

Articulated Robots Viper 650/850

6-Axis robot family, ideal for complex mechanical assemblies, material handling, inspection, and packaging

- 5 kg payload, high-efficiency, low-inertia drives and a lightweight arm to deliver maximum acceleration
- High-resolution, absolute encoders to provide high accuracy, superior slow-speed following, and easy calibration
- Available in 653 mm and 855 reach options to accommodate a wide variety of applications
- Integrated Control with EtherCAT connectivity or Standard Control with Ethernet connectivity
- Ethernet/IP control via ePLC implementation
- Clean room and IP65 models available



Ordering Information

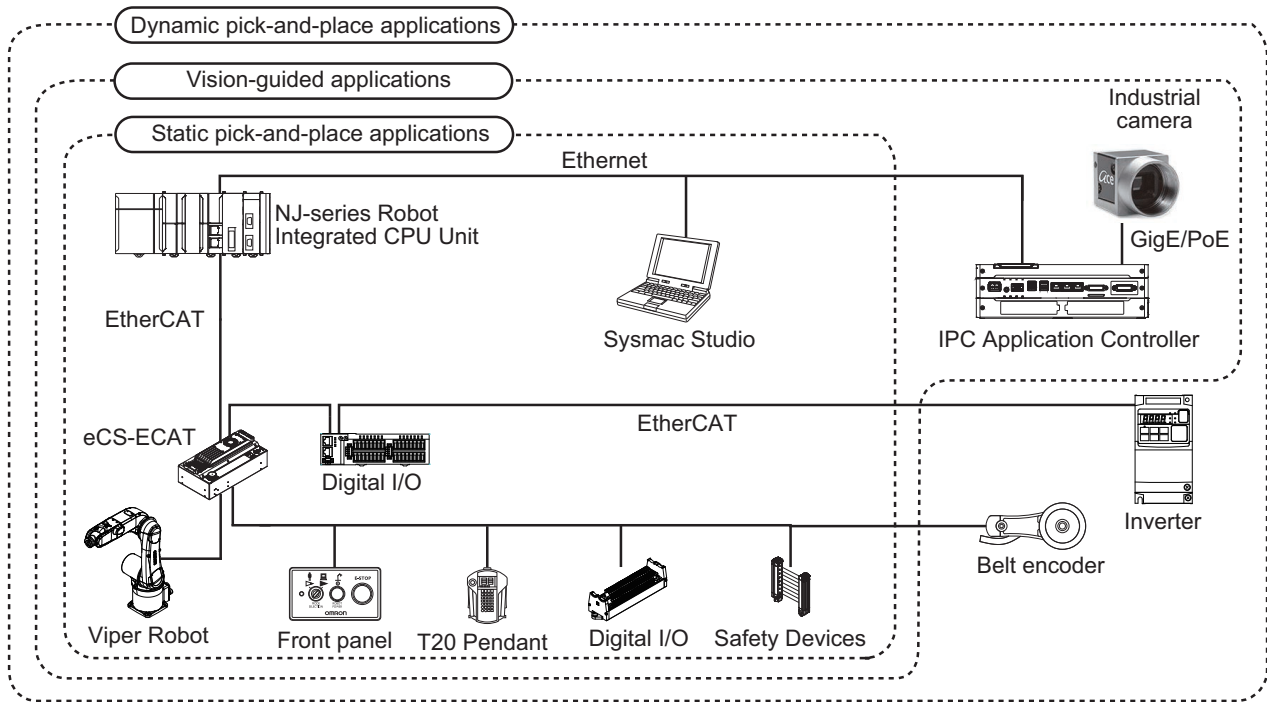
Product Model	Reach (mm)	Control Type	Connectible Controller	Protections	Part Number
Viper 650	653	Standard	eMB-60R	IP20	17210-36000
				IP65	17210-36010
				Cleanroom	17210-36020
			eMB-60R, ePLC	IP20	17211-36000
				IP65	17211-36010
				Cleanroom	17211-36020
			eMB-60R, SmartController EX	IP20	17212-36000
				IP65	17212-36010
				Cleanroom	17212-36020
			eMB-60R, Add-On	IP20	17213-36000
				IP65	17213-36010
				Cleanroom	17213-36020
			eMB-60R, ePLC, SmartController EX	IP20	17214-36000
				IP65	17214-36010
				Cleanroom	17214-36020
Viper 850	855	Integrated	eCS-eCAT	IP20	RL6-2066000
				IP65	RL6-2066010
				Cleanroom	RL6-2066020
		Standard	eMB-60R	IP20	17210-38000
				IP65	17210-38010
				Cleanroom	17210-38020
			eMB-60R, ePLC	IP20	17211-38000
				IP65	17211-38010
				Cleanroom	17211-38020
			eMB-60R, SmartController EX	IP20	17212-38000
				IP65	17212-38010
				Cleanroom	17212-38020
			eMB-60R, Add-On	IP20	17213-38000
				IP65	17213-38010
				Cleanroom	17213-38020
			eMB-60R, ePLC, SmartController EX	IP20	17214-38000
				IP65	17214-38010
				Cleanroom	17214-38020
		Integrated	eCS-eCAT	IP20	RL6-2068000
				IP65	RL6-2068010
				Cleanroom	RL6-2068020

