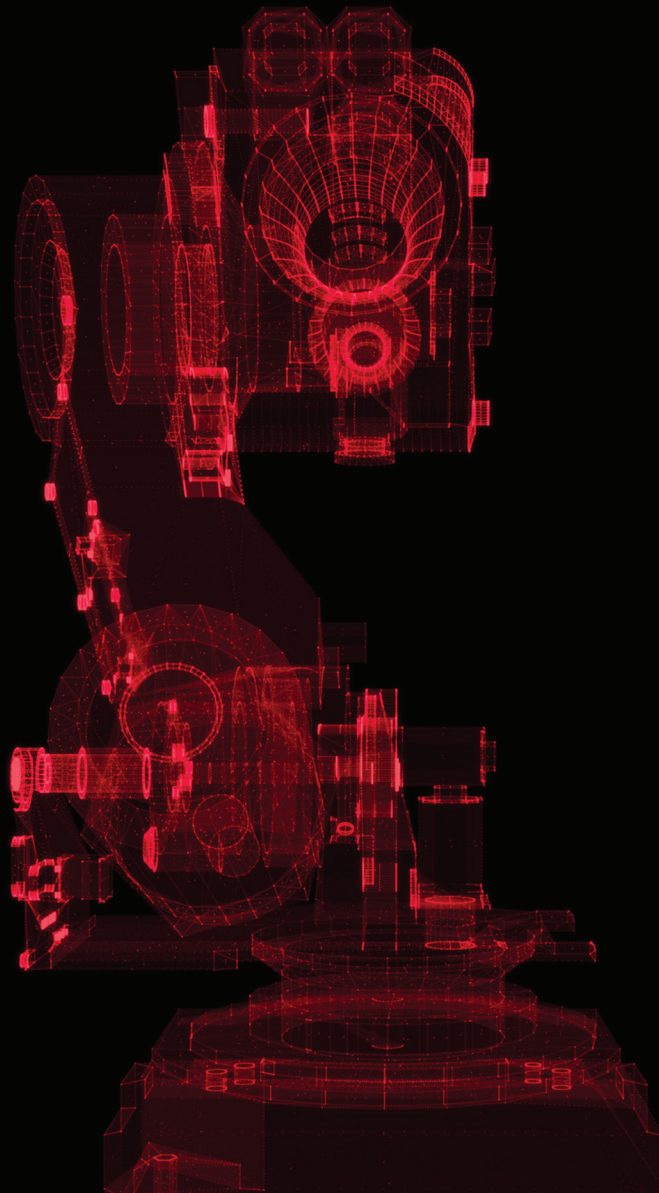


**EFORT**  
**SYSTEMS**  
A MEMBER OF EFORT GROUP



Industrial **Robots** for **Integration**

# Efficient Robots for Intelligent Integrations

Efort robots offer a ground breaking approach to small and medium payload industrial applications. The highly adaptable designs come integrated with features most commonly requested in manufacturing, machining and packaging processes.

## Inbuilt Features

### Absolute Accuracy

High precision movement to positions specified with coordinate values. Robot machining and assembly errors, zero point errors of the joint angle sensors, and arm deflection minimized by factory settings calibrated to the virtual model.

### Collision Detection

Limits damage of tool and workpiece by signaling the robot to halt upon collision. The function works independent of external sensors, and its sensitivity can be adjusted to accommodate applications requiring force application.

### Advanced Palletizing

Simple graphic interface for advanced palletizing consists of single layer layout styles including: row, column, group and pinwheel, in a customizable sequence. Singularities and reachabilities can be checked via virtual simulation.

### Vision and Conveyor Tracking

Conveyor calibration and grab calibration to achieve high grasping accuracy. The system supports Cognex and McMaster camera or any general camera, which supports the TCP/IP protocol.

### External Axis

Enables configuration of up to four external axes; linear or rotational independent of robot axes. Each axis can be set as independent or interpolated, in modality independent, synchronous or asynchronous axis can be set, and switched by the program.

### Arc Welding

Provides device configuration interface and subroutine for varied brands of welding devices. It also supports different weaving types such as triangle, sine, figure 8, and circle. GUI provides a clear guide to program interface.



# Desktop robot models

Efort Systems desktop robots cover payloads between 3 ~ 7 kg with arm stretch: 593 ~ 911 mm and repeat accuracy:  $\pm 0.02$  ~  $\pm 0.03$  mm.



