

Collaborative Robots

TM5

Collaborative robot for assembly, packaging, inspection and logistics

- Designed to promote a safe and harmonious workplace between humans and machines.
- Easy-to-use graphical programming environment for quick startup and operation.
- Built-in vision-based robot control enables visual servoing, inspection, and measurement operations.
- TMvision and landmark allows truly flexible, fast changeover.
- Plug & Play ecosystem provides the tools and versatility for many manufacturing needs.
- Capability to integrate with mobile robots enables fully autonomous machine tending and logistics handling applications.



TM5-700

TM5-900

Specification

		TM5					
Product Name		TM5-700	TM5M-700	TM5M-700 SEMI	TM5-900	TM5M-900	TM5M-900 SEMI
Part Number		RT6-000700X	RT6-010700X	RT6-010701X	RT6-000900X	RT6-010900X	RT6-010901X
Weight (kg)		22.1			22.6		
Controller Weight (kg)		13.5	14.5	14.5	13.5	14.5	14.5
Max Payload (kg)		6			4		
Reach (mm)		700			900		
Mounting		Wall, Table, Ceiling					
Typical Speed (m/s)		1.1			1.4		
Joint Range	Joint 1	±270°					
	Joint 2, 4, 5	±180°					
	Joint 3	±155°					
	Joint 6	±270°					
Joint Speeds	Joint 1, 2, 3	180°/s					
	Joint 4, 5, 6	225°/s					
Repeatability (mm)		±0.05					
IP		IP54 (robot arm), IP32 (control box), IP40 (robot stick)					
Cleanroom Class		ISO Class 5					
Operating Temperature (°C)		0 to 50					
Power Supply		100-240 VAC, 50-60 Hz	22-60 VDC	22-60 VDC	100-240 VAC, 50-60 Hz	22-60 VDC	22-60 VDC
Robot Arm Cable Length		3m/12m	1.5m	1.5m	3m/12m	1.5m	1.5m
I/O Ports	Control Box	Digital In: 16 Digital Out: 16 Analog In: 2 Analog Out: 1					
	Tool	Digital In: 4 Digital Out: 4 Analog In: 1 Analog Out: 0					
I/O Interface		3 X COM, 1 X HDMI, 3 X LAN, 4 X USB2.0, 2 X USB3.0					
Communication		RS232, Ethernet (master), Modbus TCP/RTU (master & slave)					
Integrated Camera		5M pixels, color	5M pixels, color	5M pixels, color	5M pixels, color	5M pixels, color	5M pixels, color
I/O Power Supply		24V 1.5A (control box and tool)					
Programming Environment		TMflow, flowchart based					
SEMI S2 Certified*		No	No	Yes	No	No	Yes

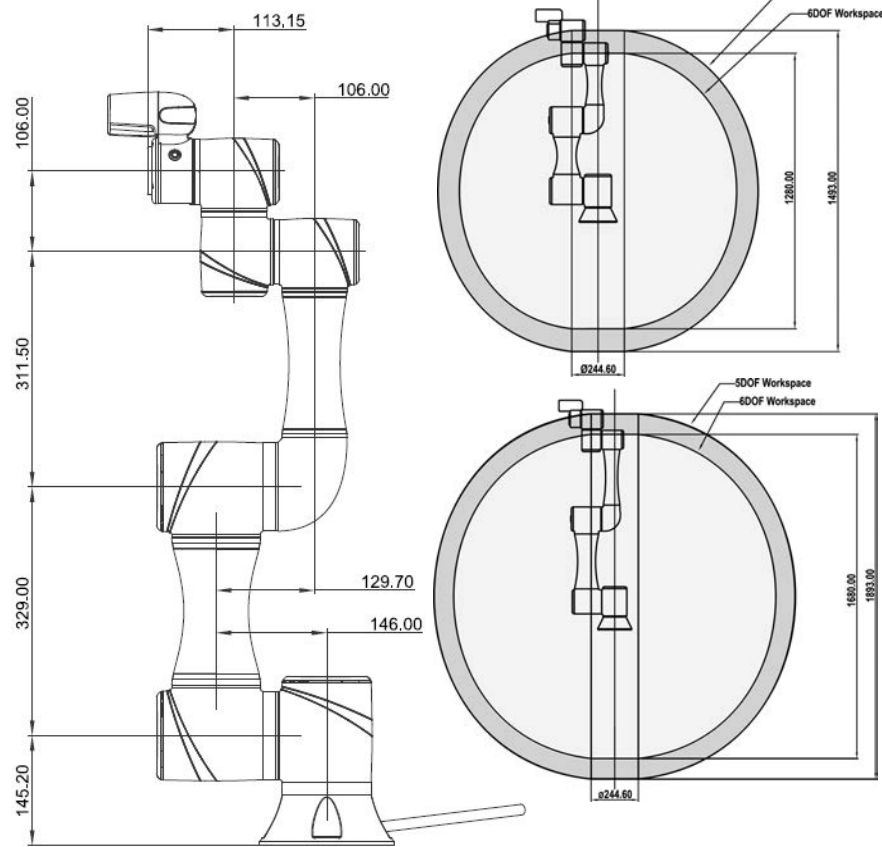
* SEMI safety SEMI safety guidelines are issued by an industry association with the same name: SEMI (Semiconductor Equipment and Materials International), which is the central global network of manufacturers of micro- and nano-electronics industries.

