

INOVANCE

Industrial Robots Overview

A robot for every application



Features & functions

- Excellent performance and fast cycle times
- Multiple fieldbus interfaces
- Lighter and more compact body
- Intuitive and easy to use

EtherCAT[®]

EtherNet/IP[™]

PROFI[®]
NET

Modbus

CE

SGS
802145

K_s

K

Robot Controller



Controller Series	IRCB501 Series		IRCB501 High-protection Series
Mounting mode	Vertical mounting, horizontal mounting, 19" rack mounting		Vertical mounting, horizontal mounting, rack mounting
Standard I/Os	16 inputs and 16 NPN outputs (extendable)		
Communication interfaces	Ethernet interface: Used for TCP/IP, Modbus TCP, Ethernet/IP, MC communication		
	EtherCAT slave IN-OUT interface: EtherCAT slave interface		
	EtherCAT master OUT interface: EtherCAT master to control external axes		
	RS232/RS485 interface: Used for serial and Modbus RTU communication (RS485 only)		
	USB2.0 interface: Used for backup/upload programs and export robot status information		
Control mode	Optional interface: PROFINET slave		
	Different control options: Windows application, teach pendant, Modbus TCP, windows API.		
Power supply	Input voltage: Single-phase 200 VAC to 240 VAC, 10A/20A, 50 Hz to 60 Hz		Input voltage: Single-phase 200 VAC to 250 VAC, 23A, 50 Hz to 60 Hz
	Max. power consumption: 3.1 kW (depending on the robot model)		Max. power consumption: 4.5 kW (depending on the robot model)
IP rating	IP20		IP54 + anti metal dust
Operating conditions	Temperature: 5° C to 40° C Relative humidity: 20% to 95% RH@30° C (non-condensing)		Temperature: 0° C to 45° C Relative humidity: 20% to 95% RH@30° C (non-condensing)
	Standard	High-Power	445 mm × 575 mm × 276 mm
Dimensions	330 mm × 338.5 mm × 130 mm	330 mm × 400 mm × 130 mm	
Weight	8 kg	10 kg	30 kg
Applicable Robots	SCARA: IR-S4/7/10 Series IR-TS4/5 Series 6-Axis: IRS311-7 Series IR-R4/R4H Series	SCARA: IR-S20 Series IR-GS20 Series IR-S50 Series 6-Axis: IR-R11 Series	6-Axis: IR-R10 Series, IR-R20 Series

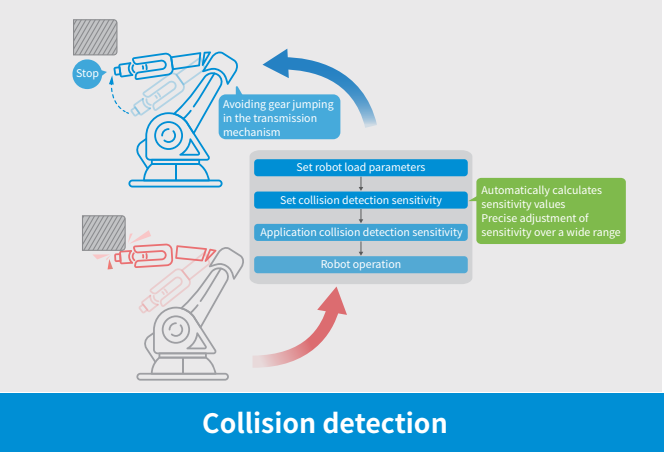
Teach Pendant Expansion Card



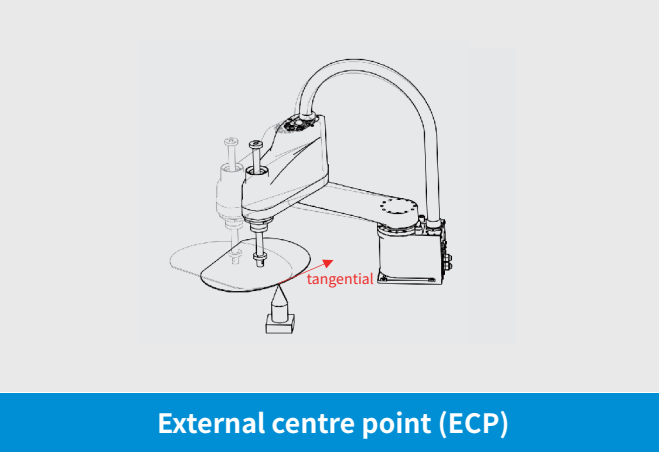
Teach Pendant Model	I RTP80-L5-INT
Cable length	5m
Screen	7-inch TFT-LCD, Touch screen operation, function keys
IP rating	IP54