ER3-600

ER7-700

ER7-900

## HIGHLIGHTS

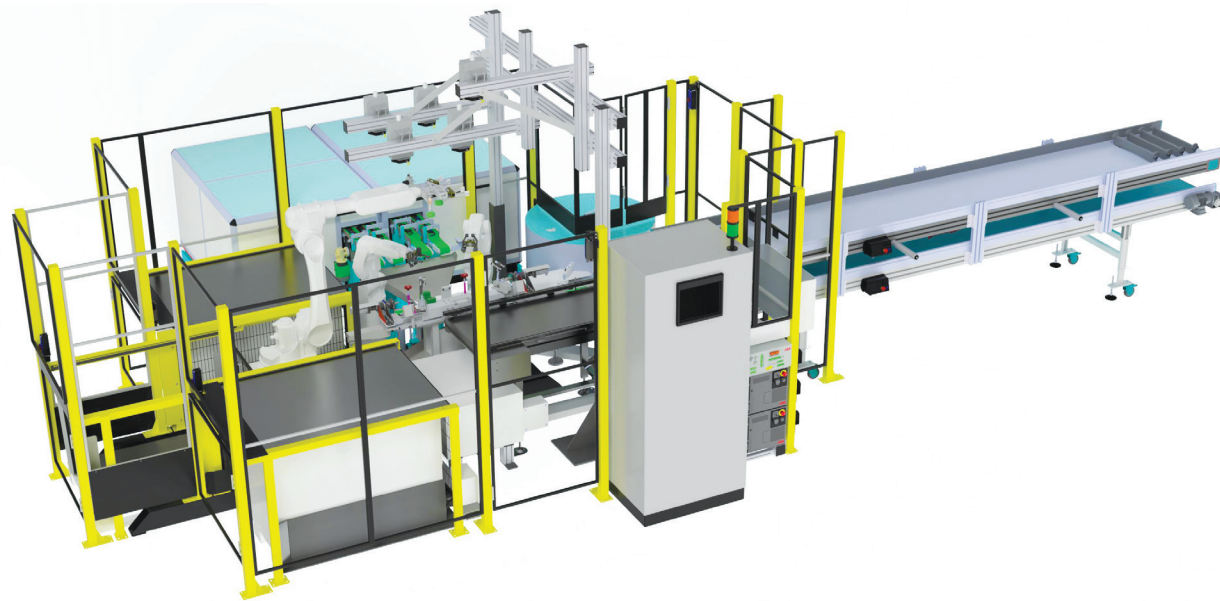
Efficient, accurate, user-friendly, stable, compact.

## APPLICATION

Sorting, assembly, glue coating, inspection, loading and unloading, packing, deburring and more.

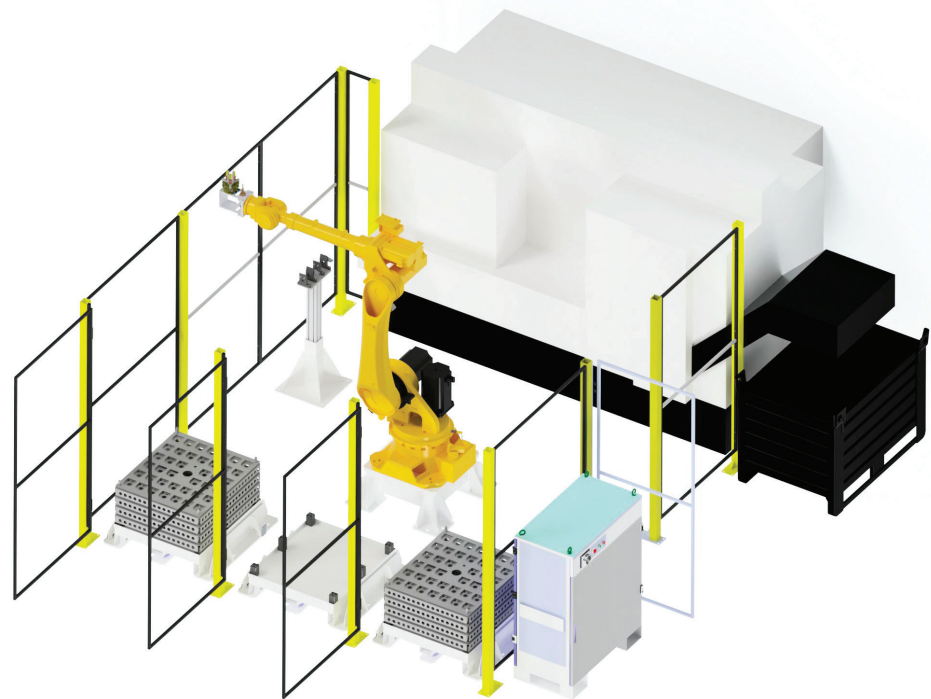
## INDUSTRIES

Metal processing, CCC electronics, PCB, food and beverage, pharmaceutical, logistics warehousing.





Small and Medium robot models



Efort Systems small and Medium robots cover payloads between 10 ~ 20 kg with arm stretch: 1143 ~ 2019 mm and repeat accuracy:  $\pm 0.03$  ~  $\pm 0.06$  mm.

Large load robot models

Efort Systems Large robots cover payloads between 35 ~ 210 kg with arm stretch: 2146 ~ 3160 mm; repeat accuracy:  $\pm 0.05$  ~  $\pm 0.1$  mm.



HIGHLIGHTS

High protection, high beat, high reliability

APPLICATION

Handling, assembly, machine tending, polishing, coating deburring and other applications.

INDUSTRIES

Automotive, SanitaryWare, Photovoltaic, PCB, Stamping.