Viper Series

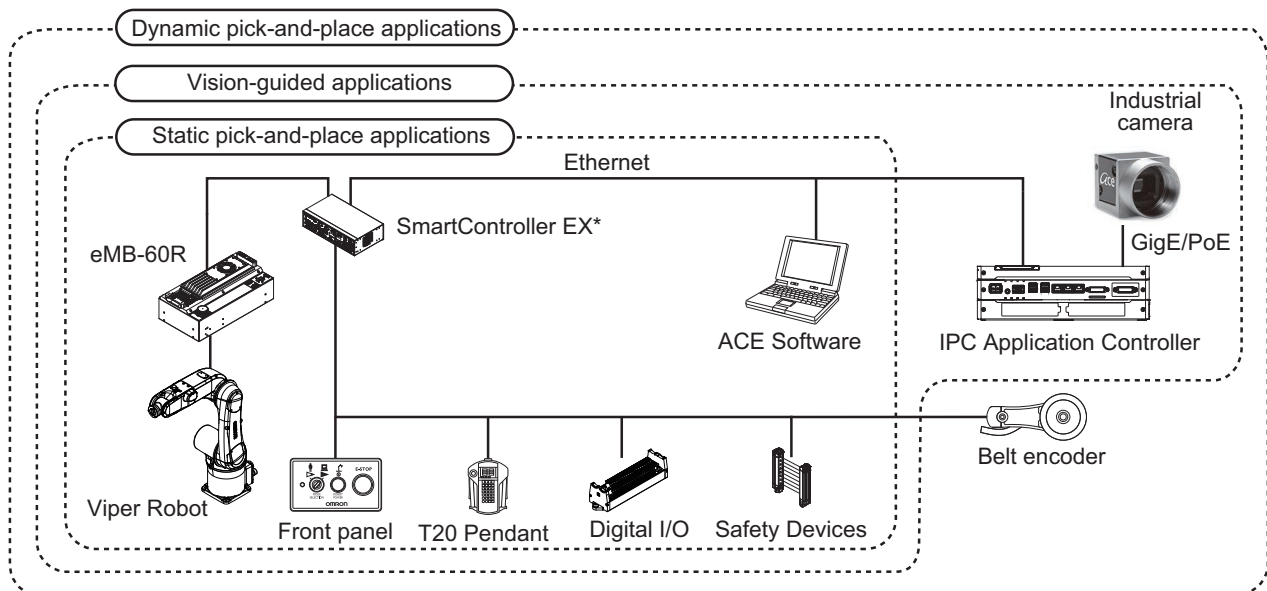
System Configuration

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

Integrated Control



Standard Control



* Without the optional SmartController EX, ethernet and accessories connect to the eMB-60R.

