

DUCO Collaboration of Welding Robot

Selection Manual for Welding Scenarios





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DUCO ROBOTS CO., LTD.

- 📍 Jinqiao Operations Headquarters: NO.358 Building 4 Jinhua Road, Shanghai
- 📍 Lingang Industrial Base: NO.199 Boyi Road, Shanghai
- ☎ 400 088 5288
- ✉ marketing@ducorobots.com

Product Introduction

DUCO Collaborative Welding Robot is equipped with two core functions: graphical interaction and lead-teaching. It comes standard with a welding process package, enabling users to quickly perform various welding tasks such as spot welding, corner welding, traverse welding, repetitive welding, overlay welding, and multi-pass welding. Additionally, the optional external axis plug-in package allows for the expansion of additional welding application scenarios and customization of various forms of welding workstations.

This robot offers outstanding repeatability and trajectory accuracy. It is compatible with laser vision weld seam tracking systems, allowing for flexible deployment as well as automatic tracking and correction functionalities. As a result, it can achieve long-term, uninterrupted output of high-quality and stable weld seams. This capability contributes to cost reduction and increased efficiency in automated welding production across industries including automotive parts manufacturing, shipbuilding, engineering machinery production, new energy sectors (e.g., solar or wind power), aerospace applications, and metal processing.

Product Features



Intuitive User Interface

- Graphical user interface, high user acceptance.
- Drag-and-drop programming, fast learning for beginners.



Rich Communication Interfaces.

- Rich communication interface, compatible with major brands.
- Compatible with welding machine brands, for plug-and-play use.



High Performance Product

- High precision ensures high-quality weld output.
- High-precision visual integration for diverse functions.



Welding Process Package

- Professional welding package balances expertise and usability.
- Supports spot, corner, oscillation, reciprocating, and multi-layer welding.



Fully Functional

- Trajectory teaching streamlines welding interaction.
- Rich button interface enables more possibilities.



Extensive Functionality Expansion

- External axis and multi-machine cooperation expand welding applications.
- Complete development interfaces facilitate building diverse welding workstations.



Product Model



GCR10-1300-W

GCR5-910-W

GCR3-618-W

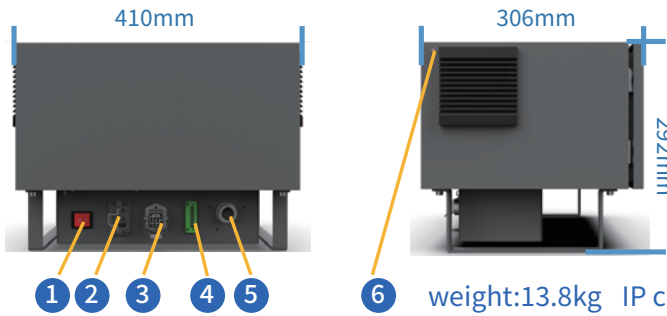
Max Payload	10kg	5kg	3kg
Degree of Freedom	6	6	6
Max TCP Speed	3.8m/s	3.6m/s	1.0m/s
Max Straight-line Speed	1.5m/s	1.5m/s	0.8m/s
Reach	1300mm	917mm	618mm
Repeatability	±0.03mm	±0.02mm	±0.02mm
Joint	Range	Max Speed	
J6	±360°	225°/s	225°/s
J5	±360°	225°/s	225°/s
J4	±360°	225°/s	225°/s
J3	±360°	225°/s	225°/s
J2	±360°	180°/s	225°/s
J1	±360°	180°/s	225°/s
Tool Interface	GB/T 14468.1-50-4-M6(eqv ISO 9409-1)		
End Joint I/O	2 Dig I/O, 24V,0.6A	2 Dig I/O, 24V,0.6A	2 Dig I/O, 24V,0.6A
Power Supply	100-240VAC 47-63Hz 10A		
Power Consumption	Typical Power Consumption400W	Typical Power Consumption200W	Typical Power Consumption200W
Installation	Installed in any Direction		
IP Class	IP65	IP65	IP65
Ambient Temperature Range	-10°C-50°C	-10°C-50°C	-10°C-50°C
Storage Temperature Range	-40°C-55°C	-40°C-55°C	-40°C-55°C
Robot Dimensions	1512x388x205mm	1100x330x200mm	769x315x150mm
Robot Package Size	958x508x516mm	698x588x450mm	532x431x330mm
Net/Gross Weight	37.8kg/46kg	22kg/30kg	13kg/20kg

Base Flange



The controller is used to control the robot's operations such as loading and unloading, grasping, polishing, handling, welding, gluing and oiling, as well as realizing the input and output control. The latest DUCO controller has tiny volume while taking into account the safety and flexibility, and has better performance in the field of human cooperation. It can be fully compatible with multiple series of robots, and also can be independently applied to automatic control systems.