* SEMI S2 is the most well-known standard in semiconductor manufacturing equipment for Environmental, Health, and Safety (EHS).

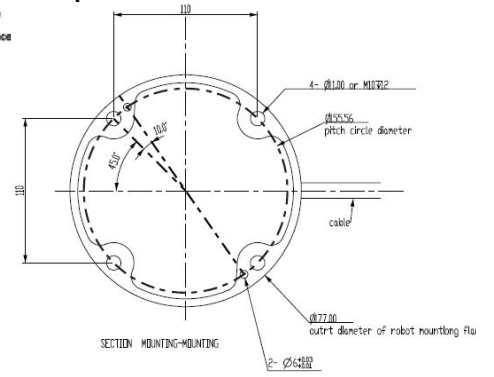
Dimensions

(Unit: mm)

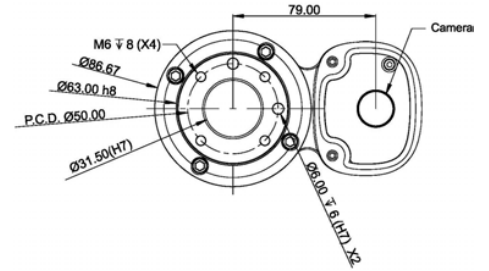
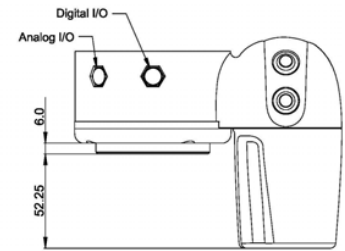
TM5-700