Specifications

Item		Model	
		650	850
Number of axes		6	
Reach		653 mm	855 mm
Maximum Payload ^{*1}		5 kg	
Repeatability	XY	±0.02 mm	±0.03 mm
Joint Range	Joint 1	±170°	
	Joint 2	-190°, +45°	
	Joint 3	-29°, +256°	
	Joint 4	±190°	
	Joint 5	±120°	
	Joint 6	±360°	
Inertia Moment (Max.)	Joint 4	0.295 kg-m ²	
	Joint 5	0.295 kg-m ²	
	Joint 6	0.045 kg-m ²	
Joint Speeds	Joint 1	328°/s	250°/s
	Joint 2	300°/s	250°/s
	Joint 3	375°/s	250°/s
	Joint 4	375°/s	375°/s
	Joint 5	375°/s	375°/s
	Joint 6	600°/s	600°/s
Electrical Requirements		24 VDC: 6 A 200 to 240 VAC: 10 A, single-phase	
Protection	Base	IP40/IP54 ^{*2}	
	Robot Joints (J4, J5, J6)	IP40/IP65 ^{*3}	
Cleanroom Class		Class 10 ^{*4}	
Mounting		Table, inverted	
Environmental Requirements	Ambient Temperature	5° to 40°C	
	Humidity Range	5% to 90% non-condensing	
Weight		34 kg	36 kg
Basic configuration	On-board I/O (Input/Output)	12/8	
	Conveyor tracking input	2	
	RS-232C serial communications port	1	
	Programming environment ^{*5}	ACE / Sysmac Studio 64-bit, ePLC	
	Robot Vision Manager	Yes	
	ePLC Connect ^{*6}	Yes	
	ePLC I/O ^{*6}	Yes	
Connectible Controller	Standard Control	eMB-60R with optional SmartController EX ^{*7}	
	Integrated Control	eCS-ECAT with NJ501-R Series	

^{*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} Standard and Cleanroom models have a base protection rating of IP40. IP54/65 models have a base protection rating of IP54.

^{*3} Standard and Cleanroom models have a joint protection rating of IP40. IP54/65 models have a joint protection rating of IP65.

^{*4} Cleanroom models only. Standard and IP54/65 models have no Cleanroom rating.

^{*5} Use Sysmac Studio for Integrated Control robots. Use ACE for Standard Control robots. ePLC is only used with Standard Control robots.

^{*6} For Standard Control robots only.

^{*7} eMB-60R and SmartController EX with eV+ 2.3 or above support ePLC functionality with NJ/NX/NY series controllers.

