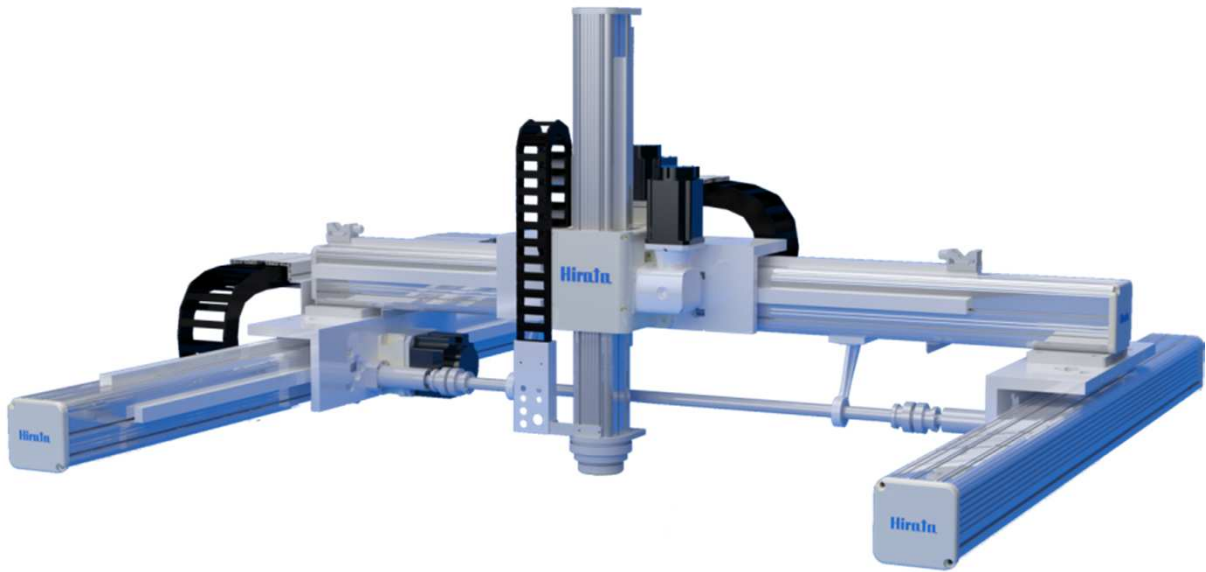


GR-1750 series

Hirata



- ◆ Long Stroke
- ◆ High Speed
- ◆ Standardized Wide Variety
- ◆ Adaptable to Heavy Duty

GR-1750 series

- Frame size 175 mm
- Travel stroke 100 mm ~ 100 m
- Operation speed 1 m/s ~ 5 m/s
- Maximum payload 250 kg

* These values may vary depending on the use conditions and environment.

Product Features

◆ Standardized Wide Variety Answers Customers' Needs

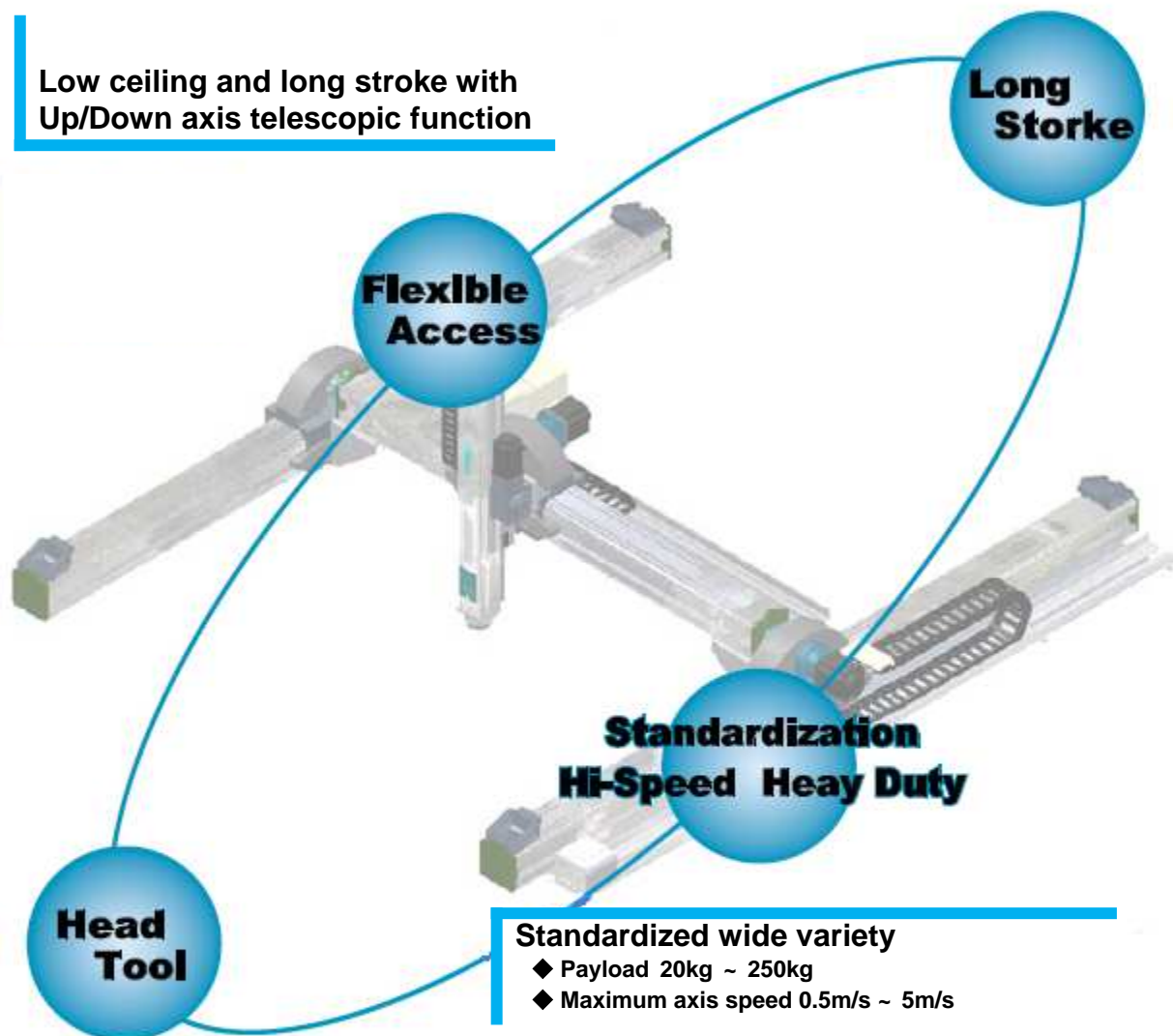
Long Stroke

(Proven stroke: 100mm ~ 100m)

- ◆ Rail power feeding apparatus
- ◆ Robot controller-equipped self-traveling drive
- ◆ Optical I/O interface



Low ceiling and long stroke with
Up/Down axis telescopic function



Head variations corresponding to various applications

Swivel turning unit



Erecting/tilting turning unit



Chuck unit



ATC



Series Configuration

Gantry robot can be configured by flexibly combining modules whose payload is from 50kg to 100kg to the tip of Up/Down axis. It can be also used as single axis module.

