

X series

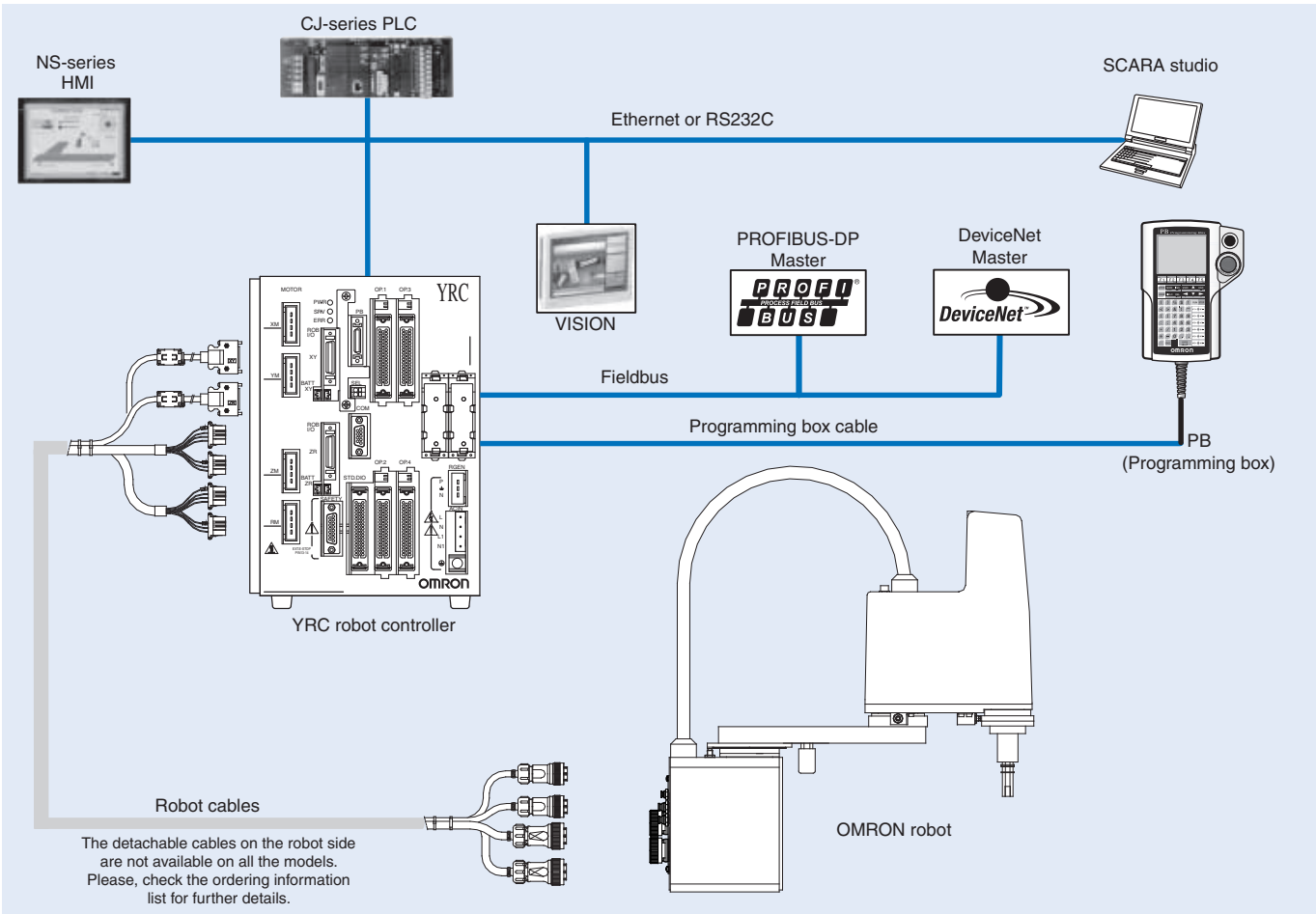
SCARA robots

SCARA robots for industrial applications:

- Higher precision and speed.
- Easier to use.
- Higher rigidity.
- Very compact design.



System configuration



YRC Robot controller

Specifications

| Item | Description | | | |
|--------------------------------------------------------------------------------------|---------------------------------|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|---|
| YRC | YRC robot controller | | | |
| Basic specifications | Number of controllable axes | | | |
| | Controllable robots | | | |
| | Maximum power consumption | | | |
| | Capacity of the connected motor | | | |
| | Dimensions (WxHxD) | | | |
| | Weight | | | |
| Input power supply | Control power supply | Single phase AC200 to 230 V +/-10% maximum (50/60 Hz) | | |
| | Motor power supply | Single phase AC200 to 230 V +/-10% maximum (50/60 Hz) | | |
| Axis control | Drive method | | | |
| | Position detection method | | | |
| | Operating method | | | |
| | Coordinate system | | | |
| | Position indication units | | | |
| | Speed setting | | | |
| | Acceleration setting | | | |
| | Resolution | | | |
| | Origin search method | | | |
| Program | Program language | | | |
| | Multitasks | | | |
| | Sequence program | | | |
| | Point-data input method | | | |
| Memory | Memory capacity | | | |
| | Programs | | | |
| | Points | | | |
| | Memory Backup battery | | | |
| | Internal flash memory | | | |
| External input/output | STD.DIO | I/O input | General input 16 points, dedicated input 10 points (NPN/PNP specifications selectable) | |
| | | I/O output | General output 8 points, dedicated output 11 points | |
| | SAFETY | | Emergency stop input (Relay contact), Service mode input (NPN/PNP specification is set according to STD.DIO setting) | |
| | Brake output | | Relay contact | |
| | Origin sensor input | | Connectable to DC 24 V normally-closed contact sensor | |
| | External communications | | RS232C: 1CH D-SUB9 (female) RS422: 1CH (Dedicated PB) | |
| | Options | Slots | | 4 |
| | | Type | Optional input/output (NPN/PNP): General input 24 points / General output 16 points | |
| | | | CC-Link: Dedicated input 16 points, Dedicated output 16 points, General input 96 points, General output 96 points (4 nodes occupied) | |
| | | | DeviceNet: Dedicated input 16 points, Dedicated output 16 points, General input 96 points, General output 96 points | |
| | | | Profibus: Dedicated input 16 points, Dedicated output 16 points, General input 96 points, General output 96 points | |
| | | | Ethernet: IEEE802.3 10Mbps (10BASE-T) | |
| IVY: Camera input (2ch), camera trigger input, PC connection input | | | | |
| Tracking: AB phase input, lighting trigger input, lighting power supply input/output | | | | |
| Lighting control: lighting trigger input, lighting power supply input/output | | | | |
| Options | Programming box | | PB (with enable switch) | |
| | Support software for PC | | SCARA STUDIO | |
| General specifications | Operating temperature | | 0°C to 40°C | |
| | Storage temperature | | -10°C to 65°C | |
| | Operating humidity | | 35% to 85% RH (non-condensing) | |
| | Absolute backup battery | | Lithium metallic battery 3.6 V 5400 mAh (2700 mAh x 2) | |
| | Absolute data backup period | | 1 year (in state with no power applied) | |
| | Noise immunity | | IEC61000-4-4 Level 3 | |
| | Protective structure | | IP10 | |

