

# i4-350L/450L/550L

**Industry leading performance, flexibility, and ease of use to address a wide range of applications.**

- 5 kg payload, high inertia, and high duty ratings enable the i4L to tackle more challenging processes with ease.
- Compact built-in internal controller, out-of-the-box table or wall mounting, and options for rear or bottom cabling reduce the physical area required and enable a customized installation.
- High visibility multi-colored LED dome light provides an intuitive visual indication of status.
- Available in 350 mm, 450 mm, and 550 mm reaches to accommodate a wide variety of applications.
- Easily integrates with the full line of OMRON automation products as well as 3rd party automation platforms.
- Built-in EtherCAT and PROFINET Fieldbus communications.



## Ordering Information

RS4-20□□□□□

1 2 3 4 5

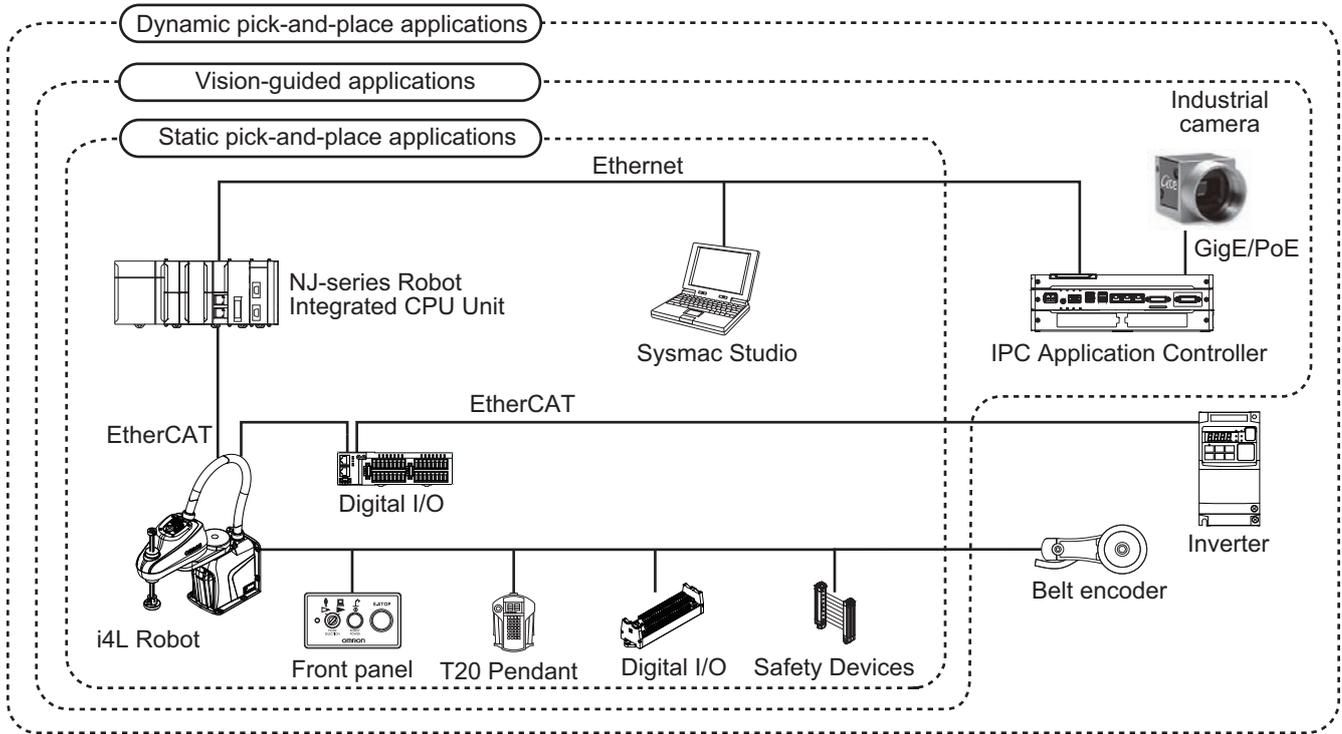
Item	Description	Details	Designation
1	Robot Type	SCARA	RS4-20
2	Control Type	Standard Control	5
		Integrated Control	6
3	Reach	350 mm	3
		450 mm	4
		550 mm	5
4	Interface Panel Orientation	Rear	0
		Bottom	1
5	Z-axis Quill Stroke Length	180 mm (standard)	2
		350 mm (i4 550L only)	4