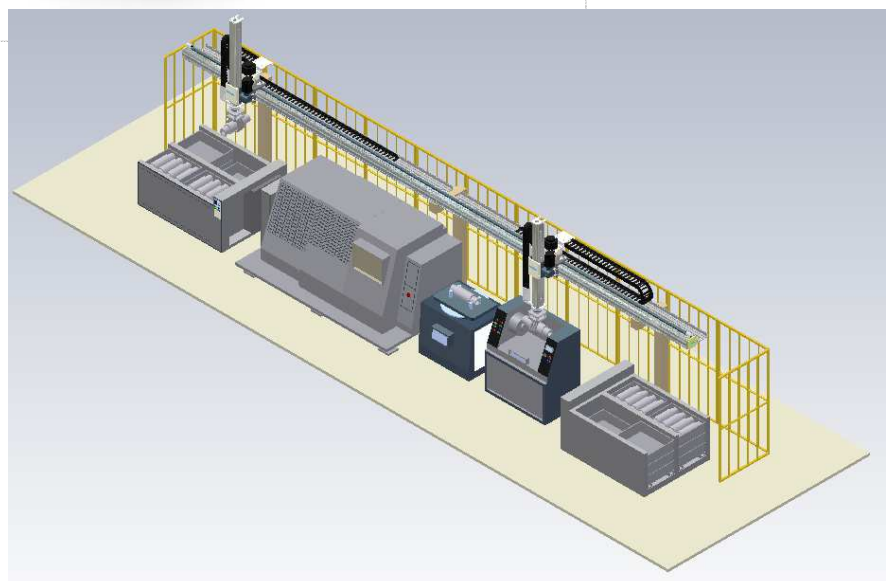
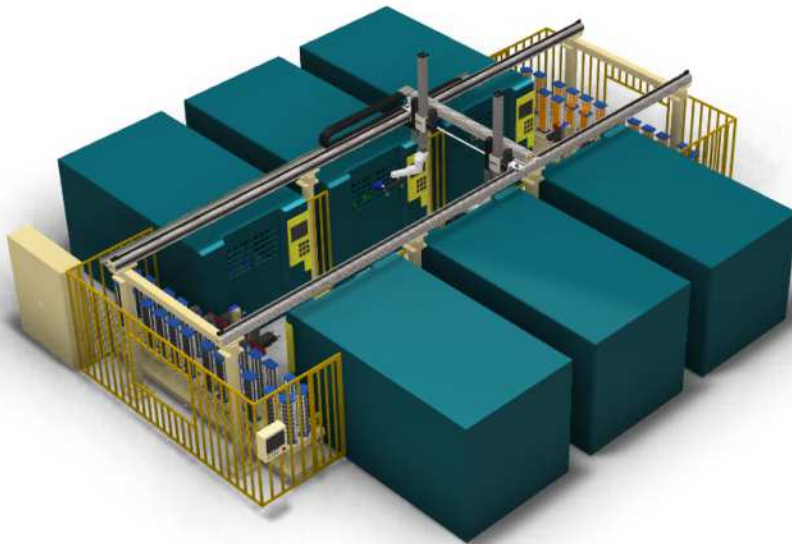
In various fields, the robot provides high reliability and performance backed by the resources and expertise of **Hirata**, a pioneer in production equipment.

Main applications

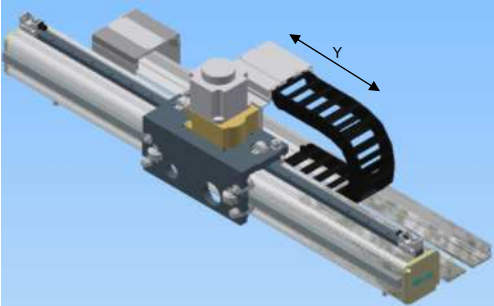
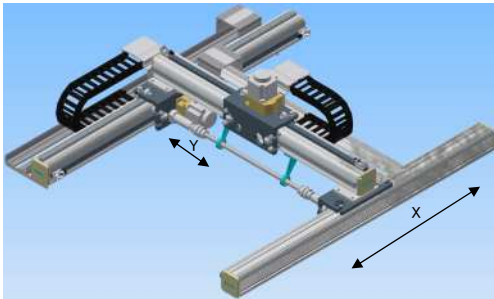
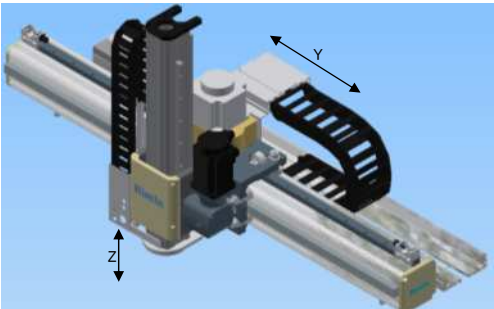
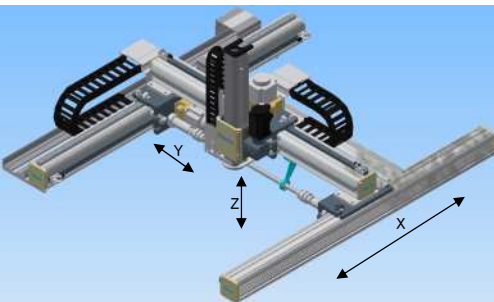
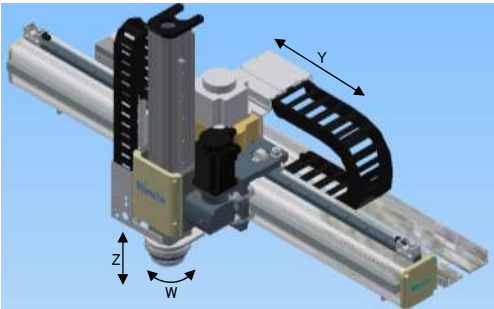
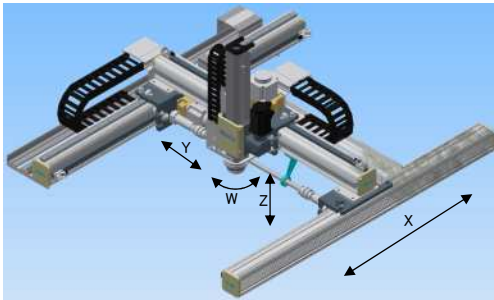
Loader/unloader
Palletizing/depalletizing
Automatic assembling

Main business activities

machine tool, molding machine, pressing machine, tier, shipbuilding, consumer electronics, automobile, medical equipment, food, aircraft, housing, flat panel, etc.



Lineup GR-1750 series

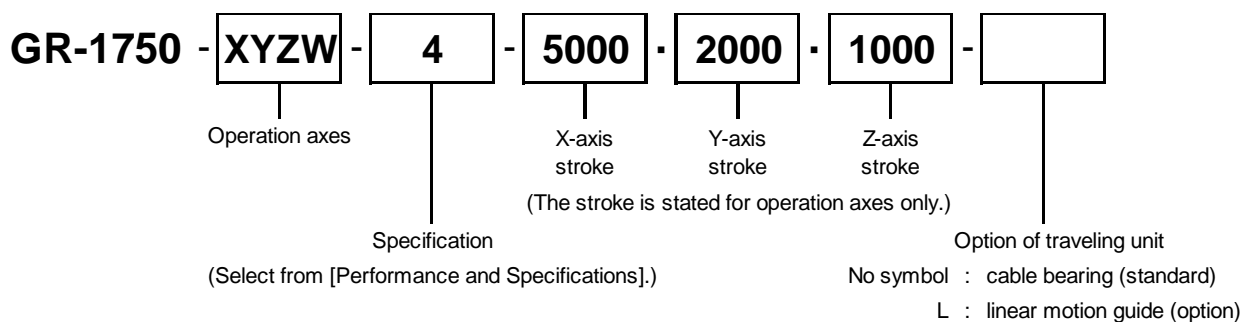
Traveling single axis type	<p>GR-1750- Y - □</p>  <p>Payload 90kg, 250kg (vertical load) 2 types</p>	Traveling 2-axis type	<p>GR-1750- XY - □</p>  <p>Payload 90kg, 250kg (vertical load) 2 types</p>
	<p>GR-1750- YZ - □</p>  <p>Payload 35kg, 50kg, 100kg 3 types</p>		<p>GR-1750- XYZ - □</p>  <p>Payload 35kg, 50kg, 100kg 3 types</p>
	<p>GR-1750- YZW - □</p>  <p>Payload 20kg, 40kg, 85kg 3 types</p>		<p>GR-1750- XYZW - □</p>  <p>Payload 20kg, 40kg, 85kg 3 types</p>