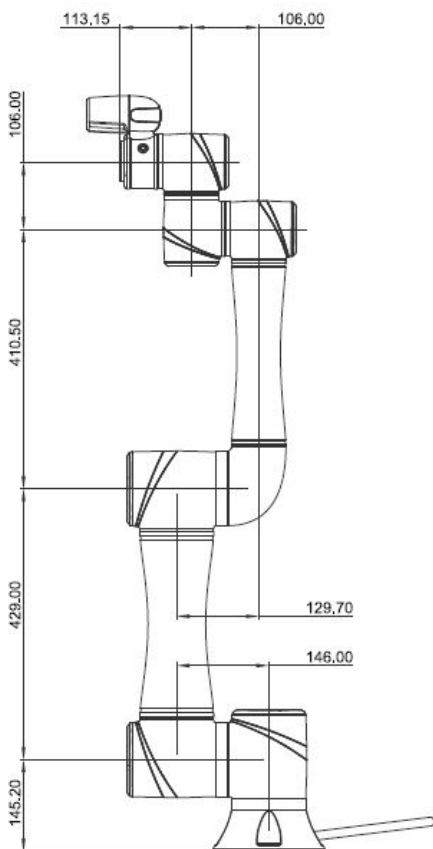
Footprint



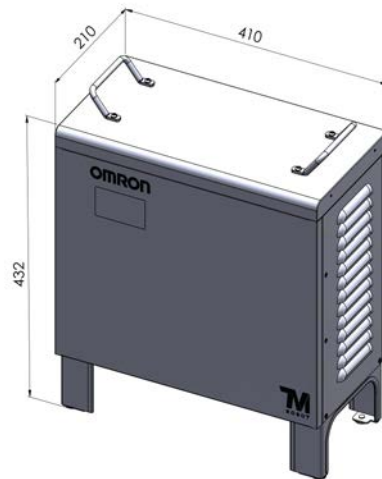
Flange



TM5-900



Control Box



Collaborative Robots TM12/14

Collaborative robot for assembly, packaging, inspection and logistics

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TM12

TM14

Specifications

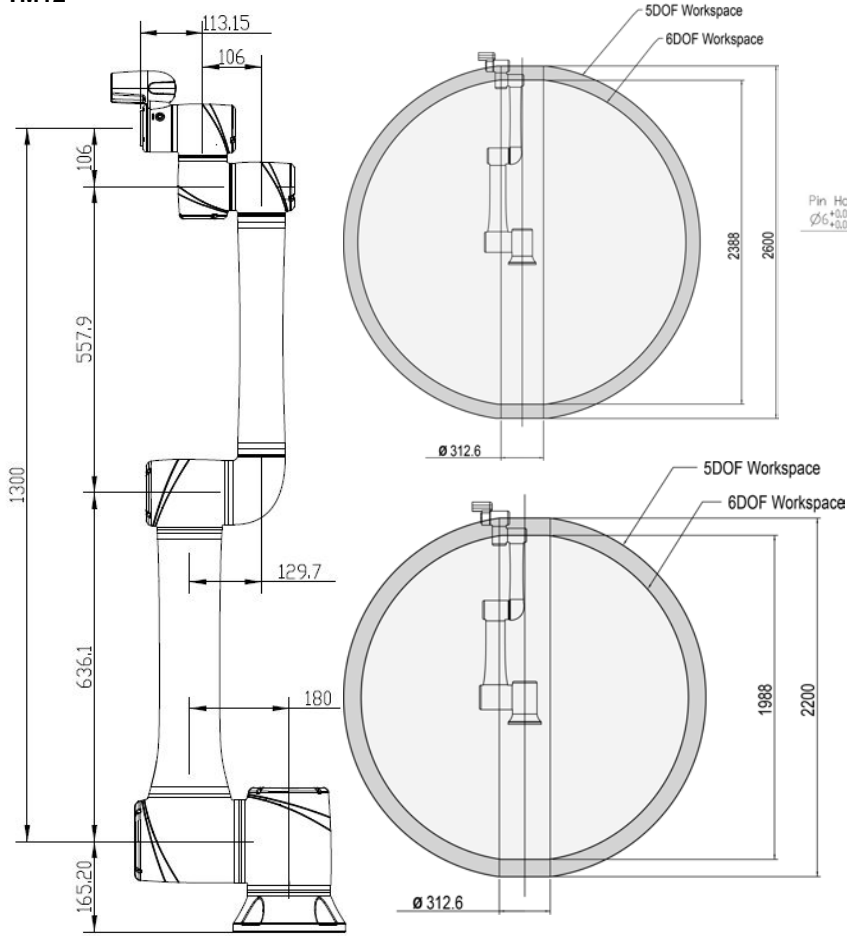
		TM12			TM14		
Product Name		TM12	TM12M	TM12M SEMI	TM14	TM14M	TM14M SEMI
Part Number		RT6-100130X	RT6-110130X	RT6-110131X	RT6-200110X	RT6-210110X	RT6-210111X
Weight (kg)		33.3			32.6		
Controller Weight (kg)		13.8	14.5	14.5	13.8	14.5	14.5
Max Payload (kg)		12			14		
Reach (mm)		1300			1100		
Mounting		Wall, Table, Ceiling					
Typical Speed (m/s)		1.3			1.1		
Joint Range	Joint 1	±270°					
	Joint 2, 4, 5	±180°					
	Joint 3	±166°			±163°		
	Joint 6	±270°					
Joint Speeds	Joint 1, 2	120°/s					
	Joint 3	180°/s					
	Joint 4, 5	180°/s			150°/s		
	Joint 6	180°/s					
Repeatability (mm)		±0.1					
IP		IP54 (robot arm), IP32 (control box), IP40 (robot stick)					
Cleanroom Class		ISO Class 5					
Operating Temperature (°C)		0 to 50					
Power Supply		100-240 VAC, 50-60 Hz	22-60 VDC	22-60 VDC	100-240 VAC, 50-60 Hz	22-60 VDC	22-60 VDC
Robot Arm Cable Length		3m/12m	1.5m	1.5m	3m/12m	1.5m	1.5m
I/O Ports	Control Box	Digital In: 16 Digital Out: 16 Analog In: 2 Analog Out: 1					
	Tool	Digital In: 4 Digital Out: 4 Analog In: 1 Analog Out: 0					
I/O Interface		3 X COM, 1 X HDMI, 3 X LAN, 4 X USB2.0, 2 X USB3.0					
Communication		RS232, Ethernet(master), Modbus TCP/RTU (master & slave)					
Integrated Camera		5M pixels, color	5M pixels, color	5M pixels, color	5M pixels, color	5M pixels, color	5M pixels, color
I/O Power Supply		24V 1.5A (control box and tool)					
Programming Environment		TMflow, flowchart based					
SEMI S2 Certified*		No	No	Yes	No	No	Yes

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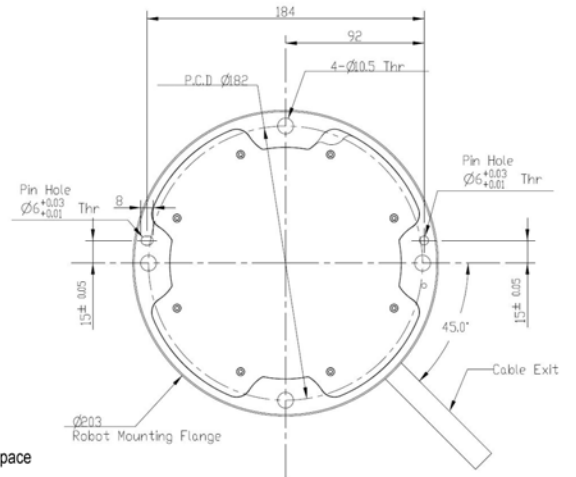
Dimensions

(Unit: mm)