YRC-Optional Input/Output unit (PNP/NPN)

| Item | Description |
|--------------------------------------|-----------------------------------------------------|
| R6YACMA241 (NPN) R6YACMA242 (PNP) | Optional Input/Output unit |
| Optional Input/Output (NPN/PNP) | 24 General purpose input, 16 General purpose output |

YRC-DeviceNet slave unit

| Item | Description | |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| R6YACDRT01 | DeviceNet slave unit | |
| Applicable controllers | YRC | |
| Applicable DeviceNet specifications | Volume 1 Release 2.0 / Volume 2 Release 2.0 | |
| Device Profile Name | Generic Device (device number 0) | |
| Number of occupied CH ^{*1} | Normal: Input/Output 24ch each, Compact: Input/Output 2ch each | |
| MAC ID setting | 0 to 63 | |
| Transmission speed setting | 500 Kbps, 250 Kbps, 125 Kbps (set using DIP switch on board) | |
| DeviceNet I/O ² | Normal | General input 96 points, General output 96 points, Dedicated input 16 points, Dedicated output 16 points |
| | Compact | General input 16 points, General output 16 points, Dedicated input 16 points, Dedicated output 16 points |
| Parallel external I/O | The master module and up to four ports can be controlled regardless of the robot program by using the pseudoserialization function | |
| Network length | Overall length ^{*3} | 100 m/500 Kbps, 250 m/250 Kbps, 500 m/125 Kbps |
| | Branch length / Overall branch length | 6 m max./39 m max., 6 m max./78 m max., 6 m max./156 m max. |
| Monitor LED | MS (Module Status), NS (Network Status) | |

*1 Use the robot parameter to select Normal or Compact.

*2 Controller I/O are updated every 10ms.

*3 These values apply when a thick cable is used. The distance is less when a fine cable is used or when thick and fine cables are mixed in use.

YRC-Profibus slave unit

| Item | Description |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| R6YACPRT01 | Profibus slave unit |
| Applicable controllers | YRC |
| Communication profile | Profibus-DP slave |
| Number of occupied nodes | 1 node |
| Setting of station address | 1 to 99 (set using Rotary switch on board) |
| Setting of communication speed | 9.6 Kbps, 19.2 Kbps, 93.75 Kbps, 187.5 Kbps, 500 Kbps, 1.5 Mbps, 3 Mbps, 6 Mbps, 12 Mbps (automatic recognition) |
| Profibus I/O ^{*1} | General input 96 points, General output 96 points, Dedicated input 16 points, Dedicated output 16 points |
| Parallel external I/O | The master module and up to four ports can be controlled regardless of the robot program by using the pseudoserialization function |
| Overall length | 100 m/3 M-6 M-12 Mbps, 200 m/1.5 Mbps, 400 m/500 Kbps, 1000 m/187.5 Kbps, 1200 m/9.6 K- 19.2 K-93.75 Kbps |
| Monitor LED | RUN, ERR, SD, RD, DATA-EX |

*1 The shortest I/O update interval of the controller is 10 ms but the actual I/O update time varies depending on the update time with the master station.

YRC-Ethernet unit

| Item | Description |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| R6YACETN01 | Ethernet unit |
| Applicable controllers | YRC |
| Network specification | As specified for Ethernet (IEEE802.3) |
| Connector specification | RJ-45 connector (8-pole modular connector) 1 port |
| Baud rate | 10 Mbps (10BASE-T) |
| Communication mode | Half Duplex (Half-duplex) |
| Network protocol | Application layer: TELNET / Transport layer: TCP / IP Network layer: IP, ICMP, ARP / Data link layer: CSMA / CD Physical layer: 10BASE-T |
| Number of simultaneous log inputs | 1 |
| Setting of IP address, etc. | Set from PB |
| Monitor LED | Run, Collision, Link, Transmit, Receive |

YRC-VISION board basic specifications

| Item | Description | |
|-------------------------|----------------------------------------------------------------------------------|-------------------------------------------------|
| R6YACVI01 | VISION board | |
| Basic specifications | Applicable controller | YRC |
| | Pixels | 640 (H) x 480 (V) (300,000 pixels, VGA) |
| | Settable part types | 40 part types |
| | Connectable cameras | Maximum 2 units ^{*1} |
| | Camera types | Double speed compatible analog camera |
| | Memory | 128 MB SDRAM, 256 MB miniSD card |
| | External I/F | Ethernet (100BASE-TX) |
| Search method | Edge search (Correlative edge filter, Sobel filter) | |
| Image input | Trigger | S/W trigger, H/W trigger, Camera internal synch |
| | External trigger input | 2 points |
| Functions | Search function | Position offset, Auto registry of point data |
| Setup support functions | Calibration, image storage function ^{*2} (all images / specified image) | |

*1 If connecting 2 units, then must be the same model.

*2 Requires Windows PC.

Accessories for YRC-VISION board

| Item | Description |
|------------|----------------------------------|
| R6YACS1 | CCD CAMERA |
| R6YACCV003 | Camera cable 3.5 m |
| R6YACCV006 | Camera cable 6 m |
| R6YACCV009 | Camera cable 9.5 m (3.5 m + 6 m) |
| R6YACLE008 | Lens 8 mm |
| R6YACLE012 | Lens 12 mm |
| R6YACLE016 | Lens 16 mm |
| R6YACLE025 | Lens 25 mm |
| R6YACLR005 | Close up ring 0.5 mm |
| R6YACLR010 | Close up ring 1.0 mm |
| R6YACLR020 | Close up ring 2.0 mm |
| R6YACLR050 | Close up ring 5.0 mm |

YRC-Tracking board basic specifications

| Item | Description | | |
|----------------------|--------------------------|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| R6YACTR01 | Tracking board | | |
| Basic specifications | Applicable controller | YRC | |
| | Lighting control section | Number of lighting connected units | Up to 2 units |
| | | Light adjusting system | PWM control (0 to 100%) (Cycle 60 KHz) Stroboscopic light (10 to 33000 μs) |
| | | Trigger | S/W trigger, H/W trigger |
| | | External trigger input | 2 points |
| | | Lighting power input | 12 VDC or 24 VDC (Supplied from outside commonly to 2 channels) |
| | | Lighting output | When DC 12 V is supplied: Less than 30 W with 2 channels totaled When DC 24 V is supplied: Less than 60 W with 2 channels totaled |
| | Pulse input section | Number of encoder connected units | Up to 2 units |
| | | Encoder power source | DC 5 V (Less than 500 mA with 2 channels totaled) (Supplied from controller) |
| | | Applicable encoder | Line driver equivalent to 26LS31 / 26C31 (Conforming to RS422) |
| | | Input phase | A, \bar{A} , B, \bar{B} , Z, \bar{Z} |
| | | Maximum response frequency | 2 MHz |
| | | Counter / Step-up multiplication | 0 to 65535 / Double, quadruple |
| | | Other | Provided with broken wire detect function |

Note: The tracking board is required when using the tracking function.

