

YAMAHA SCARA Robots

**YK250XG****YK350XG****YK400XG**

**A full model changeover  
for compact SCARA robots!  
Now redesigned into a 100% beltless structure.**

Offer more enhanced stiffness and rigidity along with excellent reliability and high accuracy.

Though compact in size, the YK-XG series robots can handle the same heavy loads as models ranked one class higher!

# YK250XG/350XG/400XG

YAMAHA Compact SCARA Robots

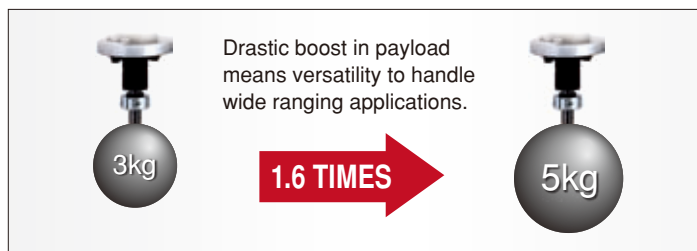
YAMAHA compact SCARA robots with arm lengths of 250mm to 400mm have evolved to be completely beltless to increase the payload capability.

Drastically enhanced arm tip rigidity and maintenance-free design give powerful support for wide-ranging applications. Adding design features such as wiring/tubing hollow-shaft and tool flange options makes the YK-XG series robots easier to use than before.



## Payload boosted 1.6 times higher than other robots in same class

Payload has now been boosted from 3kg to 5kg which is an increase of 1.6 times the previous models. The YK-XG series robots have a high tolerable moment of inertia on the arm tip axis making them extremely useful even for high-speed operation or workpieces having large offsets. Though built into a compact body, the YK-XG series robots handle the same heavy loads as SCARA robots ranked one class higher.



## Wiring/tubing hollow-shaft and tool flange options available

Available options include a hollow-shaft for easy wiring/tubing to the arm tip tool and a tool flange option for simple tool installation.



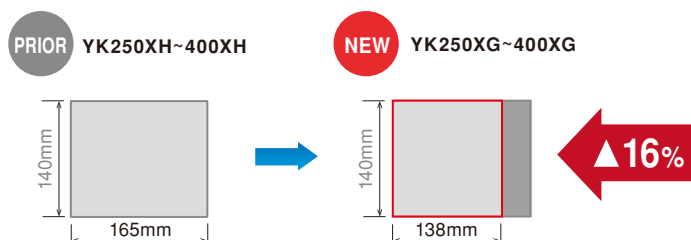
Hollow-shaft option for easy wire and air tube routing



Tool flange option for simple installation of tool onto arm tip (KCY-M1790-00)

## Cuts installation footprint by 16%

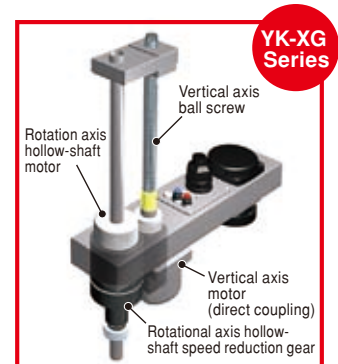
Amazing but true! Basic features such as payload are vastly improved yet the required installation space is 16 percent smaller than the previous models. Installing into much smaller space means more freedom in system design and layout.



## Fully beltless design makes the YK-XG series maintenance-free

Operation is now fully beltless through use of a direct coupling design on the ZR axis. Lost motion on the arm tip rotation axis has been drastically cut to streamline operation and maintain high precision over long periods of time.

Highly accurate positioning repeatability (0.004°) along with the above features makes the YK-XG series robots ideal for applications that require assembly of ultra-tiny components with high accuracy. Yet another plus is long-term maintenance free operation with no worries about belt breakage, stretching, or wear over the passage of time.



## R-axis moment of inertia that totally beats out the competition

Oh No! You didn't select a SCARA robot based on its standard cycle time and payload did you? SCARA robots are different from single-axis robots and Cartesian robots, so the "R-axis tolerable moment of inertia" will make a huge difference when using SCARA robots.

