

# OMRON Collaborative Robot TM S Series

## S Series Collaborative Robot (Cobot) HW 5.03 for assembly, palletizing, inspection, logistics and other applications

- Designed to promote a safe and harmonious workplace between humans and machines.
- 33 safety functions, all ISO 13849-1, Cat.3, PLd, certified
- Full ISO 10218-1 compliance
- Easy-to-use graphical programming environment for quick startup and operation.
- Built-in, vision-based, robot control enables visual servoing, inspection, and measurement operations.
- Optional camera and Landmark allows for truly flexible, fast changeover.
- Capability to integrate with mobile robots enables fully-autonomous machine tending and logistics handling applications.
- TM-Series robot arms are finished with an ESD-compliant coating.



## Part Number Structure

RT6 - □ □ □ □ □ □  
1 2 3 4 5 6

No.	Item	Specifications	Model	Designation
1	Payload (kg max.)	5	TM5S	0
		6	TM6S	9
		7	TM7S	6
		12	TM12S	1
		14	TM14S	2
		20	TM20S	4
		25	TM25S	7
		30	TM30S	8
2	Power Source	AC		0
		DC *1		1
3	Vision	With Integrated Camera		0
		Without Integrated Camera		1
4	Reach/Arm Length (mm) *2	900	TM5S	90
		1800	TM6S	18
		700	TM7S	70
		1300	TM12S	13
		1100	TM14S	11
		1300	TM20S	13
		1902	TM25S	19
		1702	TM30S	17
5	Option	Standard		0
		SEMI S2 *3		1
		Fieldbus		2
		SEMI S2 *3, Fieldbus		5
6	Cable Length (m)	Standard Length (1.5 m for DC unit / 3.0 m for AC unit)		4
		Extended Length (3.0 m for DC unit / 12 m for AC unit)		5

**Note:** Not all combinations are possible. Please refer to the Ordering Information tables for available combinations.

\*1. DC-powered cobots are capable of mobile operation when paired with an Autonomous Mobile Robot.

\*2. The payload and arm length are determined by model.

\*3. Semiconductor Equipment and Materials International (SEMI), is the central, global network of micro and nanoelectronics manufacturers that issues safety guidelines. SEMI S2 is the most well-known SEMI standard for Environmental, Health, and Safety (EHS).

## TM S Series

### Ordering Information

#### TM5S Units

Product Model	Maximum Payload (kg)	Reach (mm)	Integrated Camera	Extended Cable	DC Power Source	SEMI S2 Certified	Fieldbus	Ordering Code
TM5S	5	900	Yes	No	No	No	No	RT6-0009004
TM5S, 12 m cable				Yes				RT6-0009005
TM5S-X			No	No				RT6-0019004
TM5S-X, 12 m cable				Yes				RT6-0019005
TM5S-M			Yes	No	Yes			Yes
TM5S-M, 3 m cable				Yes		RT6-0109005		
TM5S-M SEMI			No	No	Yes	RT6-0109014		
TM5S-MX						RT6-0119004		
TM5S-MX, 3 m cable						Yes		RT6-0119005
TM5S, Fieldbus			Yes	No	No	No	Yes	RT6-0009024
TM5S, 12 m cable, Fieldbus				Yes				RT6-0009025
TM5S-X, Fieldbus			No	No				RT6-0019024
TM5S-X, 12 m cable, Fieldbus				Yes				RT6-0019025
TM5S-M, Fieldbus			Yes	No	Yes			Yes
TM5S-M, 3 m cable, Fieldbus				Yes		RT6-0109025		
TM5S-M SEMI, Fieldbus				No		RT6-0109054		
TM5S-MX, Fieldbus			No	No	Yes	No		RT6-0119024
TM5S-MX, 3 m cable, Fieldbus				Yes				RT6-0119025

#### TM6S Units

Product Model	Maximum Payload (kg)	Reach (mm)	Integrated Camera	Extended Cable	DC Power Source	SEMI S2 Certified	Fieldbus	Ordering Code
TM6S	6	1800	Yes	No	No	No	No	RT6-9001804
TM6S, 12 m cable				Yes				RT6-9001805
TM6S-X			No	No				RT6-9011804
TM6S-X, 12 m cable				Yes				RT6-9011805
TM6S-M			Yes	No	Yes			RT6-9101804
TM6S-M, 3 m cable				Yes				RT6-9101805
TM6S-MX			No	No	Yes			RT6-9111804
TM6S-MX, 3 m cable				Yes				RT6-9111805
TM6S, Fieldbus			Yes	No	No		Yes	RT6-9001824
TM6S, 12 m cable, Fieldbus				Yes				RT6-9001825
TM6S-X, Fieldbus			No	No				RT6-9011824
TM6S-X, 12 m cable, Fieldbus				Yes				RT6-9011825
TM6S-M, Fieldbus			Yes	No	Yes			RT6-9101824
TM6S-M, 3 m cable, Fieldbus				Yes				RT6-9101825
TM6S-MX, Fieldbus			No	No	Yes			RT6-9111824
TM6S-MX, 3 m cable, Fieldbus				Yes				RT6-9111825

**TM7S Units**

Product Model	Maximum Payload (kg)	Reach (mm)	Integrated Camera	Extended Cable	DC Power Source	SEMI S2 Certified	Fieldbus	Ordering Code	
TM7S	7	700	Yes	No	No	No	No	RT6-6007004	
TM7S, 12 m cable				Yes				RT6-6007005	
TM7S-X			No	No				RT6-6017004	
TM7S-X, 12 m cable				Yes				RT6-6017005	
TM7S-M			Yes	No	Yes			Yes	RT6-6107004
TM7S-M, 3 m cable				Yes		RT6-6107005			
TM7S-M SEMI			No	Yes	Yes	RT6-6107014			
TM7S-MX					No			RT6-6117004	
TM7S-MX, 3 m cable				Yes				RT6-6117005	
TM7S, Fieldbus			Yes	No	No	No	Yes	RT6-6007024	
TM7S, 12 m cable, Fieldbus				Yes				RT6-6007025	
TM7S-X, Fieldbus			No	No				RT6-6017024	
TM7S-X, 12 m cable, Fieldbus				Yes				RT6-6017025	
TM7S-M, Fieldbus			Yes	No	Yes			Yes	RT6-6107024
TM7S-M, 3 m cable, Fieldbus				Yes		RT6-6107025			
TM7S-M SEMI, Fieldbus				No		Yes		RT6-6107054	
TM7S-MX, Fieldbus			No	No	Yes	No		RT6-6117024	
TM7S-MX, 3 m cable, Fieldbus				Yes				RT6-6117025	