Accessories for YRC-Tracking board

| Item | Description |
|------------|--------------------------------|
| R6YACCR005 | Encoder cable for tracking 10m |

YRC-Lighting control board basic specifications

| Item | Description | |
|----------------------|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| R6YACLI01 | Lighting control board | |
| Basic specifications | Applicable controller | YRC |
| | Number of lighting connected units | Up to 2 units |
| | Light adjusting system | PWM control (0 to 100%) (Cycle 60KHz) Stroboscopic light (10 to 33000us) |
| | Trigger | S/W trigger, H/W trigger |
| | External trigger input | 2 points |
| | Lighting power input | 12VDC or 24VDC (Supplied from outside commonly to 2 channels) |
| | Lighting output | When DC12V is supplied: Less than 30W with 2 channels totaled When DC24V is supplied: Less than 60W with 2 channels totaled |

Accessories for YRC-PB (Programming box)

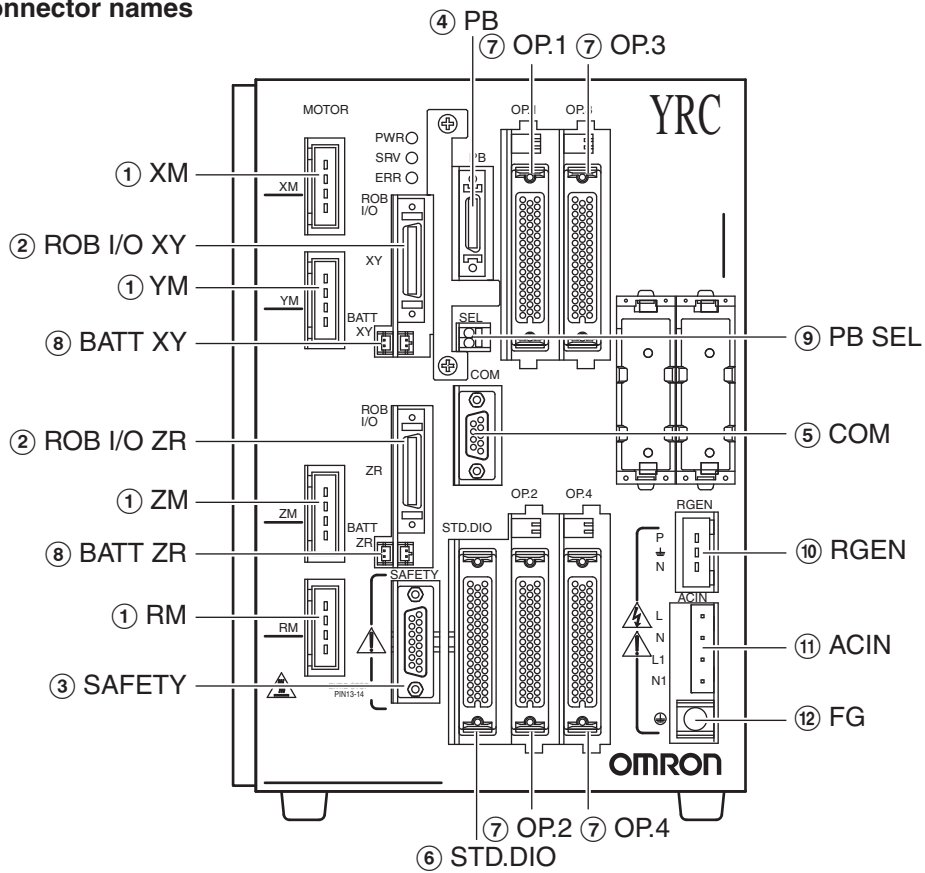
| Item | Description |
|-------------|---------------------------|
| R6YACPB005E | Programming box cable 5m |
| R6YACPB012E | Programming box cable 12m |

Accessories for YRC-SCARA studio software

| Item | Description |
|------------|-------------------------------|
| R6YACSSC1 | Support software SCARA studio |
| R6YACCC005 | Communication cable 9-9 pin |

YRC-Nomenclature

Connector names

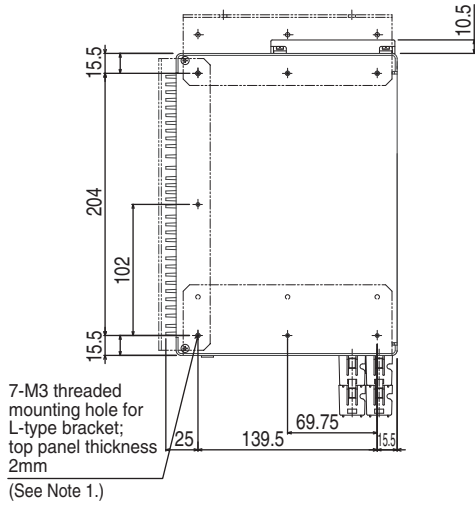


| | Connector name | Function |
|---|-------------------|--------------------------------------------------------------------------------|
| ① | XM/YM/ZM/RM | Connectors for servomotor drive |
| ② | ROB I/O [XY/ZR] | Connectors for servomotor feedback and sensor signals |
| ③ | SAFETY | Input/output connector for safety function such as emergency stop |
| ④ | PB | Connector for PB |
| ⑤ | COM | RS-232C interface connector. |
| ⑥ | STD.DIO | Connector for dedicated input/output and standard generalpurpose input/output |
| ⑦ | OP.1 ,2, 3, 4 | Conectors attached to optional expansion I/O boards |
| ⑧ | BATT [XY/ZR] | Battery connector for absolute backup |
| ⑨ | PB SEL | PB selector switch contact |
| ⑩ | RGEN [P/±/N] | Connector for regenerative unit |
| ⑪ | AC IN [L/N/L1/N1] | Terminal block for power cable. Use ring-tongue terminals to make connections. |
| ⑫ | FG | Ground terminal (±) . Provide Class D grounding (100 ohms or less) . |