If the R-axis tolerable moment of inertia is small, the job cycle time becomes significantly longer when handling heavy or large offset workpieces. All YAMAHA SCARA robots use an arm tip rotation axis that is directly coupled to a speed reduction gear. This delivers extremely high R-axis tolerable moment of inertia compared to ordinary belt-driven SCARA robots, and makes YAMAHA robots ideal for high-speed operation.

### • Basic specifications: Compared to other manufacturer's robots

| Model     | Arm length | Payload | R-axis tolerable moment of inertia |
|-----------|------------|---------|------------------------------------|
| YK250XG   | 250mm      | 5kg     | 0.05kgm <sup>2</sup>               |
| A Company | ↑          | 3kg     | 0.015kgm <sup>2</sup>              |
| B Company | ↑          | 3kg     | 0.017kgm <sup>2</sup>              |

## Uses high-reliability position resolver

The YK-XG series robots use a resolver for position detection the same as in other YAMAHA robots. The resolver has few parts and a rugged design that give it overwhelmingly high reliability compared to optical encoders.

The robot contains absolutely no electrical circuits, so there are fewer unexpected failures and the downtime during maintenance work or during production is held to a minimum.



## Ordering method

**YK250XG - 150**

**RCX240S**

**BB**

| Robot model    |
|----------------|
| YK250XG: 250mm |
| YK350XG: 350mm |
| YK400XG: 400mm |

| Z-axis stroke |
|---------------|
| 150: 150mm    |

| Tool flange         |
|---------------------|
| No entry: None      |
| F: With tool flange |

| Hollow shaft         |
|----------------------|
| No entry: None       |
| S: With hollow shaft |

| Cable length |
|--------------|
| 3L: 3.5m     |
| 5L: 5m       |
| 10L: 10m     |

Controller

| Usable for CE      |
|--------------------|
| No entry: Standard |
| E: CE marking      |

| Expansion I/O <sup>Note 1</sup> |
|---------------------------------|
| N, P: Standard I/O 16/8         |
| N1, P1: 40/20                   |
| N2, P2: 64/40                   |
| N3, P3: 88/56                   |
| N4, P4: 112/72                  |

| Network option                |
|-------------------------------|
| No entry: None                |
| CC: CC-Link                   |
| DN: DeviceNet                 |
| PB: Profibus                  |
| EN: Ethernet                  |
| YC: YC-Link <sup>Note 2</sup> |

| iVY system       |
|------------------|
| No entry: None   |
| VY: iVY (Vision) |
| TR: iVY+Light    |
| +Tracking        |
| LC: iVY+Light    |

| Battery   |
|-----------|
| BB: 4 pcs |

Note 1. Use N to N4 when NPN is selected on the I/O board, and P to P4 when PNP is selected.  
 Note 2. Available only for the master.

## Specifications

| Robot model   |                             | YK250XG                                      | YK350XG | YK400XG |     |
|---|-----------------------------|--|---------|---------|-----|
| Axis specifications                                       | X-axis                      | Arm length (mm)                              | 100     | 200     | 250 |
|   |                             | Rotation angle (°)                           |         | ±140    |     |
|   | Y-axis                      | Arm length (mm)                              |         | 150     |     |
|   |                             | Rotation angle (°)                           |         | ±144    |     |
|   | Z-axis                      | Stroke (mm)                                  |         | 150     |     |
|   | R-axis                      | Rotation angle (°)                           |         | ±360    |     |
| AC servo motor output                                     | X-axis/Y-axis/Z-axis/R-axis | 200W / 150W / 50W / 100W                     |         |         |     |
| Maximum speed   | XY resultant (m/s)          | 4.5  | 5.6     | 6.1     |     |
|   | Z-axis (m/s)                |  | 1.1     |         |     |
|   | R-axis (°/s)                |  | 1020    |         |     |
| Repeatability *1  | XY-axes (mm)                |  | ±0.01   |         |     |
|   | Z-axis (mm)                 |  | ±0.01   |         |     |
|   | R-axis (°)                  |  | ±0.004  |         |     |
| Maximum payload (kg)                                      |                             |  | 5kg *4  |         |     |
| Standard cycle time (sec): When using 2kg payload *2      |                             |  | 0.49    |         |     |
| R-axis tolerable moment of inertia *3 (kgm <sup>2</sup> ) |                             |  | 0.05    |         |     |
| User wiring (sq × wires)                                  |                             |  | 0.2×10  |         |     |
| User tubing (Outer diameter)                              |                             |  | φ4×3    |         |     |
| Travel limit  |                             | 1.Soft limit 2.Mechanical stopper (XYZ-axes) |         |         |     |
| Weight (kg)   |                             | 18.5   | 19      | 19.5    |     |