HIGHLIGHTS

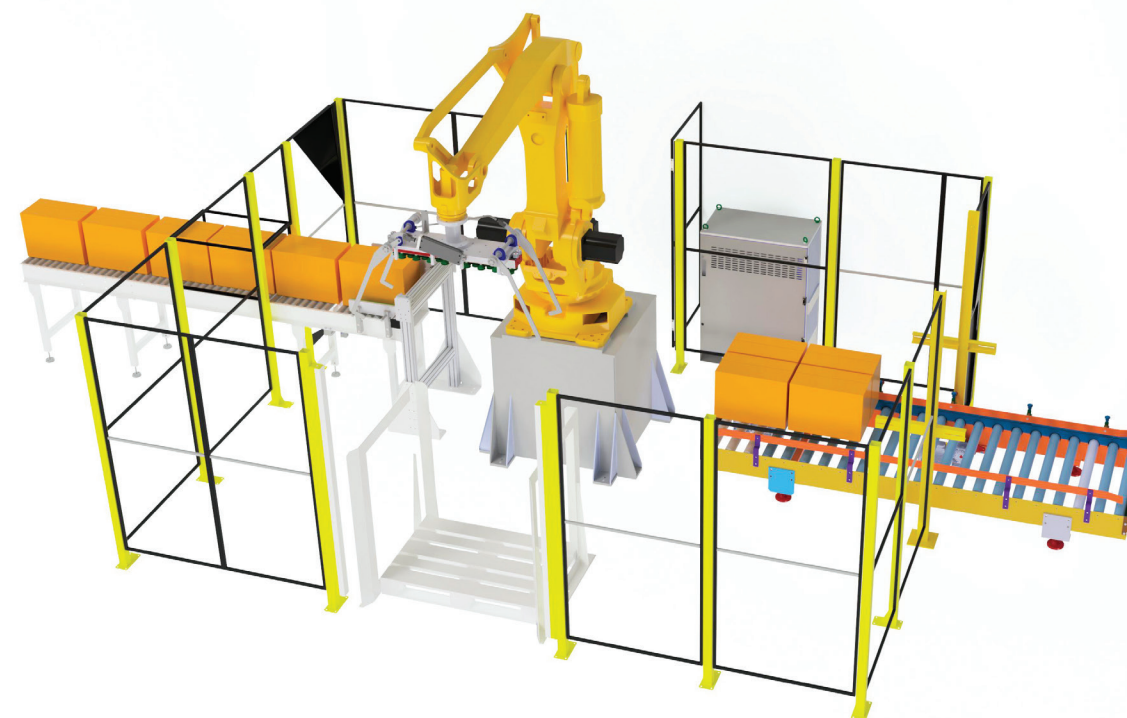
High overload, high protection, high beat, high reliability.

APPLICATION

Metal processing, loading and unloading, grinding, welding, handling and other applications.

INDUSTRIES

Automotive, SanitaryWare, Photovoltaic, PCB, Stamping.