Control Box



- 1 System Switch
- 2 AC Input
- 3 Robot Arm Interface
- 4 Teach Pendant Shielding Interface
- 5 Teach Pendant Interface

weight:13.8kg IP class:IP54

User Interface

DI

User DI	16 Channels(8 channels can be equipped with functional DI)
Input Effective Level	PNP,L:-3V-5V,H:11V-30VDC,2-15mA
Switching Time	TON:50ms TOFF:50ms

DO

User DO	16 Channels(8 channels can be equipped with functional DO)
VOUT	PNP, 22-28V,Max:0.5A
LOUT	PNP, <2A(When exceeding 2A, the user needs to expand the power supply)
Switching Time	TON:50ms TOFF:50ms

A I/O

Analog Voltage Input 2	Input Voltage Signal	0-10V Accuracy ±1%
	Input Impedance	48KΩ
	Resolution	12-bit
Analog Voltage Output 2	Output Voltage Signal	0-10V Accuracy ±1%
	Resolution	12-bit

SDI

Emergency Signal Input	1Channels(Passive signal, dry contact input)
Protective Stop Input	1Channels(Passive signal, dry contact input)
Configurable Secure Input	2Channels(Passive signal, dry contact input)

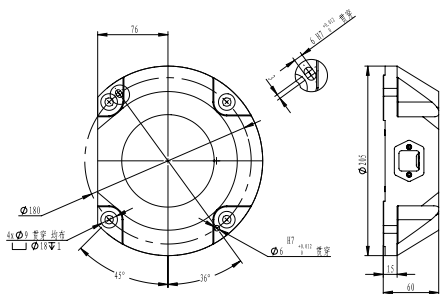
SDO

Configurable Secure Output	2Channels(PNP Active Signal)
Emergency Stop Feedback Output	2Channels(PNP Active Signal)
VOUT	23.52V-25.2VDC (Max 0.5A ScP)

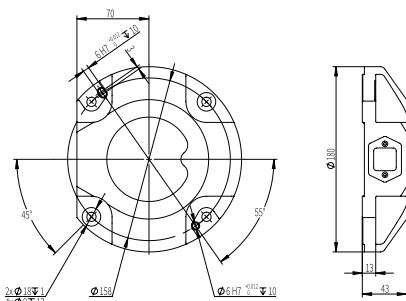
通讯/COM

CAN	1Channels, bps configurable 10k、20k、50k、100k、125k、250k、500k、1000k bps
RS485	1Channels, bps configurable 4800、9600、19200、38400、115200 bps
LAN	2-way (1-way gigabit, 1-way 100Mbit) Support MODBUS TCP, PROFINET, TCP/IP
EtherCAT	1Channels, EtherCAT COM
INC A+, A-, B+, B-, Z+, Z-	Working voltage: 24VDC Frequency: <200KHz Input: square wave signal

