ROBOT SMART

Laser welding seam tracking manual

About us

Beijing Minyue Technology Co., Ltd. (hereinafter referred to as "Minyue Technology") was established in 2016. It is a high-tech innovative company focused on intelligent applications for industrial robots. The company integrates the research and development, production, and sales of laser vision welding seam tracking systems, intelligent binocular vision systems, and industrial robot intelligent decision-making systems. The company's headquarters and R&D center are located in Beijing and Wuhan,with the manufacturing and solution center in Anhui, and the office and after-sales center in Xuzhou.

The core R&D members of the company are graduates of renowned universities such as Tsinghua University, Huazhong University of Science and Technology, and Beihang University. They have deep understanding and experience in robotics, image processing algorithms, 3D vision algorithms, sensor design, CAM/CAD, and artificial intelligence. The company continuously refines and iterates its hardware and software products through application scenarios, accumulating a rich industry process database. It is committed to empowering and serving system integrators in the fields of automatic welding and cutting, providing intelligent and easy-to-use vision products, and achieving "driverless" solutions for industrial robots to reduce manpower, increase efficiency, and lower costs.

Mission

To make intelligent robots ubiquitous in factories worldwide

Vision

To become a world-class company in intelligent industrial application products

24H	**100%**	**500+**
Service Response	PhD and master's degree holders in the development team	Partners

The welding environment is complex, with high labor intensity, low welding efficiency, and unstable processing quality, which has always been a common issue in the industrial robot welding industry. Through the application of laser vision guidance and tracking systems, accurate positioning and real-time tracking can be achieved, ensuring that the work is carried out in an efficient and standardized manner. This effectively addresses the issues of inconsistent quality, high labor intensity, and unpredictable welding defects, thereby significantly reducing the workload for workers and improving production efficiency.

SmartEye

The welding environment is complex, with high labor intensity, low welding efficiency, and large processing errors, which have always plagued the industrial robot welding industry. By applying the welding optical vision seam tracking system for accurate positioning and real-time tracking, utilizing three control modes: scan before welding, post-correction, and real-time tracking, it effectively addresses issues such as poor workpiece consistency, large processing errors, and irregular gaps in weld seams. This reduces a significant amount of manual operation in the later stages, liberates labor, and improves welding efficiency

1 Aluminum alloy housing
Effective heat dissipation

2 High-precision CMOS sensor chip
High sensitivity, low noise

3 FPGA
High-speed image processing unit

4 Light source
Red line laser

5 Protective cover
Protects the optical lens and laser

6 Protection device
Protects the sensor from arc light and spatter damage

7 Power interface
Provides power to the sensor system

8 Communication interface
Real-time fast communication

9 Air knife interface
Air blowing to maintain low temperature and reduce interference

Product features

High positioning accuracy
Without increasing hardware costs, the maximum achievable accuracy is ±0.05mm.

Fast data processing
Data processing time is as fast as 10ms, ensuring that the robot's welding guidance is completed without affecting the original signal or cutting process efficiency

Anti-arc light interference
Adapts to 200% and non-standard light systems, suitable for special scenarios involving aluminum alloy and other materials.ciency

Universal lower-level platform
Based on a universal robot developmentplatform, it can complete the matching of new products with the robot bodyin as fast as 15 days.

Low layout difficulty
Equipped with standardized hardware components and structured software API support not dependent on the programming habits of system engineers

High layout efficiency
Standardized product design complete supporting manuals and training materials allow users to complete the layout in as little as 3 hours

01 Positioning and deviation correction

The positioning and deviation correction function is used for flexible welding scenarios of different workpieces with the same model but inconsistent tolerances. This function ensures that no manual intervention is required when switching workpieces, and the robot is guided by the positioning and deviation correction system to achieve precise welding.
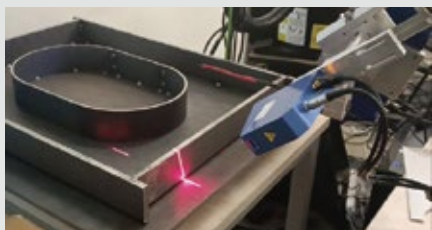
TWO–POINT POSITIONING