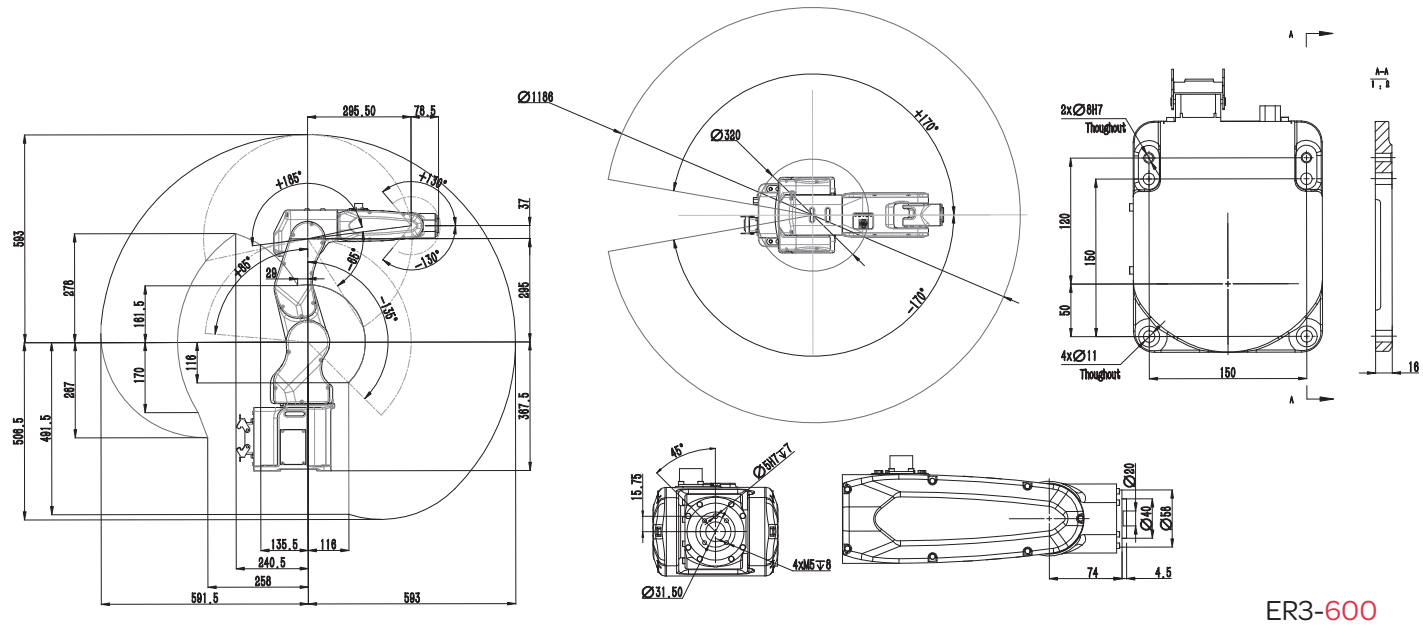
## Standard Specifications

MODEL		ER3-600	ER7-700	ER7-900	ER10-1600	ER10-2000	ER15-1400
Degree of Freedom (axes)		6					
Max. Payload (kg)		3	7	7	10	10	15
Max. reach (mm)		593	716	911	1640	2019	1420
Positional Repeatability (mm)		±0.02		±0.03	±0.05		±0.03
Controller		EC2-S6			EC-M6	EC-S6-2	
Environmental Condition	Ambient Temperature (°C)	0-45					
	Humidity	<80%/40 (No Condensation)					
Power Requirement (kw)		1.5kW			3.5kW		3kW
Wrist allow torque (N.m)	J4	4.45	16	16	20	22	42
	J5	4.45	16	16	20	22	42
	J6	2.2	9	9	10	16	20
Wrist allowable inertial moment (kg.m <sup>2</sup> )	J4	0.27	0.45	0.45	0.625	1.0	2.0
	J5	0.27	0.45	0.45	0.625	1.0	2.0
	J6	0.03	0.14	0.14	0.2	0.3	0.7
Maximum Speed (°/sec)	J1	400	380	300	170	170	260
	J2	300	350	255	160	150	255
	J3	520	400	320	180	146	210
	J4	500	450	450	330	360	450
	J5	530	450	450	360	360	450
	J6	840	720	720	600	500	600
Motion Range (°)	J1	±170	±170	±170	±160	±175	±170
	J2	+85/-135	+80/-135	+100/-135	+80/-135	+64/-142	+90/-160
	J3	+185/-65	+195/-70	+200/-75	+163/-75	+165/-81	+175/-85
	J4	±190	±190	±190	±180	±178	±190
	J5	±130	±120	±120	±130	±128	±130
	J6	±360	±360	±360	±360	±720	±360
Installation		Floor, Ceiling, Wall					
Degree of Protection		IP40	IP65/IP67 (Wrist)		IP67 (Wrist)/IP54 (Others)		IP65/IP67 (Wrist)