Expansion Card Model	IRCB501-0016ETND-BD	IRCB501-1600END-BD	IRCB501-2ENID-BD	IRCB501-2PN-BD	IRCB501-FS-01-BD
Description	General I/O expansion card with 16 NPN outputs	General I/O expansion card with 16 inputs	2-channel differential input incremental encoder expansion card	PROFINET expansion card	Safety function expansion card
Matching controller	IRCB501 Series, IRCB501 High-protection Series				

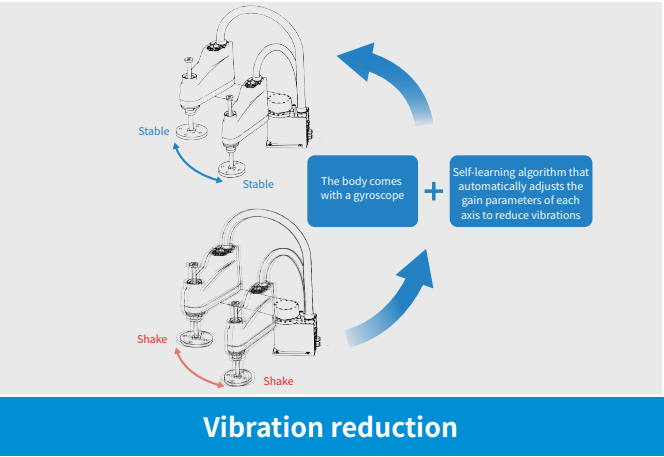
Robot controller functions



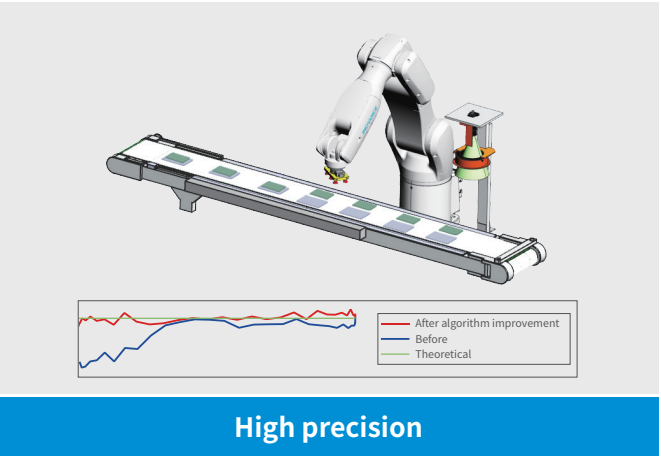
Real time detection of the robot's operating status can effectively avoid gear jumping caused by robot collisions at low speeds, and achieve rapid stopping at high speeds, reducing damage to the robot and equipment caused by collisions.



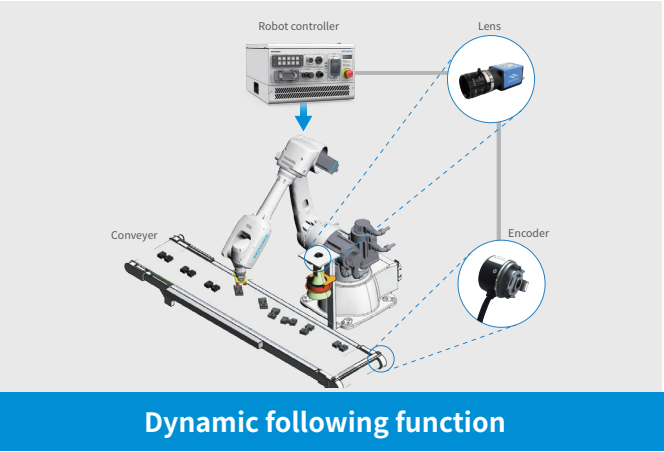
When the tool is at a fixed point and the robot is holding the workpiece, it is possible to perform precise interpolations to follow the contour of the workpiece using the position of the fixed tool as the central point. Thanks to the ECP function, the teaching process is simplified in this type of application.