SUITABLE FOR STRAIGHT–LINE 2D OFFSET WELDS
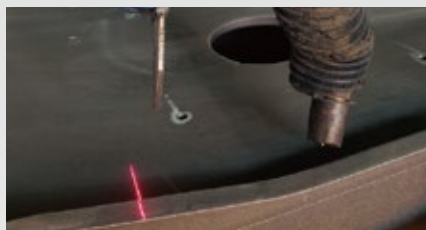
MULTI–POINT POSITIONING

SUITABLE FOR MULTI–SEGMENT 2D OFFSET WELDS

SEGMENT POSITIONING

SUITABLE FOR MULTI–SEGMENT 3D OFFSET WELDS

02 Real–time tracking

The real–time tracking function is used in welding scenarios requiring high efficiency and no spatial interference. The sensor is fixed relative to the welding torch, and the welding torch automatically adjusts the welding path according to the 3D coordinate data

03 Pre–scan and post–welding

The pre–scan and post–welding function allows the sensor to first collect geometric information of the weld, and then the welding torch automatically welds according to the geometric information of the weld. This function is suitable for high–reflective, narrow welding spaces and complex weld scenarios
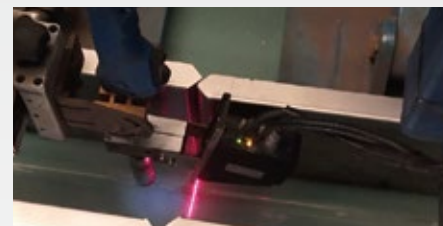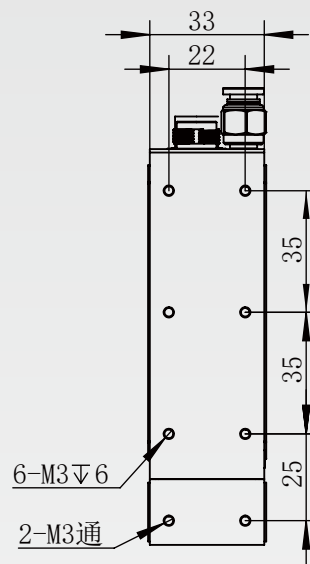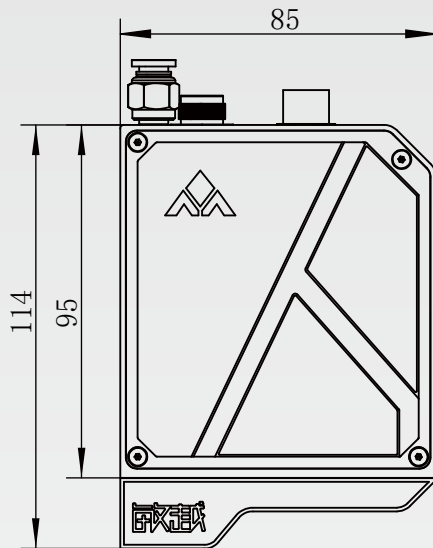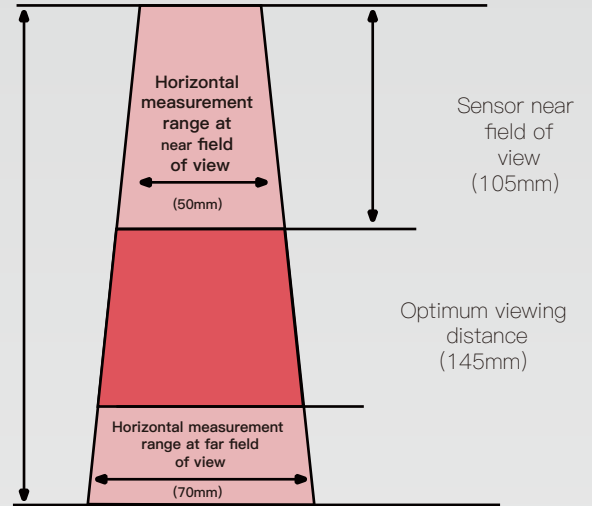