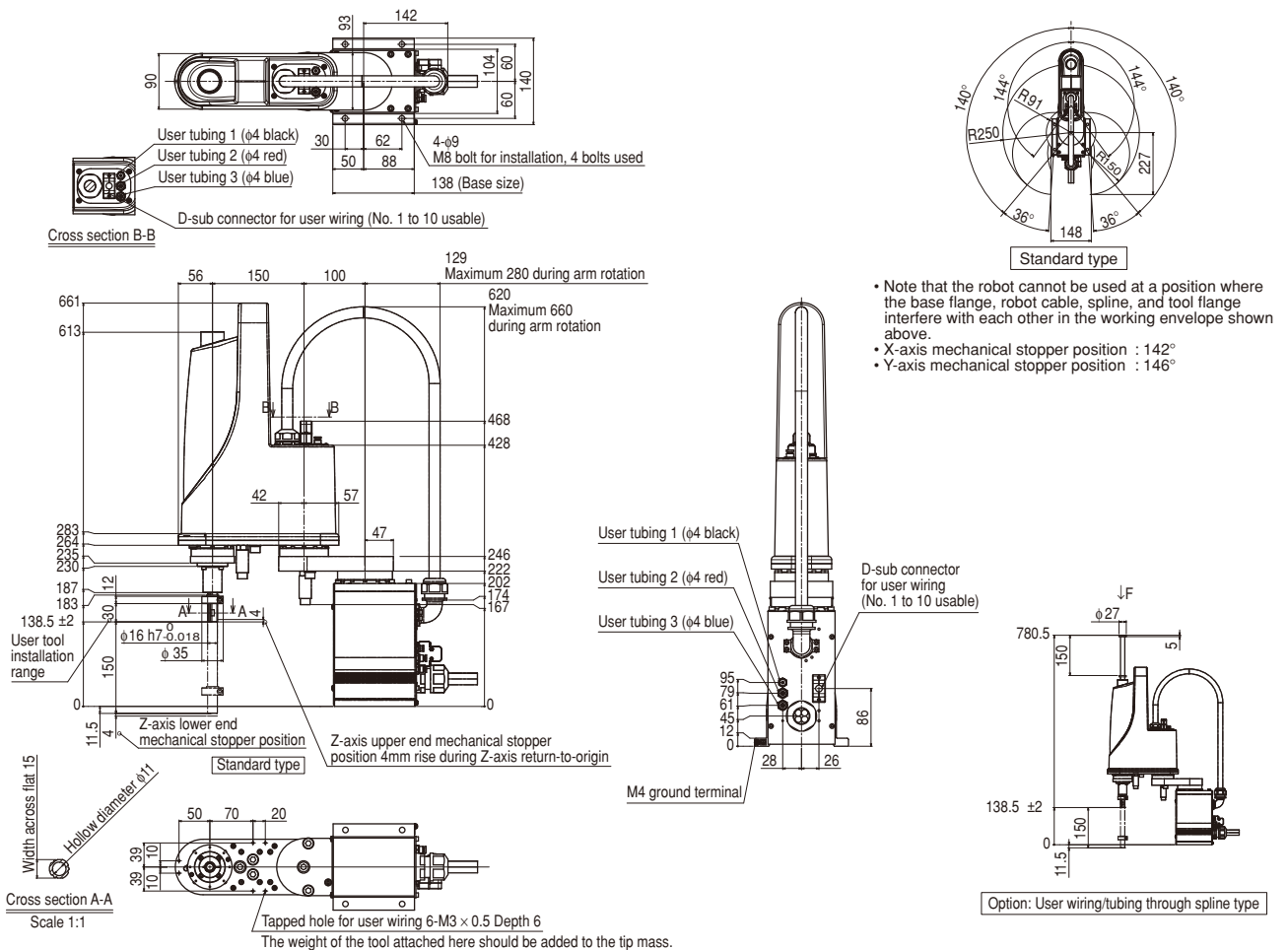
\*1 : This is the value at a constant ambient temperature. (X,Y axes)