Selection Procedure

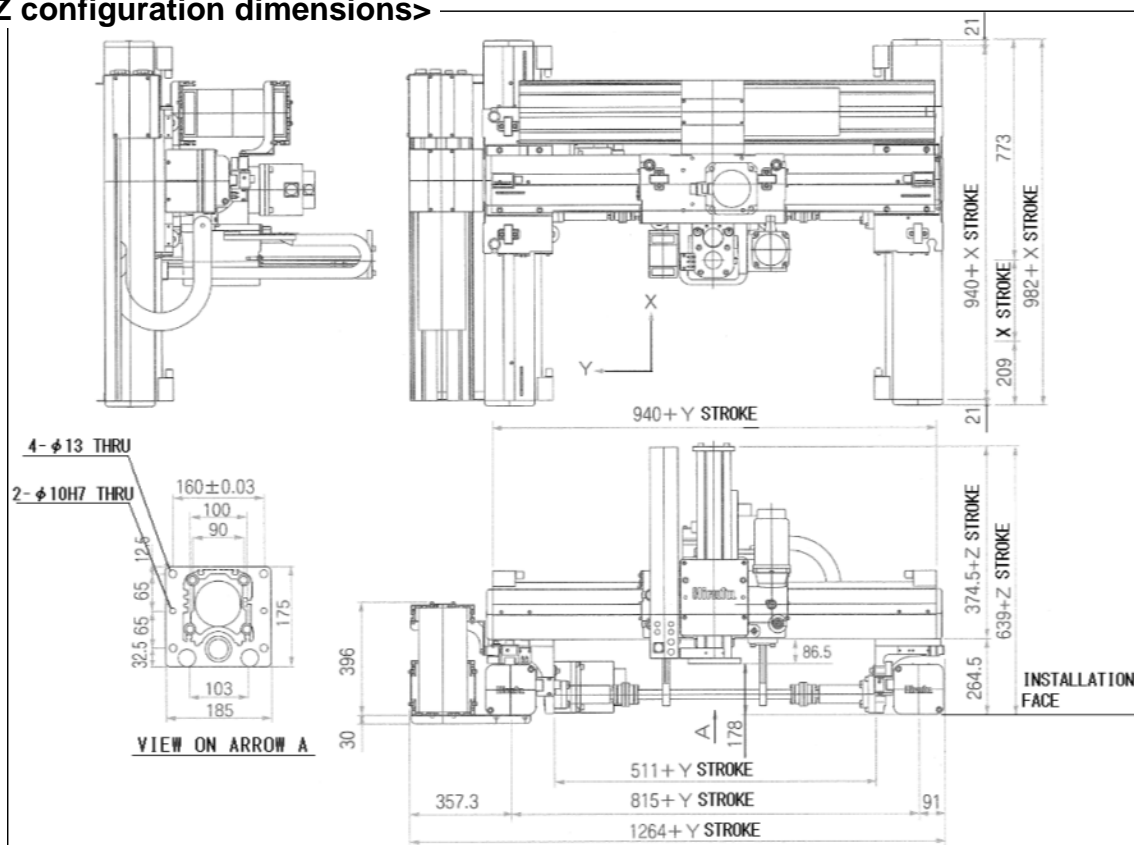
1. From the production lineup on the previous page, select an axis configuration type which meets required specifications. (For example, in the case of GR-1750 series, 4-axis XYZW configuration, select GR-1750-XYZW type.)
2. On the page [Performance and Specifications], from 4-axis XYZW configuration (XYZW type), based on the payload, stroke, speed, and the other conditions, decide the robot type.
(For example, in the case of workpiece+hand weight: 65kg, required traveling speed: 1.5m/s, required strokes X-axis: 10m, Y-axis: 1.5m, Z-axis: 1.0m, select "XYZW-4".)
3. On the page [Performance and Specifications], check the dimensions of main body and the calculations of allowable moment and inertia to decide options.
4. Referring to Product Number Definition shown below, decide the final product number.
(For example, GR-1750-XYZW-10000·1500·1000 - L)

Product Number Definition

<Example of product number>



<XYZ configuration dimensions>



Performance and Specifications Traveling Single Axis Type

GR-1750- Y - □

GR-1750- YZ - □

GR-1750- YZW - □

Axis	Type	Max. Payload (kg) *1	Allowable Moment (kgf·m) *2	Axis Type	Max. Speed X·Y·Z (m/s) W (deg/s)	Max. Stroke X·Y·Z (m) W (deg) *3	Repeatability X·Y·Z (mm) W (deg)	Motor Power (kW)
X	Y-1	90	40	-	-	-	-	-
Y				GRY-L	5	20	±0.2	3.5
Z				-	-	-	-	-
W				-	-	-	-	-
X	Y-2	250	40	-	-	-	-	-
Y				GRY-M	2.5	20	±0.2	2.0
Z				-	-	-	-	-
W				-	-	-	-	-
X	YZ-1	35	29	-	-	-	-	-
Y				GRY-L	5	20	±0.2	3.5
Z				HMZ175L	1.5	1	±0.1	2.0
W				-	-	-	-	-
X	YZ-2	50	29	-	-	-	-	-
Y				GRY-M	2.5	20	±0.2	2.0
Z				HMZ175L	1.5	1.5	±0.1	2.0
W				-	-	-	-	-
X	YZ-4	100	29	-	-	-	-	-
Y				GRY-M	2.5	20	±0.2	2.0
Z				HMZ175H	1	1.5	±0.1	2.0
W				-	-	-	-	-
X	YZW-1	20	26	-	-	-	-	-
Y				GRY-L	5	20	±0.2	3.5
Z				HMZ175L	1.5	1	±0.1	2.0
W				HMW-100	150°	300°	±0.1°	0.4
X	YZW-2	40	26	-	-	-	-	-
Y				GRY-M	2.5	20	±0.2	2.0
Z				HMZ175L	1.5	1.5	±0.1	2.0
W				HMW-100	150°	300°	±0.1°	0.4
X	YZW-4	85	26	-	-	-	-	-
Y				GRY-M	2.5	20	±0.2	2.0
Z				HMZ175H	1	1.5	±0.1	2.0
W				HMW-100	150°	300°	±0.1°	0.4

*1 Payload: For Z-axis equipped type, the value is when Z-axis stroke is 300mm. The conversion value is 2kg / 100ST.

*2 Allowable moment: For the calculation formula, refer to the technical material.

*3 Maximum stroke: For Y-axis stroke longer than 20m, please consult with Hirata.

Performance and Specifications Traveling 2-Axis Type

GR-1750- XY - □

GR-1750- XYZ - □

GR-1750- XYZW - □

Axis	Type	Max. Payload (kg) *1	Allowable Moment (kgf·m) *2	Axis Type	Max. Speed X·Y·Z (m/s) W (deg/s)	Max. Stroke X·Y·Z (m) W (deg) *3	Repeatability X·Y·Z (mm) W (deg)	Motor Power (kW)
X	XY-1	90	40	GRX-M	2.5	20	±0.2	2.0
Y				GRY-L	5	3.9	±0.2	3.5
Z				-	-	-	-	-
W				-	-	-	-	-
X	XY-2	90	40	GRX-H	2.5	20	±0.2	3.5
Y				GRY-L	5	5.1	±0.2	3.5
Z				-	-	-	-	-
W				-	-	-	-	-
X	XY-3	250	40	GRX-H	2.5	20	±0.2	3.5
Y				GRY-M	2.5	3.6	±0.2	2.0
Z				-	-	-	-	-
W				-	-	-	-	-
X	XYZ-1	35	29	GRX-H	2.5	20	±0.2	3.5
Y				GRY-L	5	5.1	±0.2	3.5
Z				HMZ175L	1.5	1	±0.1	2.0
W				-	-	-	-	-
X	XYZ-2	50	29	GRX-H	2.5	20	±0.2	3.5
Y				GRY-M	2.5	5.1	±0.2	2.0
Z				HMZ175L	1.5	1.5	±0.1	2.0
W				-	-	-	-	-
X	XYZ-4	100	29	GRX-H	2.5	20	±0.2	3.5
Y				GRY-M	2.5	5.1	±0.2	2.0
Z				HMZ175H	1	1.5	±0.1	2.0
W				-	-	-	-	-
X	XYZW-1	20	26	GRX-H	2.5	20	±0.2	3.5
Y				GRY-L	5	5.1	±0.2	3.5
Z				HMZ175L	1.5	1	±0.1	2.0
W				HMW-100	150°	300°	±0.1°	0.4
X	XYZW-2	40	26	GRX-H	2.5	20	±0.2	3.5
Y				GRY-M	2.5	5.1	±0.2	2.0
Z				HMZ175L	1.5	1.5	±0.1	2.0
W				HMW-100	150°	300°	±0.1°	0.4
X	XYZW-4	85	26	GRX-H	2.5	20	±0.2	3.5
Y				GRY-M	2.5	5.1	±0.2	2.0
Z				HMZ175H	1	1.5	±0.1	2.0
W				HMW-100	150°	300°	±0.1°	0.4

*1 Payload: For Z-axis equipped type, the value is when Z-axis stroke is 300mm. The conversion value is 2kg / 100ST.