Viper Series

Items Included With the Robot

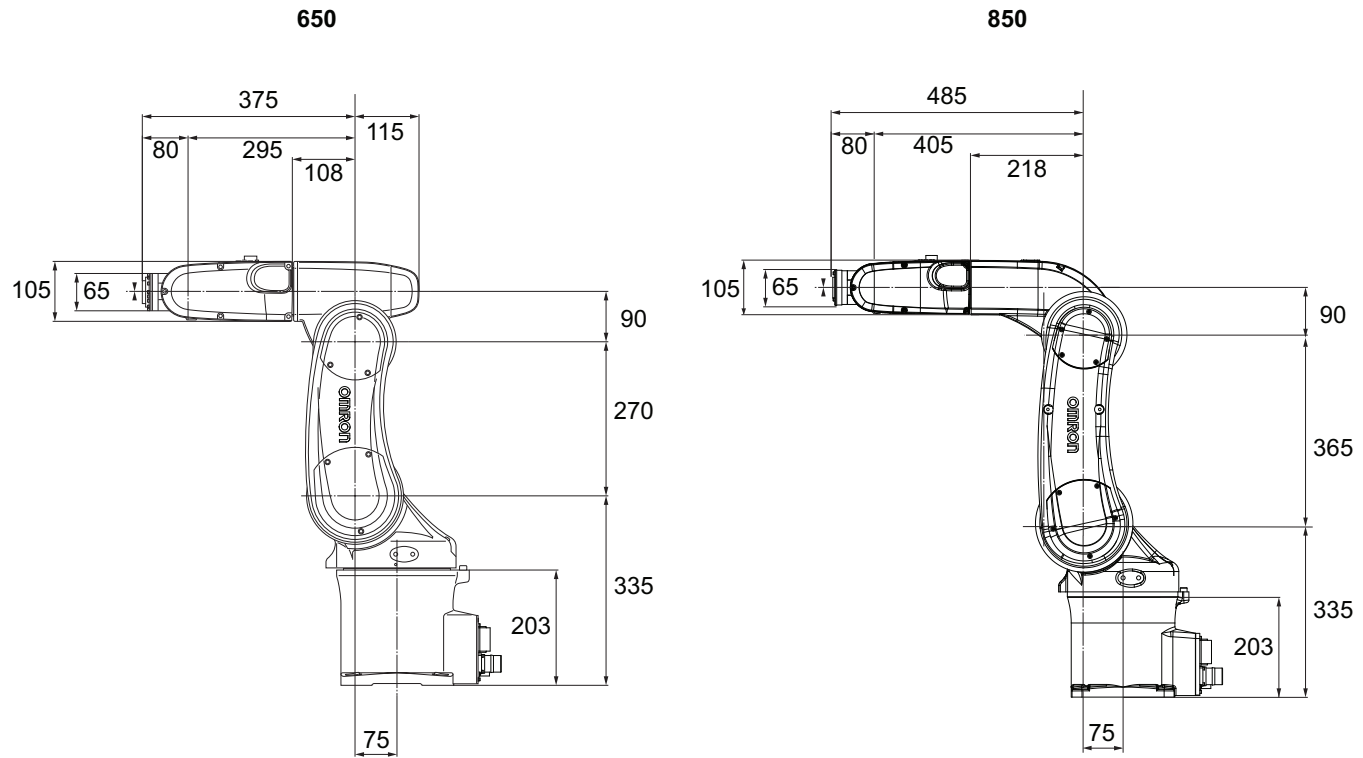
Item		Description
Integrated Control Models	eCS-ECAT	Robot Controller and Amplifier
Standard Control Models	eMB-60R	Robot Controller and Amplifier
	XSYS Cable	Connects SmartController EX with XSYSTEM connection of eMB-60R (SmartController EX Bundle only)
	Firewire Cable	4.5 m FireWire cable (SmartController EX Bundle only)
	SmartController EX	Controls up to four robots (SmartController EX Bundle only)
All Models	DC Control Power Connector	Control power connector and pins
	AC High Power Connector	High power connector and pins
	Robot Power Cable	4 m cable connects eMB-60R to Robot
	XSYSTEM Cable	1.8 m cable providing 3 connectors for XMCP, XFP, and XUSR signals
	Front Panel	Remote mounted device for robot mode, power, indication, and emergency stop
	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
	Documentation Dongle	USB memory stick containing user manuals (Viper, ACE, and V+) and ACE Software
	Printed Documentation	Fixed Robot Safety Guide, Declarations of Incorporation (MDOI), and Declaration of Conformance to KC Standards (UKCA)
	Cable Connectors	Connectors for CN20 and C21 (IP20 bundles only)
	Cable Connectors and Plugs	Connector and plugs for CN20 and CN21 (IP65 & CR only)

Options and Additional Items

Item	Description	Details	Part Number
IO Blox	Extend the robot's capabilities by providing expandable I/O capacity.	Connects to robot. 0.3 m cables included.	90356-30200
IO Blox (Additional)	Extend the robot's capabilities by providing expandable I/O capacity.	Connects to previous IO Blox. Up to 8 can be added. 0.3 m cables included.	90356-30100
T20 Pendant	Hand held device for moving, teaching and debugging the robot.	Includes 10 m cable	10046-010
IPC Application Controller	Allows execution of PackManager and Robot Vision Manager applications.	Includes 24 VDC connector	20152-000
XBELT I/O Adapter Cable	Splits the XBELTIO port on the interface panel into belt encoder, IO Blox, and RS-232 branches.	0.6 m cable length	13463-000
Belt Encoder to M12 Y Adapter Cable	Splits the belt encoder connection on the XBELTIO cable into two belt encoder branches.	3 m cable length	09443-000
EXPIO-to-IOBlox Cable	Connects IO Blox devices to either controller EXPIO connector.	3 m cable length	04677-000
XIO/TIN (Breakout) Cable	Connects to the XIO connector on the controller interface panel to add multiple I/O devices to the system without using an IO Blox unit.	5 m cable length	04465-000
XIO Cable	Connects an XIO Termination Block to the XIO port on the eCS-ECAT interface panel.	2 m cable length	03695-000
200-240 VAC AC Power Cable	Transfers AC power to the robot.	5 m cable	04118-000
Power Supply	Power supply for the robot. Includes 5 m power cable.	24 VDC, 10 A, 240 W	23912-000