\*2 : Back and forth horizontal 300mm, vertical 25mm during rough positioning

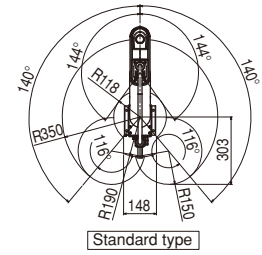
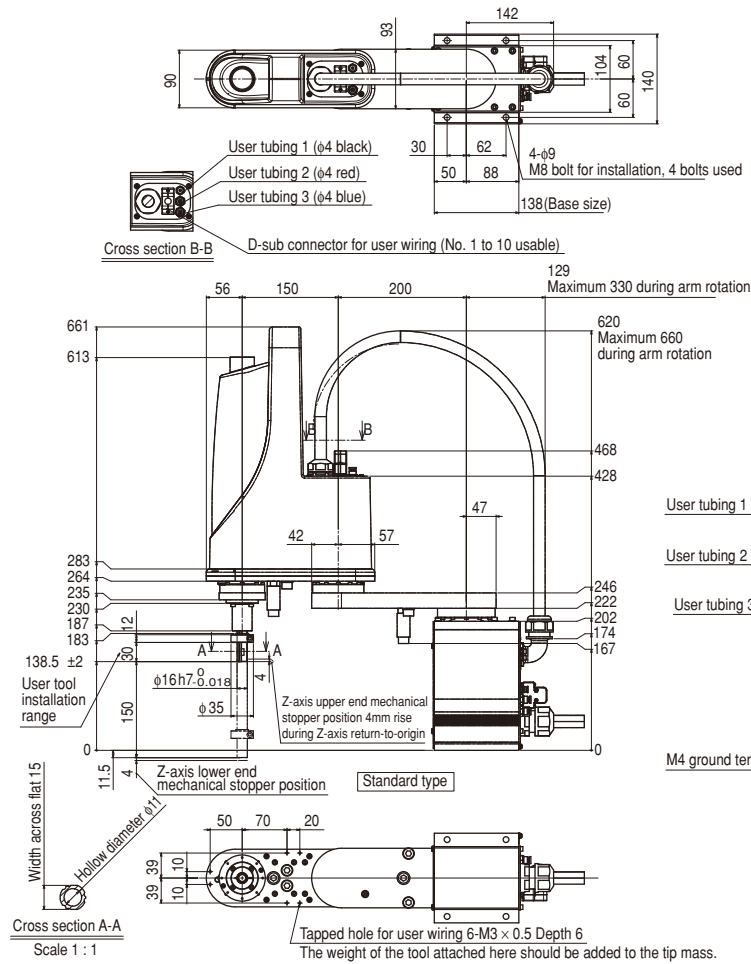
\*3 : There are limits to acceleration coefficient settings.

\*4 : Maximum payload is 4 kg when tool flange and hollow shaft options are installed.