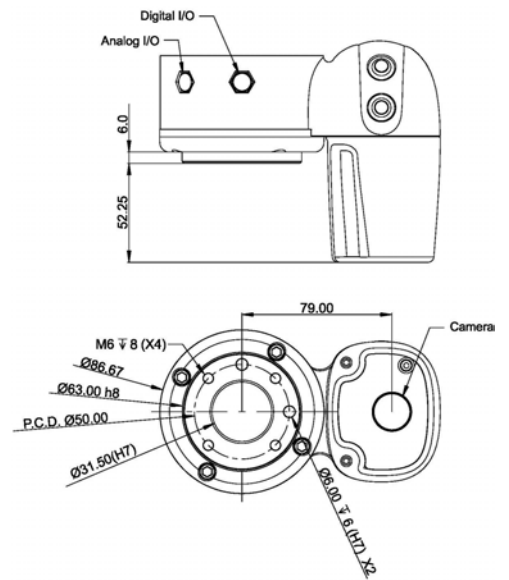
TM12



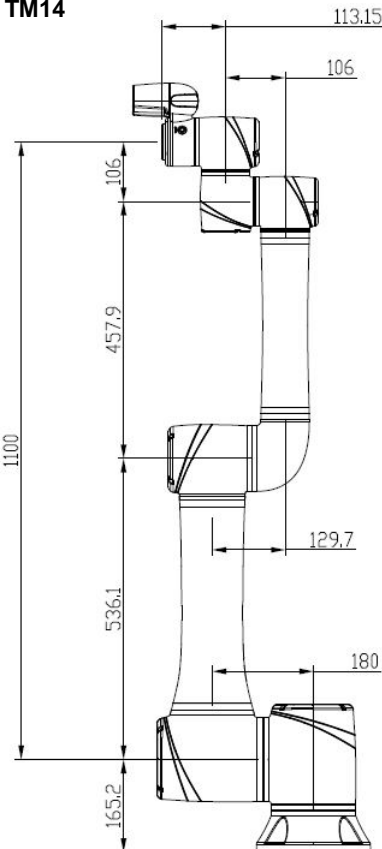
Footprint



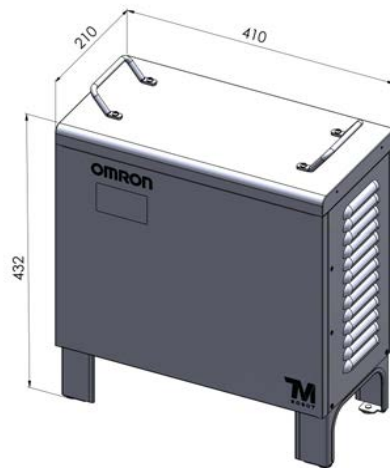
Flange



TM14



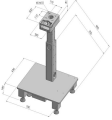






Control Box



Accessories & Software

Accessories

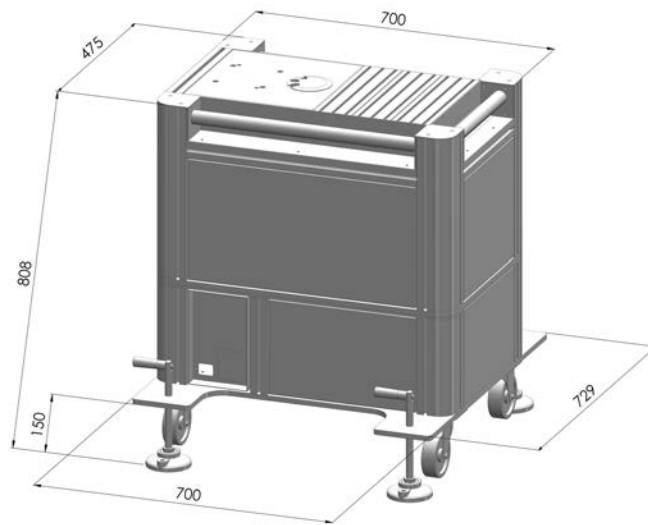
Appearance	Product Name	Description	Remarks	Part Number
	Landmark	Robot positioning tool as a reference to the environment.	2 included with purchase of a robot.	RT6-A000008
	Mobile Workstation (MWS)	MWS is a convenient tool for users to mount the robot arm on work surface, and store the control box safely within. Users can move the MWS with the robot to different work cells easily.	Compatible with OMRON TM5 only.	RT6-A000010
	Robot stand	Similar to MWS, the robot stand can be moved with the robot to different work stations easily.	Height adjustable. Compatible with OMRON TM5 only.	RT6-A000009
	SSD with cable	128 GB solid state hard drive.	SATA cable included. Recommended for external cameras image logging.	RT6-A000012
	Kit, calibration set with additional pin	Toolkit for teaching a precise tool center point (TCP) that can be used for manual workspace calibration within TMvision	Required for TCP and manual vision calibration	RT6-A000002
	Robot stick stand	Mounting fixture for the robot stick.	Can be used on desktops, walls, and MWS.	RT6-A000000
	Pneumatic control box	Controls the inputs and outputs and monitors air pressure for Kilews screw driving applications.	Compatible with Kilews screw driving solution kit only. Recommended to attach to the robot stand.	RT6-A000015