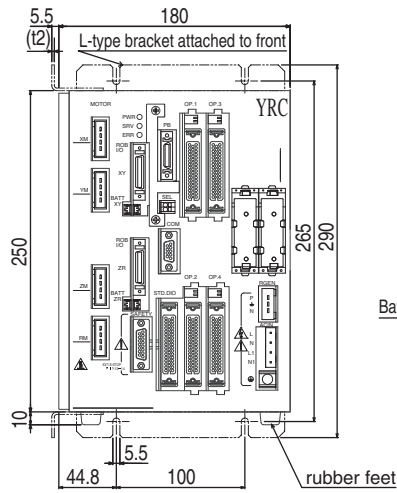
Dimensions

Standard YRC

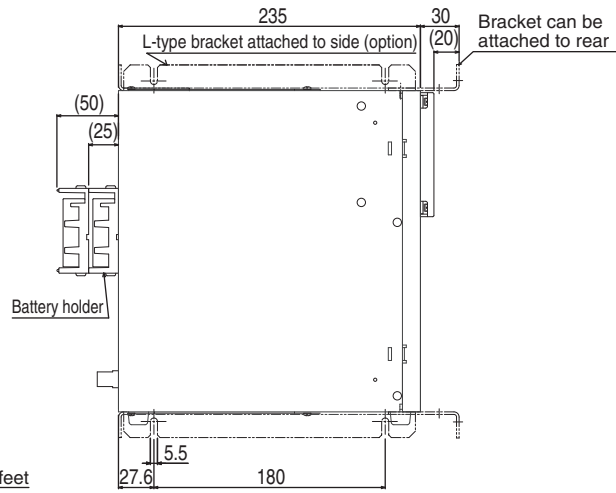
Top view



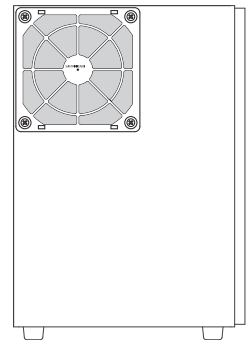
Front view



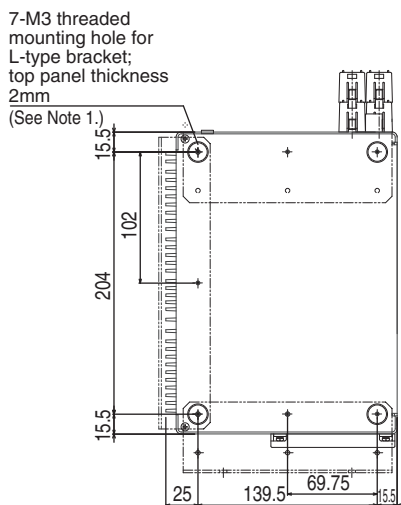
Side view



Rear view



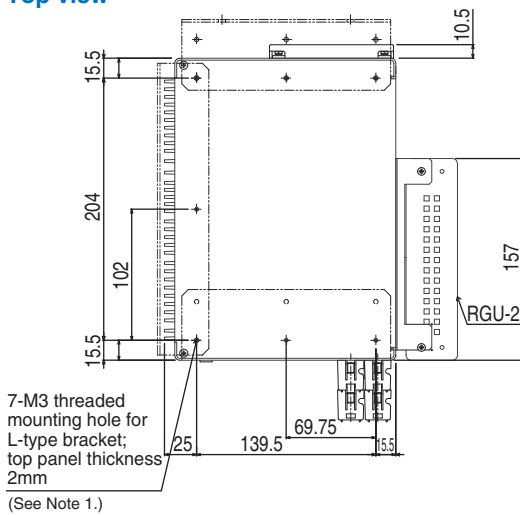
Bottom view



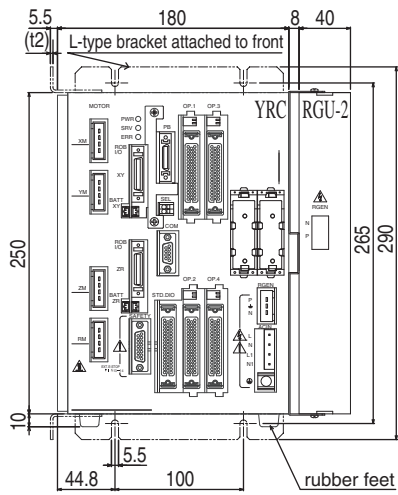
Note 1: When installing this controller using the supplied L-type brackets, remove the rubber feet on the bottom plate.