In the wave of intelligent manufacturing, production manufacturers require more intelligent and flexible custom welding systems. Minyue Technology provides customers with intelligent customized welding solutions. By utilizing machine vision, artificial intelligence, and other technologies, traditional welding equipment is endowed with "eyes" and a "brain," offering customers efficient, flexible, and stable welding processes, helping enterprises step into the era of intelligent manufacturing
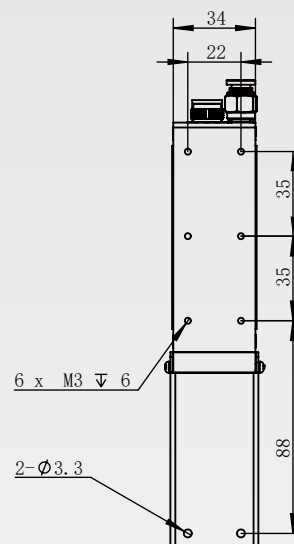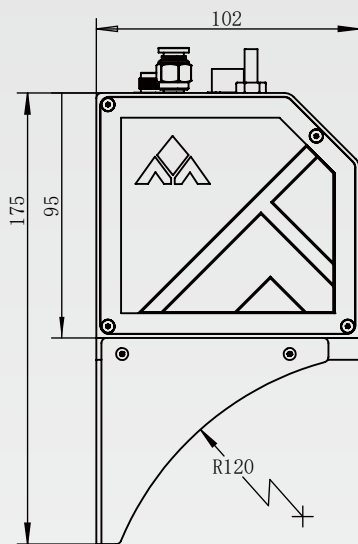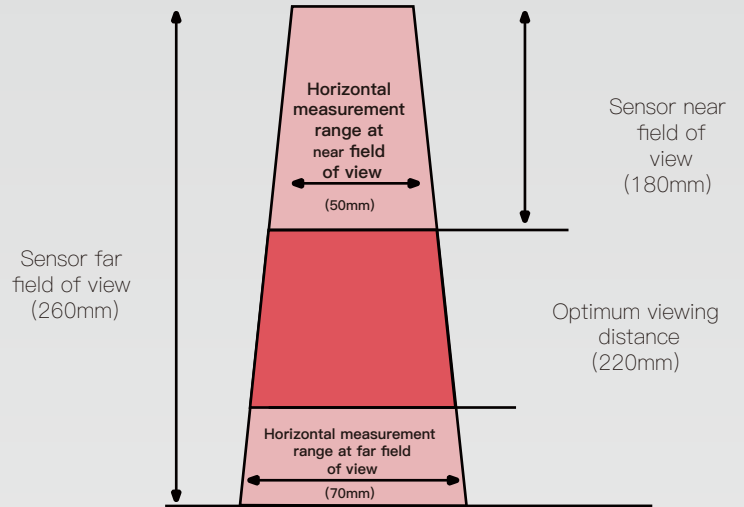
WRP–150

Sensor far field of view (185mm)

Horizontal measurement range at near field of view (50mm)

Sensor near field of view (105mm)

Optimum viewing distance (145mm)

Horizontal measurement range at far field of view (70mm)

85
114
95
33
22
35
35
25
6-M3▽6
2-M3通

WRP-150 Universal type, IP67 rating,suitable for gas shielded arc welding,submerged arc welding,etc.

Mode	Sensor near field of view(mm)	Sensor far field of view(mm)	Optimum viewing distance (mm)	Horizontal measurement range at near field of view(mm)	Horizontal measurement range at far field of view(mm)	Detection cycle (ms)	Horizontal detection accuracy (mm)	Vertical detection accuracy (mm)	Narowest butt weld(mm)	Minimum lap weld (mm)	Weight (g)
WRP150	105	185	145	50	70	20	0.06	0.1	0.3	0.2	500
WRP150(B)	105	185	145	50	70	20	0.06	0.1	0.3	0.2	500

WRP–220

Sensor far
field of view
(260mm)

Horizontal
measurement
range at
near field
of view
(50mm)

Sensor near
field of
view
(180mm)

Optimum viewing
distance
(220mm)