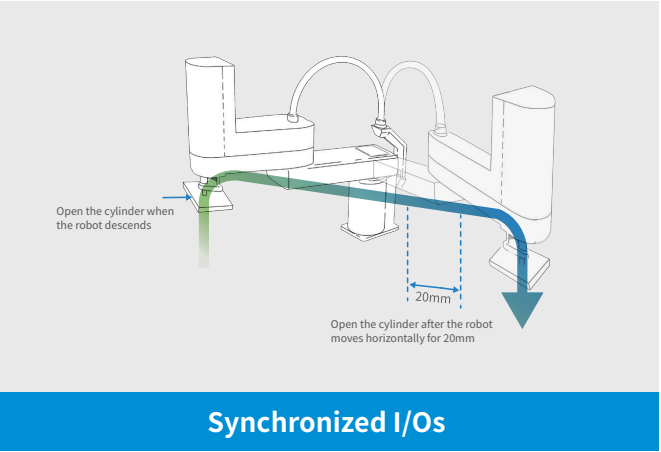
It can effectively reduce the shaking caused by resonance, eccentric load, and large load during the robot's movement process, making the robot's movement more stable and still ensuring excellent production performance during high-speed and high-precision operations.



Considering the influence of robot body structure, external factors and visual system on robot motion accuracy, high-precision control algorithms are adopted to meet high-precision loading and unloading. This algorithm is also applicable to continuous motion trajectories.



The optional external encoder card allows obtaining the movement speed of the parts to easily perform a pick & place on the fly. The robot is able to accurately follow the moving parts and with the help of artificial vision, pick up them without altering the production line.



In the robot's motion path, precise control of I/O opening and closing actions can be carried out based on actual conditions, which is widely used for detection, high-speed transportation, dispensing, laser and other applications. I/O control can be specified based on the position, time, and distance of the movement.