**TM12S Units**

Product Model	Maximum Payload (kg)	Reach (mm)	Integrated Camera	Extended Cable	DC Power Source	SEMI S2 Certified	Fieldbus	Ordering Code
TM12S	12	1300	Yes	No	No	No	No	RT6-1001304
TM12S, 12 m cable				Yes				RT6-1001305
TM12S-X			No	No				RT6-1011304
TM12S-X, 12 m cable				Yes				RT6-1011305
TM12S-M			Yes	No	Yes			RT6-1101304
TM12S-M, 3 m cable				Yes		RT6-1101305		
TM12S-M SEMI			No	Yes	Yes	RT6-1101314		
TM12S-MX					No			RT6-1111304
TM12S-MX, 3 m cable				Yes	RT6-1111305			
TM12S, Fieldbus			Yes	No	No	No	Yes	RT6-1001324
TM12S, 12 m cable, Fieldbus				Yes				RT6-1001325
TM12S-X, Fieldbus			No	No				RT6-1011324
TM12S-X, 12 m cable, Fieldbus				Yes				RT6-1011325
TM12S-M, Fieldbus			Yes	No	Yes			RT6-1101324
TM12S-M, 3 m cable, Fieldbus				Yes		RT6-1101325		
TM12S-M SEMI, Fieldbus				No		Yes		RT6-1101354
TM12S-MX, Fieldbus			No	No	Yes	No		RT6-1111324
TM12S-MX, 3 m cable, Fieldbus				Yes				RT6-1111325

## TM S Series

### TM14S Units

Product Model	Maximum Payload (kg)	Reach (mm)	Integrated Camera	Extended Cable	DC Power Source	SEMI S2 Certified	Fieldbus	Ordering Code
TM14S	14	1100	Yes	No	No	No	No	RT6-2001104
TM14S, 12 m cable				Yes				RT6-2001105
TM14S-X				No				No
TM14S-X, 12 m cable			Yes					RT6-2011105
TM14S-M			Yes	No	Yes	Yes		RT6-2101104
TM14S-M, 3 m cable				Yes				RT6-2101105
TM14S-M SEMI				No	Yes			RT6-2101114
TM14S-MX			No			RT6-2111104		
TM14S-MX, 3 m cable			Yes		No	RT6-2111105		
TM14S, Fieldbus			Yes	No	No	No	RT6-2001124	
TM14S, 12 m cable, Fieldbus				Yes			RT6-2001125	
TM14S-X, Fieldbus				No			RT6-2011124	
TM14S-X, 12 m cable, Fieldbus			Yes	RT6-2011125				
TM14S-M, Fieldbus			Yes	No	Yes		RT6-2101124	
TM14S-M, 3 m cable, Fieldbus				Yes			RT6-2101125	
TM14S-M SEMI, Fieldbus				No	Yes		RT6-2101154	
TM14S-MX, Fieldbus			No	No	Yes		No	RT6-2111124
TM14S-MX, 3 m cable, Fieldbus				Yes				RT6-2111125

### TM20S Units

Product Model	Maximum Payload (kg)	Reach (mm)	Integrated Camera	Extended Cable	DC Power Source	SEMI S2 Certified	Fieldbus	Ordering Code
TM20S	20	1300	Yes	No	No	No	No	RT6-4001304
TM20S, 12 m cable				Yes				RT6-4001305
TM20S-X			No	No				RT6-4011304
TM20S-X, 12 m cable				Yes				RT6-4011305
TM20S, Fieldbus			Yes	No			Yes	RT6-4001324
TM20S, 12 m cable, Fieldbus				Yes				RT6-4001325
TM20S-X, Fieldbus			No	No				RT6-4011324
TM20S-X, 12 m cable, Fieldbus				Yes				RT6-4011325

### TM25S Units

Product Model	Maximum Payload (kg)	Reach (mm)	Integrated Camera	Extended Cable	DC Power Source	SEMI S2 Certified	Fieldbus	Ordering Code
TM25S	25	1902	Yes	No	No	No	No	RT6-7001904
TM25S, 12 m cable				Yes				RT6-7001905
TM25S-X			No	No				RT6-7011904
TM25S-X, 12 m cable				Yes				RT6-7011905
TM25S-M			Yes	No	Yes	RT6-7101904		
TM25S-M, 3 m cable				Yes		RT6-7101905		
TM25S-MX			No	No	Yes	No		RT6-7111905
TM25S-MX, 3 m cable				Yes				RT6-7001904
TM25S, Fieldbus			Yes	No	No	No	Yes	RT6-7001924
TM25S, 12 m cable, Fieldbus				Yes				RT6-7001925
TM25S-X, Fieldbus			No	No				RT6-7011924
TM25S-X, 12 m cable, Fieldbus				Yes				RT6-7011925
TM25S-M, Fieldbus			Yes	No	Yes			RT6-7101924
TM25S-M, 3 m cable, Fieldbus				Yes				RT6-7101925
TM25S-MX, Fieldbus			No	No	Yes	No		RT6-7111925
TM25S-MX, 3 m cable, Fieldbus				Yes				RT6-7001924










**TM30S Units**

Product Model	Maximum Payload (kg)	Reach (mm)	Integrated Camera	Extended Cable	DC Power Source	SEMI S2 Certified	Fieldbus	Ordering Code		
TM30S	30	1702	Yes	No	No	No	No	RT6-8001704		
TM30S, 12 m cable				Yes				RT6-8001705		
TM30S-X			No	No				RT6-8011704		
TM30S-X, 12 m cable				Yes				RT6-8011705		
TM30S-M			Yes	No	Yes			RT6-8101704		
TM30S-M, 3 m cable				Yes				RT6-8101705		
TM30S-MX			No	No	Yes	No		RT6-8111705		
TM30S-MX, 3 m cable				Yes				RT6-8001704		
TM30S, Fieldbus			Yes	No	No	No	Yes	RT6-8001724		
TM30S, 12 m cable, Fieldbus				Yes				RT6-8001725		
TM30S-X, Fieldbus			No	No				RT6-8011724		
TM30S-X, 12 m cable, Fieldbus				Yes				RT6-8011725		
TM30S-M, Fieldbus			Yes	No	Yes			RT6-8101724		
TM30S-M, 3 m cable, Fieldbus				Yes				RT6-8101725		
TM30S-MX, Fieldbus			No	No	Yes	No		RT6-8111725		
TM30S-MX, 3 m cable, Fieldbus				Yes				RT6-8001724		