Horizontal measurement
range at far field
of view
(70mm)
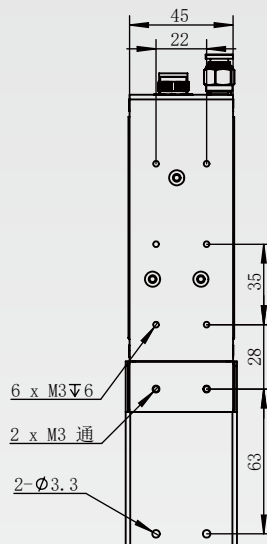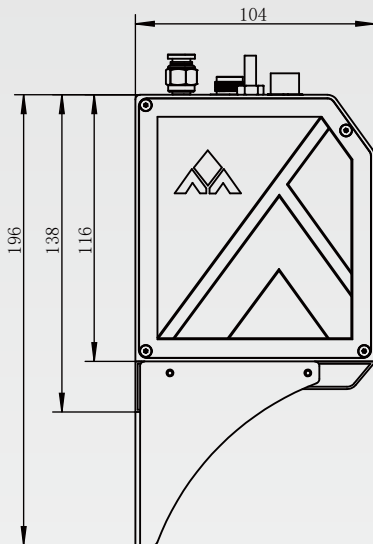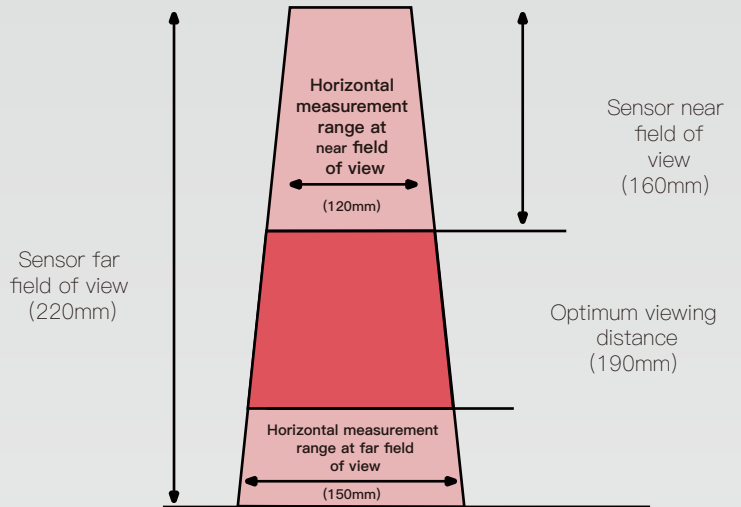

102
175
95
R120

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35
88
6 x M3 ▽ 6
2−Ø3.3

WRP-220

Uinversal type, IP67 rating,suitable for gas shielded arc welding,submerged arc welding,etc.

Mode	Sensor near field of view(mm)	Sensor far field of view(mm)	Optimum viewing distance (mm)	Horizontal measurement range at near field of view(mm)	Horizontal measurement range at far field of view(mm)	Detection cycle (ms)	Horizontal detection accuracy (mm)	Vertical detection accuracy (mm)	Narowest butt weld(mm)	Minimum lap weld (mm)	Weight (g)
WRP–220	180	260	220	50	70	20	0.06	0.1	0.3	0.2	500
WRP–220(B)	180	260	220	50	70	20	0.06	0.1	0.3	0.2	500

WRM

Sensor far
field of view
(220mm)

Horizontal
measurement
range at
near field
of view

(120mm)

Horizontal measurement
range at far field
of view

(150mm)

Sensor near
field of
view
(160mm)

Optimum viewing
distance
(190mm)

104

196
138
116

45
22

35
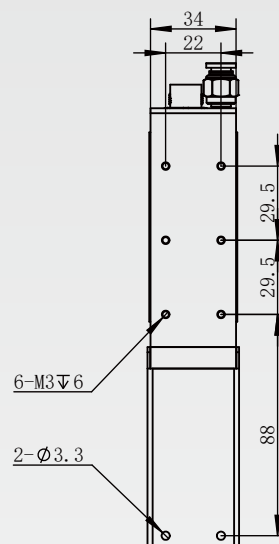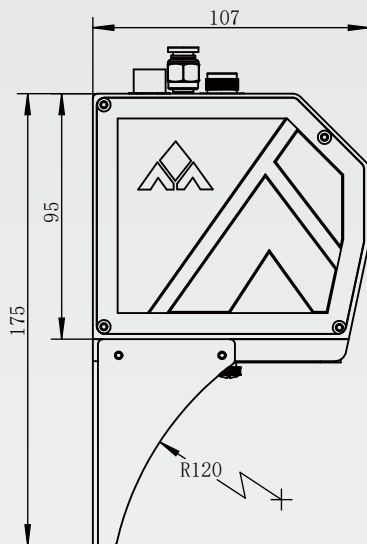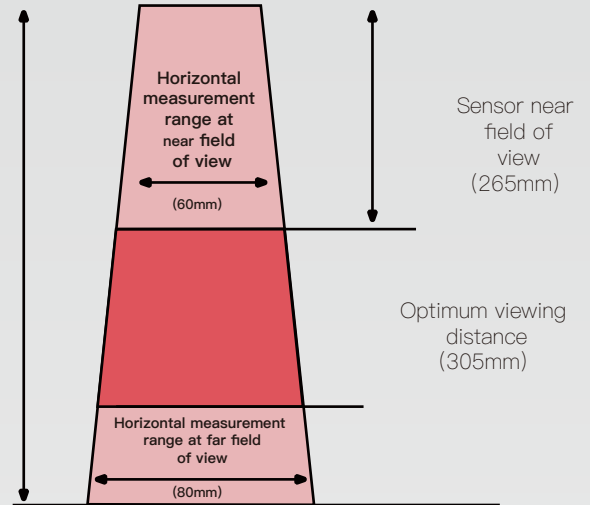28
63