# i4L-Series

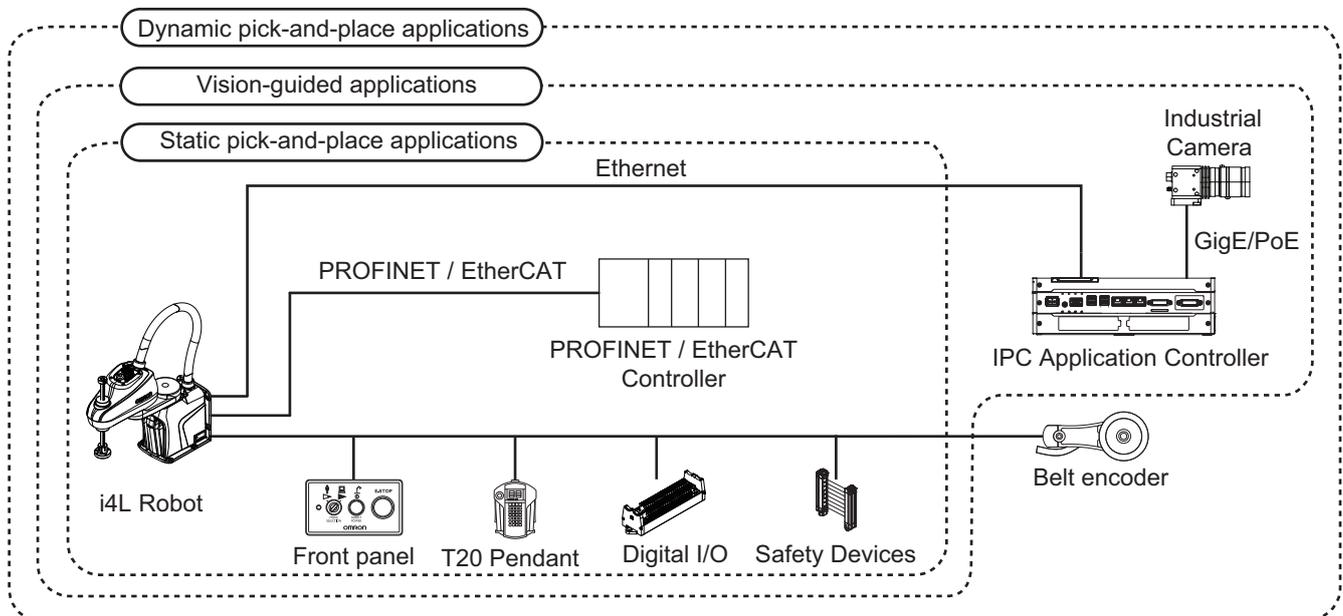
## System Configuration

Typical system configurations are shown below. Other equipment and connections are possible.

### Integrated Control



### Standard Control



## Specifications

Product		i4-350L	i4-450L	i4-550L	
Quill Length		180 mm	180 mm	180 mm	350 mm
Number of Axes		4			
Reach		350mm	450 mm	550 mm	
Maximum Payload*1		5 kg			
Repeatability at 100% Speed	XY	±0.01 mm			
	Joint 3	±0.01 mm			
	Joint 4	±0.01°			
Joint Range	Joint 1	±136°			
	Joint 2	±136°	±148°		
	Joint 3	180 mm*2			350 mm*3
	Joint 4	±300,000 rotations (Standard Control), ±1 rotation (Integrated Control)			
Inertia Moment (Max.)	Joint 4	0.05 kg-m <sup>2</sup>			
Torque Limits	Joint 4	1.1 N-m continuous, 5.1 N-m peak*4			
Maximum Push Force - Downward, No Load*5	Joint 3	150 N			
Joint Speeds	Joint 1	456 deg/s			
	Joint 2	456 deg/s			
	Joint 3	800 mm/s			
	Joint 4	6000 deg/s			
Cycle Times*6	Burst*7	0.54 s	0.48 s		
	Sustained	0.57 s			0.54 s
	Blended Burst*6	0.45 s	0.42 s	0.38 s	
Electrical Requirements	Control Power	24 VDC 5 A / 120 W			
	High Power	48 VDC 15 A / 720 W rated 20 A / 960 W max.			
Protection	IP20 / NEMA Type 1				
Mounting	Table, Wall				
Environmental Requirements	Ambient Temperature	5° to 40°C			
	Humidity Range	5% to 90% non-condensing			
Weight	15.1 kg	15.9 kg	16.4 kg	16.5 kg	
On-board I/O (Primary and Secondary Interface Panels)	17 Sinking (NPN) / Sourcing (PNP) Inputs, 12 Sourcing (PNP) Outputs				
PROFINET	PROFINET v2.4, class B, vendor specific I/O device profile				
EtherCAT SubDevice	FreeRun and DC (Distributed Clock) with Sync0				
Electrical Pass-through Ports	15 pin, D-sub, male				
Pneumatic Pass-through Ports	4 (6 mm) and 2 (4mm) push-type fittings, max. pressure 0.55 MPa				
Belt Encoder	2 line driver inputs (A, B, and Z)				
RS-232C Serial Communication Ports	1 (troubleshooting information only)				
Programming Software	Sysmac Studio / ACE Version 4*8				
IPC Application Manager	Robot Vision Manager, PackManager				
Controller	NJ501-R Series (Integrated Control robots only)				
Standards	EN ISO 12100, EN ISO 13849-1, EN ISO 10218-1, EN 60204-1, EN 61000-6-4, EN 61000-6-2, KN 61000 6-2, KN 61000 6-4				