## Standard Specifications

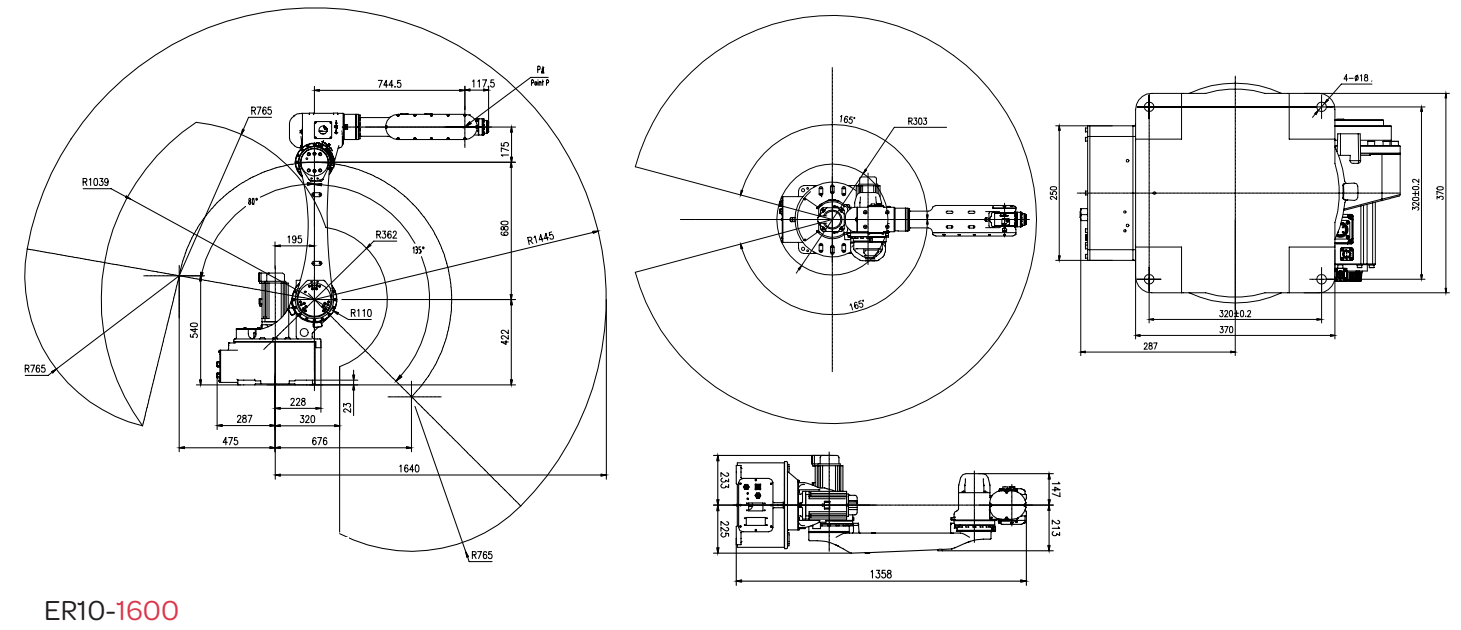
MODEL		ER20-1100	ER20-1700	ER50-2100	ER130-4-2800	ER180-4-3200	ER210-2700
Degree of Freedom (axes)		6			4		6
Max. Payload (kg)		20	20	50	130	180	210
Max. reach (mm)		1143	1722	2146	2816	3160	2674
Positional Repeatability (mm)		±0.03	±0.06	±0.05	±0.1		
Controller		EC-S6-2	EC-M6		EC-M4		EC-M6
Environmental Condition	Ambient Temperature (°C)	0-45					
	Humidity	<80%/40 (No Condensation)					
Power Requirement (kw)		3kW	3.5kW	5.5kW	8kW		
Wrist allow torque (N.m)	J4	42	42	182	-	-	1337
	J5	42	42	182	-	-	1337
	J6	20	26	120	36.25	-80	720
Wrist allowable inertial moment (kg.m <sup>2</sup> )	J4	2.0	1.18	12.68	-	-	141.1
	J5	2.0	1.18	12.68	-	-	141.1
	J6	0.7	0.8	0.10	50	50	79
Maximum Speed (°/sec)	J1	260	170	130	110	104	100
	J2	255	150	110	110	104	90
	J3	210	146	130	105	104	85
	J4	450	360	200	-	-	109
	J5	450	360	200	-	-	105
	J6	600	550	285	130	250	200
Motion Range (°)	J1	±170	±175	±180	±178	±175	±180
	J2	+83/-160	+64/-142	+70/-130	+42/-85	+40/-86	+60/-80
	J3	+175/-85	+165/-73	+175/-80	+85/-55	+60/-52	+90/-83
	J4	±190	±178	±360	-	-	±360
	J5	±130	±128	±115	-	-	±120
	J6	±360	±720	±450	±360	±360	±360
Installation		Floor, Ceiling, Wall		Floor, Shelf	Floor, Ceiling		Floor, Shelf
Degree of Protection		IP65/IP67 (Wrist)	IP67 (Wrist)/IP54 (Others)		IP40		IP65