Software

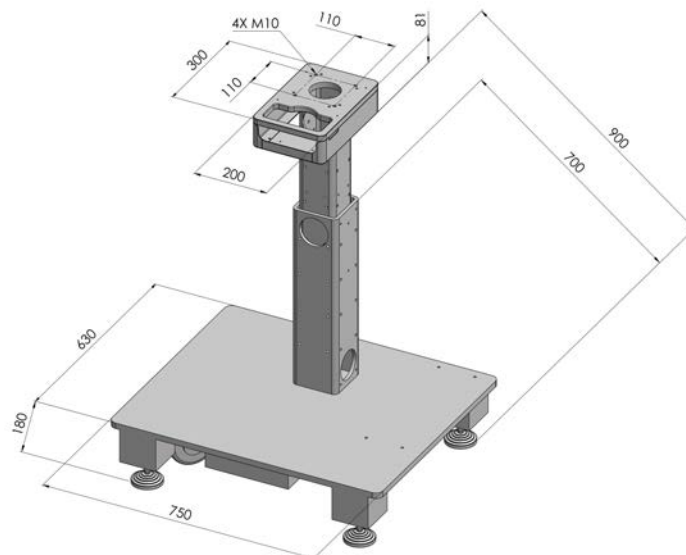
Product Name	Add-On Product Names	Part Number	Add-On Part Numbers	Remarks
USB Dongle	-	RT6-A000004	-	Required for all extra software licenses.
TMflow	-	N/A, Free Download	-	Software required to control the cobot.
	TM Identify & Measure	-	RT6-S100000	License, add-on to TMflow. Includes: identification of pose variation, specific color area size, subtract reference image, line/circle burr, counting and gauge.
	TM External Vision	-	RT6-S100002	License, add-on to TMflow. Required when using eye-to-hand cameras.
	TM OCR	-	RT6-S100003	License, add-on to TMflow. Includes: Text OCR and Number OCR.
TMflow Editor	-	RT6-S200001	-	License, provides a convenient way to open and edit project offline.
	TMflow Editor - Offline AOI	-	RT6-S100005	License, add-on to TMflow Editor. Enables TMflow Editor to offline edit a TMflow project that includes AOI vision.

Accessories Dimensions

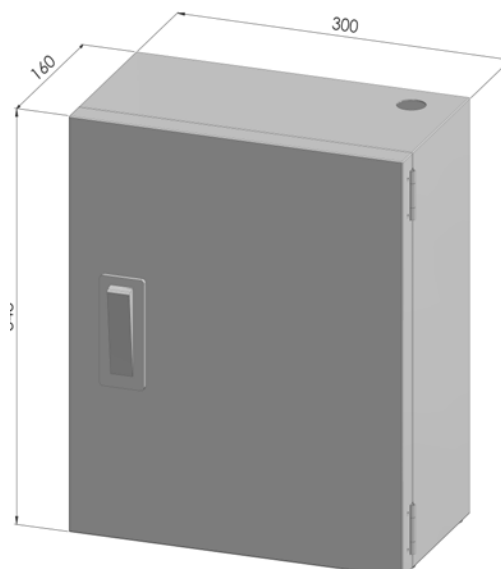
Mobile Work Station (MWS)














Robot Stand



















Pneumatic Control Box










Recommended Plug & Play Hardware

Category	Appearance	Company	Product Name	Manufacturer SKU Number*	Description	
Grippers		Robotiq	Adaptive Gripper 2-Finger 85/140 for OMRON TM robot	85 kit: AGC-OMRON-KIT-85 140 kit: AGC-OMRON-KIT-140	A 2-finger adaptive gripper that can adapt to parts of various shapes and sizes. Comes in two stroke options – 85mm and 140mm. Each kit includes: - End effector coupling kit - 10-meter communication cable - RS485 to RS232 converter - RS485 to USB converter - Screw kit - Quick start guide	
			Hand-E gripper for OMRON TM robot	HND-OMRON-KIT	A 2-finger parallel gripper with an IP67 rating, 50mm stroke. Each kit includes: - Fingertip starting kit - End effector coupling kit - 10-meter communication cable - RS485 to RS232 converter - RS485 to USB converter - Screw kit - Quick start guide	
			EPick for Omron TM robot	VAC-OMRON-EPICK-KIT1	VAC-OMRON-EPICK-KIT2	A vacuum gripper that uses an integrated vacuum generator. Each kit includes: -Basic gripper unit -End effector coupling kit -10-meter communicable cable -RS485 to RS232 converter -RS485 to USB converter -Quick start guide -Vacuum cup(s): 1.5 bellows, 55mm diameter
				VAC-OMRON-EPICK-KIT2		KIT1 includes 1 vacuum cup KIT2 has a suction system for 2 cups KIT4 has a suction system for 4 cups
				VAC-OMRON-EPICK-KIT4		KIT1 includes 1 vacuum cup KIT2 has a suction system for 2 cups KIT4 has a suction system for 4 cups
			AirPick for Omron TM robot	VAC-OMRON-AIRPICK-KIT1	VAC-OMRON-AIRPICK-KIT2	A vacuum gripper that uses an external pneumatic supply. Each kit includes: -Basic gripper unit -Tubing 8mm-8m -End effector coupling kit -RS485 to RS232 converter -RS485 to USB converter -Quick start guide -Vacuum cup(s): 1.5 bellows, 55mm diameter
				VAC-OMRON-AIRPICK-KIT2		KIT1 includes 1 vacuum cup KIT2 has a suction system for 2 cups KIT4 has a suction system for 4 cups
				VA-OMRON-AIRPICK-KIT4		KIT1 includes 1 vacuum cup KIT2 has a suction system for 2 cups KIT4 has a suction system for 4 cups
			I/O Coupling		IO-CPL-OMRON-KIT	Component that connects the Robotiq adaptive/vacuum gripper to the wrist of the OMRON TM robot to eliminate the need for an external serial communication cable. Each kit includes: - I/O Coupling - Screw kit - Micro-USB to USB cable - 16G USB Stick
			Dual-Grip Adapter Plate		AGC-APL-159-002	Adapter plate and mounting screws to mount two grippers onto the OMRON TM robot.
			2F-85 Dual kit for OMRON Robots 2F-140 Dual kit for OMRON Robots HAND-E Dual kit for OMRON Robots		OMRON-DUAL-AGC-85 OMRON-DUAL-AGC-140 OMRON-DUAL-HND	Kit that enables dual gripper setting. Each kit includes: - Chosen gripper x 2 - Mechanical coupling x 2 - USB to RS485 Adapter - Communication Cable - M12 5 Pins Splitter - Dual-Grip Adapter Plate - Screw kit x 2