\*1 Payload includes any object(s) attached to a robot link or tool flange, including end-effectors, tooling, valves, grippers, and objects being handled by the robot.

\*2 Bellows reduce the z-axis travel by 27 mm in the retracted position and 27 mm in the extended position.

\*3 Bellows reduce the z-axis travel by 53 mm in the retracted position and 53 mm in the extended position.

\*4 Values can be achieved in a 20°C ambient operating temperature. Values may decrease in higher ambient temperatures. The peak torque can be applied for up to 200 ms with a duty cycle of 10%.

\*5 At a duty cycle of 1 seconds pushing and then 3 seconds not pushing.

\*6 Cycle time is defined as a continuous path with straight-line motion in which the robot tool moves up 25 mm, laterally 305 mm, down 25 mm, and then back along the same path (not achievable over all paths in the robot working envelope). Values listed are with no joint 4 rotation, at 20°C ambient with a 2.0 kg payload. Blended Burst cycle uses the same criteria with arc motion.

\*7 Burst cycle times may increase by up to 20% when bellows are present.

\*8 Use Sysmac Studio for Integrated Control robots. Use ACE Version 4 for Standard Control robots.

# i4L-Series

## Version Information

The details in this document apply to products operating with the following hardware and software versions.

- Integrated Control Robot Controller Version: Revision B
- Standard Control Robot Controller Version: Revision B
- Integrated Control Robot Firmware Version: 5.0C
- Standard Control Robot Firmware Version: 6.102C
- ACE Software Version: 4.8.3
- PROFINET functionality requires a minimum firmware version of 6.06C and an ACE software version of 4.7.3
- EtherCAT functionality requires a minimum firmware version of 6.102C and an ACE software version of 4.8.3

## Items Included With the Robot

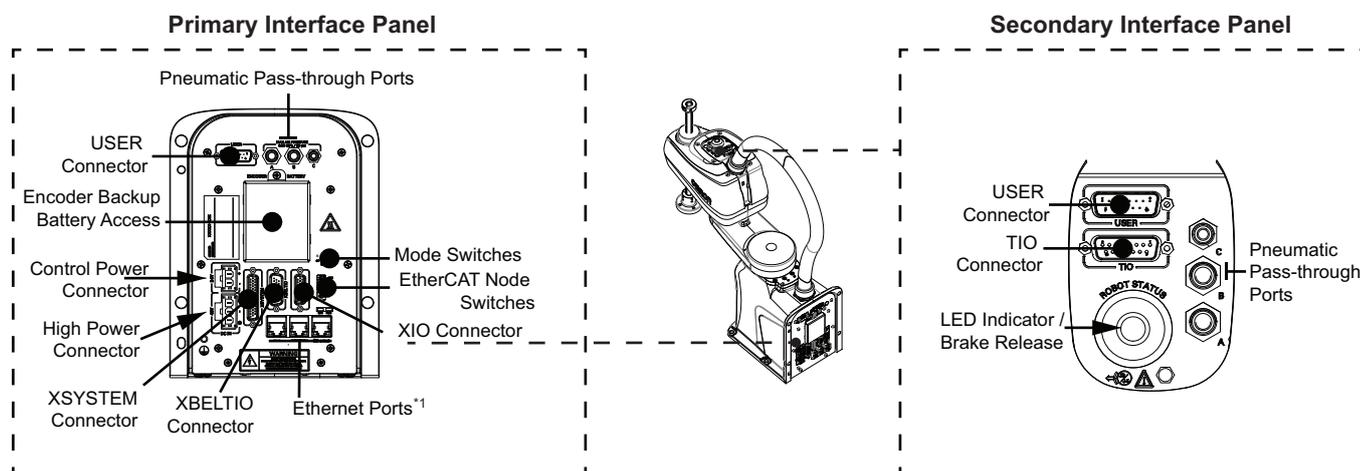
Item	Description
Front Panel	Remote mounted device for robot mode, power, indication, and emergency stop.
XSYSTEM Cable	1.8 m cable providing 3 connectors for XMCP, XFP, and XUSR signals.
XMCP Connector Jumper	Jumper for XMCP connector on XSYSTEM cable.
XFP Connector Jumper	Jumper for XFP connector on XSYSTEM cable.
XUSR Connector Jumper	Jumper for XUSR connector on XSYSTEM cable.
Control Power Connector	Control power connector and pins
High Power Connector	High power connector and pins
Documentation Dongle	USB memory stick containing user manuals (i4L, ACE, and V+), ACE Software, and Firmware (eV+ 2.6c11)
Printed Documentation	Fixed Robot Safety Guide, Declarations of Incorporation (MDOI), and Declaration of Conformance to KC Standards (UKCA)
Labels	CE, Light Color Status, UKCA, Robot Labels in French
Screws	4 X M8x10 SHCS, 1 X grounding screw

