ROBO.666

Group 2: Industrial Robot in Harsh Conditions

Detailed Design Specification

Version: 0

Date:

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## Introduction?

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### Environment Conditions

Operating Environment: Indoor and outdoor.

Temperature Range: –40 to +40 °C.

Lighting Conditions: All lighting conditions, including direct sunlight and complete darkness.

Environmental factors: Dust, mud, moisture, snow and rain.

### Specification of materials

Steel Plate:

Dimension: 200x200x8 mm

Weight: approx. 2.5kg

Rebar:

Dimension: 25mm Dia x 3000mm long

Weight: 11.56kg

## Hardware Components

### Manipulator

### End effector

A grey metal object with a hole

Description automatically generated

Material: 304 stainless steel

Dimension: 125(L) x 100 (W) x 204.5 (H) mm

Total weight: 3.85 kg

Operating temperature: -40 to +40°C

Humidity: 0 – 90%

IP rating: IP67

Gripper:

Type: Pneumatic Magnetic Gripper

Dimension: 80 (L) x 55 (W) x 114 (H) mm

Weight: 2.4 kg

Operating temperature: 0 to +40°C (Heating / Low temperature graded internal sealant required for subzero temperature)

Humidity: 0 – 90%

Supplied air requirement: 6.0 bar, water separation, particle filter ≤ 5 µm

Gripping capacity: 13kg (Safety Factor 3)

Residual gripping capacity: 0.1kg max.

\*\* Additional heating at the end effector is required to prevent condensation forming inside the magnetic gripper.

Alternative:

Type: Electro-permanent Magnetic Gripper

Advantages:

No moving parts

Can be sealed completely to achieve IP69.

Vibration resistant

No heating required

[FluxGrip FG40 datasheet – Zubax Robotics](https://files.zubax.com/products/com.zubax.fluxgrip/FluxGrip_FG40_datasheet.pdf)

Disadvantage:

Cannot find available product in the market for the payload in our application

### Bolt tray

### Sensors

Type: Inductive Proximity Sensor

Dimension: 67 (L) x 40 (W) x 40 (H) mm

Weight: 130 g

IP rating: IP69K

Operating temperature: -40 to +85°C

Range: 0 - 40mm

Operating voltage: 10-60 VDC

Output: DO

## Software Components

### Control system