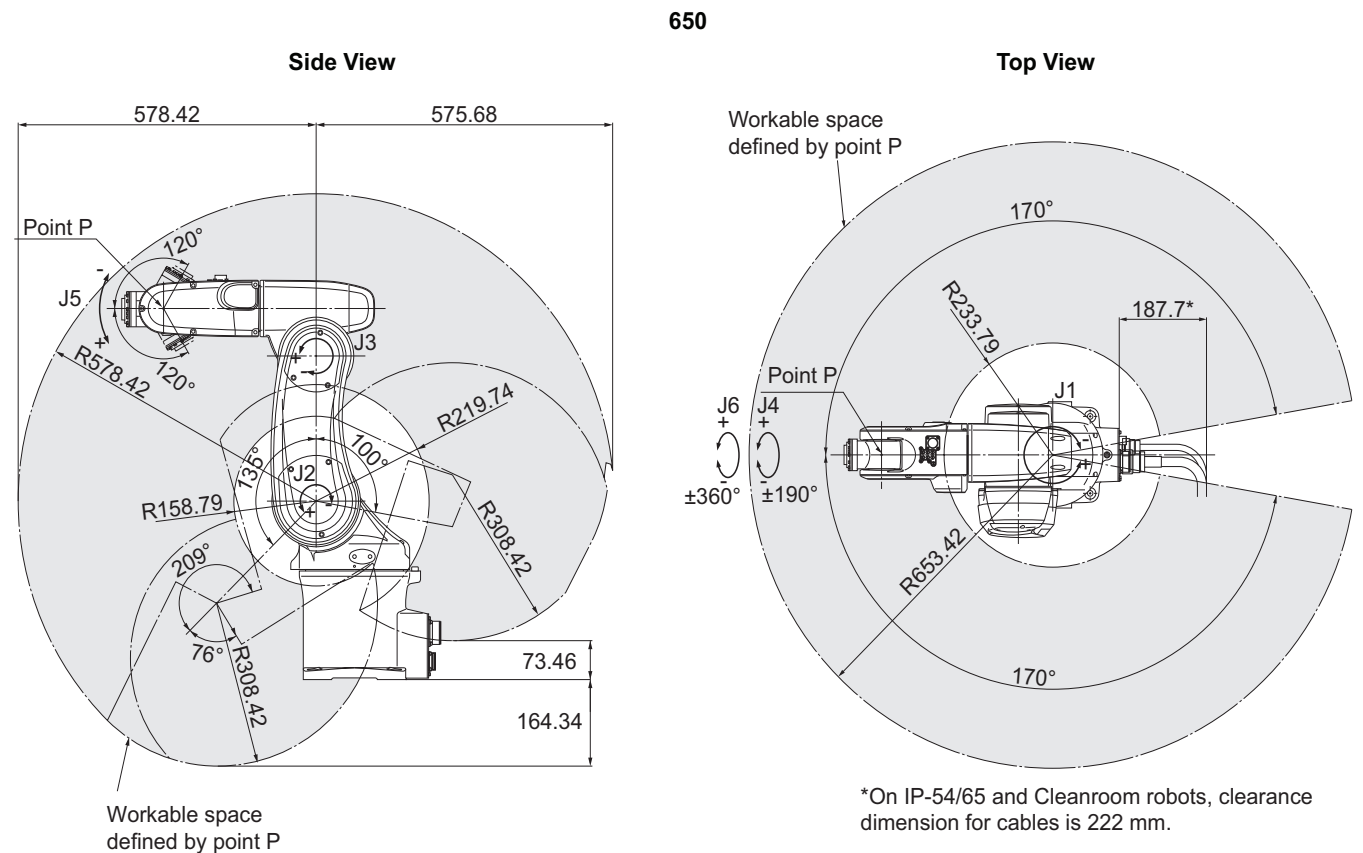
Robot Dimensions

(Unit: mm)