## Options and Additional Items

Item	Description	Details	Ordering Code
XSYSTEM Cable with Jumpers	Provides connections and jumpers for a Front Panel, Teach Pendant, and other user-supplied devices.	1.8 m cable length.	13323-000
High Power Connector	3-position connector provides 48 VDC High Power to the internal servo amplifiers.	Includes connector, 4 pins, and ground screw	22009-000F
Control Power Connector	2-position connector provides 24 VDC Control Power.	Includes connector and 3 pins.	02708-000F
Control Power Kit	Provides 24 VDC Control Power to the robot.	Includes 24 VDC power supply (S8VK-G24024) and 5.0 m DC cable with pre-installed connector to robot.	23912-000
High Power Kit	Provides 48 VDC power to the robot.	Includes two 48 VDC power supplies (S8VK-G48048), redundancy unit, and DC cabling with pre-installed connector to robot (5.0 m).	23913-000
XBELTIO Cable	Provides connections to Belt Encoder, EXPIO, and RS-232 signals.	0.6 m cable length.	13463-000
XIO Cable	Connection to XIO termination block.	2.0 m cable length.	03695-000
XIO Breakout Cable	Provides a flying leads connection to digital I/O at the XIO connector on the robot.	5.0 m cable length.	04465-000
XIO Termination Block and Cable	Provides terminal block digital I/O connections at the XIO connector on the robot.	Includes a terminal block with a 2.0 m cable.	90356-40100
IO Blox Kit	Provides additional I/O (8 inputs and 8 outputs).	Includes an IO Blox unit with a 0.3 m cable.	90356-30200
IO Blox Expansion Kit	Provides IO Blox unit expansion.	Includes an IO Blox unit with a 0.3 m cable.	90356-30100

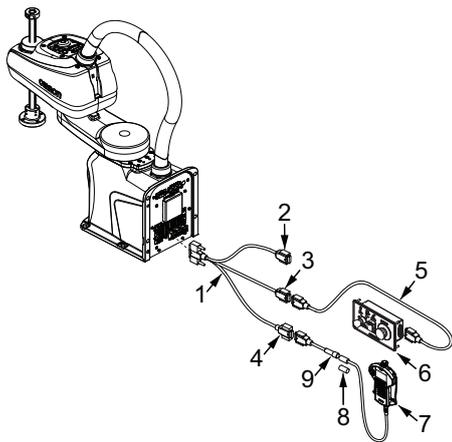
Item	Description	Details	Ordering Code
IO Blox Extension Cable	Connects two IO Blox units.	3.0 m cable length.	04679-030
		0.3 m cable length.	04679-003
	Connects an IO Blox unit and a robot.	3.0 m cable length.	04677-030
		0.3 m cable length.	04677-003
Encoder Kit	Includes all equipment to add an encoder to a robot.	Includes encoder, mounting bracket, and 5 m cable.	09742-001
Encoder Extension Cable	Replaces or extends the Encoder Kit cable.	5.0 m cable length.	09446-050
Pneumatic Valve Kit	Provides three robot-controlled pneumatic valves.	Includes valves (VQZ1121-5MO1-C4-Q), components, and hardware.	22872-000
Belt Encoder Y-adapter Cable	Provides two M12 connectors for the Belt Encoder signals/connector on the XSYSTEM cable.	3.0 m cable length.	09443-000
Front Panel Kit	Remote mounted device for robot mode, power, indication, and emergency stop.	Includes a Front Panel with a 3.0 m cable.	92546-10358
Tool Flange (ISO)	Replacement i4L tool flange.		19360-016F
Camera Mounting Kit	Used to mount a Basler or Sentech camera to the outer link.	Includes camera mount, adapter plate, and mounting hardware	22871-000
T20 Pendant Kit	Provides all required equipment for the T20 Pendant.	Includes the T20 Pendant, 3.0 m adapter cable, and an M23 jumper plug.	10046-010
IPC Application Controller	Used to execute PackManager and Robot Vision Manager applications.		AC1-152000
NJ501-R Series Robotics Integrated Controller	Machine controller with sequence, motion, and robotics functionality.	Refer to Cat. No. P140 for more information.	NJ501-R□□□
Sysmac Studio	Settings and creation of programs to control a robot with the Robot Integrated CPU Unit and IPC Application Controller.	A license for the Standard Edition (SYSMAC-SE201L) is required.	SYSMAC-SE200D-64
3D Simulation	Perform 3D simulation including robots and peripheral devices.		SYSMAC-SA401L-64
PackManager	Enables full functionality of the PackManager software.		20409-000
Robot Vision Manager	Enables the Robot Vision Manager functionality and inspection tools library.		20410-000
PackManager + Robot Vision Manager	Enables functionality of both PackManager and Robot Vision Manager		20433-000
Bellows Installation Kit	Two bellows and associated hardware for protecting the quill.	180 mm quill length.	22839-000
Bellows Installation Kit		350 mm quill length.	22868-000
Replacement Bellows	Upper or lower replacement bellows.	180 mm quill length.	22861-000F
Replacement Bellows		350 mm quill length.	22862-000F
Encoder Backup Battery	3.6 V battery (three required).		20269-000F