*2 Allowable moment: For the calculation formula, refer to the page [Technical Materials].

*3 Maximum stroke: For Y-axis stroke longer than 20m, please consult with Hirata.

Performance and Specifications Traveling Axis X-Axis

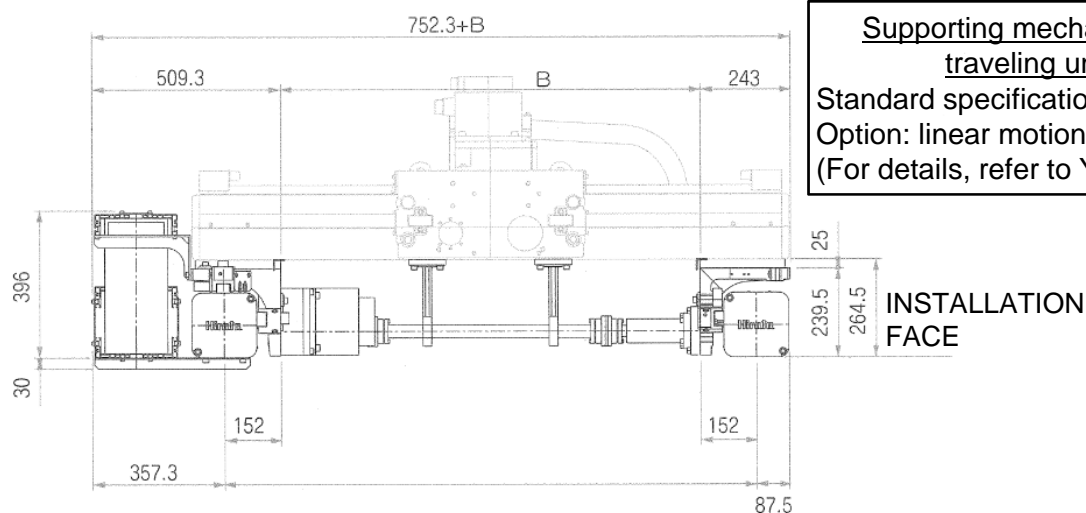
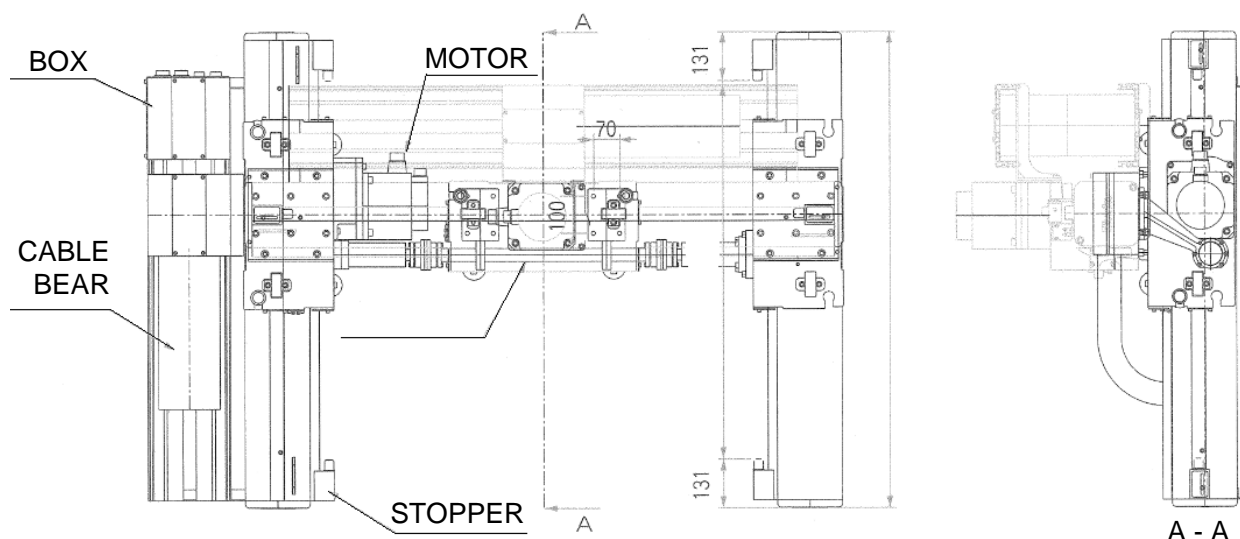
1. Specifications

Axis Type	Max. Payload (kg)	Allowable Moment (kgf·m) *1	Max. Speed (m/s)	Max. Accel Time (mm/s)	Repeatability (mm)	Max. Stroke (m) *2	Motor Power (kW)	Weight (kg)
GRX-M	250	40	2.5	0.3	±0.2	20	2.0	190 (1000ST) (+100kg / +1000ST)
GRX-H	400	40	2.5	0.5	±0.2	20	3.5	192 (1000ST) (+100kg / +1000ST)

*1 For the calculation of moment, refer to the page [Application].

*2 For the maximum stroke longer than 20m, please consult with Hirata.

2. External Dimensions



Supporting mechanism of traveling unit
 Standard specification: bearing
 Option: linear motion guide
 (For details, refer to Y-axis.)

Traveling Axis Y-Axis

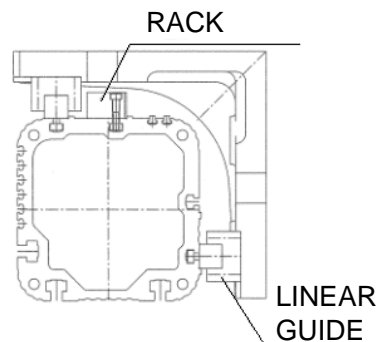
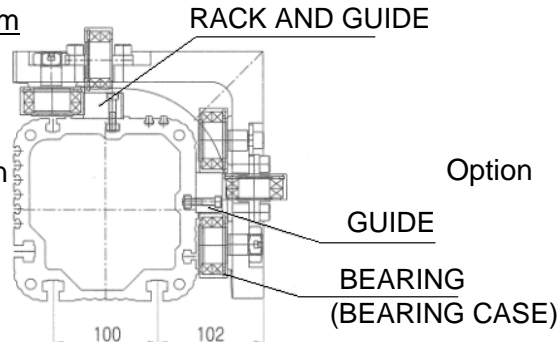
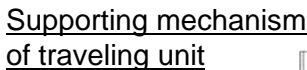
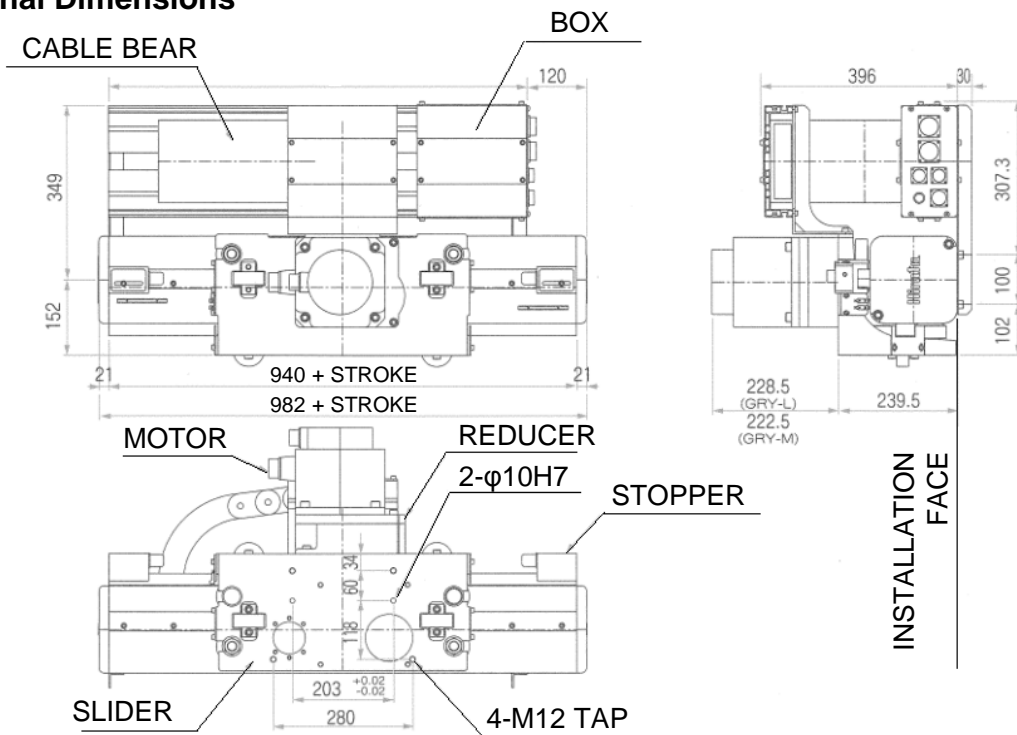
1. Specifications