6 x M3▽6
2 x M3 通
2-∅3.3

WRM
Special for detecting large range of horizontal viewing , high accuracy

Mode	Sensor near field of view(mm)	Sensor far field of view(mm)	Optimum viewing distance (mm)	Horizontal measurement range at near field of view(mm)	Horizontal measurement range at far field of view(mm)	Detection cycle (ms)	Horizontal detection accuracy (mm)	Vertical detection accuracy (mm)	Narowest butt weld(mm)	Minimum lap weld (mm)	Weight (g)
WRM	160	220	190	120	150	15	0.07	0.1	0.5	0.2	700

LDWP–305

Sensor far field of view (345mm)

Horizontal measurement range at near field of view
(60mm)

Sensor near field of view (265mm)

Optimum viewing distance (305mm)

Horizontal measurement range at far field of view
(80mm)

107

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175

R120

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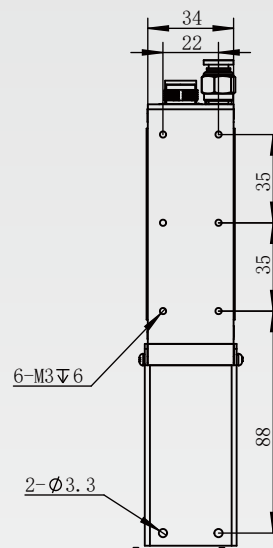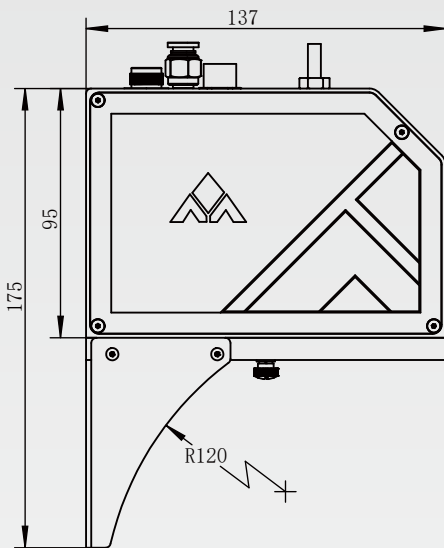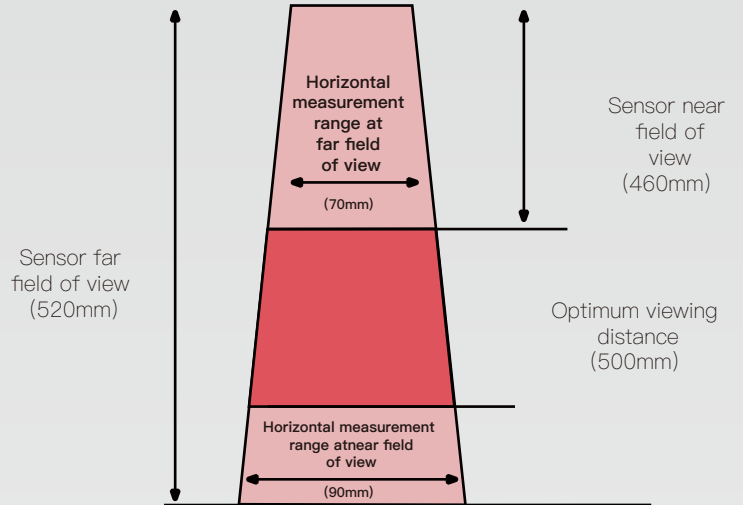
29.5

29.5

88

6–M3▽6

2–Φ3.3

LDWP-305

Long distance of vertical viewing, broad view, suitable to detect steel construction engineering machinery, etc.