## Interface Panels



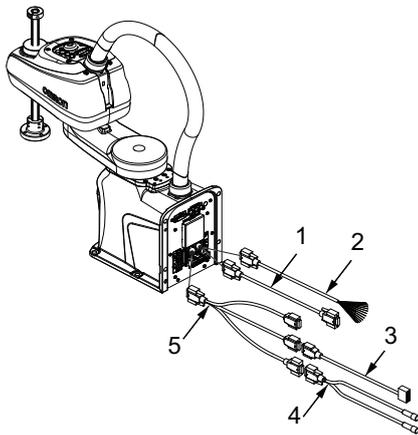
\*1 IN/1 and OUT/2 can be configured for EtherCAT or PROFINET fieldbus communications.

Standard Cables and Connections



Item	Description	Function	Ordering Code
1	XSYSTEM Cable	Main interface cable.	13322-000
2	XUSR Connector	User-supplied safety devices.	
3	XFP Connector	Front Panel connections.	
4	XMCP Connector	T20 Pendant.	92546-10358
5	Front Panel Extension Cable		
6	Front Panel	High-power, mode, and E-stop.	
7	T20 Pendant		10046-010
8	T20 Pendant Jumper Plug	Used when T20 Pendant is not connected.	
9	T20 Pendant Adapter Cable		

Optional Cables and Connections



Item	Description	Function	Ordering Code
1	XIO Cable	Connection to XIO termination block.	03695-000
2	XIO Breakout Cable	I/O flying leads.	04465-000
3	EXPIO to IO Blox Cable	IO Blox connections.	04677-030
4	Belt Encoder Y-adapter Cable	Direct encoder connections.	09443-000
5	XBELTIO Adapter Cable	Encoder, force, and RS-232 signal interface cable.	13463-000

Mounting Options

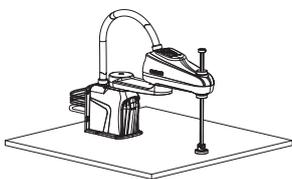
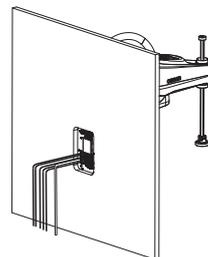
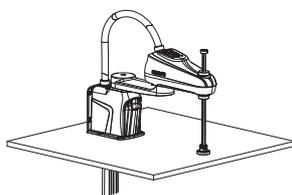
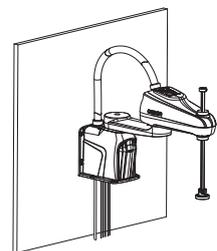