Technical Data



Series		IR-S4	IR-S7				IR-S10			IR-S20		IR-GS20		IR-S50	IR-TS4	IR-TS5
Model		IR-S4-40Z15S-INT	IR-S7-50Z20S-INT	IR-S7-60Z20S-INT	IR-S7-70Z20S3-INT	IR-S10-60Z20S-INT	IR-S10-70Z20S-INT	IR-S10-80Z20S-INT	IR-S20-80Z42S-INT	IR-S20-100Z42S-INT	IR-GS20-80Z42S-INT	IR-GS20-100Z42S-INT	IR-S50-120Z40S-INT	IR-TS4-35Z15S-INT	IR-TS5-55Z15S-INT	
Code		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Arm length	J1+J2 (mm)	400	500	600	700	600	700	800	800	1000	800	1000	1200	350	550	
	J1 (mm)	225	225	325	425	225	325	425	350	550	350	550	600	175	275	
	J2 (mm)	175	275	275	275	375	375	375	450	450	450	450	600	175	275	
Maximum speed	J1+J2 (mm/s)	7200	7120	7850	8590	9100	9800	10500	9550	10800	9550	10800	7400	6180	9712	
	J3 (mm/s)	1300	1600	1600	1600	1600	1600	1600	1010	1010	1010	1010	750	1300	1300	
	J4 (° /s)	2600	2000	2000	2000	2700	2700	2700	705	705	705	705	600	2600	2000	
Repeatability	J1+J2 (mm)	±0.01	±0.02	±0.02	±0.02	±0.02	±0.02	±0.025	±0.04	±0.04	±0.04	±0.04	±0.05	±0.01	±0.015	
	J3 (mm)	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.02	±0.01	±0.01	
	J4 (°)	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.005	±0.01	±0.01	
Load	Rated (kg)	2	3	3	3	5	5	5	10	10	10	10	-	2	2	
	Maximum (kg)	4	7	7	7	10	10	10	20	20	20	20	50	4	5	
Permissible moment inertia of J4	Rated (kg·m ²)	0.005	0.01	0.01	0.01	0.02	0.02	0.02	0.5	0.5	0.5	0.5	-	0.005	0.01	
	Maximum (kg·m ²)	0.05	0.12	0.12	0.12	0.3	0.3	0.3	1	1	1	1	2.45	0.05	0.12	
Mounting base dimensions (mm)		120×120 (4-Φ9)	150×150 (4-Φ9)	150×150 (4-Φ9)	150×150 (4-Φ9)	150×150 (4-Φ9)	150×150 (4-Φ9)	150×150 (4-Φ9)	200×200 (4-Φ16)	200×200 (4-Φ16)	200×200 (4-Φ16)	200×200 (4-Φ16)	200×200 (4-Φ14)	95×95×160 (6-Φ6.6)	95×95×160 (6-Φ6.6)	
Cable		Stand: 3m/5m/10m/15m High Flexible: 3m/5m/10m/15m							Stand: 3m/5m/10m/15m High Flexible: 3m/5m/10m/15m							
Weight (excluding cables)		12 kg	17 kg	17.5 kg	19 kg	18.5 kg	19 kg	20.5 kg	53 kg	56 kg	54 kg	57 kg	136 kg	18.5 kg	20 kg	
Press-in force of J3		100N	150N	150N	150N	200N	200N	200N	250N	250N	250N	250N	-	100N	150N	
Customer signal line		15 (15pin: D-sub)/15 (15pin: D-sub)							9 (9 pin: D-sub), 15 (15 pin: D-sub)					15 (15pin:D-sub)		
		CAT5E												CAT5E		
Customer air piping		Φ6 mm × 2, 0.59 Mpa							Φ6 mm × 2, 0.59 Mpa (6 kgf/cm2:86 psi)				Φ6 mm × 3, 0.59 Mpa	Φ6 mm × 2, 0.59 Mpa		
		Φ4 mm × 1, 0.59 Mpa							Φ4 mm × 2, 0.59 Mpa (6 kgf/cm2:86 psi)					Φ4 mm × 1, 0.59 Mpa		
Operating conditions	Ambient temperature ^[1]	5~40° C (no excessive temperature changes)							5~40° C (no excessive temperature changes)							
	Relative humidity	10~80%							10~80%							
Shipment Conditions	Ambient temperature	-10°C ~55°C							-10°C ~55°C							
	Relative humidity	≦ 80% RH, non-condensing							≦ 80% RH, non-condensing							
Storage Conditions	Ambient temperature	-10°C ~55°C							-10°C ~55°C							
	Relative humidity	≦ 80% RH, non-condensing							≦ 80% RH, non-condensing							
Noise level ^[2]		Laeq=70dB(A)							Laeq=75dB(A)					Laeq=70dB(A)		
Maximum motion range	J1 (°)	±132	±132	±132	±132	±132	±132	±132	±132	±132	±132	±132	±128	±225	±225	
	J2 (°)	±141	±150	±150	±150	±150	±150	±150	±152	±152	±152	±152	±150	±225	±225	
	J3 (mm)	150	200	200	200	200	200	200	420	420	420	420	400	150	150	
	J4 (°)	±360	±360	±360	±360	±360	±360	±360	±360	±360	±360	±360	±360	±720	±720	
Standard cycle time (s) ^[3]		0.342	0.351	0.36	0.375	0.361	0.386	0.416	0.36	0.38	0.36	0.38	0.84	0.306	0.351	
Certification		CE, cSGSus, KCs, Kc							CE, cSGSus, KCs, Kc							

- Note
- **[1]** If this product is used in a low temperature environment close to the lowest temperature of the product specification, or if it is suspended for a long time due to holidays and nights, it is recommended to warm up for 10 minutes before running
- **[2]** Noise test conditions: 4 joint linkage, 100% speed and acceleration, duty cycle 50%, measurement position: the front of the robot, 1000mm away from the action area, and more than 50mm from the base mounting surface.
- **[3]** Standard cycle time for 4kg SCARA: 1kg load, the time required for the robot to go back and forth with a gate command (300 mm horizontally, 25 mm vertically)
Standard cycle time for 7kg/10kg SCARA : 2kg load, the time required for the robot to go back and forth with a gate command (300 mm horizontally, 25 mm vertically)
Standard cycle time for 20kg SCARA: 2kg load, the time required for the robot to go back and forth with a gate command (300 mm horizontally, 25 mm vertically)
Standard cycle time for 50kg SCARA: 5kg load, the time required for the robot to go back and forth with a gate command (300 mm horizontally, 25 mm vertically)
Standard cycle time for 4kg/5kg Inverted SCARA : 1kg load, the time required for the robot to go back and forth with a gate command (300 mm horizontally, 25 mm vertically)