Category	Appearance	Company	Product Name	Manufacturer SKU Number*	Description
Grippers		OnRobot	RG2 Gripper	102012	Electric 2-finger gripper. Each kit includes: - RG2 Gripper - Fingertip adapters (pre-mounted) - Integrated Quick Changer (tool side) - Torx key
			RG6 Gripper	102021	Electric 2-finger gripper with larger stroke. Each kit includes: - RG2 Gripper - Fingertip adapters (pre-mounted) - Integrated Quick Changer (tool side) - Torx key
			VG10 Electric Vacuum Gripper	101661	Flexible and adjustable electrical vacuum gripper. Each kit includes: - VG10 Gripper - d30mm suction cups x 16 (pre-mounted) - Integrated Quick Changer (tool side) - d40mm suction cups x4 - d15mm suction cups x4 - Blind screws x16 - Positioning arrows - Torx key
			Gecko Gripper	102215	Gripper that uses van der Waals force to pick up flat and porous objects without compressed air. Each kit includes: - Gecko Gripper - Gecko Pads x4 (pre-mounted) - Integrated Quick Changer (tool side) - Spare Gecko Pads x8 - Pad removal tools
			Quick Changer-robot side	102037	Manual tool changer to attach on the robot's end-of-arm. Either the Quick Changer (robot side) or the Dual Quick Changer must be purchased for use of all OnRobot grippers. Each kit includes: - Quick Changer robot side - Screws - Torx key
			Quick Changer- tool side	102014	Manual tool changer to attach on the tool side. (All OnRobot grippers have this component integrated, so this is only necessary when user is developing own tool.)
			Quick Changer Kit	102277	Each kit includes: - Quick Changer (robot side)x1 - Quick Changer (tool side)x2 - Torx key - Screws and pins
			Dual Quick Changer	101788	Manual tool changer to attach on the robot's end-of-arm for dual gripper configuration. Either the Quick Changer (robot side) or the Dual Quick Changer must be purchased for use of all OnRobot grippers. Each kit includes: - Dual Quick Changer - Screws - Torx key
			OMRON TM Robot Kit	102359	This kit must be purchased for the use of OnRobot grippers on OMRON TM collaborative robot. Each kit includes: - Compute Box - Power supply - Adapter plate (included in all kits but only necessary for VG10 and Gecko grippers) - USB stick with software components and User Manual - Device cable 5m - UTP cable 0.5m - I/O cable 0.3m - Cable management hook/loop

Category	Appearance	Company	Product Name	Manufacturer SKU Number*	Description
Grippers		Schmalz	ROB-SET ECBPi OMRON	10.03.01.00544	Complete vacuum gripper for collaborative robots. Each kit includes: - Vacuum generator (ECBPi) - End-effector coupling kit - Connection cable - Mounting flange - Flat suction cup - Bellows suction cup - Bolts and t-nuts - Operating instructions
			ROB-SET FXCB OMRON	10.01.43.00120	Area gripper equipped with integrated pneumatic vacuum generation. (Needs external air supply.) Each kit includes: - Pneumatic area gripper (FXCB) - Connection cable - Mounting flange - Bolts and t-nuts - Operating instructions
		Schunk	Co-act EGP-C 40 N-N-TMID	1374363	Electric 2-finger parallel gripper certified for collaborative operation with actuation via 24 V and digital I/O. Each kit includes: - Co-act EGP-C gripper - Assembly and Operating Manual - Accessory pack
			Co-act AUB EGP 40/12 Co-act AUB EGP 40/24 Co-act AUB-F EGP 40/xx	1401285 1401286 1409839	Gripping fingers for Co-act EGP-C.
3D Bin Picking		Pick-it	Pick-it M	PI-M-2.0	Plug & Play 3D camera and software for picking objects sized 50x50x10mm or larger. Each kit includes: - Pre-calibrated 3D camera - Pick-it software - Industrial processor - 3G dongle to connect directly to Pick-it support - Calibration plate and ROI box teaching markers - All connection cables (plug & play) - Quick start guide
			Pick-it M-HD	PI-M-HD	Plug & Play 3D camera and software for picking objects sized 10x10x5mm or larger. Each kit includes: - Pre-calibrated 3D camera - Pick-it software - Industrial processor - 3G dongle to connect directly to Pick-it support - Calibration plate and ROI box teaching markers - All connection cables (plug & play) - Quick start guide
Screw Driving		Kilews	Screw Driving Solution Kit	-	Kilews screwdriver kit and pneumatic control box. Each kit includes: - Screwdriver SKD-BN512LM - Power Controller SKP-32BC-60W - Flange E31700-3 - Air Nozzle KS-TM-B500 - Signal box - Pneumatic control box - Installation guide