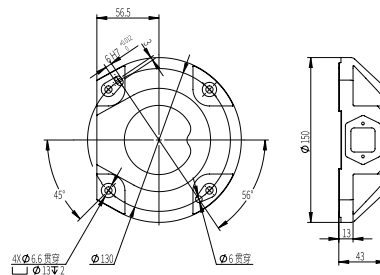
Base Flange



GCR10-1300-W

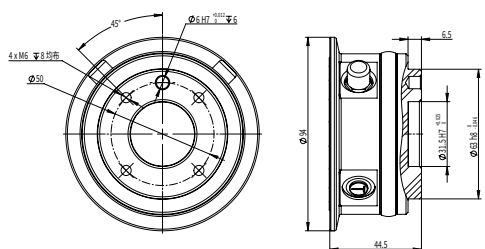


GCR5-910-W

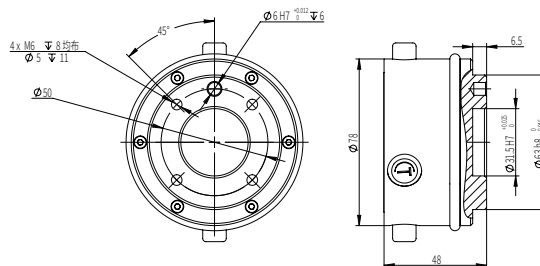


GCR3-618-W

Tool Flange



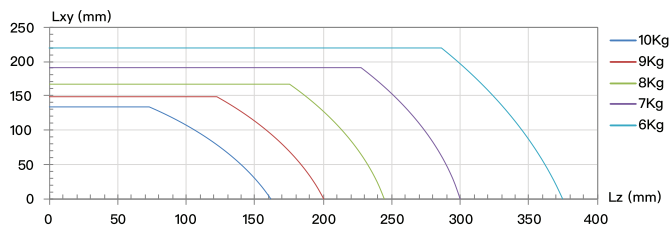
GCR10-1300-W



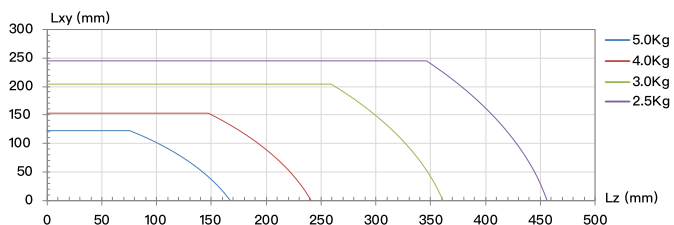
GCR5-910-W/GCR3-618-W

Payload Diagram

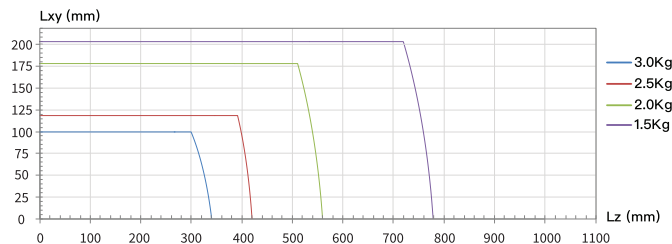
GCR10-1300-W Payload Diagram



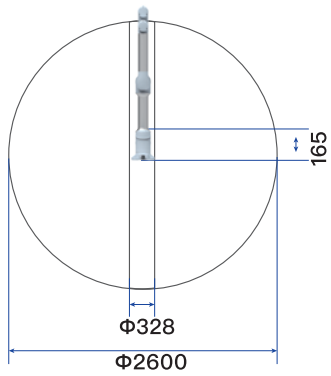
GCR5-910-W Payload Diagram



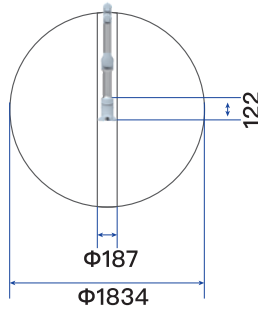
GCR3-618-W Payload Diagram



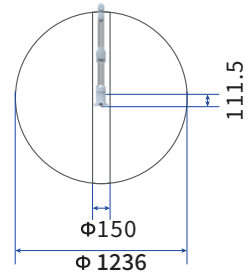
WorkSpace



GCR10-1300-W



GCR5-910-W



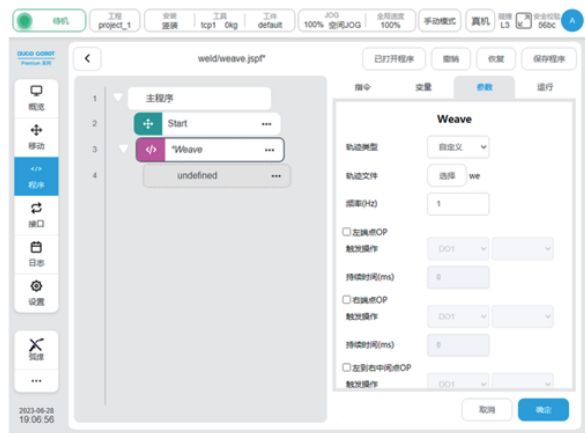
GCR3-618-W

Welding Process Package

DUCO proprietary welding process package integrates welding machine configuration, welding settings, process parameter settings, vision sensor settings, as well as starting, ending, arc tracking, weaving, and multi-layer multi-pass welding functions, and various quick commands, eliminating complicated interface operations. It is convenient to operate and adjust, and a regular worker can operate it within a short time, providing customers with a safer and more efficient solution.



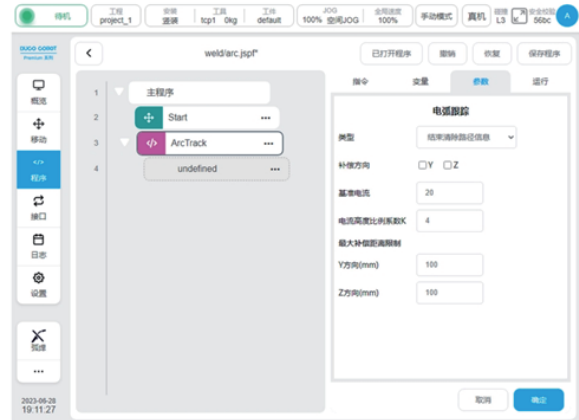
Welding Setup



Spot Welding



Multi-pass Welding



Arc Tracking

■ Support Welding Power Supply Brand



■ Support to Visual Sensor Brands



● ■ External Shaft Process Package

Supporting the extension of robot degrees of freedom through an external axis or the transformation of the workpiece position through an external axis, which can be controlled separately or in conjunction with the robot, provides more possibilities for welding scene applications.

The following are the supported external axis models:

Brand	Drive Model	Communication Protocol
HUICHUAN	SV630N/SV660N	EtherCAT



External Axis Setup



External Axis Calibration