Technical Data

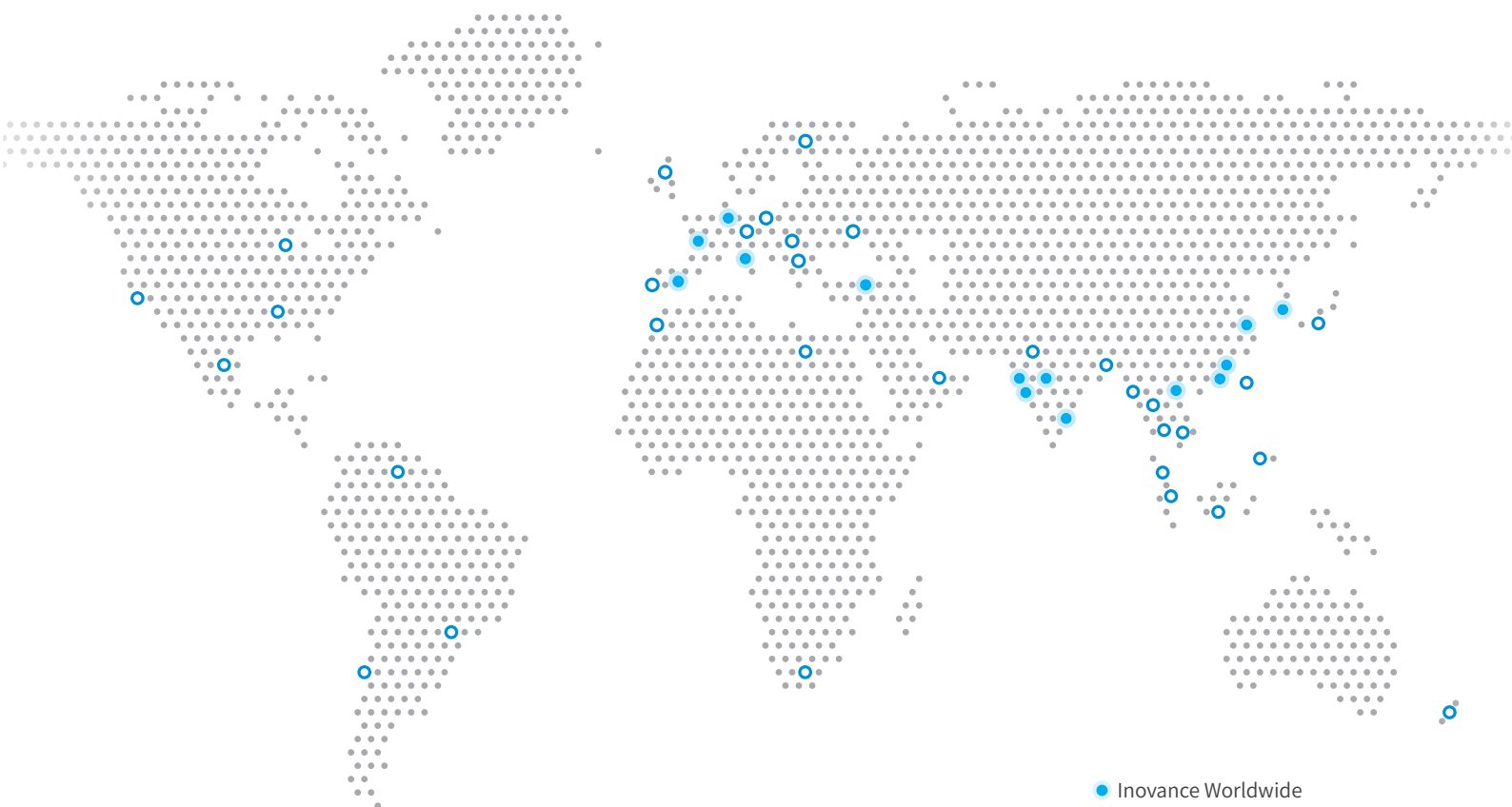


Series		IR-R4	IR-R4H	IRS311-7		IR-R11	IR-R10		IR-R20	
Model		IR-R4-56S-INT	IR-R4H-54S-INT	IRS311-7-70TS-INT	IRS311-7-90TS-INT	IR-R11-90S-INT	IR-R10-110S-INT	IR-R10-140S-INT	IR-R10-200S-INT	IR-R20-170S-INT
Code		-	-	-	-	-	-	-	-	-
Structural style		Vertical axis cascading structure				Vertical axis cascading structure				
Number of axis		6 axes				6 axes				
Maximum reach (mm)		560.6	545.7	717	911	901.9	1101.6	1422	2045	1723
Repeatability (mm)		±0.01	±0.02	±0.02	±0.03	±0.02	±0.02	±0.05	±0.05	±0.05
Maximum load (kg)		4	4	7	7	11.3	10	10	10	20
IP rating		IP40	IP40	IP65	IP65	IP40	IP40	Body: IP65 Wrist: IP67	Body: IP65 Wrist: IP67	Body: IP65 Wrist: IP67
Max. speed	J1 (° /s)	450	450	450	300	300	300	200	190	190
	J2 (° /s)	460	460	380	280	225	225	200	175	175
	J3 (° /s)	520	520	520	360	330	330	200	200	200
	J4 (° /s)	560	560	550	550	450	450	375	400	400
	J5 (° /s)	560	560	550	550	420	420	375	360	360
	J6 (° /s)	900	900	1000	620	720	720	600	610	610
Maximum motion range	J1 (°)	±170	±170	±170	±170	±170	±170	±170	±170	±170
	J2 (°)	-120~+110	-120~+110	-135~+80	-125~+80	-135~+100	-135~+100	-160~+60	-155~+80	-155~+80
	J3 (°)	-69~+205	-65~+195	-70~+190	-70~+190	-66~+210	-66~+210	-80~+160	-75~+160	-75~+160
	J4 (°)	±190	±190	±190	±190	±190	±190	±180	±180	±180
	J5 (°)	±120	±120	±120	±120	±125	±125	±140	±140	±140
	J6 (°)	±360	±360	±360	±360	±360	±360	±360	±360	±360
Allowed wrist torque	J4 (N·m)	8.86	8.86	16.6	16.6	20.45	18.59	22	22	42
	J5 (N·m)	8.86	8.86	16.6	16.6	20.45	18.59	22	22	42
	J6 (N·m)	4.9	4.9	9.4	9.4	10.8	9.8	9.8	10	20
Allowed wrist inertia	J4 (N·m)	0.2	0.2	0.47	0.47	0.6	0.6	0.63	1	1.18
	J5 (N·m)	0.2	0.2	0.47	0.47	0.6	0.6	0.63	1	1.18