Category	Appearance	Company	Product Name	Manufacturer SKU Number*	Description
Vision		Basler	GigE camera, color, 5MP, CMOS 1/2.5", 14 fps	acA2500-14gc, Rolling Shutter	External camera for eye-to-hand robot applications. Maximum 2 external cameras per robot.
			GigE camera, mono, 5MP, CMOS 1/2.5", 14 fps	acA2500-14gm, Rolling Shutter	
			GigE camera, color, 5MP, CMOS 1", 21fps	acA2500-20gc, Global Shutter	
			GigE camera, mono, 5MP, CMOS 1", 21 fps	acA2500-20gm, Global Shutter	
			GigE camera, color, 5MP, CMOS 2/3", 23fps	acA2440-20gc, Global Shutter	
			GigE camera, mono, 5MP, CMOS 2/3", 23 fps	acA2440-20gm, Global Shutter	
			GigE, camera, color, 10MP, CMOS 1/2.3", 10 fps	acA3800-10gc, Rolling Shutter	
			GigE, camera, mono, 10MP, CMOS 1/2.3", 10 fps	acA3800-10gm, Rolling Shutter	
			GigE, camera, color, 12.2 MP, CMOS 1/1.7", 8 fps	acA4024-8gc, Rolling Shutter	
GigE, camera, mono, 12.2 MP, CMOS 1/1.7", 8 fps	acA4024-8gm, Rolling Shutter				
Force sensor		ATI	Axia80	9105-TM-Axia80	Six-axis force/torque sensor with EtherCAT communication. Each kit includes: - Interface plate - Power and Ethernet cable - Digital delivery of calibration documents and user manual
		Robotiq	FT-300	FTS-300-OMRON-KIT	Six-axis force/torque sensor with RS485 Serial Communication. Each kit includes: - Coupling - RS485 to RS232 converter - Power and communication cable with USB adapter - Screw kit
Connectivity		ADLINK	EtherCAT I/O Expansion Modules KIT	EPS - 9905+6000+2032+1132	A Kit that includes: chassis w/ EtherCAT ports and voltage input, 32-channel digital output module, 32-channel digital input module.
			EtherCAT I/O Expansion Modules (DO Module)	EPS-2032	32-channel digital output module.
			EtherCAT I/O Expansion Modules (DI Module)	EPS-1132	32-channel digital input module.
		Advantech	Serial Device Server EKI-1524-CE	EKI-1524-CE	External device with serial ports that communicates with the robot via TCP/IP.
			Modbus to PROFINET Gateways	EKI-1242IPNMS	A gateway to transform Omron TM robot's Modbus to PROFINET, whereby Omron TM robot as slave could communicate with PROFINET master devices.
Cable Management		Murrplastik	FHS-C-SET TM5 (TM5-700 & TM5-900)	83693500	Cable management dress pack. Each kit includes: Conduit (Cable routing hose, Length:2m, Interior diameter: ~21mm) 4x Attachment straps 2x End plugs Cable insertion tool Installation instructions
			FHS-C-SET TM12 / TM14 (TM12 & TM14)	83693501	
			FHS-RS-SET TM5 (TM5-700 & TM5-900)	83693506	Cable management dress pack. Each kit includes: Conduit (Cable routing hose, Length:2m, Interior diameter: ~21mm) 2x Conduit clamps Self-retracting hose guide (2x Ball joint fixing, Ball joint strain relief, Feedback system, System holder) Tool-end clamp End sleeve Cable puller Installation instructions
			FHS-RS-SET TM12 / TM14 (TM12 & TM14)	83693507	

* Manufacturer SKU numbers are 3rd party part numbers, not OMRON part numbers.

Ordering Information

Model Number Legend

RT6 - 0 0 0 7 0 0 0

(1) (2) (3) (4) (5) (6) (7) (8)

No.	Item	Specifications	Symbol
(1)	Collaborative Robots - Techman		
(2)	Model Type	TM5	0
		TM12	1
		TM14	2
(3)	Power Supply	AC	0
		DC	1
(4)	Eye in Hand	Standard	0
		X Model*	1
(5)(6)	Arm Length	700 (TM5)	70
		900 (TM5)	90
		1300 (TM12)	13
		1100 (TM14)	11
(7)	Semi	Standard	0
		Semi	1
(8)	Cable Length	Standard Length (3m/1.5m)*	1
		Extended Length (12m)*	2

* X model refers to robot models without integrated camera system.

* 1.5m cable is only standard on DC models.

* 12m cable is not available on DC models.

