf•m)  |
| Allowable Inertia<br>(GD <sup>2</sup> /4) <sup>3)</sup>  | R-Axis                   |      | 10 kg•m <sup>2</sup>                                      |
|  | B-Axis                   |      | 10 kg•m <sup>2</sup>                                      |
|  | T-Axis                   |      | 4 kg•m <sup>2</sup>                                       |
| Approx. Mass   |                          |      | 615 kg  |
| Protective enclosure                                     |                          |      | Body: IP65 Wrist part: IP67                               |
| Mounting method  |                          |      | Floor-mounted tilt-mounted, wall-mounted, ceiling-mounted |
| Power Capacity   |                          |      | 4.5 kVA   |
| Equivalent continuous sound pressure level <sup>4)</sup> |                          |      | 72 dB or less   |

1 SI units are used in this table. However, gravitational unit is used in ( ).

2 Conformed to ISO9283

3 Refer to *chapter 6.1 "Allowable Wrist Load"* for details on the allowable moment and the allowable inertia.

4 Conformed to equivalent continuous A-weighted sound pressure level measured in accordance with ISO11201 (EN31201).

1, Measurement is carried out when the maximum load is mounted to the manipulator and operated in the maximum speed.

2, Measurement is carried out:

-between 1.2 m and 1.5 m above the ground.

-400 mm away from the P-point maximum envelope.

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## 9.1 Inspection Schedule

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### 9.1 Inspection Schedule

Replace the following table with table 9-2 "Inspection Parts and Grease Used".

*Table 9-2: Inspection Parts and Grease Used*

| Inspection number | Grease used    | Items   |
|-------------------|----------------|---|
| 10, 11            | RV grease LB00 | Speed reducers for each axis<br>B- and T-axis gears |

### 9.4 Notes on Grease Replenishment/Exchange Procedures

Where the following types of grease appear in the manual, they should be replaced as follows:

Gear and each axis speed reducer

Molywhite RE No.00 to RV grease LB00

## 10 Recommended Spare Parts

It is recommended to keep the parts and components in the following table in stock as spare parts for the YR-1-06VX50-C00, YR-1-06VXL35-C00.

To purchase lead wires of the wire harness or etc., check the order/ manufacture no. and contact YASKAWA representative.

Product performance cannot be guaranteed when using spare parts from any company other than YASKAWA. The spare parts are ranked as follows:

- Rank A: Expendable and frequently replaced parts.
- Rank B: Parts for which replacement may be necessary as a result of frequent operation.
- Rank C: Drive unit.



For replacing parts in Rank B or Rank C, contact your YASKAWA representative.

Table 10-1: Recommend Spare Parts for the YR-1-06VX50-C00 (Sheet 1 of 3)

| Rank | Parts No. | Name   | Type           | Manufacturer                 | Qty   | Qty per Unit | Remarks   |
|------|-----------|--|----------------|------------------------------|-------|--------------|---|
| A    | 1         | Grease   | RV grease LB00 | YASKAWA Electric Corporation | 16 kg | -            |   |
| A    | 2         | Liquid Gasket  | TB1206C        | ThreeBond Co., Ltd.          | -     | -            |   |
| A    | 3         | Adhesive   | LOCTITE 243    | Henkel Japan Ltd             | -     | -            |   |
| A    | 4         | Sealing Bond for Flange                                | LOCTITE 518    | Henkel Japan Ltd             | -     | -            |   |
| A    | 5         | Seal Tape  | TB4501         | ThreeBond Co., Ltd.          | -     | -            |   |
| A    | 6         | Battery Pack   | HW1483880-A    | YASKAWA Electric Corporation | 1     | 3            |   |
| A    | 7         | Lead Wire for Battery Replacement                      | HW1471281-A    | YASKAWA Electric Corporation | 1     | -            |   |
| B    | 8         | Replacement Kit for S-Axis Speed Reducer <sup>1)</sup> | HW1485086-A    | YASKAWA Electric Corporation | 1     | 1            | Speed reducer: HW1382898-A<br>Input gear: HW0313741-1 |
| B    | 9         | Replacement Kit for L-Axis Speed Reducer <sup>1)</sup> | HW1485871-A    | YASKAWA Electric Corporation | 1     | 1            | Speed reducer: HW9381465-B<br>Input gear: HW9482771-A |
| B    | 10        | Replacement Kit for U-Axis Speed Reducer <sup>1)</sup> | HW1485872-A    | YASKAWA Electric Corporation | 1     | 1            | Speed reducer: HW0387753-A<br>Input gear: HW0313740-1 |