Axis Type	Max. Payload (kg)	Allowable Moment (kgf·m) *1	Max. Speed (m/s)	Max. Accel Time (mm/s)	Repeatability (mm)	Max. Stroke (m) *2	Motor Power (kW)	Weight (kg)
GRY-L	90	40	5	0.5	±0.2	20 (Combined with X-axis: 5.1m)	3.5	80(1000ST) (+50kg / +1000ST)
GRY-M	250	40	2.5	0.3	±0.2	20 (Combined with X-axis: 5.1m)	2.0	85(1000ST) (+50kg / +1000ST)

*1For the calculation of moment, refer to the page [Application].

*2For the maximum stroke longer than 20m, please consult with Hirata.

2. External Dimensions



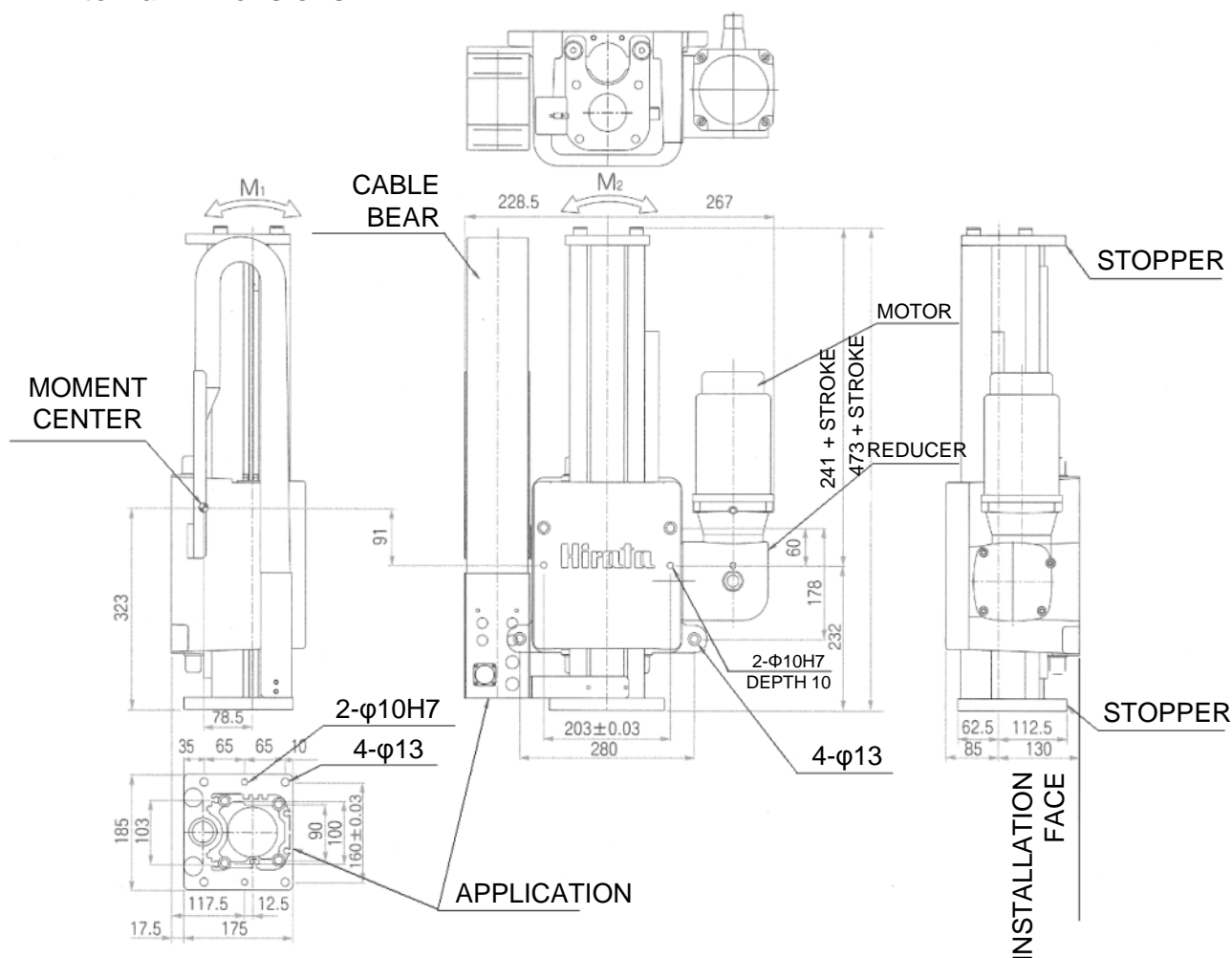
*For the linear guide type, the maximum speed is 1.8m/s.

Performance and Specifications Traveling Axis Z-Axis

1. Specifications

Axis Type	Max. Payload (kg) ※1	Allowable Moment (kgf·m) *1	Max. Speed (m/s)	Max. Accel Time (mm/s)	Repeatability (mm)	Stroke Range (mm)	Motor Power (kW)	Weight (kg)
HMZ175L	50	$M_1 = 43$ $M_2 = 40$	1.5	0.2	± 0.1	300 ~ 1500	2.0	59(300ST) (+2.5kg / +100ST)
HMZ175H	100	$M_1 = 43$ $M_2 = 40$	1	0.4	± 0.1	300 ~ 1500	2.0	59(300ST) (+2.5kg / +100ST)