**Items Included with a System**

Control Box Cable	1.5, 3, and 12 m options	
Robot Stick	Hand control to manually position and teach cobot	
Control Box	Robot Control Box	
Calibration Plate	Plate for calibrating cobot integrated camera. Not included with S-X model cobots	
I/O Cable	1 m 8-pin digital I/O cable	
Landmark	Two robot positioning tools. Not included with S-X model cobots	
Ground Wire	Two 2 m wires	
Jumper Wire	Two 3 cm wires	
Power Cord	(TM5S, TM6S, TM7S, TM12S, TM14S, TM20S) Three 1.8 m Control Box power cords, types B, G, and F	(TM25S and TM30S) Control Box power cord. 1 cable, 5 m
SEMI Switch	Emergency OFF switch (SEMI cobots)	
SEMI ESTOP Cable	3 m Emergency OFF cable (SEMI cobots)	
External Brake Release Cable	3 m cable for external brake release (TM25S and TM30S only)	
Joint 6 Force/Torque Sensor	Force/Torque sensor for force control applications and improved load manipulation (TM25S and TM30S only)	

## Accessories and Optional Items

Appearance	Product Name	Description	Remarks	Ordering Code
	Landmark 2.0	Robot positioning tool as a reference to the environment.	Two included with purchase of a cobot. Not included with S-X model cobots.	RT6-A000028
	Mobile Workstation (MWS)	MWS is a convenient tool for users to mount the cobot arm on work surface, and safely store the control box. Users can easily move the MWS with the cobot to different work cells.	Compatible with OMRON TM5S, TM7S, TM5-700, and TM5-900.	RT6-A000010
	Robot stand	Similar to MWS, the robot stand can be easily moved with the cobot to different work stations.	Compatible with OMRON TM5S, TM7S, TM5-700, and TM5-900.	RT6-A000009
	SSD with cable	128 GB solid-state disk	SATA cable included. Recommended for external cameras image logging.	RT6-A000012
	Kit, calibration set with additional pin	The 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
	Polarizer Light Module, S-Series	Improves the reflection caused by the cobot's own light source on the surface of highly-reflective objects.	For S-series cobots only.	RT6-A000025
	Air Filter (ROHS)	Replacement air filter for the control box.	The filter must be changed regularly to maintain efficiency. The replacement procedure can be found in the Hardware Installation Manual.	19937-214F
	TM Screen (Teaching Pendant) with Pen	The TM Screen devices can be combined with the Robot Stick design to become a teaching pendant, and operate the cobot from the touch screen environment.	The TM Screen is only compatible with S-Series units. No additional wiring is needed.	RT6-A000024
	TM5S/TM7S Metal Joint Cover Sets	6-piece-set of black metal joint covers without logo. Designed for harsh working environments.	Only available for TM5S and TM7S units.	RT6-A000027

## Software

Product Name	Add-On Product Names	Remarks	Ordering Code
TMflow 2.X.X	N/A	Software required to control the cobot. Free download	N/A
Super Software Dongle	TM Identify & Measure	License, add-on to TMFlow. Includes: identification of pose variation, specific color area size, subtract reference image, line/circle burr, counting and gauge.	RT6-A000026
	TM External Vision	License, add-on to TMFlow. Required when using eye-to-hand cameras.	
	TM OCR	License, add-on to TMFlow. Includes: Text OCR and Number OCR.	
	PalletBoost 5 License	License, add-on to TMFlow 2.22 or above. Additional 5 kg payload license for TM25S and TM30S.	

## Specifications

Product		TM5S	TM6S	TM7S	TM12S	TM14S	TM20S	TM25S	TM30S
Robot Arm Weight, With Camera / Without Camera (kg)		23.9 / 23.6	35.5 / 35.2	22.9 / 22.6	33.3 / 33.0	33 / 32.7	33.3 / 33.0	81.6 / 81.3	80.6 / 80.3
Control Box Weight, AC unit / DC unit (kg) *1		13.5 / 8.9						17.5 / 11.7	
Maximum Payload (kg)		5	6	7	12	14	20	25	30
Reach (mm)		900	1800	700	1300	1100	1300	1902	1702
Mounting		Wall, Table, Ceiling							
Joint Ranges	J1, J2, J4, J5, J6	± 360°							
	J3	± 158°	± 166°	± 152°	± 162°	± 159°	± 162°	± 166°	± 170°
Joint Speed	J1	210°/s	130°/s	210°/s	130°/s		130°/s	100°/s	
	J2		95°/s						
	J3	210°/s	210°/s		125°/s	130°/s			
	J4	225°/s					160°/s	195°/s	
	J5						190°/s		210°/s
	J6	450°/s						225°/s	
Average Speed (m/s) *2		1.4	1.1		1.3	1.1		2.1	
Repeatability (mm)		± 0.03	± 0.1	± 0.03			± 0.05		
Degrees of Freedom		6 rotating joints							
I/O Ports	Control Box	Digital In: 16 / Digital Out: 16 Analog In: 2 / Analog Out: 2							
	Tool Conn.	Digital In: 3 / Digital Out: 3							
I/O Power Supply	Control Box	24 V 2.0 A							
	Tool Conn.	24 V 1.5 A							
Ingress Protection		IP65 for Robot Arm, IP54 for Control Box *3, Robot Stick and TM Screen							
Cleanroom Class		ISO Cleanroom Class 3							
Operating Temperature and Humidity		0 to 50°C, 85% max. (with no condensation)							
Motor Power Supply	AC Units	100 to 240 VAC, 50/60 HZ						200 to 240 VAC, 50/60 Hz	
	DC Units	24 to 60 VDC						48 to 60 VDC	
I/O Interface		2 COM, 1 HDMI, 3 LAN, 2 USB2.0, 4 USB3.0							
Communication		RS-232/RS-422/RS-485, Ethernet, Modbus TCP/RTU (MainDevice & SubDevice), EtherCAT (optional), PROFINET (optional), EtherNet/IP (optional)							
Programming Environment		TMFlow (flowchart-based), TMScript (script-based), TMCraft (developer-based)							
Certifications		TÜV-certified ISO 13849-1, ISO 10218-1, ISO/TS 15066, UL1740, CAN/CSA Z424-14 (R2019), SEMI S2 (optional)							
Positioning Accuracy		2D Positioning: 0.1 *4 (camera models only)							
Robot Vision	Eye in Hand (Built in)	1.2MP / 5MP, color camera (camera models only)							
	Eye to Hand (Optional)	Supports maximum of 2 GigE 2D cameras							
Force x-y-z (TM25S/30S)	Range	± 300 N							
	Precision	2% full scale							
	Accuracy	5.5% full scale							
Torque x-y-z (TM25S/30S)	Range	± 30 Nm							
	Precision	0.3% full scale							
	Accuracy	5% full scale							

\*1. The weight indicated applies to robots with no option. The weight for the fieldbus option will be 0.02 kg heavier than that of the standard unit. The weight of the DC SEMI S2 option for the TM5S/6S/7S/12S/14S units is 9.9 kg.

\*2. Average speed is determined for each robot by performing a large linear motion at full project speed and default acceleration with no payload.

\*3. The AC Control Box has an IP54 rating. The DC Control Box is not IP rated.