Table 10-1: Recommend Spare Parts for the YR-1-06VX50-C00 (Sheet 2 of 3)

| Rank | Parts No. | Name   | Type                            | Manufacturer                 | Qty | Qty per Unit | Remarks   |
|------|-----------|--|---------------------------------|------------------------------|-----|--------------|---|
| B    | 11        | Replacement Kit for R-Axis Speed Reducer <sup>1)</sup> | HW1485873-A                     | YASKAWA Electric Corporation | 1   | 1            | Speed reducer: HW0387754-A  |
| B    | 12        | Replacement Kit for B-Axis Speed Reducer <sup>1)</sup> | HW1485874-A                     | YASKAWA Electric Corporation | 1   | 1            | Speed reducer: HW0387737-B  |
| B    | 13        | Replacement Kit for T-Axis Speed Reducer <sup>1)</sup> | HW1485875-A                     | YASKAWA Electric Corporation | 1   | 1            | Speed reducer: HW0389043-A  |
| B    | 14        | Wrist Unit   | HW1173743-A                     | YASKAWA Electric Corporation | 1   | 1            |   |
| B    | 15        | Internal Wiring Harness                                | HW1173234-B                     | YASKAWA Electric Corporation | 1   | 1            |   |
| B    | 16        | Lead Wire for S-Axis Signal                            | HW1372597-AD                    | YASKAWA Electric Corporation | 1   | 1            | Lead wire between the S-axis motor and the multi-port connector             |
| B    | 17        | Lead Wire for L-Axis Signal                            | HW1372597-AE                    | YASKAWA Electric Corporation | 1   | 1            | Lead wire between the L-axis motor and the multi-port connector             |
| B    | 18        | Lead Wire for U-Axis Signal                            | HW1372597-AF                    | YASKAWA Electric Corporation | 1   | 1            | Lead wire between the U-axis motor and the multi-port connector             |
| B    | 19        | Lead Wire for R-Axis Signal                            | HW1372597-AG                    | YASKAWA Electric Corporation | 1   | 1            | Lead wire between the R-axis motor and the multi-port connector             |
| B    | 20        | Lead Wire for B-Axis Signal                            | HW1372597-AH                    | YASKAWA Electric Corporation | 1   | 1            | Lead wire between the B-axis motor and the multi-port connector             |
| B    | 21        | Lead Wire for T-Axis Signal                            | HW1372597-AI                    | YASKAWA Electric Corporation | 1   | 1            | Lead wire between the T-axis motor and the multi-port connector             |
| B    | 22        | Lead Wire  | HW1471359-A                     | YASKAWA Electric Corporation | 1   | 1            | Lead wire between the multi-port in the casing and the multi-port connector |
| C    | 23        | Bypass Cable   | HW1471212-C                     | YASKAWA Electric Corporation | 1   | -            | Signal lead wires for tentative recovery from failure                       |
| C    | 24        | S-Axis AC Servomotor                                   | SGM7G-30APK-YR1*<br>HW1385396-A | YASKAWA Electric Corporation | 1   | 1            |   |
| C    | 25        | L-Axis AC Servomotor                                   | SGM7G-37APK-YR1*<br>HW1385397-A | YASKAWA Electric Corporation | 1   | 1            |   |
| C    | 26        | U-Axis AC Servomotor                                   | SGM7G-13APK-YR1*<br>HW1385395-A | YASKAWA Electric Corporation | 1   | 1            |   |
| C    | 27        | R-, B-, and T-Axes AC Servomotor                       | SGM7G-09APK-YR1*<br>HW1385163-A | YASKAWA Electric Corporation | 1   | 3            |   |

## 10 Recommended Spare Parts

Table 10-1: Recommend Spare Parts for the YR-1-06VX50-C00 (Sheet 3 of 3)

| Rank | Parts No. | Name                   | Type        | Manufacturer                 | Qty | Qty per Unit | Remarks                              |
|------|-----------|------------------------|-------------|------------------------------|-----|--------------|--------------------------------------|
| C    | 28        | Multi-port Connector   | HW1384619-A | YASKAWA Electric Corporation | 1   | 3            |                                      |
| C    | 29        | Power Supply Board Box | HW1372944-A | YASKAWA Electric Corporation | 1   | -            |                                      |
| C    | 30        | Dummy Connector        | HW1471285-A | YASKAWA Electric Corporation | 1   | -            | For dismounting function of the axis |

- 1 Replacement kit for the speed reducer includes the speed reducer and the gear described in the Remarks. For details of the replacement kit for the speed reducer, contact your YASKAWA representatives.

Table 10-2: Recommend Spare Parts for the YR-1-06VXL35-C00 (Sheet 1 of 2)