YRC with RGU2 option installed

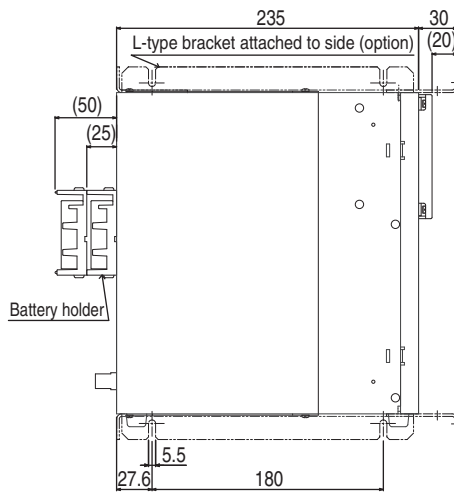
Top view



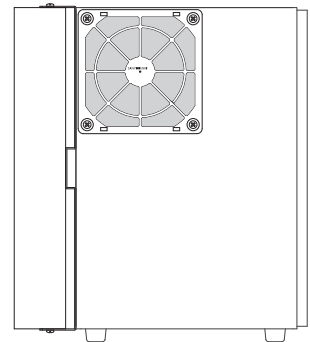
Front view



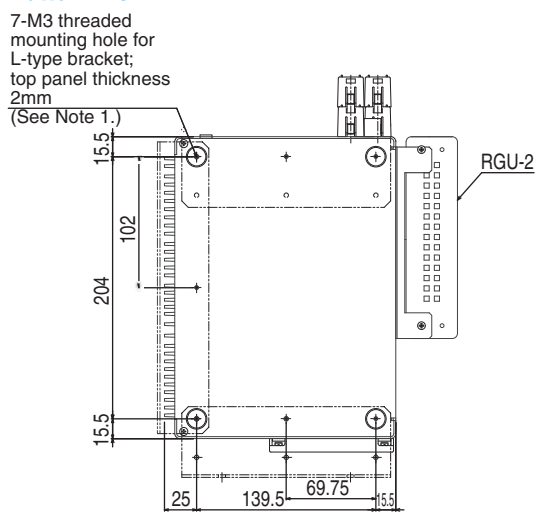
Side view



Rear view

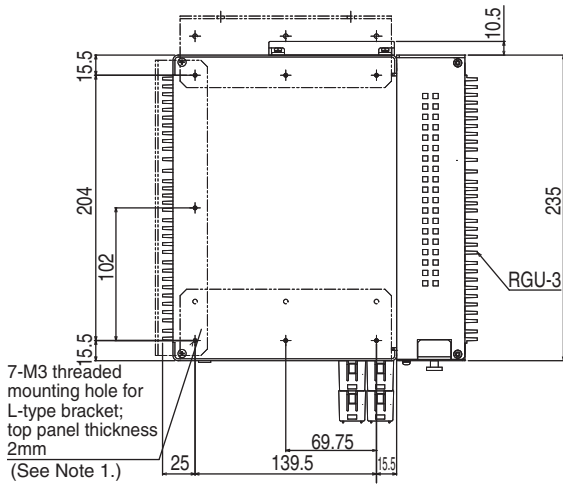


Bottom view

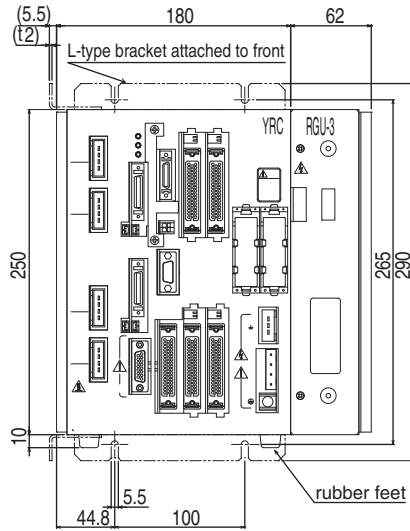


YRC with RGU3 option installed

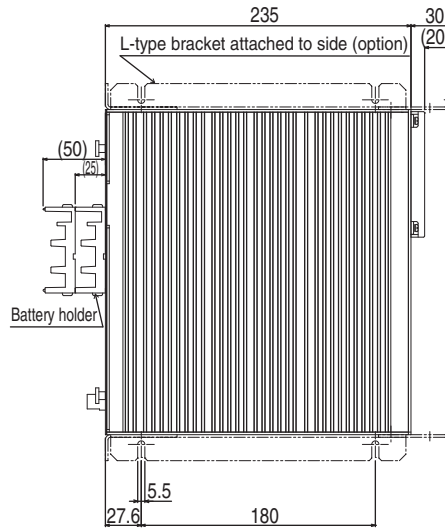
Top view



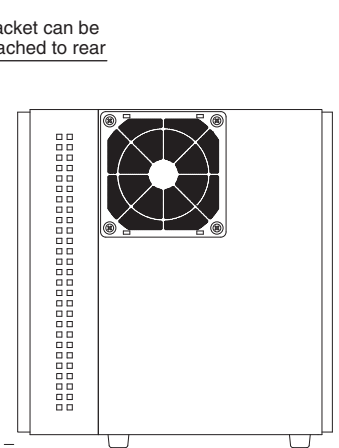
Front view



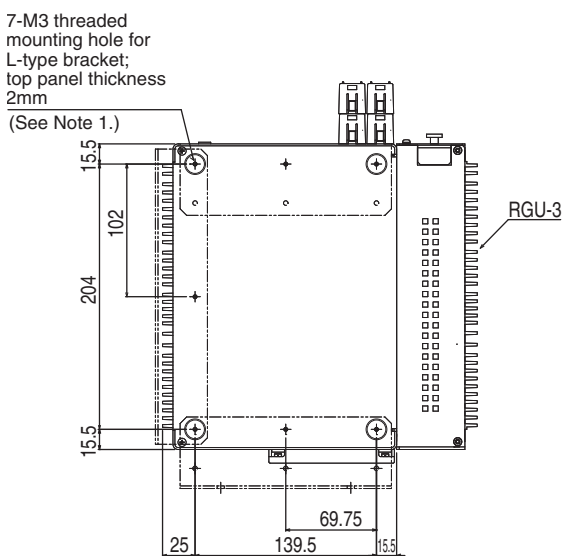
Side view



Rear view



Bottom view



R6YXH250 X SERIES

Specifications

| | | X axis | Y axis | Z axis | R axis |
|------------------------------------------------------------------|-------------------------|--------------------------------------------------|----------------|--------------------------|--------------------------|
| Reach (mm) | | 250 | | | |
| Maximum payload (kg) | | 3 | | | |
| Repeatability ¹ (XYZ:mm) (R:°) | | +/-0.01 | | +/-0.01 | +/-0.005 |
| Axis specifications | Arm length (mm) | 125 | 125 | 150 | ---- |
| | Rotation range (°) | +/-115 | +/-140 | ---- | +/-360 |
| Deceleration mechanism | Speed reducer | Harmonic drive | Harmonic drive | Ball screw | Harmonic drive |
| | Transmission method | Motor to speed reducer | Direct-coupled | Timing belt transmission | Timing belt transmission |
| | Speed reducer to output | Direct-coupled | | | |
| AC servo motor output (W) | | 200 | 100 | 100 | 100 |
| Maximum speed (XYZ:m/sec) (R:°/sec) | | 4 | | 1 | 1020 |
| Standard cycle time: with 2kg payload ² (sec) | | 0.54 | | | |
| R axis allowable moment inertia ³ (kgm ²) | | 0.05 | | | |
| User wiring (sq x pcs) | | 0.2 x 10 | | | |
| User tubing (Outer diameter) | | Ø4 x 3 | | | |
| Movement limit setting | | 1.Soft limit 2.Mechanical stopper (X, Y, Z axis) | | | |
| Robot cable length (m) | | Standard: 3.5 Option: 5, 10 | | | |
| Weight (kg) (Excluding robot cable) | | 15 | | | |

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

*2 When moving 25mm in vertical direction and 300mm in horizontal direction reciprocally.

*3 There are limits to the setting of the acceleration coefficient.