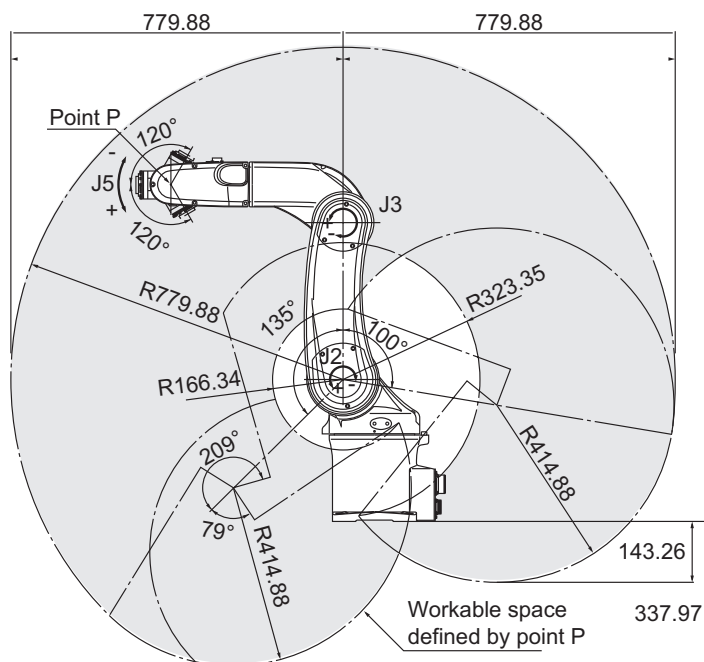


Arm Reach Dimensions

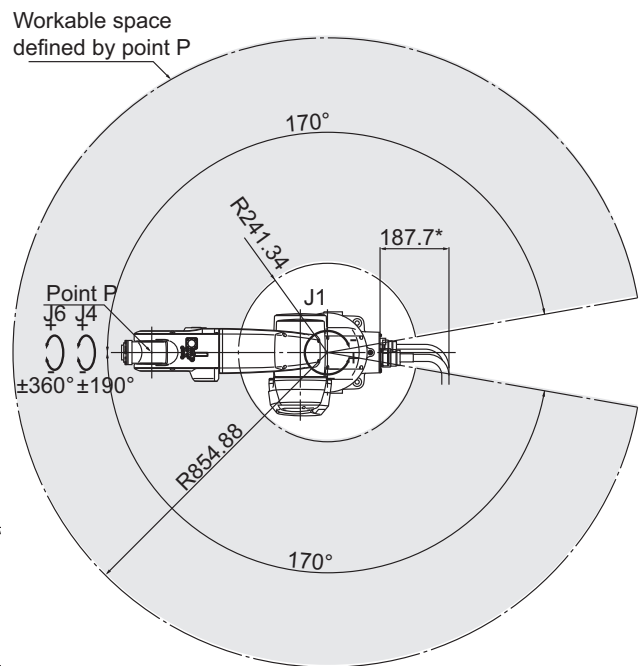
(Unit: mm)



Side View

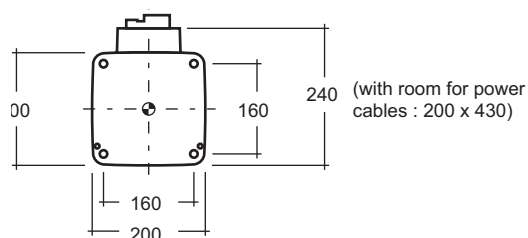
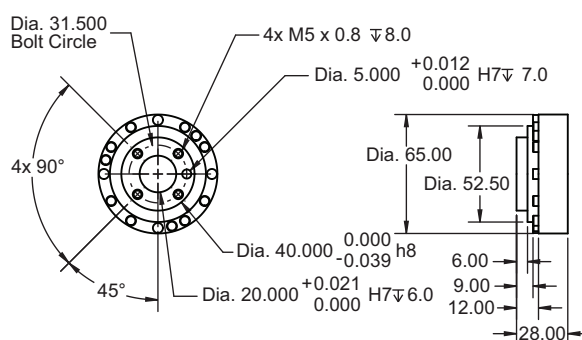
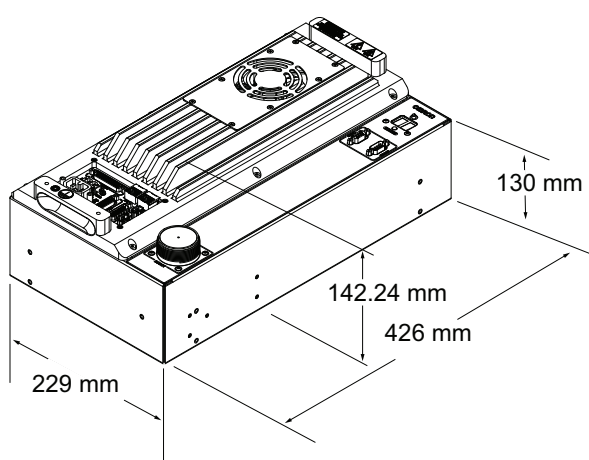
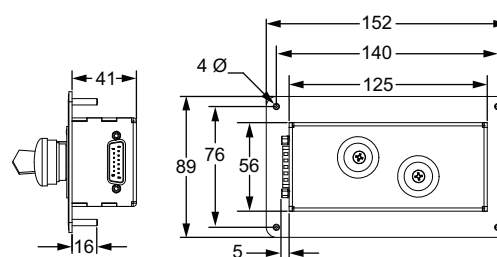