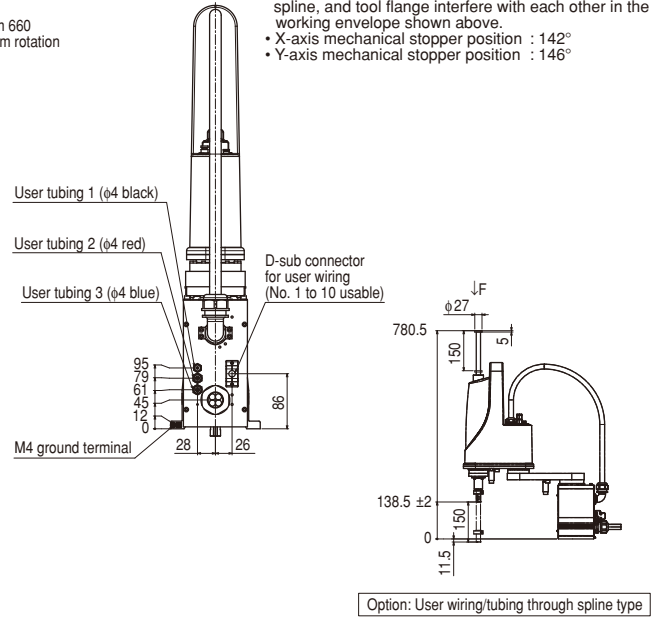
## YK250XG



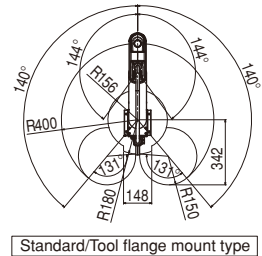
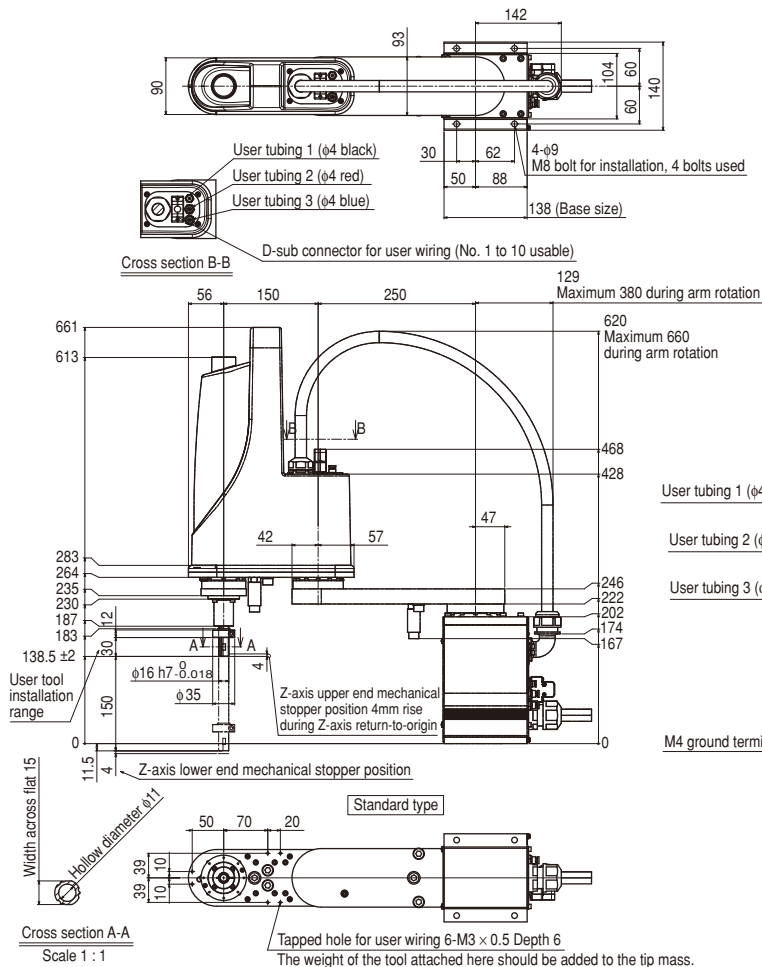
# YK350XG