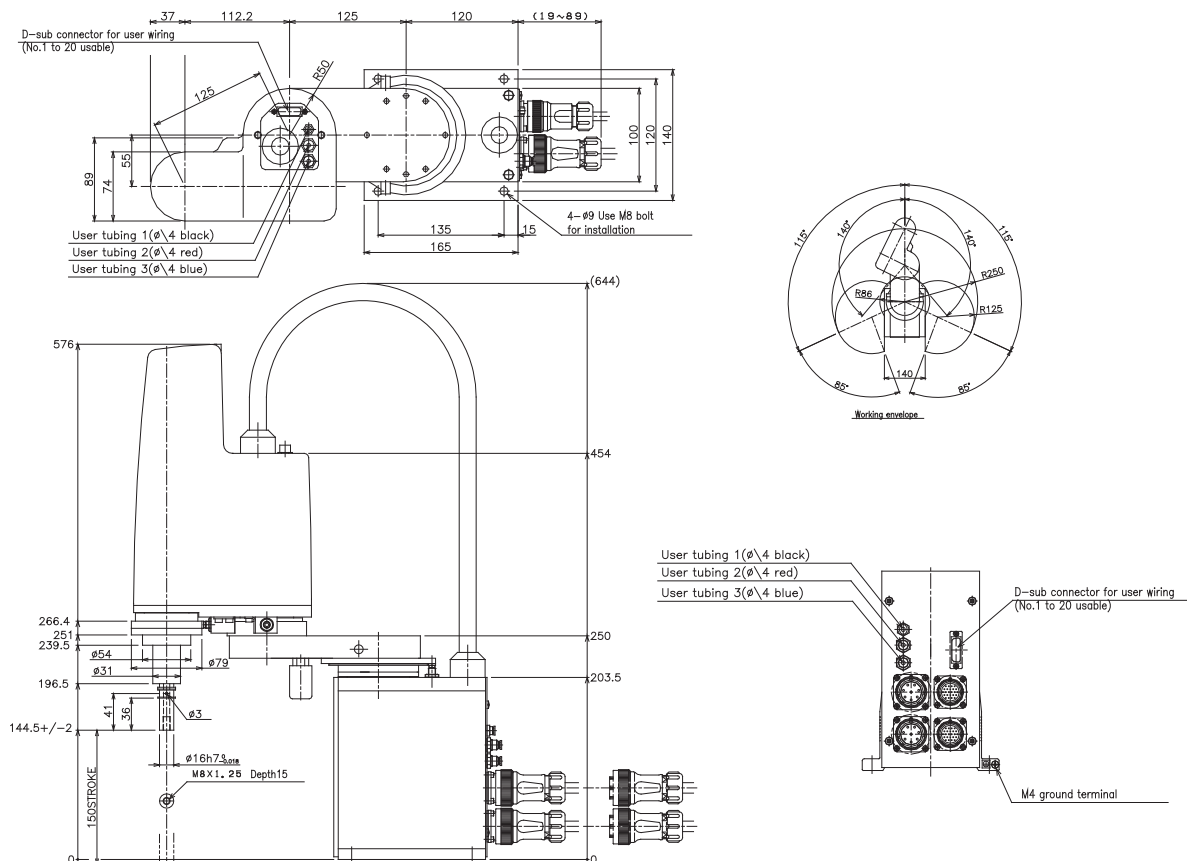
Controller

| Controller | Power consumption (VA) | Operating method |
|------------|------------------------|----------------------------------------------------------------------------------------|
| YRC | 1000 | Programming / I/O point trace / Remote command / Operation using RS-232C communication |

Ordering information

| Description | Model |
|----------------------------------------------------------------|----------------|
| SCARA Reach: 250mm, Vertical Stroke: 150mm, Max. payload: 3kg. | R6YXH250150YRC |

Dimensions



R6YXH350 X SERIES

Specifications

| | | X axis | Y axis | Z axis | R axis |
|------------------------------------------------------------------|---------------------|--------------------------------------------------|----------------|--------------------------|--------------------------|
| Reach (mm) | | 350 | | | |
| Maximum payload (kg) | | 3 | | | |
| Repeatability ¹ (XYZ:mm) (R:°) | | +/-0.01 | | +/-0.01 | +/-0.005 |
| Axis specifications | Arm length (mm) | 225 | 125 | 150 | ---- |
| | Rotation range (°) | +/-115 | +/-140 | ---- | +/-360 |
| Deceleration mechanism | Speed reducer | Harmonic drive | Harmonic drive | Ball screw | Harmonic drive |
| | Transmission method | Motor to speed reducer | Direct-coupled | Timing belt transmission | Timing belt transmission |
| | | Speed reducer to output | Direct-coupled | | |
| AC servo motor output (W) | | 200 | 100 | 100 | 100 |
| Maximum speed (XYZ:m/sec) (R:°/sec) | | 5 | | 1 | 1020 |
| Standard cycle time: with 2kg payload ² (sec) | | 0.54 | | | |
| R axis allowable moment inertia ³ (kgm ²) | | 0.05 | | | |
| User wiring (sq x pcs) | | 0.2 x 10 | | | |
| User tubing (Outer diameter) | | Ø4 x 3 | | | |
| Movement limit setting | | 1.Soft limit 2.Mechanical stopper (X, Y, Z axis) | | | |
| Robot cable length (m) | | Standard: 3.5 Option: 5, 10 | | | |
| Weight (kg) (Excluding robot cable) | | 15 | | | |

*1 This is the value at a constant ambient temperature. (X,Y axes)
 *2 When moving 25mm in vertical direction and 300mm in horizontal direction reciprocally.
 *3 There are limits to the setting of the acceleration coefficient.

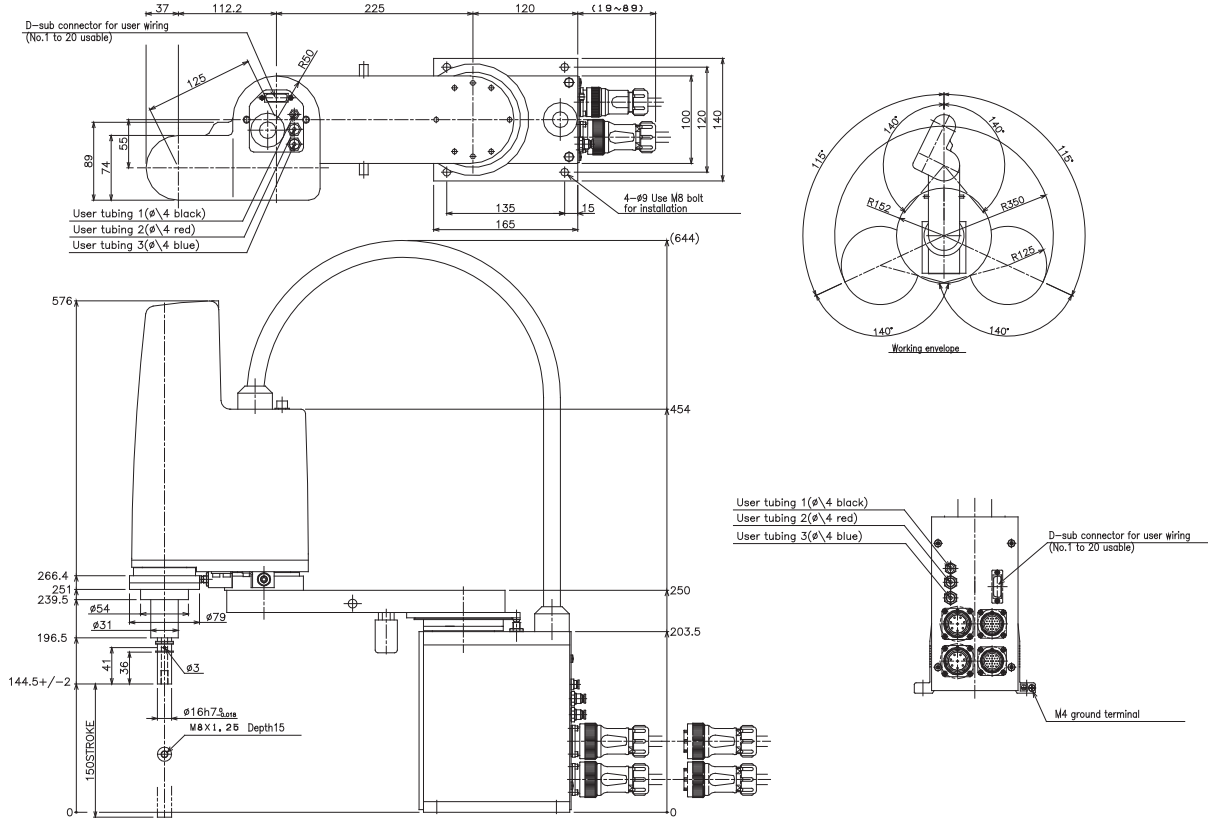
Controller

| Controller | Power consumption (VA) | Operating method |
|------------|------------------------|----------------------------------------------------------------------------------------|
| YRC | 1000 | Programming / I/O point trace / Remote command / Operation using RS-232C communication |