\*4. The data in this table are measured by TM laboratory and the working distance is 100 mm. It should be noted that in practical applications, the relevant values may be different due to factors such as the on-site ambient light source, object characteristics, and vision programming methods that will affect the change in accuracy.

## Version Information

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

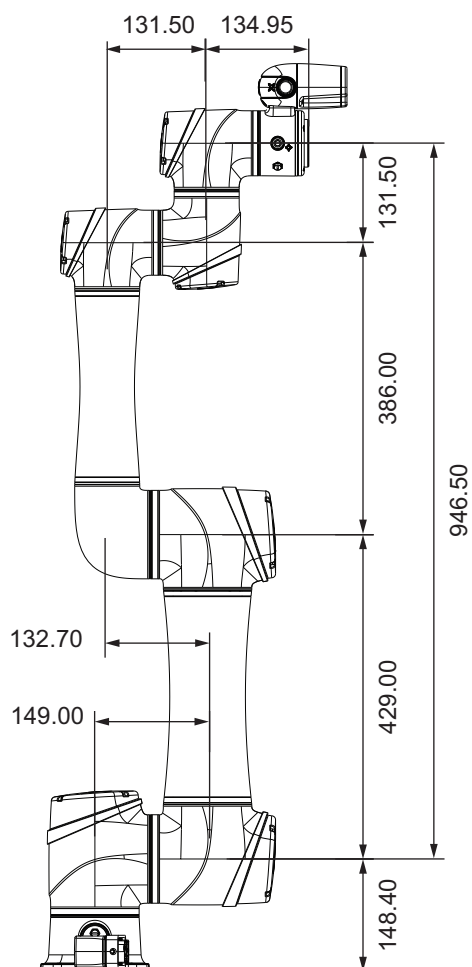
- Robot Hardware Version: 5.03
- TMFlow Version: 2.22

# TM S Series

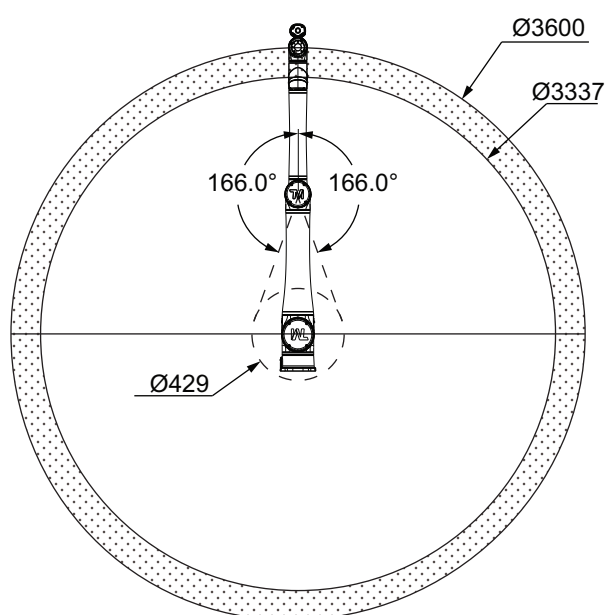
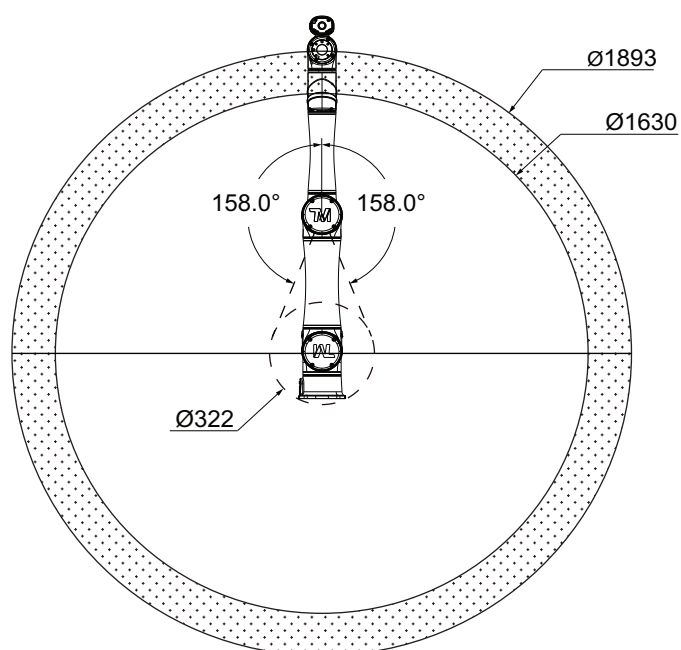
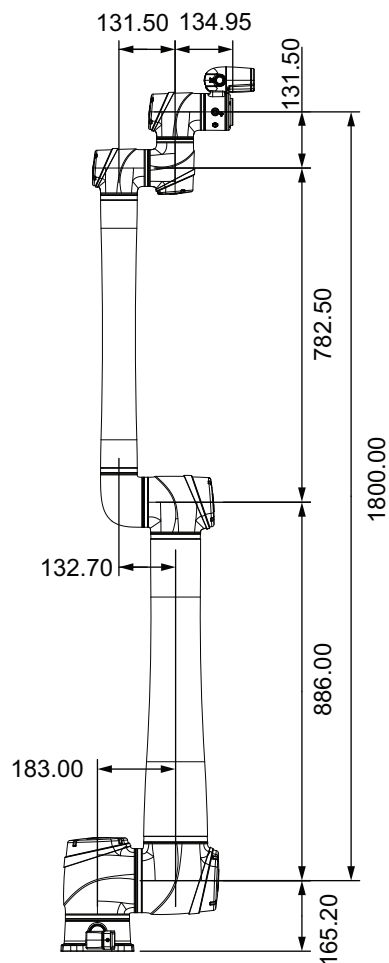
## Dimensions

(Units: mm)