Cobot Part Number List

Type	Part Number
TM5-700	RT6-0007001
TM5-700, 12m cable	RT6-0007002
TM5X-700	RT6-0017001
TM5X-700, 12m cable	RT6-0017002
TM5M-700	RT6-0107001
TM5M-700 SEMI	RT6-0107011
TM5MX-700	RT6-0117001
TM5-900	RT6-0009001
TM5-900, 12m cable	RT6-0009002
TM5X-900	RT6-0019001
TM5X-900, 12m cable	RT6-0019002
TM5M-900	RT6-0109001
TM5M-900 SEMI	RT6-0109011
TM5MX-900	RT6-0119001
TM12	RT6-1001301
TM12, 12m cable	RT6-1001302
TM12X	RT6-1011301
TM12X, 12m cable	RT6-1011302
TM12M	RT6-1101301
TM12M SEMI	RT6-1101311
TM12MX	RT6-1111301
TM14	RT6-2001101
TM14, 12m cable	RT6-2001102
TM14X	RT6-2011101
TM14X, 12m cable	RT6-2011102
TM14M	RT6-2101101
TM14M SEMI	RT6-2101111
TM14MX	RT6-2111101

Accessories Part Number List

Type	Part Number
Landmark	RT6-A000008
Mobile Workstation (MWS)	RT6-A000010
Robot stand	RT6-A000009

Type	Part Number
SSD with cable	RT6-A000012
Kit, calibration set with additional pin	RT6-A000002
Robot stick stand	RT6-A000000
Pneumatic control box	RT6-A000015

Software Part Number List

Type	Part Number
USB Dongle	RT6-A000004
TMflow	N/A, Free Download
TM Identify & Measure	RT6-S100000
TM External Vision	RT6-S100002
TM OCR	RT6-S100003
TMflow Editor	RT6-S200001
TMflow Editor - Offline AOI	RT6-S100005

Related Manuals

Manual No.	English Title
I623	TM5 Regular Payload Series Hardware Installation Manual
I624	TM12 & TM14 Medium & Heavy Payload Series Hardware Installation Manual
I626	Software Manual TMflow
I627	Software Manual TMvision
I628	TM Mobile Work Station Manual
I629	TM Robot Stand Manual
I630	Pneumatic Control Box Manual
I648	Safety Manual
I848	Expression Editor and Listen Node Reference Guide

Robot Parts Code and Bundled Accessories

Type	TM5-700					TM5-900				
	TM5-700	TM5M-700	TM5M-700 SEMI	TM5X-700	TM5MX-700	TM5-900	TM5M-900	TM5M-900 SEMI	TM5X-900	TM5MX-900
Product Name										
Part Number	RT6-000700X	RT6-010700X	RT6-010701X	RT6-001700X	RT6-011700X	RT6-000900X	RT6-010900X	RT6-010901X	RT6-001900X	RT6-011900X
Overview	Robot and control box with built-in vision system			Robot and control box without vision system		Robot and control box with built-in vision system			Robot and control box without vision system	
Purpose	Typical for use in single collaborative robot system					Typical for use in single collaborative robot system				
Bundled Accessories	<ul style="list-style-type: none"> TM5-700 robot arm (1) Robot stick (1) Control box (1) Calibration plates (one large and one small) (not included with the X model bundles) IO cables (2) Landmark (2) (not included with the X model bundles) Ground wire (1) Conducting wire, 3 cm (2) Power cable for the control box (4 standard part number, 1 mobile part number) SEMI emergency OFF switch (SEMI model only) 					<ul style="list-style-type: none"> TM5-900 robot arm (1) Robot stick (1) Control box (1) Calibration plates (one large and one small) (not included with the X model bundles) IO cables (2) Landmark (2) (not included with the X model bundles) Ground wire (1) Conducting wire, 3 cm (2) Power cable for the control box (4 standard part number, 1 mobile part number) SEMI emergency OFF switch (SEMI model only) 				
Type	TM12					TM14				
	TM12	TM12M	TM12M SEMI	TM12X	TM12MX	TM14	TM14M	TM14M SEMI	TM14X	TM14MX
Product Name										
Part Number	RT6-100130X	RT6-110130X	RT6-110131X	RT6-101130X	RT6-111130X	RT6-200110X	RT6-210110X	RT6-210111X	RT6-201110X	RT6-211110X
Overview	Robot and control box with built-in vision system			Robot and control box without vision system		Robot and control box with built-in vision system			Robot and control box without vision system	
Purpose	Typical for use in single collaborative robot system					Typical for use in single collaborative robot system				
Bundled Accessories	<ul style="list-style-type: none"> TM12 robot arm (1) Robot stick (1) Control box (1) Calibration plates (one large and one small) (not included with the X model bundles) IO cables (2) Landmark (2) (not included with the X model bundles) Ground wire (1) Conducting wire, 3 cm (2) Power cable for the control box (4 standard part number, 1 mobile part number) SEMI emergency OFF switch (SEMI model only) 					<ul style="list-style-type: none"> TM14 robot arm (1) Robot stick (1) Control box (1) Calibration plates (one large and one small) (not included with the X model bundles) IO cables (2) Landmark (2) (not included with the X model bundles) Ground wire (1) Conducting wire, 3 cm (2) Power cable for the control box (4 standard part number, 1 mobile part number) SEMI emergency OFF switch (SEMI model only) 				

* Please note the calibration plates and landmark are not included with the X model bundles.

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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.

No. 438A Alexandra Road # 05-05/08 (Lobby 2),
Alexandra Technopark,
Singapore 119967
Tel: (65) 6835-3011/Fax: (65) 6835-2711

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.

4550 Norris Canyon Road, Suite 150, San Ramon, CA 94583 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) 21-5037-2222/Fax: (86) 21-5037-2200

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