Ordering information

| Description | Model |
|----------------------------------------------------------------|----------------|
| SCARA Reach: 350mm, Vertical Stroke: 150mm, Max. payload: 3kg. | R6YXH350150YRC |

Dimensions



R6YXH400 X SERIES

Specifications

| | | | X axis | Y axis | Z axis | R axis |
|-------------------------------------------------------------------|---------------------|-------------------------|--------------------------------------------------|----------------|--------------------------|--------------------------|
| Reach (mm) | | | 400 | | | |
| Maximum payload (kg) | | | 3 | | | |
| Repeatability ^{*1} (XYZ:mm) (R:°) | | | +/-0.01 | | +/-0.01 | +/-0.005 |
| Axis specifications | Arm length (mm) | | 225 | 175 | 150 | ---- |
| | Rotation range (°) | | +/-115 | +/-140 | ---- | +/-360 |
| Deceleration mechanism | Speed reducer | | Harmonic drive | Harmonic drive | Ball screw | Harmonic drive |
| | Transmission method | Motor to speed reducer | Direct-coupled | | Timing belt transmission | Timing belt transmission |
| | | Speed reducer to output | Direct-coupled | | | |
| AC servo motor output (W) | | | 200 | 100 | 100 | 100 |
| Maximum speed (XYZ:m/sec) (R:°/sec) | | | 6 | | 1 | 1020 |
| Standard cycle time: with 2kg payload ^{*2} (sec) | | | 0.49 | | | |
| R axis allowable moment inertia ^{*3} (kgm ²) | | | 0.05 | | | |
| User wiring (sq x pcs) | | | 0.2 x 10 | | | |
| User tubing (Outer diameter) | | | Ø4 x 3 | | | |
| Movement limit setting | | | 1.Soft limit 2.Mechanical stopper (X, Y, Z axis) | | | |
| Robot cable length (m) | | | Standard: 3.5 Option: 5, 10 | | | |
| Weight (kg) (Excluding robot cable) | | | 15 | | | |

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

*2 When moving 25mm in vertical direction and 300mm in horizontal direction reciprocally.

*3 There are limits to the setting of the acceleration coefficient.

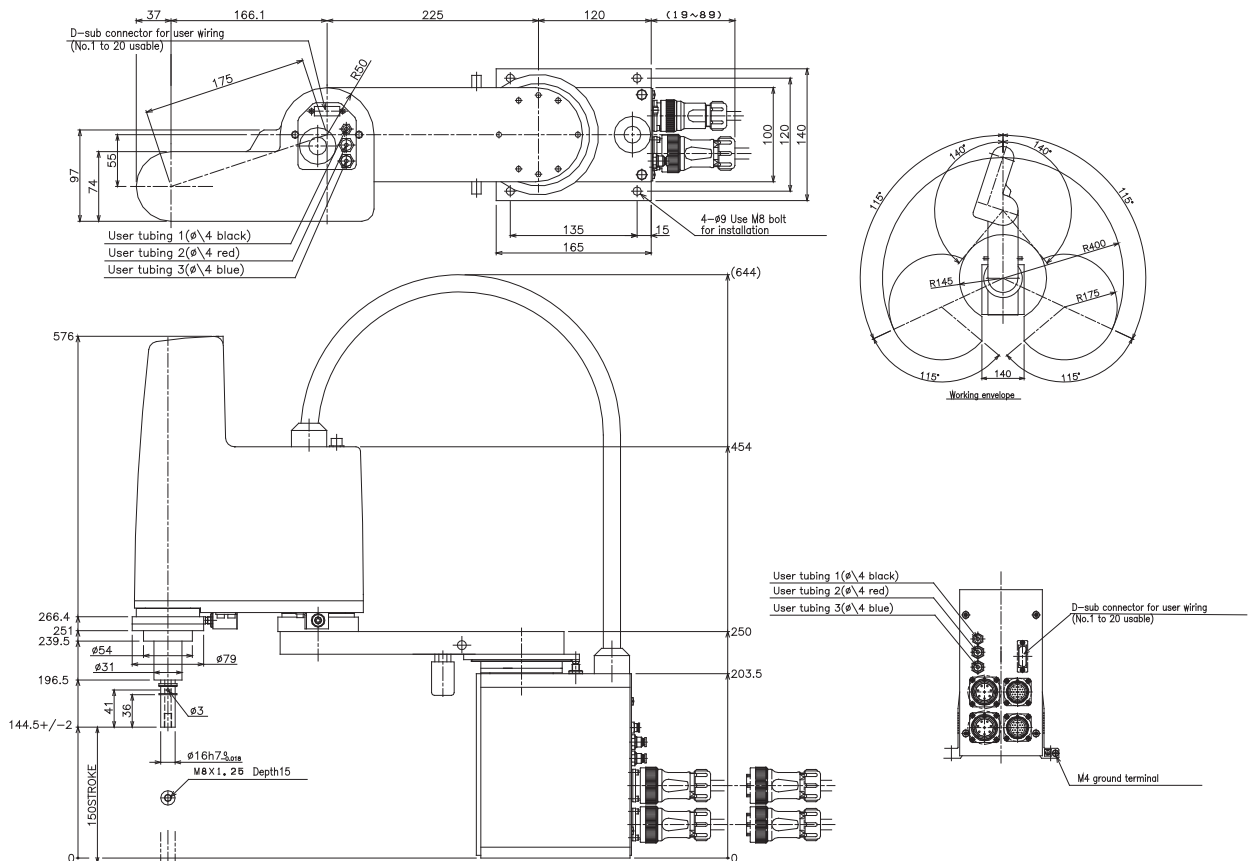
Controller

| Controller | Power consumption (VA) | Operating method |
|------------|------------------------|----------------------------------------------------------------------------------------|
| YRC | 1000 | Programming / I/O point trace / Remote command / Operation using RS-232C communication |

Ordering information

| Description | Model |
|----------------------------------------------------------------|----------------|
| SCARA Reach: 400mm, Vertical Stroke: 150mm, Max. payload: 3kg. | R6YXH400150YRC |