### TM5S/TM5S-X \*/TM5S-M/TM5S-MX \*



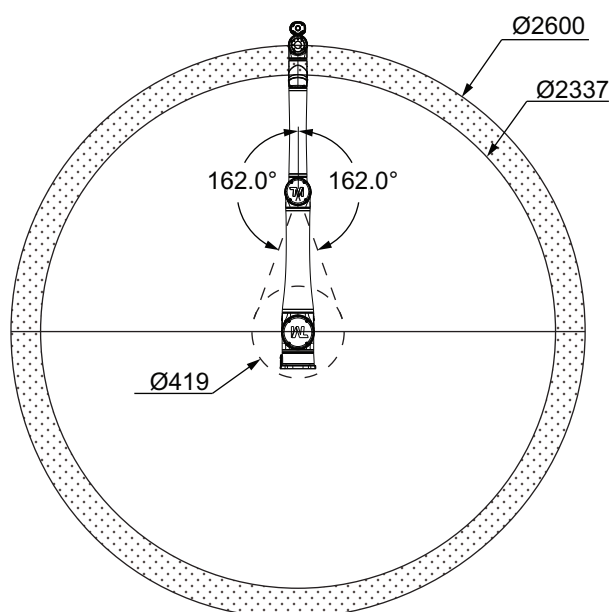
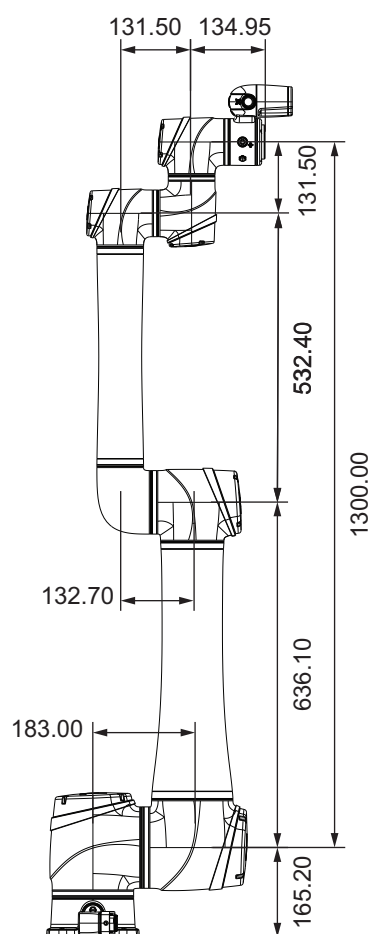
### TM6S/TM6S-X \*/TM6S-M/TM6S-MX \*



\* Dimensions do not include the camera. Refer to *the Camera Dimensions* on page 14 for more information.

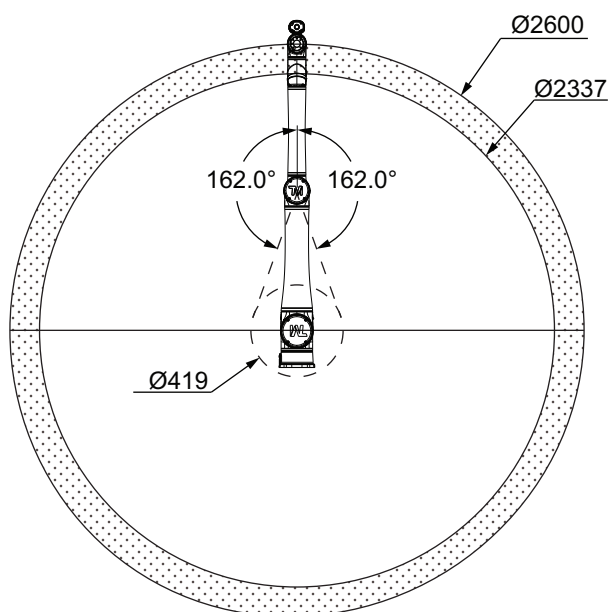
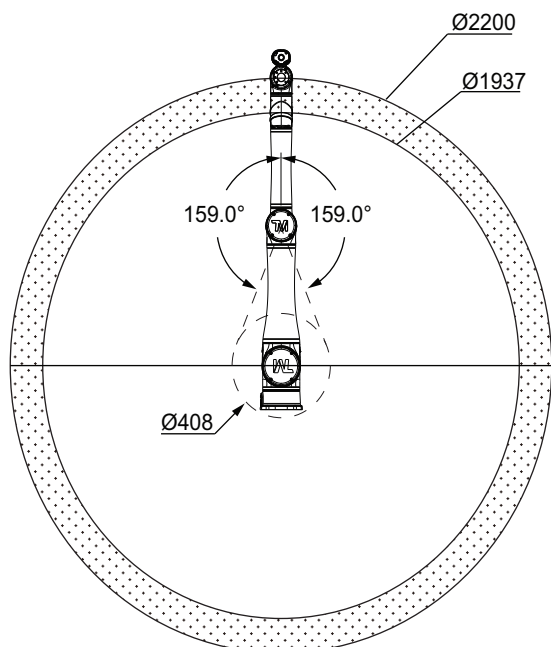
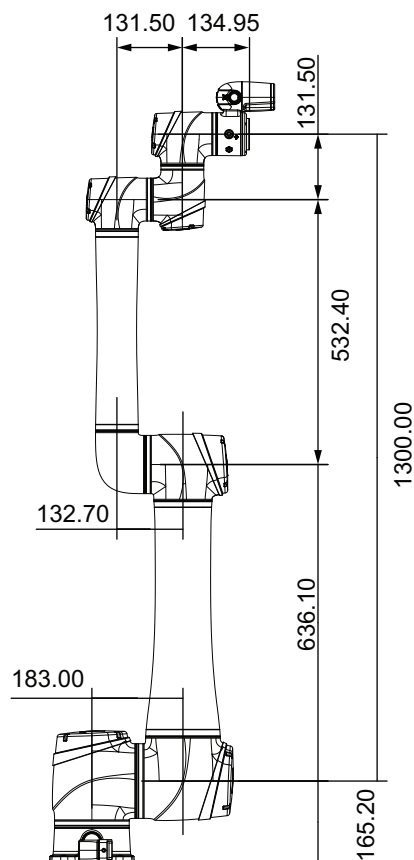
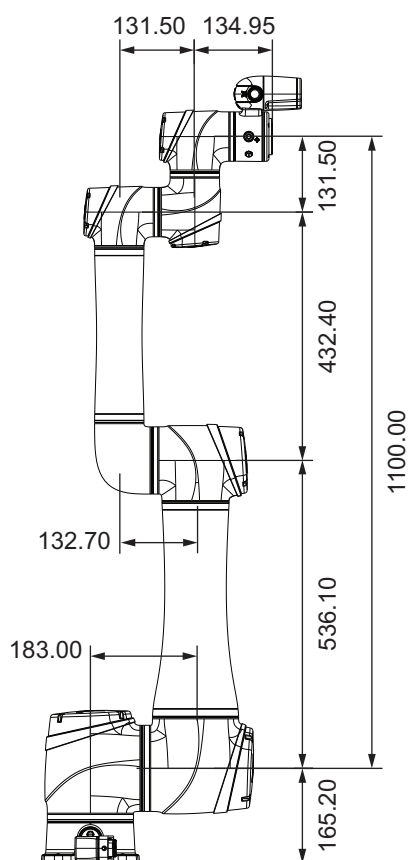