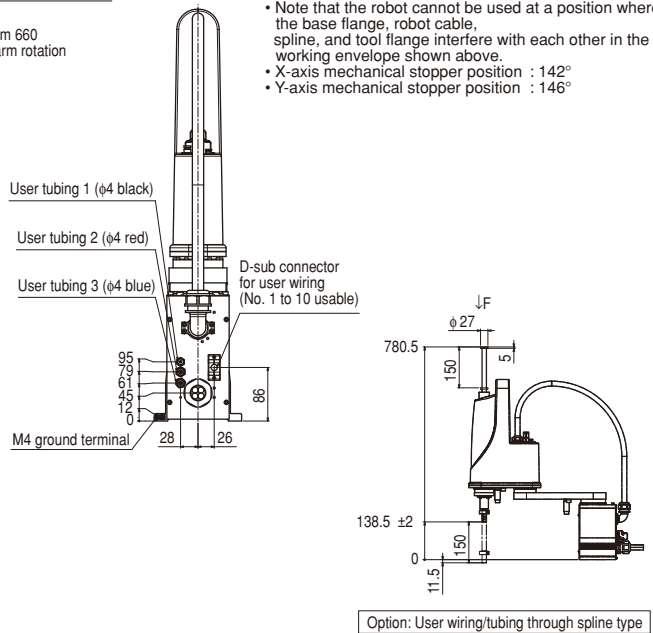
- Note that the robot cannot be used at a position where the base flange, robot cable, spline, and tool flange interfere with each other in the working envelope shown above.
- X-axis mechanical stopper position : 142°
- Y-axis mechanical stopper position : 146°



# YK400XG



- Note that the robot cannot be used at a position where the base flange, robot cable, spline, and tool flange interfere with each other in the working envelope shown above.
- X-axis mechanical stopper position : 142°
- Y-axis mechanical stopper position : 146°

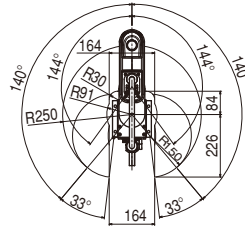
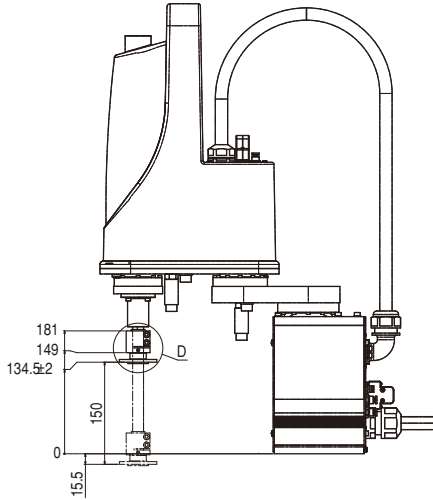
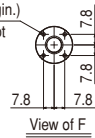




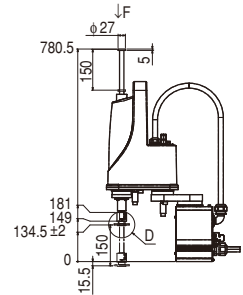
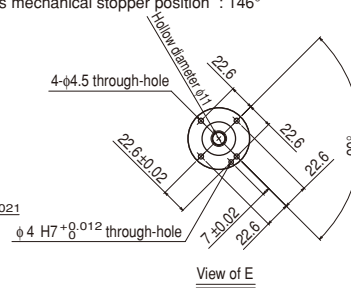
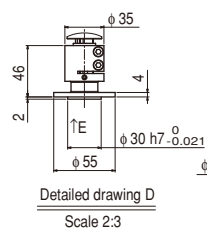
## Tool flange mount type

### YK250XG

4-M3 × 0.5 through-hole (No phase relation to R-axis origin.)  
As this hole is intended for the wiring/tubing clamp, do not attach a large load to it.



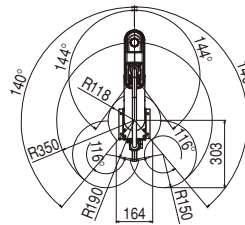
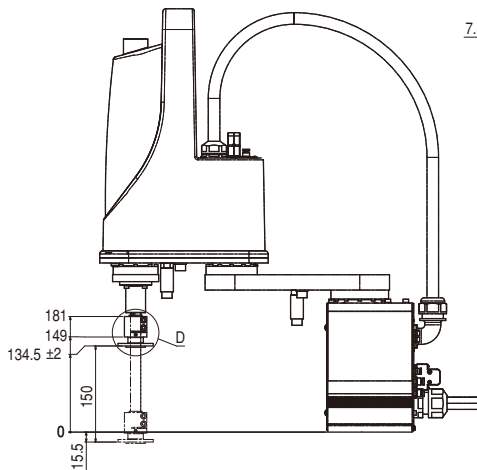
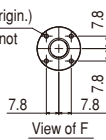
- Note that the robot cannot be used at a position where the base flange, robot cable, spline, and tool flange interfere with each other in the working envelope shown above.
- X-axis mechanical stopper position : 142°
- Y-axis mechanical stopper position : 146°