Dimensions



R6YXX1200 X SERIES

Specifications

| | | | X axis | Y axis | Z axis | R axis |
|------------------------------------------------------------------|---------------------|-------------------------|--------------------------------------------------|----------------|--------------------------|--------------------------|
| Reach (mm) | | | 1200 | | | |
| Maximum payload (kg) | | | 50 | | | |
| Repeatability ¹ (XYZ:mm) (R:°) | | | +/-0.05 | | +/-0.02 | +/-0.005 |
| Axis specifications | Arm length (mm) | | 600 | 600 | 400 | ---- |
| | Rotation range (°) | | +/-125 | +/-150 | ---- | +/-360 |
| Deceleration mechanism | Speed reducer | | Planetary gear | Planetary gear | Ball screw | Harmonic drive |
| | Transmission method | Motor to speed reducer | Direct-coupled | | Timing belt transmission | Timing belt transmission |
| | | Speed reducer to output | Direct-coupled | | | |
| AC servo motor output (W) | | | 900 | 800 | 600 | 400 |
| Maximum speed (XYZ:m/sec) (R:°/sec) | | | 7.4 | | 0.75 | 600 |
| Standard cycle time: with 2kg payload ² (sec) | | | 0.91 | | | |
| R axis allowable moment inertia ³ (kgm ²) | | | 2.45 | | | |
| User wiring (sq x pcs) | | | 0.2 x 20 | | | |
| User tubing (Outer diameter) | | | Ø6 x 3 | | | |
| Movement limit setting | | | 1.Soft limit 2.Mechanical stopper (X, Y, Z axis) | | | |
| Robot cable length (m) | | | Standard: 3.5 Option: 5, 10 | | | |
| Weight (kg) (Excluding robot cable) | | | 124 | | | |

- *1 This is the value at a constant ambient temperature. (X, Y axes)
- *2 When moving 25mm in vertical direction and 300mm in horizontal direction reciprocally.
- *3 There are limits to the setting of the acceleration coefficient.

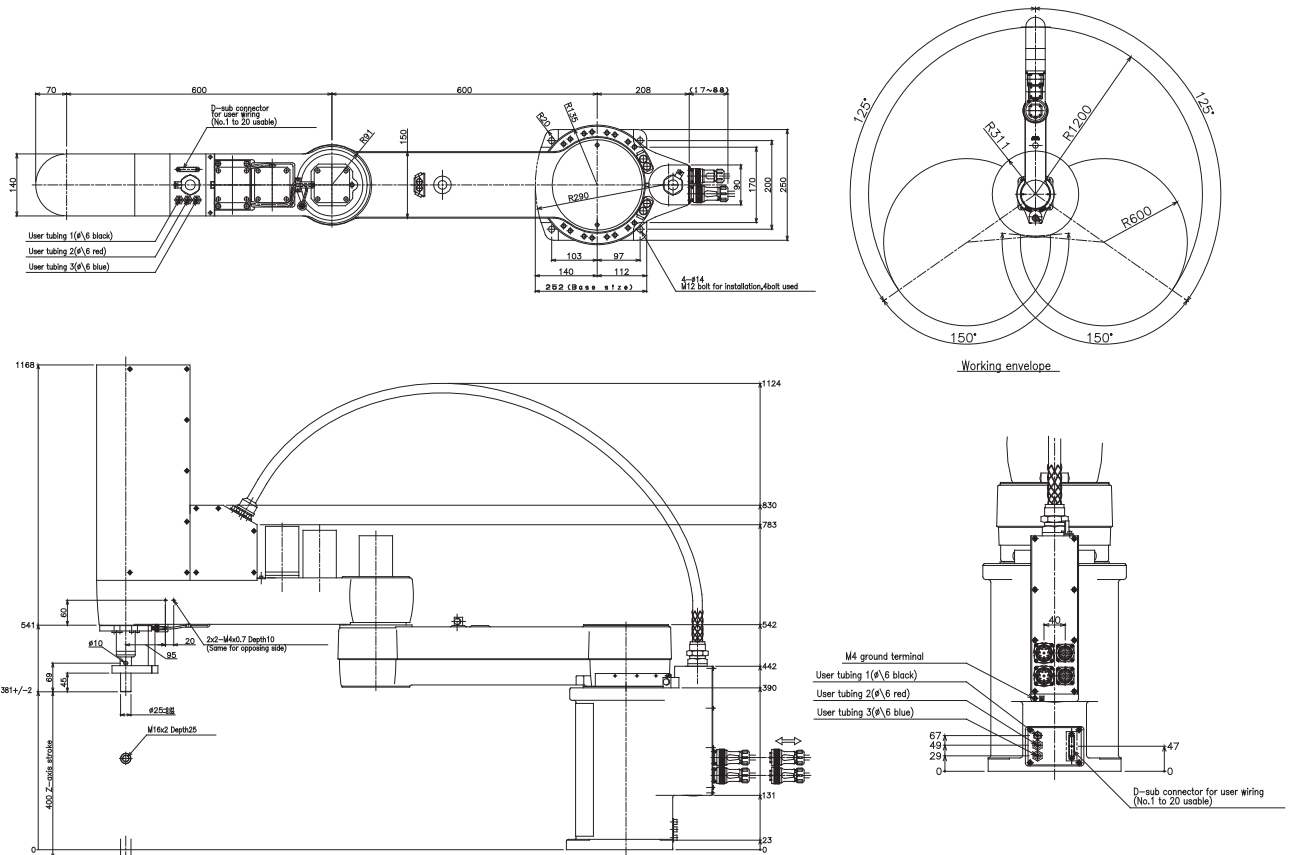
Controller

| Controller | Power consumption (VA) | Operating method |
|------------|------------------------|----------------------------------------------------------------------------------------|
| YRC | 2500 | Programming / I/O point trace / Remote command / Operation using RS-232C communication |

Ordering information

| Description | Model |
|------------------------------------------------------------------|-----------------|
| SCARA Reach: 1200mm, Vertical Stroke: 400mm, Max. payload: 50kg. | R6YXX1200400YRC |

Dimensions



SCARA Robots X series

Ordering information

| | Series | Reach (mm) | Z-axis stroke (mm) | Payload (kg) | Robot item code | RGU | Robot cable length (m) | Cable item code | Detachable robot cable |
|-----|--------|------------|--------------------|--------------|-----------------|------|------------------------|-----------------|------------------------|
| R6Y | XH | 250 | 150 | 3 | R6YXH250150YRC | N.A. | 3.5 | R6YACCX003XGX | ● |
| | | | | | | | 5.0 | R6YACCX005XGX | ● |
| | | | | | | | 10.0 | R6YACCX010XGX | ● |
| | XH | 350 | 150 | 3 | R6YXH350150YRC | N.A. | 3.5 | R6YACCX003XGX | ● |
| | | | | | | | 5.0 | R6YACCX005XGX | ● |
| | | | | | | | 10.0 | R6YACCX010XGX | ● |
| | XH | 400 | 150 | 3 | R6YXH400150YRC | N.A. | 3.5 | R6YACCX003XGX | ● |
| | | | | | | | 5.0 | R6YACCX005XGX | ● |
| | | | | | | | 10.0 | R6YACCX010XGX | ● |
| | XX | 1200 | 400 | 50 | R6YXX1200400YRC | RGU2 | 3.5 | R6YACCX003XGX | ● |
| | | | | | | | 5.0 | R6YACCX005XGX | ● |
| | | | | | | | 10.0 | R6YACCX010XGX | ● |

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
 To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.