Top View



*On IP-54/65 and Cleanroom robots, clearance dimension for cables is 222 mm.

Other Dimensions

Footprint

Tool Flange

eCS-ECAT / eMB-60R

Front Panel


Related Manuals

Catalog Number	Manual Title
I599	Viper 650/850 Robot with eMB-60R User's Guide
I654	Viper 650/850 Robot with EtherCAT User's Manual
I633	Automation Control Environment (ACE) Version 4 User's Manual
I679	Automation Control Environment (ACE) Version 4 Camera Configuration User's Manual
I609	ACE Sight Reference Guide
I590	Robot Safety Guide
I671	V+ User's Manual
I672	V+ Keyword Reference Manual
I601	T20 Pendant User's Manual
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

Terms and Conditions Agreement

Read and understand this catalog.

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

Warranties.

- (a) Exclusive Warranty. Omron's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Omron (or such other period expressed in writing by Omron). Omron disclaims all other warranties, express or implied.
- (b) Limitations. OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCTS. BUYER ACKNOWLEDGES THAT IT ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE.

Omron further disclaims all warranties and responsibility of any type for claims or expenses based on infringement by the Products or otherwise of any intellectual property right. (c) Buyer Remedy. Omron's sole obligation hereunder shall be, at Omron's election, to (i) replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product, (ii) repair the non-complying Product, or (iii) repay or credit Buyer an amount equal to the purchase price of the non-complying Product; provided that in no event shall Omron be responsible for warranty, repair, indemnity or any other claims or expenses regarding the Products unless Omron's analysis confirms that the Products were properly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be approved in writing by Omron before shipment. Omron Companies shall not be liable for the suitability or unsuitability or the results from the use of Products in combination with any electrical or electronic components, circuits, system assemblies or any other materials or substances or environments. Any advice, recommendations or information given orally or in writing, are not to be construed as an amendment or addition to the above warranty.

See <http://www.omron.com/global/> or contact your Omron representative for published information.

Limitation on Liability: Etc.

OMRON COMPANIES SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE OR STRICT LIABILITY.

Further, in no event shall liability of Omron Companies exceed the individual price of the Product on which liability is asserted.

Suitability of Use.

Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases.

NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY OR IN LARGE QUANTITIES WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

Programmable Products.

Omron Companies shall not be responsible for the user's programming of a programmable Product, or any consequence thereof.

Performance Data.

Data presented in Omron Company websites, catalogs and other materials is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of Omron's test conditions, and the user must correlate it to actual application requirements. Actual performance is subject to the Omron's Warranty and Limitations of Liability.

Change in Specifications.

Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without any notice. When in doubt, special part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Omron's representative at any time to confirm actual specifications of purchased Product.

Errors and Omissions.

Information presented by Omron Companies has been checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.

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

OMRON Corporation Industrial Automation Company

Kyoto, JAPAN

Contact : 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

Authorized Distributor:

©OMRON Corporation 2023 All Rights Reserved.
In the interest of product improvement,
specifications are subject to change without notice.

Cat. No. I897-E-01 0923

21861-520A