	J6 (N·m)	0.067	0.067	0.15	0.15	0.2	0.2	0.2	0.2	0.5
Customer connections	Wiring	12 signal lines 30V 0.5A	12 signal lines 30V 0.5A, 8 signal lines 30V 0.2A	12 signal lines 30V 0.5A	12 signal lines 30V 0.5A	12 signal lines 30V 0.5A	12 signal lines 30V 0.5A	18 signal lines 30V 0.5A	18 signal lines 30V 0.5A	18 signal lines 30V 0.5A
	Air	Φ4 mm × 4, 0.59 Mpa	Φ4 mm × 4, 0.59 Mpa	Φ4 mm × 2, 0.59 Mpa	Φ4 mm × 2, 0.59 Mpa	Φ4 mm × 4, 0.59 Mpa	Φ4 mm × 4, 0.59 Mpa	Φ8 mm × 1, 0.59 Mpa	Φ8 mm × 1, 0.59 Mpa	Φ8 mm × 1, 0.59 Mpa
Operating conditions	Ambient temperature (° C)	0~45				0~45				
	Relative humidity	5% to 95% RH (non-condensing)	5% to 95% RH (non-condensing)	5% to 95% RH (non-condensing)	5% to 95% RH (non-condensing)	5% to 95% RH (non-condensing)	5% to 95% RH (non-condensing)	10% to 80% RH (non-condensing)	10% to 80% RH (non-condensing)	10% to 80% RH (non-condensing)
	Maximum temperature gradient (° C/min)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Shipment conditions	Ambient temperature (°C)	-10~55						0~45		
	Relative humidity	≤ 95% RH, non-condensing						≤ 80% RH, non-condensing		
Storage conditions	Ambient temperature (°C)	-10~55						0~45		
	Relative humidity	≤ 95% RH, non-condensing						≤ 80% RH, non-condensing		
Cable		Stand: 3m/5m/10m/15m High Flexible: 3m/5m/10m/15m				Stand: 3m/5m/10m/15m High Flexible: 3m/5m/10m/15m		Stand: 3m/5m/10m/15m	Stand: 3m/5m/10m/15m High Flexible: 5m/10m/15m	
Weight		24 kg	24.5 kg	38 kg	40 kg	45 kg	48 kg	130 kg	245 kg	240 kg
Controller		IRCB501 Series				IRCB501 Series		IRCB501 High-Protection Series		
Mounting mode		Floor mounted				Floor mounted				
Certification		CE, cSGSus, KCs, Kc				CE, cSGSus, KCs, Kc				



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