## Motion Range and Dimensions

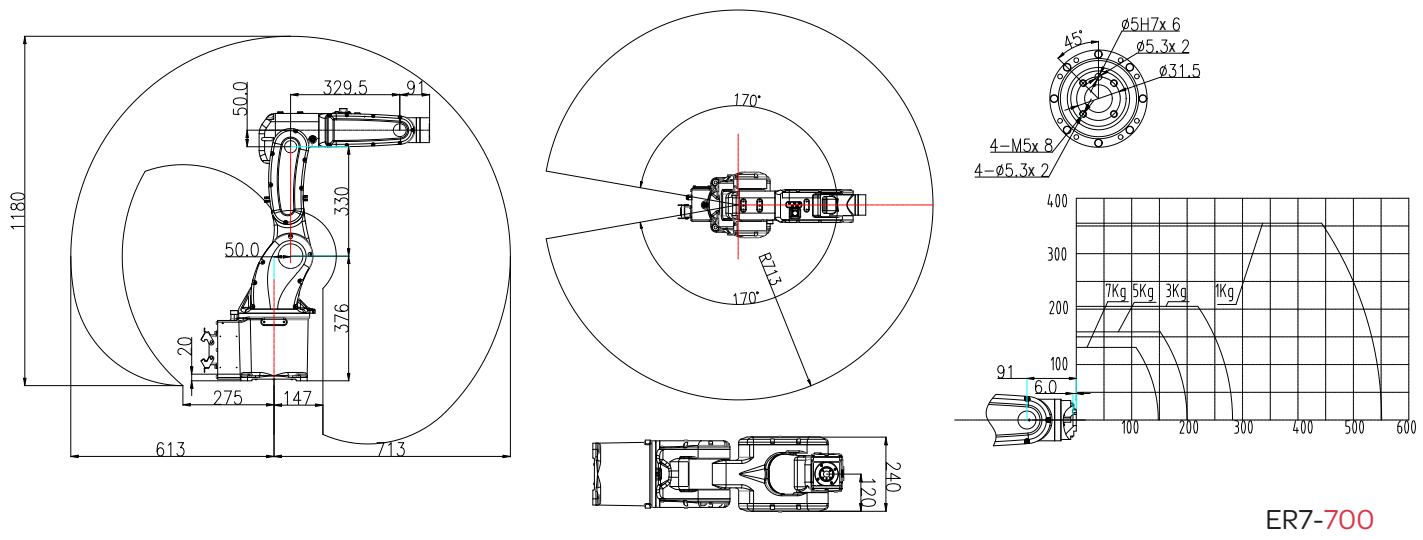


ER3-600

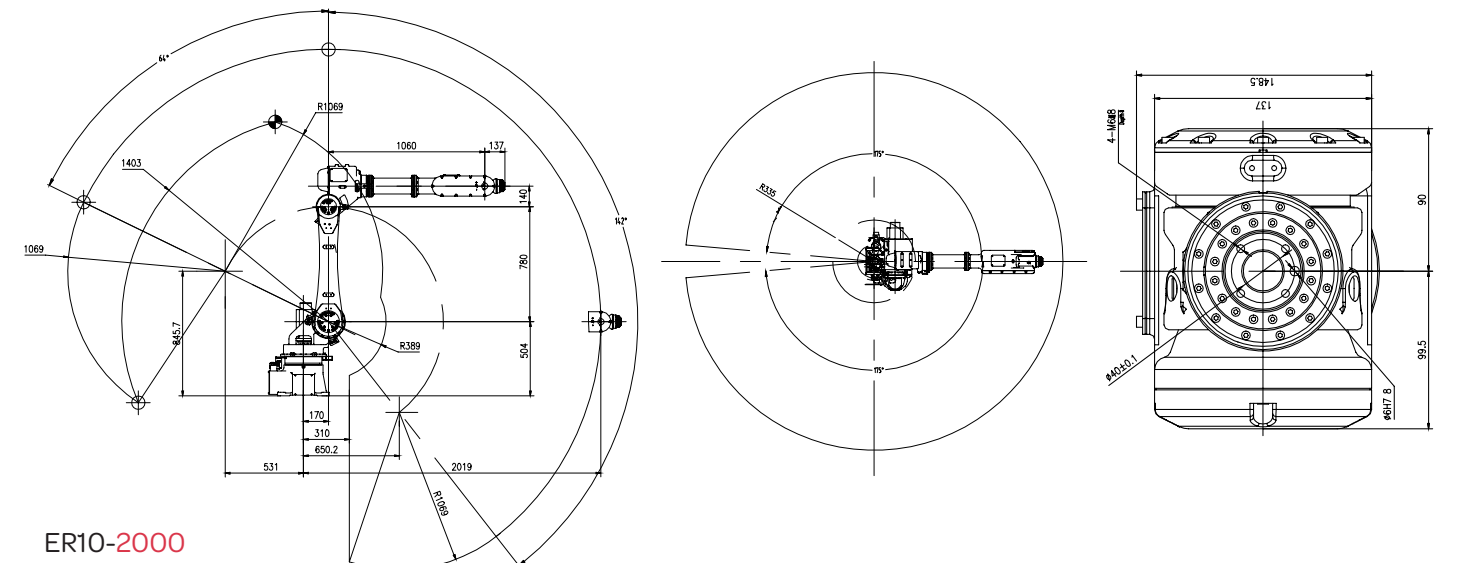
## Motion Range and Dimensions



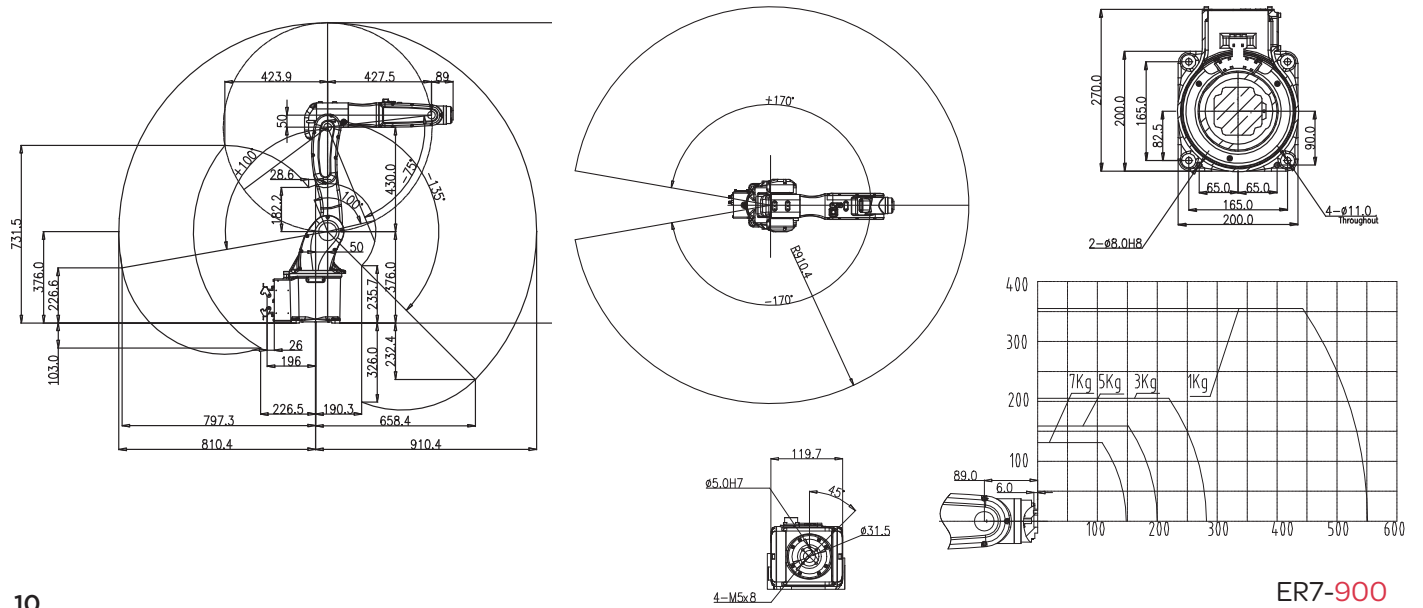
ER10-1600



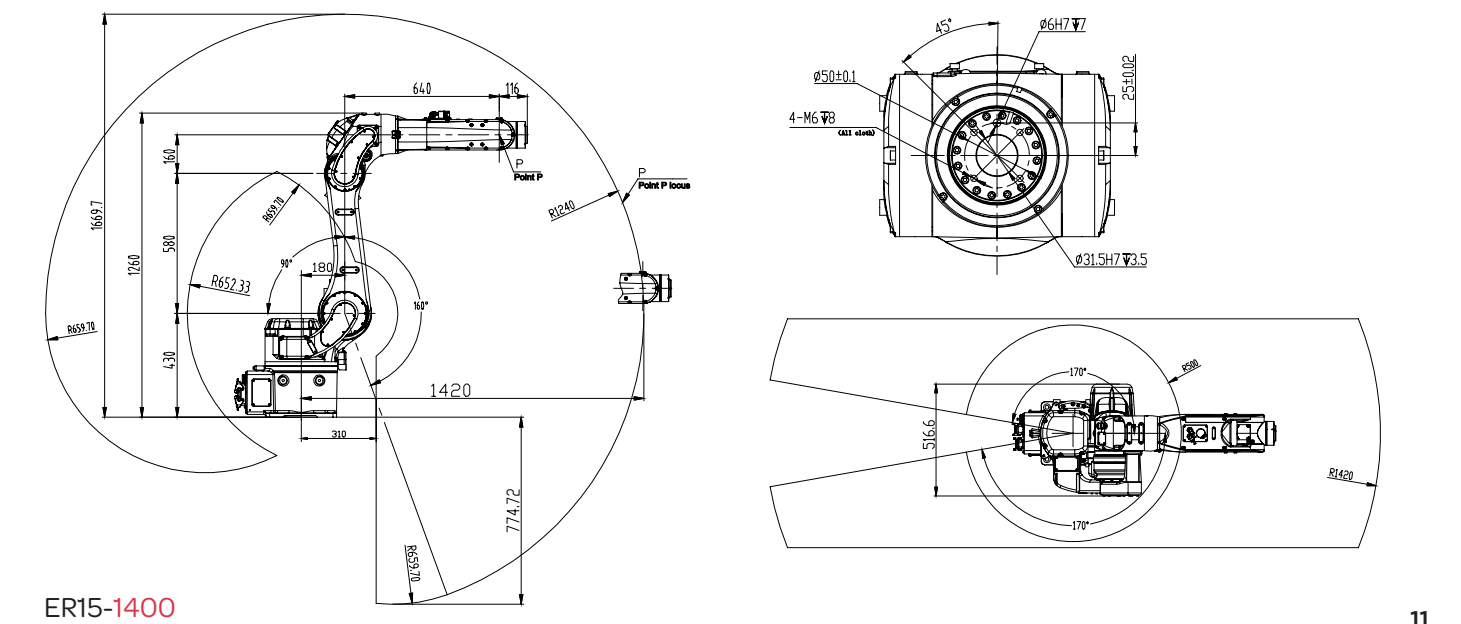
ER7-700



ER10-2000



ER7-900



ER15-1400





# A gateway to intelligent automation



S-Type Cabinet



M-Type Cabinet



Teach Pendant

## Key Features

- Microprocessor ARM Cortex A9 Dual Core (800MHz)
- Number of controlled axes: up to 32 interpolated axes, driven through Ethercat fieldbus

## Memory

- Micro SD flash memory
- 1 GB DRAM
- 512 Kbyte retentive memory ram for parameters and alarm history storage