2. External Dimensions



Performance and Specifications Traveling Axis W-Axis

1. Specifications

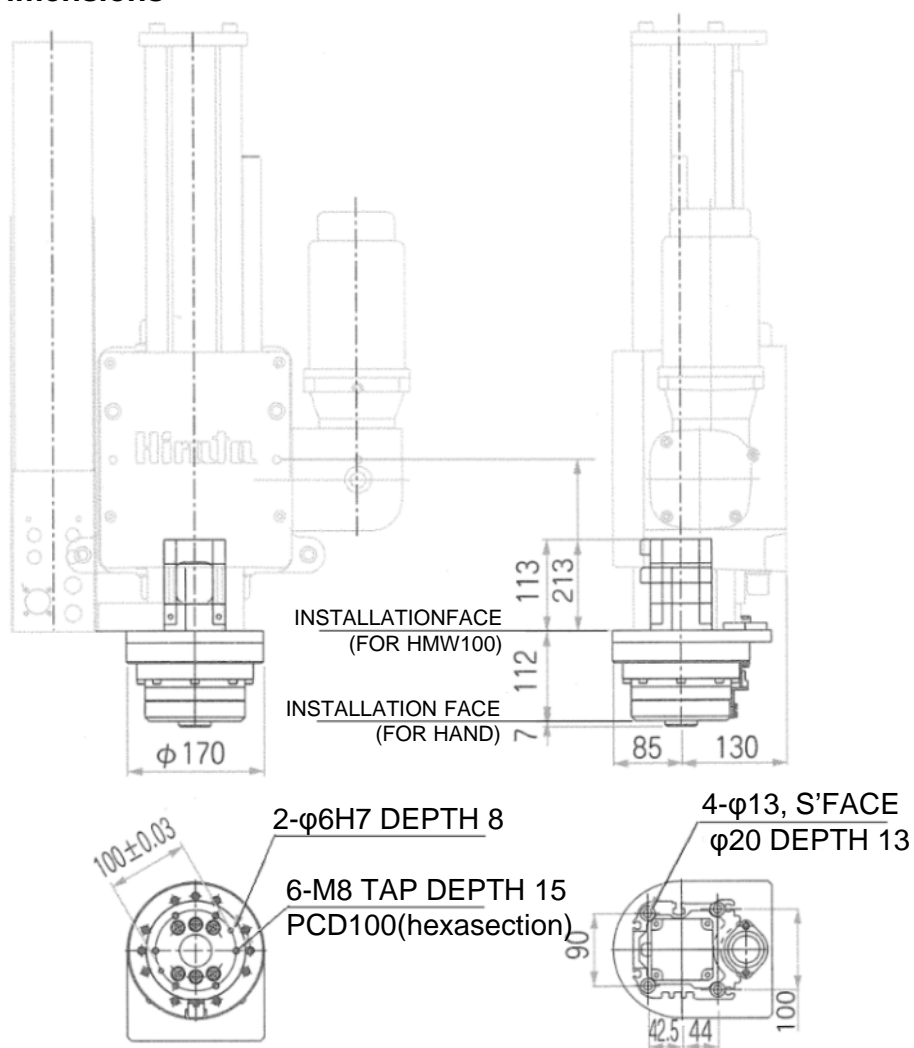
Axis Type	Max. Payload (kg) *1	Allowable Moment (kgf·m) *1 *2	Allowable Inertia <GD> (kgf·m ²) *2	Max. Speed (deg/s)	Max. Accel Time (mm/s)	Repeatability (deg)	Max. Stroke (deg)	Motor Power (W)	Weight (kg)
HMW-100	100	26	27.5	150	0.5	±0.1	300	400	15

*1 The payload and allowable moment are those of the single unit of W-axis.

When use it with another axis, refer to the page [Performance and Specifications].

*2 For the calculations of allowable moment and inertia, refer to the page [Application].

2. External Dimensions

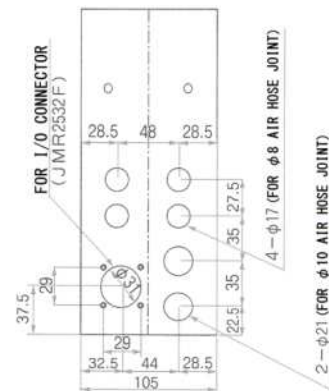


Application Specifications

1. Air Hose, I/O Cable

	I/O Cable	Air Hose	Air Hose Joint
Standard	To the backside of slider 30 cores×1piece To the end of Z-axis 30 cores×1piece (These cables are not connected at the slider.)	To the backside of slider: 1piece (blade hose φ16) From the backside of slider to the end of Z-axis φ10×1piece, φ8×2pcs	To the backside of slider tap 2pcs×PT3/8 To the end of Z-axis One-touch fitting φ8×2pcs One-touch fitting φ10×1piece
Option		1 piece can be added to the backside of slider (blade hose φ16) From the backside of slider to the end of Z-axis φ10 X7pcs (max.) or equivalent can be added. (φ8 or smaller is also possible.)	To the end of Z-axis One-touch fitting φ8×2pcs One-touch fitting φ10×1piece can be added.

End of Z-axis



2. T-slot Dimensions

X/Y-axis frame

Technical drawing of the X/Y-axis frame. The overall width is 175 and the overall height is 175. The frame has a central rectangular opening. Dimensions include: 57.5 (width of top flange), 80 (width of top flange), 14 (width of top flange), 31 (width of top flange), 37.5 (width of bottom flange), 57.5 (width of bottom flange), 100 (width of bottom flange), 47.5 (width of bottom flange), 14 (width of bottom flange), 74 (width of bottom flange), and 5 X 14 PITCH = 70 (pitch of the top flange). Feature locations are marked with letters A, B, C, D, E, F, G, H, and I.

Z-axis frame

Technical drawing of the Z-axis frame. The overall width is 103 and the overall height is 7.5. The frame has a central rectangular opening. Dimensions include: 60 (width of bottom flange), 56.7 (width of bottom flange), 68.8 (width of bottom flange), and 7.5 (width of bottom flange). Feature locations are marked with letters E, F, G, H, and I.

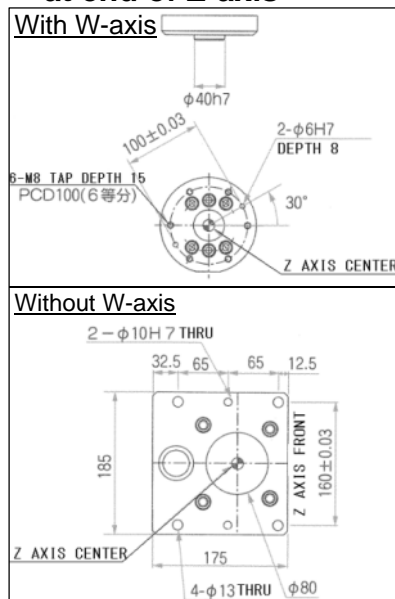
Cable bear guide

Technical drawing of the Cable bear guide. The overall width is 86.5 and the overall height is 7.5. The guide has a central rectangular opening. Dimensions include: 46.5 (width of bottom flange), 27.5 (width of bottom flange), 20 (width of bottom flange), 39.5 (width of bottom flange), 16.5 (width of bottom flange), and 7.5 (width of bottom flange). Feature locations are marked with letters G, H, and I.

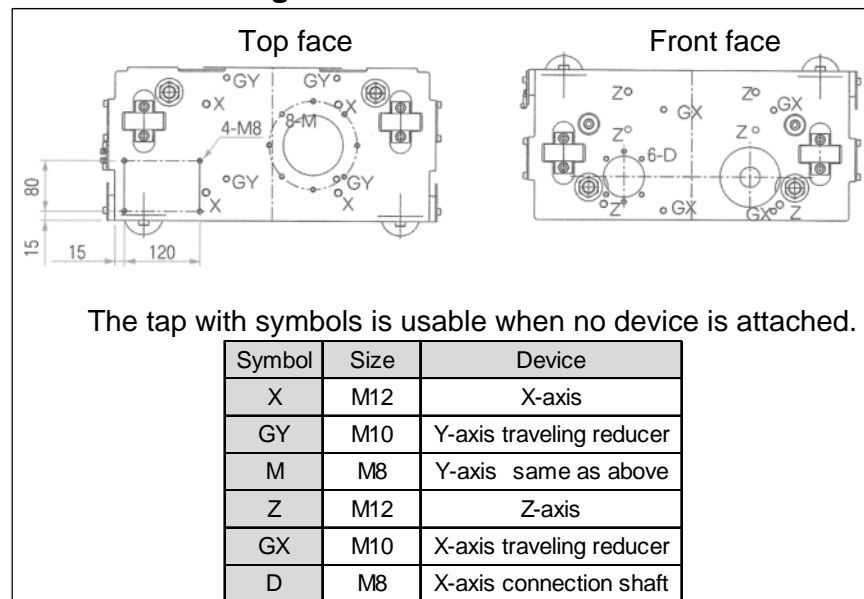
Cross-section diagram of the frame. The diagram shows a T-shaped profile with dimensions T (width of the top flange), S (width of the top flange), U (width of the bottom flange), and V (width of the bottom flange).