Table Mount

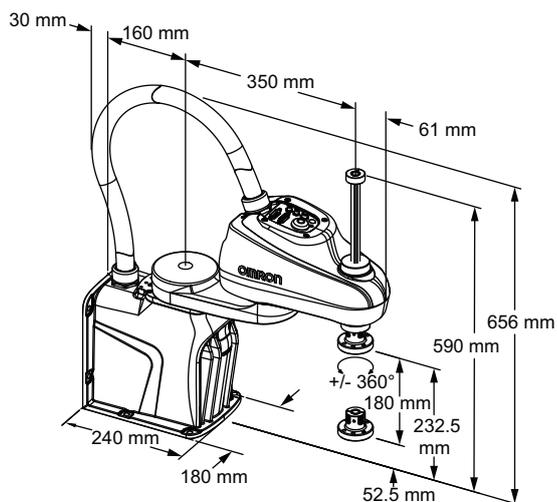


Wall Mount

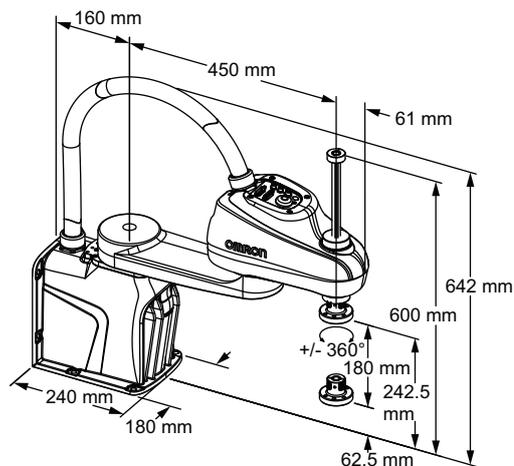


# Robot Dimensions

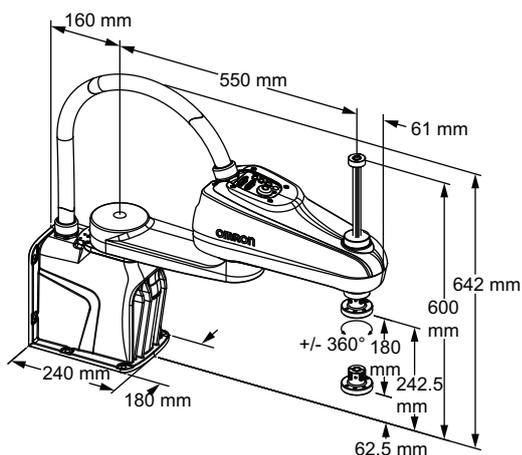
**i4-350L**



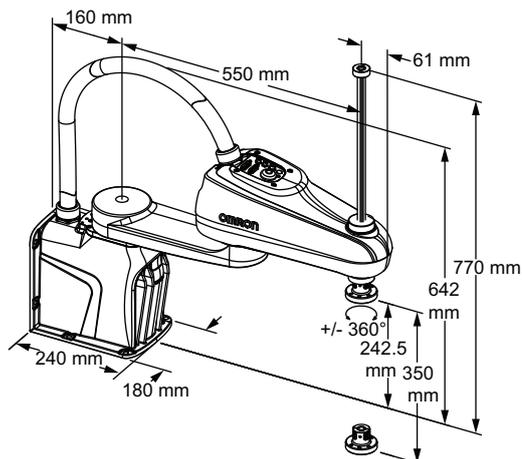
**i4-450L**



**i4-550L**



**i4-550L (350 mm Z)**

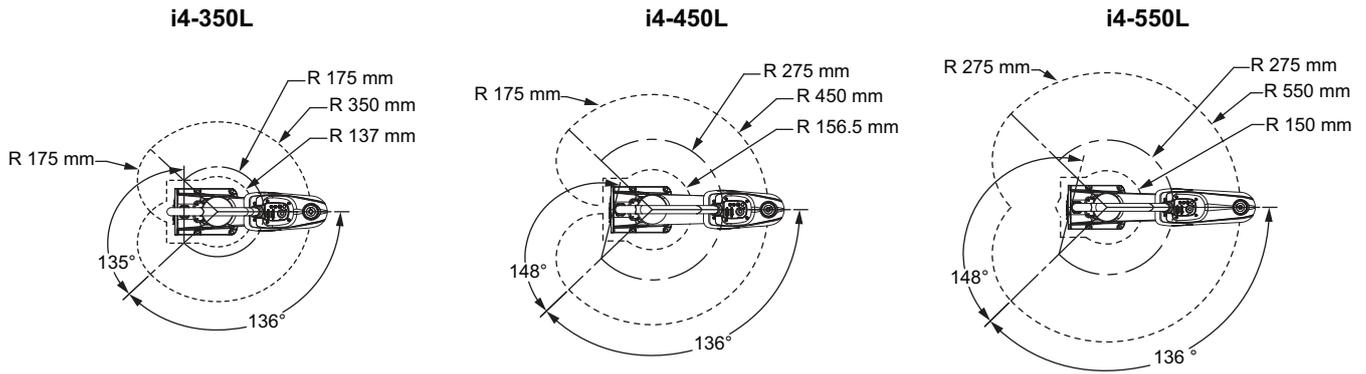


- Note:**
1. There must be at least 183 mm of clearance from the Primary Interface Panel connectors to provide adequate space for cables.
  2. The z-axis quill has a hollow shaft design and can be utilized for routing cables and pneumatic lines to an end-effector. The inner diameter of this hollow shaft is 11 mm.