**TM12S/TM12S-X \*/TM12S-M/TM12S-MX \***



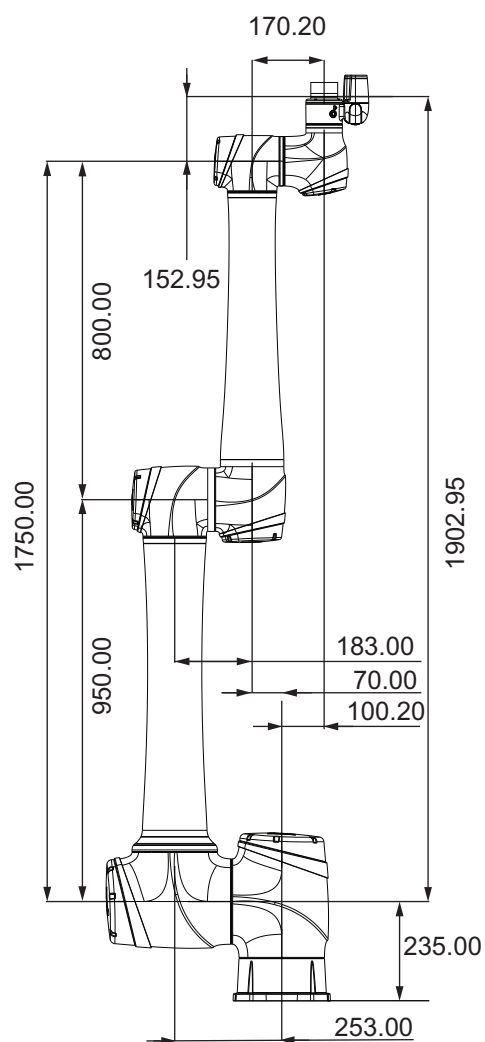
\* Dimensions do not include the camera. Refer to *the Camera Dimensions* on page 14 for more information.

## TM14S/TM14S-X \*/TM14S-M/TM14S-MX \*

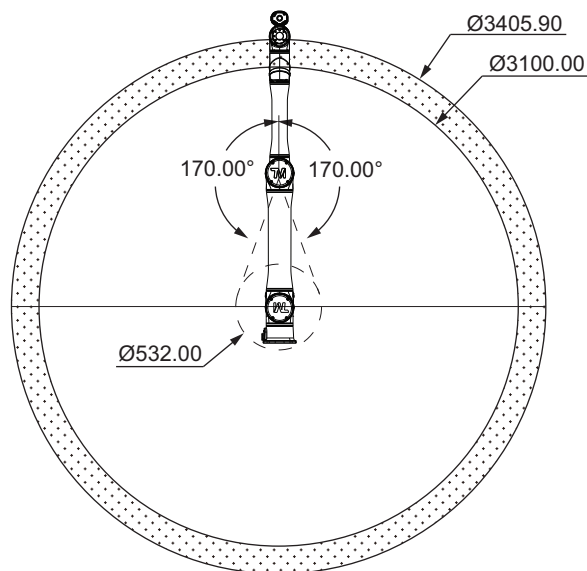
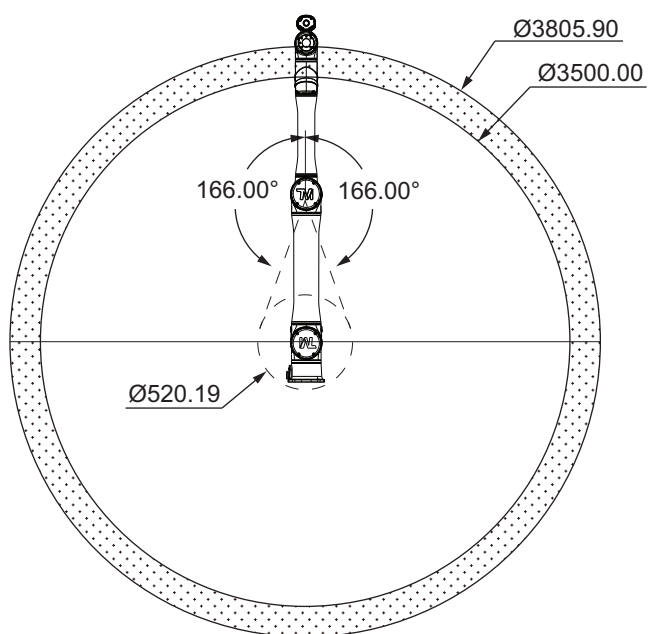
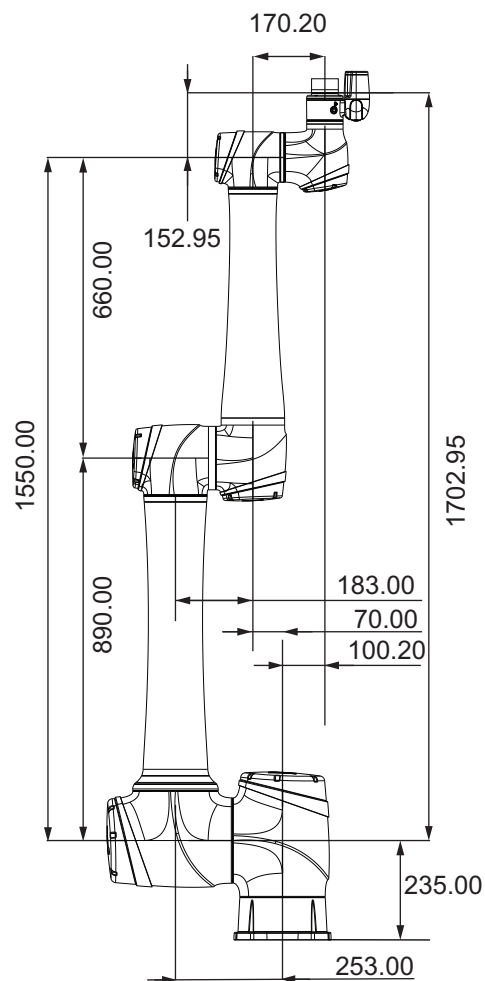


\* Dimensions do not include the camera. Refer to *the Camera Dimensions* on page 14 for more information.