## Communication

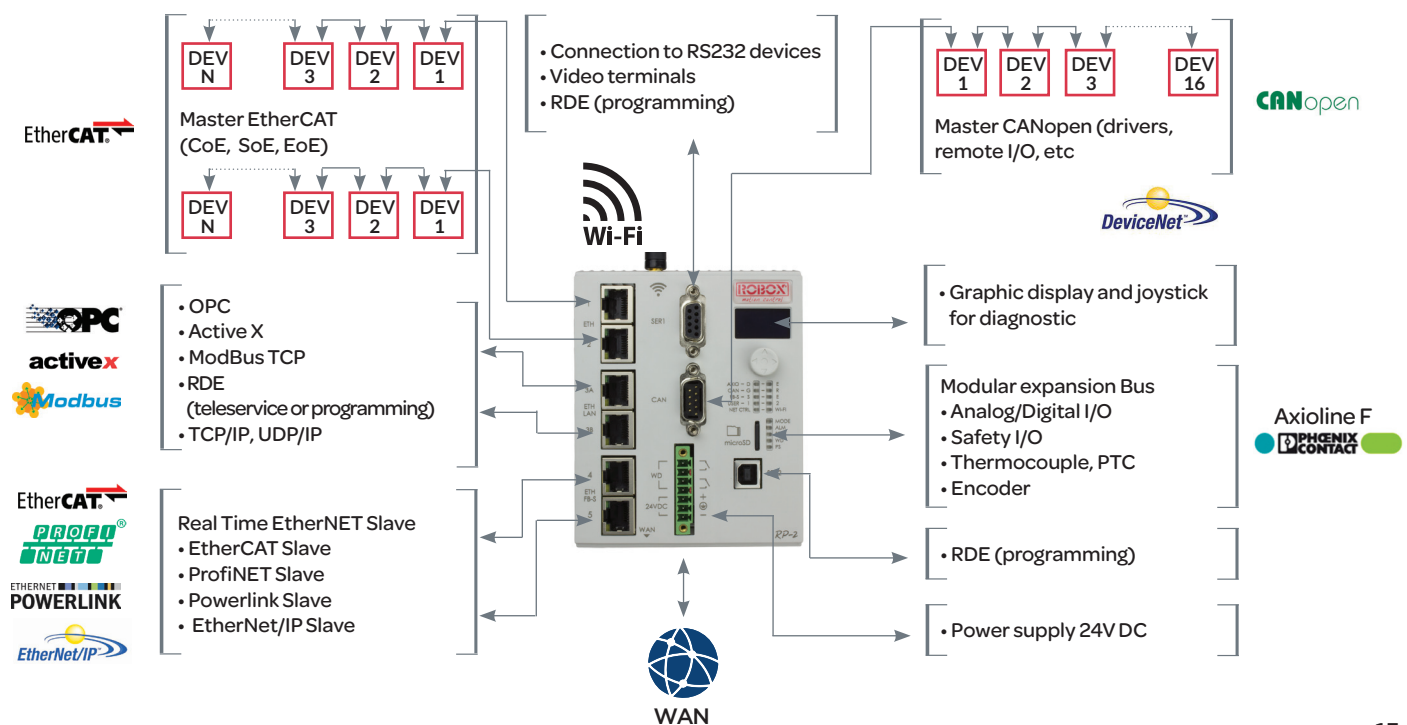
- n. 2, 10/100 Mbits/s Ethernet channels dedicated to Master fieldbus (EtherCAT CoE, SoE, EoE) for axes control and/or remote I/O
- n. 2, 10/100 Mbits/s Ethernet channels with internal switch for general purposes (TCP/IP, UDP, TFTP, Modbus/TCP, Ethernet/IP, Robox BCC/31/TCP)
- n. 1 Wi-Fi channel
- n. 1, 10/100 Mbits/s Ethernet channel with WAN functionality
- n. 1 Canbus channel (Master DS301, DS401, DS402, protocols for axes control and/or remote I/O, Device Net, Robox Cnet)

- n. 1 USB-B-UART serial channel for general purposes (Robox BCC/31, DF1)
- n. 1 RS232 serial channel for general purposes (Robox BCC/31, DF1)
- Master bus Axioline for communication with Axioline peripherals
- Diagnostic web server
- O.P.C. Server, ActiveX, .Net Library, rLibQt, rLibJava e rLibC++ available for communication in Windows environment

## Specifications

MODEL	EC2-S6	EC-M6	EC-S6-2	EC-M4	Optional
Dimension (mm)	W522 x D430 x H247	W522 x D560 x H1165	W430 x D467 x H483	W522 x D560 x H1165	
Power Supply	220V±10%, 50/60Hz	3×380V±10%, 50/60Hz	Single-phase 220V±10%, 50/60Hz	3×380V±10%, 50/60Hz	
Digital IO	32 digital IO ports (Expansion Supported)	16 digital inputs / 18 digital outputs (expansion supported)	24 digital IO ports (expansion supported)	16 digital inputs / 18 digital outputs (expansion supported)	
Number of controlled axes	6			4	
Degree of protection	IP20	IP54	IP20	IP54	
Cable Length	Teach Pendant (m)	10	8		
	Robot Controller(m)	4	8		
Mass (kg)	20	125	25	125	
Communication Type	TCP/IP, Modbus-TCP, CAN open, EtherCAT				ProfiNET
Environmental Condition	Temperature (°C)	0°C - 45°C			
	Humidity	80% RH, No condensation (40)			

## Device Connections







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