# i4L-Series

## Arm Reach Dimensions

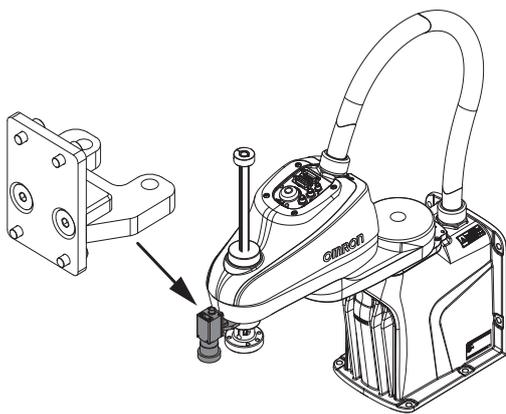
(Unit: mm)



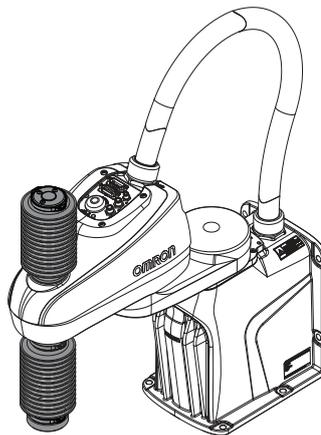
Note: Reach restrictions behind the robot may vary based on robot configuration, type, and cable configuration.