TM25S/TM25S-X \*/TM25S-M/TM25S-MX \*

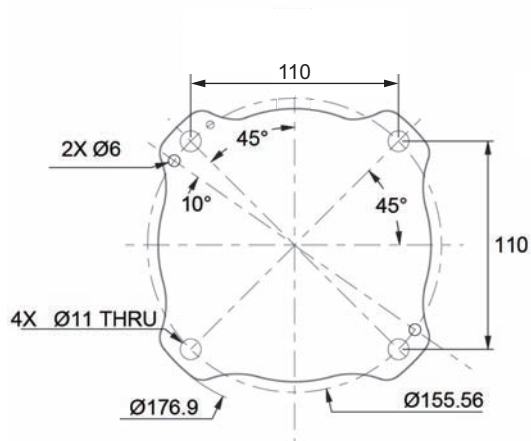


TM30S/TM30S-X \*/TM30S-M/TM30S-MX \*

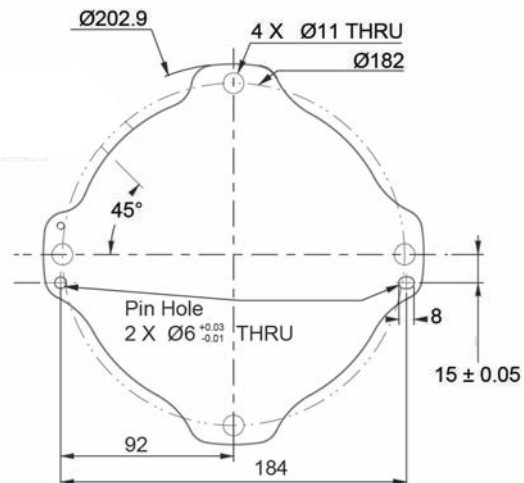


\* Dimensions do not include the camera. Refer to the Camera Dimensions on page 14 for more information.

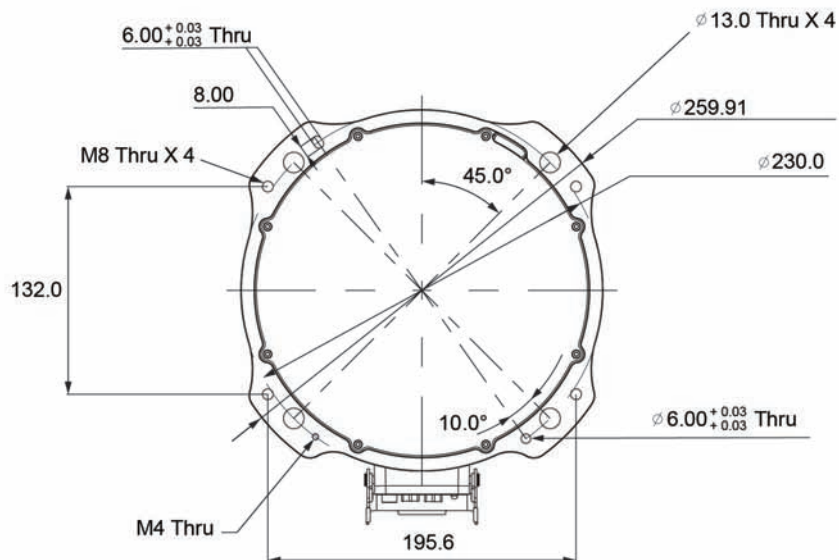
Footprint (TM5S/7S Models)



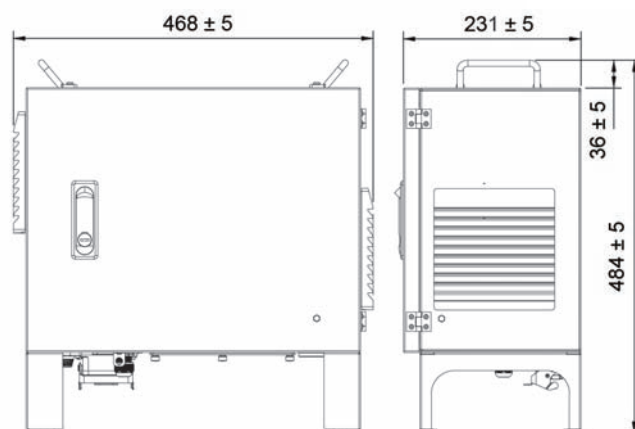
Footprint (TM6S/12S/14S/20S Models)



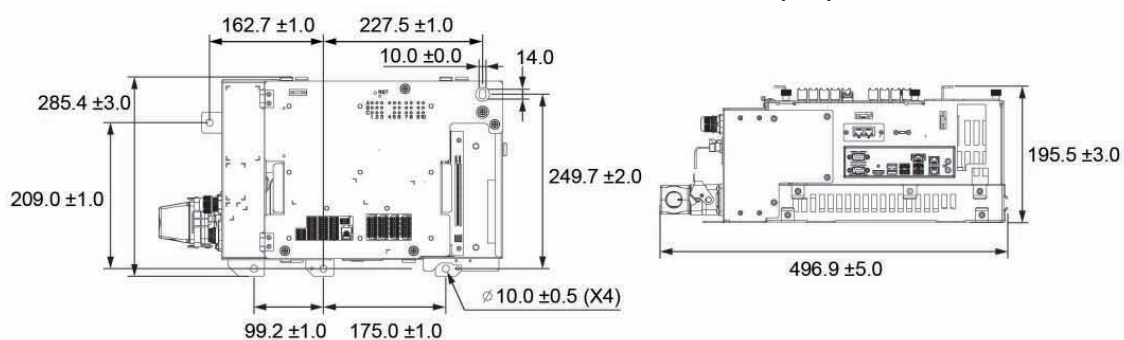
Footprint (TM25S/30S Models)



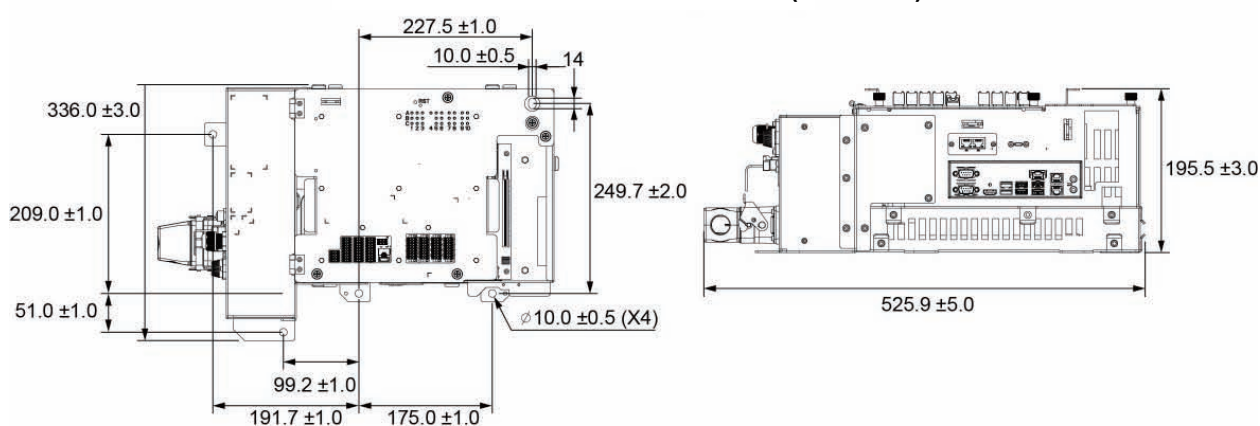
TM5S/6S/7S/12S/14S/20S Control Box (AC)