| Rank | Parts No. | Name   | Type           | Manufacturer                 | Qty   | Qty per Unit | Remarks   |
|------|-----------|--|----------------|------------------------------|-------|--------------|---|
| A    | 1         | Grease   | RV grease LB00 | YASKAWA Electric Corporation | 16 kg | -            |   |
| A    | 2         | Liquid Gasket  | TB1206C        | ThreeBond Co., Ltd.          | -     | -            |   |
| A    | 3         | Adhesive   | LOCTITE 243    | Henkel Japan Ltd             | -     | -            |   |
| A    | 4         | Sealing Bond for Flange                                | LOCTITE 518    | Henkel Japan Ltd             | -     | -            |   |
| A    | 5         | Seal Tape  | TB4501         | ThreeBond Co., Ltd.          | -     | -            |   |
| A    | 6         | Battery Pack   | HW1483880-A    | YASKAWA Electric Corporation | 1     | 3            |   |
| A    | 7         | Lead Wire for Battery Replacement                      | HW1471281-A    | YASKAWA Electric Corporation | 1     | -            |   |
| B    | 8         | Replacement Kit for S-Axis Speed Reducer <sup>1)</sup> | HW1485086-A    | YASKAWA Electric Corporation | 1     | 1            | Speed reducer: HW1382898-A<br>Input gear: HW0313741-1           |
| B    | 9         | Replacement Kit for L-Axis Speed Reducer <sup>1)</sup> | HW1485881-A    | YASKAWA Electric Corporation | 1     | 1            | Speed reducer: HW9381465-A<br>Input gear: HW0409103-1           |
| B    | 10        | Replacement Kit for U-Axis Speed Reducer <sup>1)</sup> | HW1485872-A    | YASKAWA Electric Corporation | 1     | 1            | Speed reducer: HW0387753-A<br>Input gear: HW0313740-1           |
| B    | 11        | Replacement Kit for R-Axis Speed Reducer <sup>1)</sup> | HW1485873-A    | YASKAWA Electric Corporation | 1     | 1            | Speed reducer: HW0387754-A                                      |
| B    | 12        | Replacement Kit for B-Axis Speed Reducer <sup>1)</sup> | HW1485874-A    | YASKAWA Electric Corporation | 1     | 1            | Speed reducer: HW0387737-B                                      |
| B    | 13        | Replacement Kit for T-Axis Speed Reducer <sup>1)</sup> | HW1485875-A    | YASKAWA Electric Corporation | 1     | 1            | Speed reducer: HW0389043-A                                      |
| B    | 14        | Wrist Unit   | HW1173743-A    | YASKAWA Electric Corporation | 1     | 1            |   |
| B    | 15        | Internal Wiring Harness                                | HW1173234-A    | YASKAWA Electric Corporation | 1     | 1            |   |
| B    | 16        | Lead Wire for S-Axis Signal                            | HW1372597-AD   | YASKAWA Electric Corporation | 1     | 1            | Lead wire between the S-axis motor and the multi-port connector |
| B    | 17        | Lead Wire for L-Axis Signal                            | HW1372597-AE   | YASKAWA Electric Corporation | 1     | 1            | Lead wire between the L-axis motor and the multi-port connector |
| B    | 18        | Lead Wire for U-Axis Signal                            | HW1372597-AF   | YASKAWA Electric Corporation | 1     | 1            | Lead wire between the U-axis motor and the multi-port connector |

## 10 Recommended Spare Parts

Table 10-2: Recommend Spare Parts for the YR-1-06VXL35-C00 (Sheet 2 of 2)

| Rank | Parts No. | Name                             | Type                            | Manufacturer                 | Qty | Qty per Unit | Remarks   |
|------|-----------|----------------------------------|---------------------------------|------------------------------|-----|--------------|---|
| B    | 19        | Lead Wire for R-Axis Signal      | HW1372597-AG                    | YASKAWA Electric Corporation | 1   | 1            | Lead wire between the R-axis motor and the multi-port connector             |
| B    | 20        | Lead Wire for B-Axis Signal      | HW1372597-AH                    | YASKAWA Electric Corporation | 1   | 1            | Lead wire between the B-axis motor and the multi-port connector             |
| B    | 21        | Lead Wire for T-Axis Signal      | HW1372597-AI                    | YASKAWA Electric Corporation | 1   | 1            | Lead wire between the T-axis motor and the multi-port connector             |
| B    | 22        | Lead Wire                        | HW1471359-A                     | YASKAWA Electric Corporation | 1   | 1            | Lead wire between the multi-port in the casing and the multi-port connector |
| C    | 23        | Bypass Cable                     | HW1471212-C                     | YASKAWA Electric Corporation | 1   | -            | Signal lead wires for tentative recovery from failure                       |
| C    | 24        | S-Axis AC Servomotor             | SGM7G-30APK-YR1*<br>HW1385396-A | YASKAWA Electric Corporation | 1   | 1            |   |
| C    | 25        | L-Axis AC Servomotor             | SGM7G-37APK-YR1*<br>HW1385397-A | YASKAWA Electric Corporation | 1   | 1            |   |
| C    | 26        | U-Axis AC Servomotor             | SGM7G-13APK-YR1*<br>HW1385395-A | YASKAWA Electric Corporation | 1   | 1            |   |
| C    | 27        | R-, B-, and T-Axes AC Servomotor | SGM7G-09APK-YR1*<br>HW1385163-A | YASKAWA Electric Corporation | 1   | 3            |   |
| C    | 28        | Multi-port Connector             | HW1384619-A                     | YASKAWA Electric Corporation | 1   | 3            |   |
| C    | 29        | Power Supply Board Box           | HW1372944-A                     | YASKAWA Electric Corporation | 1   | -            |   |
| C    | 30        | Dummy Connector                  | HW1471285-A                     | YASKAWA Electric Corporation | 1   | -            | For dismounting function of the axis  |

1 Replacement kit for the speed reducer includes the speed reducer and the gear described in the Remarks. For details of the replacement kit for the speed reducer, contact your YASKAWA representatives.

# MOTOMAN-GP50,GP35L SUPPLEMENTAL INSTRUCTIONS

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