## Other Information

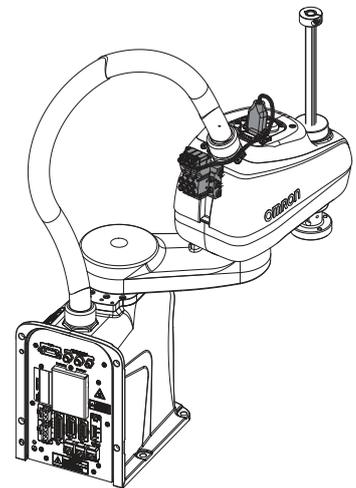
Camera Bracket



Bellows

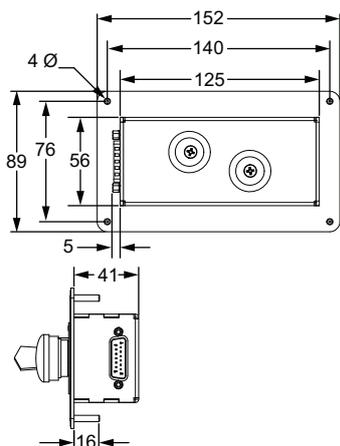


Pneumatic Valve Kit

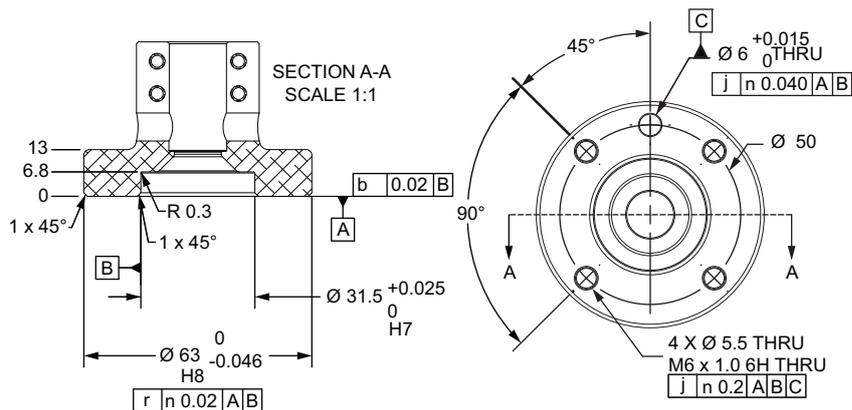


# Other Dimensions

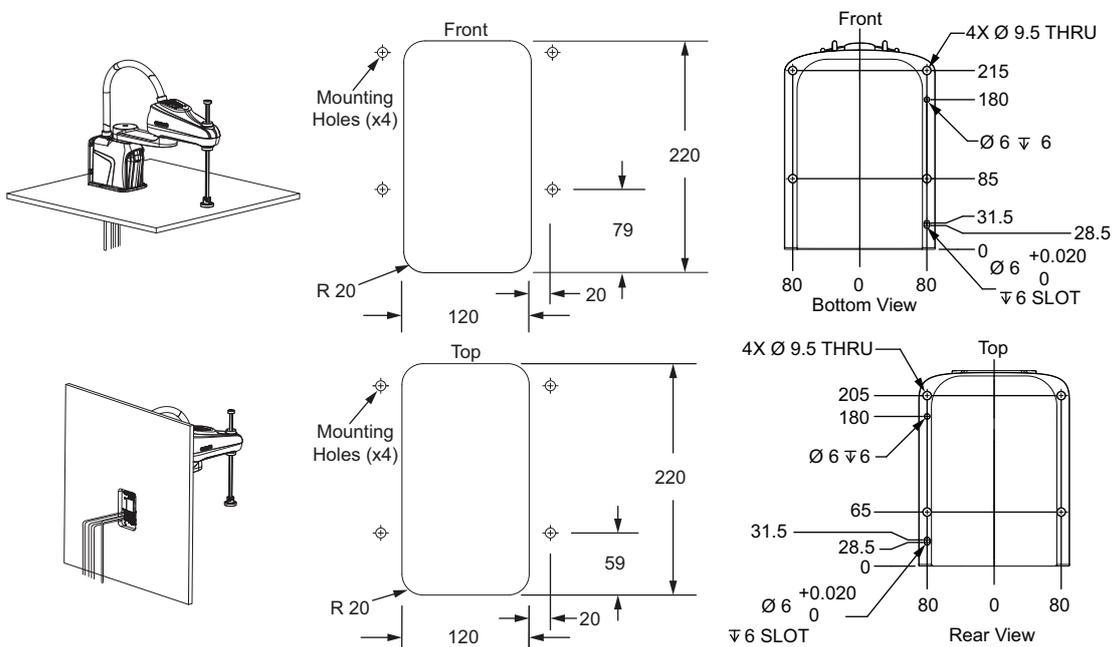
Front Panel



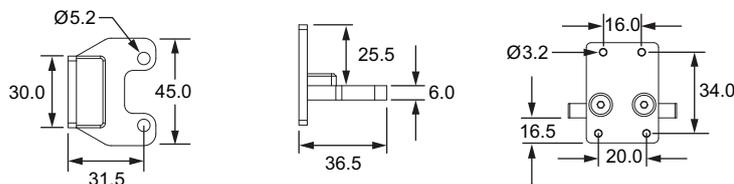
Tool Flange



Mounting Flange/Cable Exit Cutout



Camera Mounting Bracket



## i4L-Series

### Related Manuals

Catalog Number	Manual Title
I590	Robot Safety Guide
I601	T20 Pendant User's Manual
I658	i4L Robots User's Manual
I659	i4L Robots with EtherCAT User's Manual
I632	IPC Application Controller User's Manual
I633	Automated Control Environment (ACE) Version 4 User's Manual
I671	V+ User's Manual
I672	V+ Keyword Reference Manual
M130	Industrial Robot Fieldbus Configuration User's Guide
O037	NJ-series Robot Integrated CPU Unit User's Manual
O049	Machine Automation Controller NJ-series Robot Integrated System Startup Guide
W504	Sysmac Studio Version 1 Operation Manual
W595	Sysmac Studio Robot Integrated System Building Function with Robot Integrated CPU Unit Operation Manual
W618	Sysmac Studio 3D Simulation Function Operation Manual
W621	Sysmac Studio Robot Integrated System Building Function with IPC Application Controller Operation Manual

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**Note: Do not use this document to operate the Unit.**

**OMRON Corporation Industrial Automation Company**

**Kyoto, JAPAN**

**Contact : [www.ia.omron.com](http://www.ia.omron.com)**

**Regional Headquarters**

**OMRON EUROPE B.V.**

Wegalaan 67-69, 2132 JD Hoofddorp  
The Netherlands  
Tel: (31) 2356-81-300 Fax: (31) 2356-81-388

**OMRON ASIA PACIFIC PTE. LTD.**

438B Alexandra Road, #08-01/02 Alexandra  
Technopark, Singapore 119968  
Tel: (65) 6835-3011 Fax: (65) 6835-3011

**OMRON ELECTRONICS LLC**

2895 Greenspoint Parkway, Suite 200  
Hoffman Estates, IL 60169 U.S.A.  
Tel: (1) 847-843-7900 Fax: (1) 847-843-7787

**OMRON ROBOTICS AND SAFETY TECHNOLOGIES, INC.**

4225 Hacienda Drive, Pleasanton, CA 94588 U.S.A.  
Tel: (1) 925-245-3400 Fax: (1) 925-960-0590

**OMRON (CHINA) CO., LTD.**

Room 2211, Bank of China Tower, 200 Yin Cheng Zhong Road,  
PuDong New Area, Shanghai, 200120, China  
Tel: (86) 21-6023-0333 Fax: (86) 21-5037-2388

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**CSM\_3\_1**

**Cat. No. I874-E1-03** 0226 (0622)