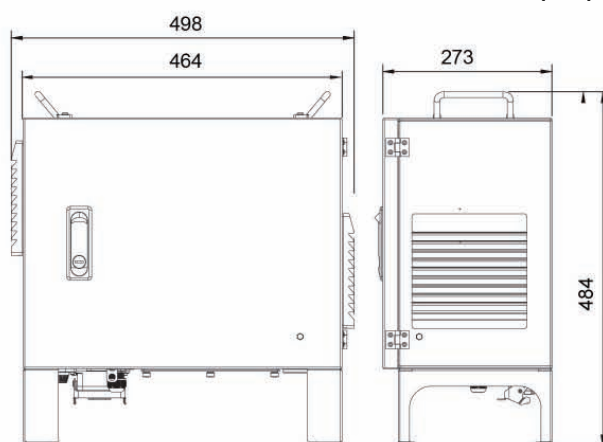
**TM5S/6S/7S/12S/14S Control Box (DC)**



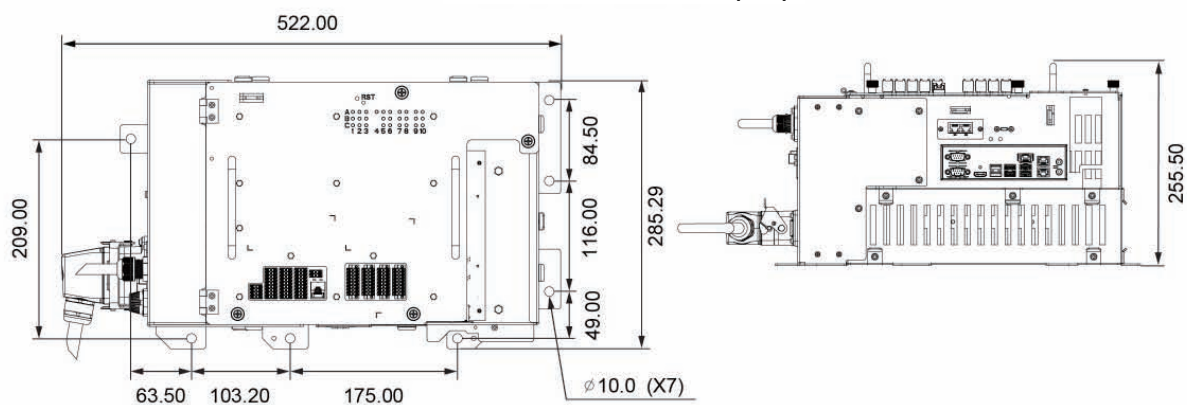
**TM5S/7S/12S/14S Control Box (DC SEMI)**



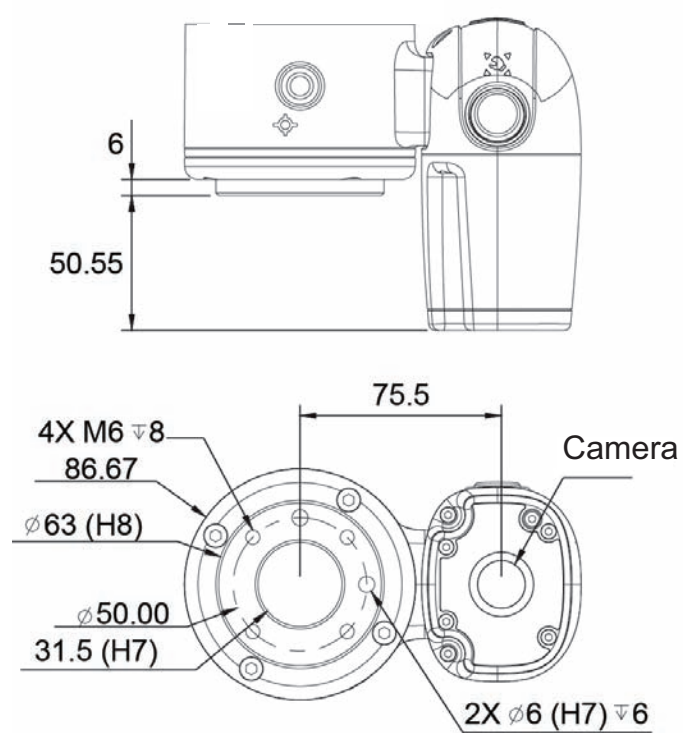
**TM25S/30S Control Box (AC)**



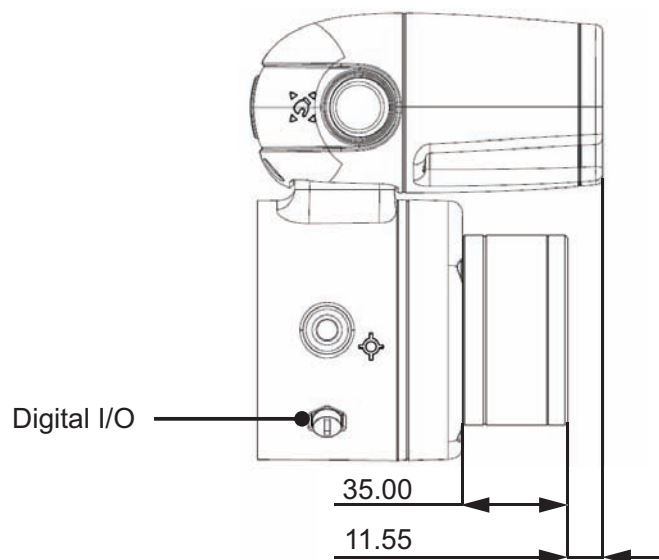
**TM25S/30S Control Box (DC)**



## Tool Flange



## Tool Flange with Integrated Force/Torque Sensor (TM25S/TM30S Models)



## Related Manuals

Catalog Number	Title
<b>M135</b>	Omron TM Collaborative Robot S Series: TM5S/TM6S/TM7S/TM12S/TM14S/TM20S Hardware Installation Manual
<b>M104</b>	Omron TM Collaborative Robot S Series: TM25S and TM30S Hardware Installation Manual
<b>I688</b>	Omron TM Collaborative Robot S Series: Safety Manual
<b>I689</b>	Omron TM Collaborative Robot: Software Manual TMFlow, Version 2
<b>I690</b>	Omron TM Collaborative Robot: TMVision Software Manual, Version 2
<b>I691</b>	Omron TM Collaborative Robot S Series: Touch Screen User's Manual
<b>I628</b>	Omron TM Collaborative Robot: Mobile Work Station User's Manual
<b>I629</b>	Omron TM Collaborative Robot: Robot Stand User's Manual
<b>I664</b>	Omron TM Collaborative Robot: TMScript Language Manual

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