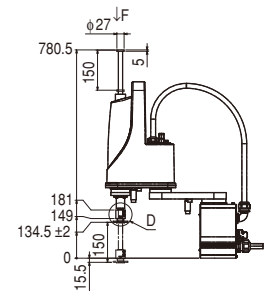
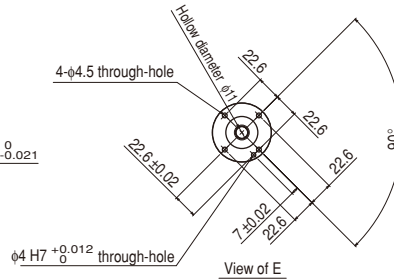
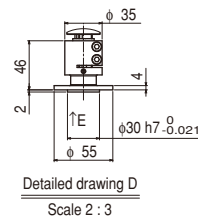
Option: User wiring/tubing through spline type

### YK350XG

4-M3 × 0.5 through-hole (No phase relation to R-axis origin.)  
As this hole is intended for the wiring/tubing clamp, do not attach a large load to it.



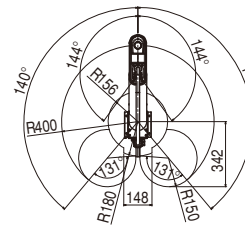
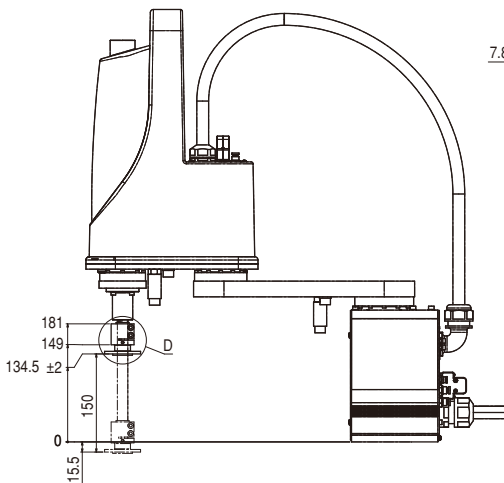
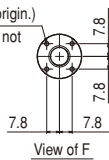
- Note that the robot cannot be used at a position where the base flange, robot cable, spline, and tool flange interfere with each other in the working envelope shown above.
- X-axis mechanical stopper position : 142°
- Y-axis mechanical stopper position : 146°



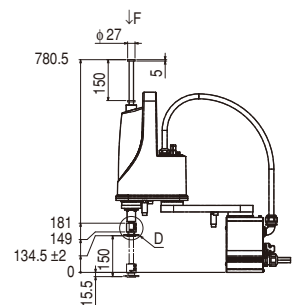
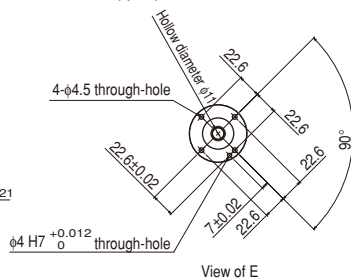
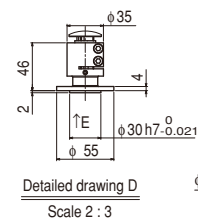
Option: User wiring/tubing through spline type

### YK400XG

4-M3 × 0.5 through-hole (No phase relation to R-axis origin.)  
As this hole is intended for the wiring/tubing clamp, do not attach a large load to it.



- Note that the robot cannot be used at a position where the base flange, robot cable, spline, and tool flange interfere with each other in the working envelope shown above.
- X-axis mechanical stopper position : 142°
- Y-axis mechanical stopper position : 146°



Option: User wiring/tubing through spline type



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