Symbol	A	B	C	D	E	F	G	H
S	9	5	2	7	5	3	2	2
T	10	7	3	7	5	5	7	7
U	20	13	8.5	14	9.5	9.5	13	11
V	11	6.6	6	6.6	5	5.8	9	7

3. Mounting surface at end of Z-axis

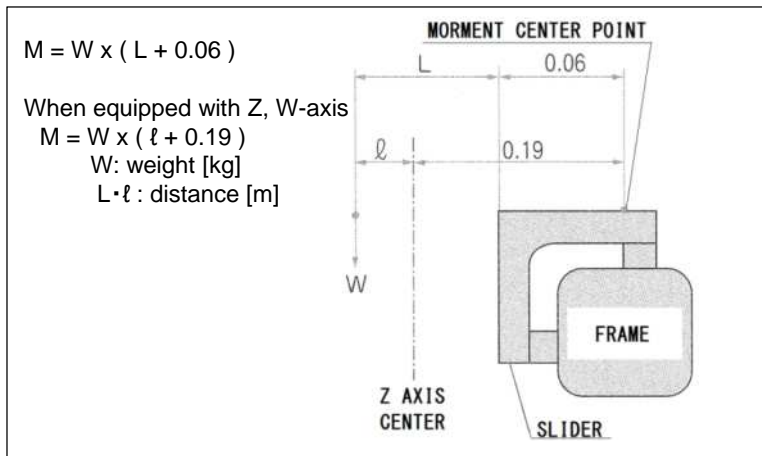


4. Slider Mounting Surface



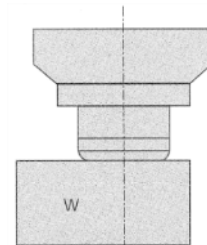
Technical Materials

1. Moment Approximate Calculation Formula



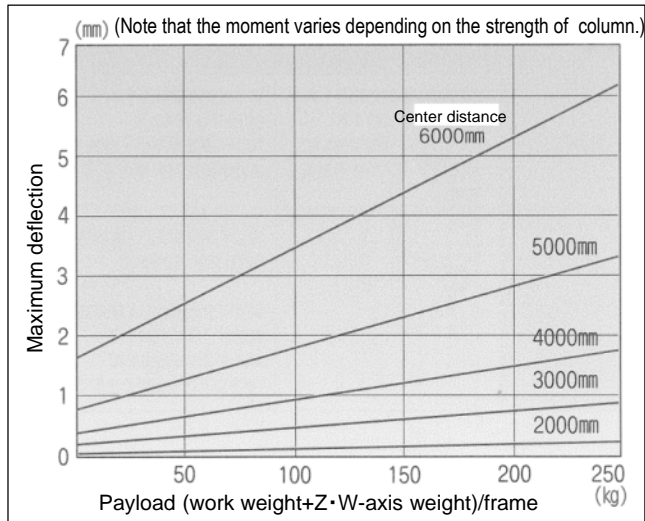
2. Inertia Approximate Calculation Formula

$GW^2 = W \times D^2 \quad \text{kgf} \cdot \text{m}^2$
 W : weight [kg]
 D² : rotation diameter [m²]



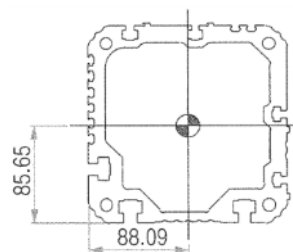
Rotation axis

3. Allowable Frame Deflection

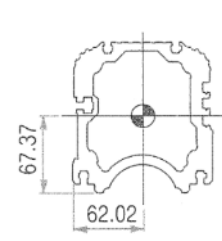


4. Aluminum frame cross section secondary moment

X/Y-axis frame



Z-axis frame



	$I_x \text{ cm}^2$	$I_y \text{ cm}^2$
X-Y-axes	3498	3604
Z-axis	1015	1041

5. Precautions for System Up

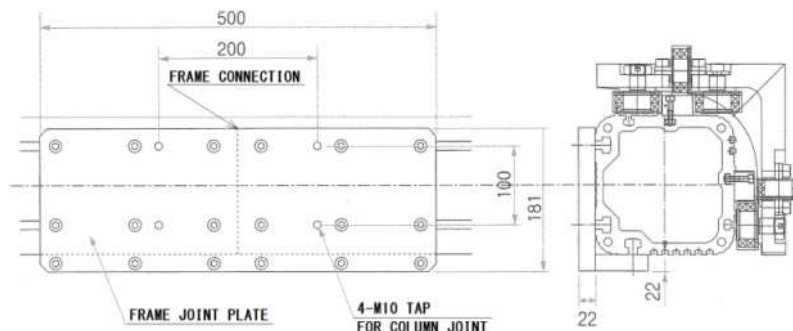
■ Column position

The distance between columns should be 6m or less and they should be positioned $\pm 1\text{m}$ within the joint of frame (standard length: 6m). When places to install the columns are limited because of the layout, contact Hirata. Set the columns randomly to reduce the frame deflection. (For the frame deflection, refer to the graph of [Allowable Frame Deflection].)

When installing a column to the joint of frame, work out a design based on the dimensions shown in the figure below. (The design should be different from the one when a column is installed to the frame directly.)

■ Number of Axes to Install

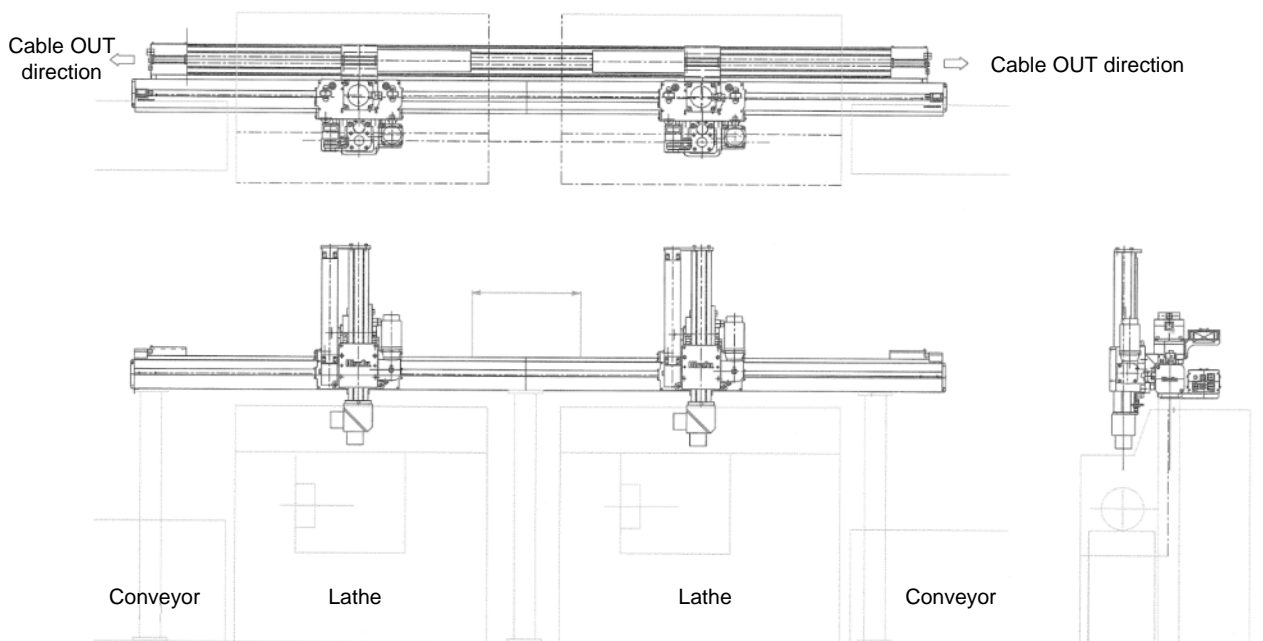
It is possible to attach multiple Z-axes to Y-axis, and multiple Y-axes to X-axis. In such cases, install the axes so that the maximum frame deflection is 7mm or less.



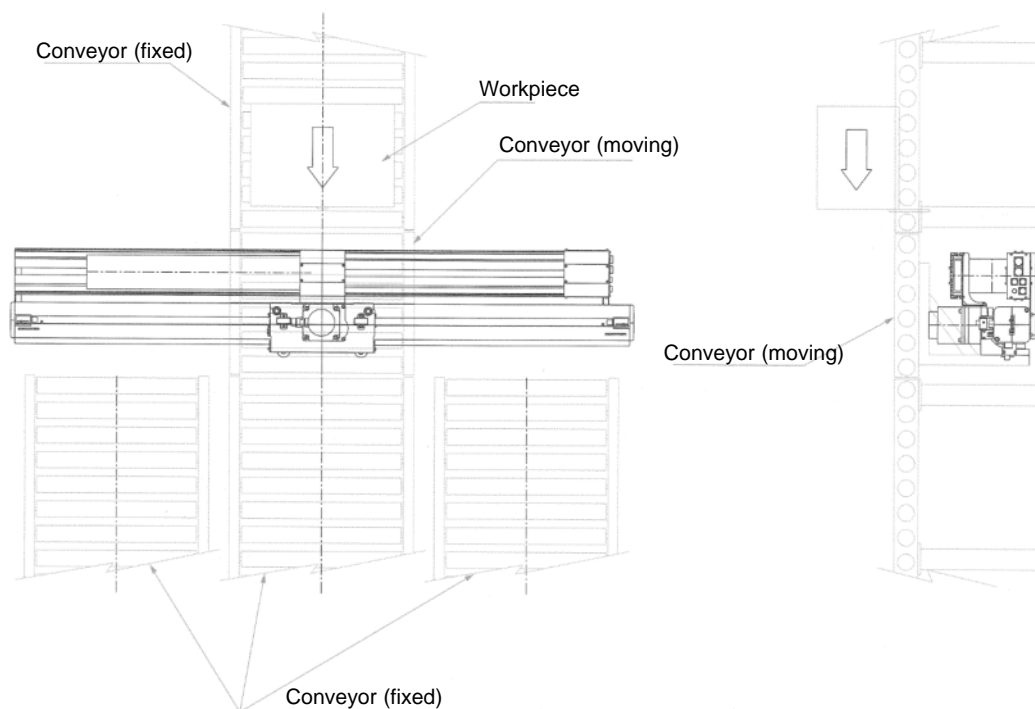
Example of System Layout

1. Traveling Single Axis Type

Loader/unloader (GR-1750-XYZ)



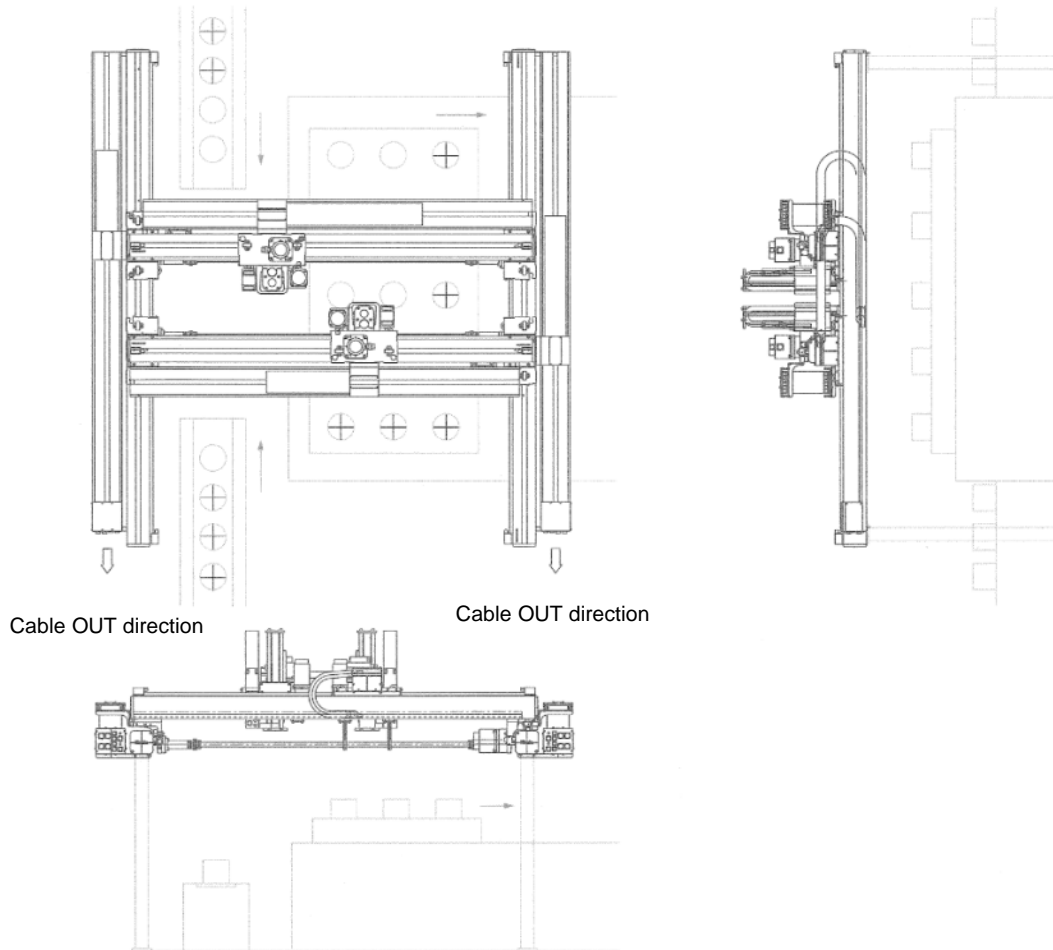
Conveyor sorting (GR-1750-Y)



Example of System Layout

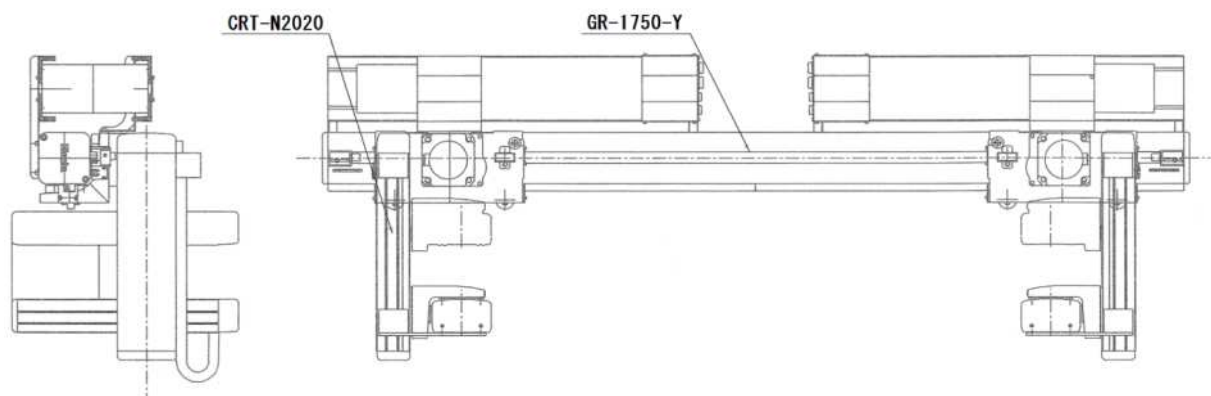
2. Traveling 2-Axis Type

Conveyor transferring (GR-1750-YZ)



3. Special Specifications

Combination of traveling single axis and orthogonal type robot





*Note: Illustration uses simulated image and may differ from an actual product .
*The contents of the catalog are subject to change without prior notice.

■ Contact

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2014/10/31

HRCT-1409-E01

The Global Production Engineering Company

Hirata