Mode	Sensor near field of view(mm)	Sensor far field of view(mm)	Optimum viewing distance (mm)	Horizontal measurement range at near field of view(mm)	Horizontal measurement range at far field of view(mm)	Detection cycle (ms)	Horizontal detection accuracy (mm)	Vertical detection accuracy (mm)	Narowest butt weld(mm)	Minimum lap weld (mm)	Weight (g)
LDWP–305	265	345	305	60	80	20	0.07	0.1	0.3	0.2	600
LDWP–305(B)	265	345	305	60	80	20	0.07	0.1	0.3	0.2	600

LDWEP–500

Sensor far field of view (520mm)

Horizontal measurement range at far field of view (70mm)

Sensor near field of view (460mm)

Optimum viewing distance (500mm)

Horizontal measurement range at near field of view (90mm)

137

9.5

175

R120

34

22
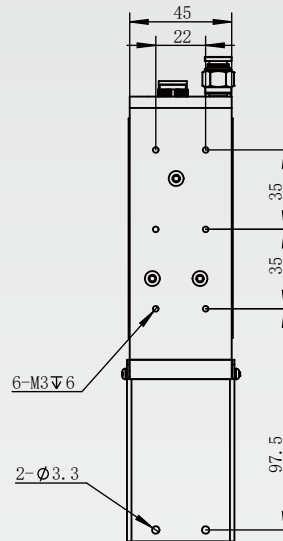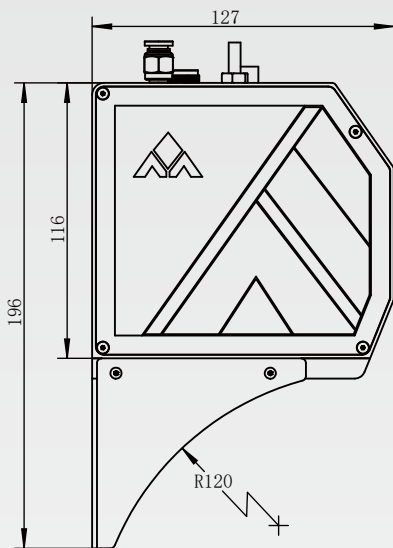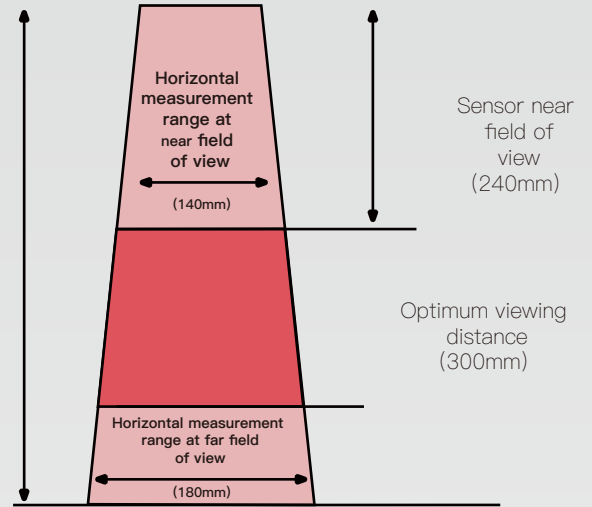
35

35

88

6–M3▽6

2–Ø3.3

LDWEP-500   Long distance of vertical viewing, avoid interfering,suitable for long distance tracking

Mode	Sensor near field of view(mm)	Sensor far field of view(mm)	Optimum viewing distance (mm)	Horizontal measurement range at near field of view(mm)	Horizontal measurement range at far field of view(mm)	Detection cycle (ms)	Horizontal detection accuracy (mm)	Vertical detection accuracy (mm)	Narowest butt weld(mm)	Minimum lap weld (mm)	Weight (g)
LDWEP–500	460	520	500	70	90	10	0.06	0.1	0.8	0.3	600
LDWEP–500(B)	460	520	500	70	90	10	0.06	0.1	0.8	0.3	600

LDWM

Sensor far field of view (360mm)

Horizontal measurement range at near field of view (140mm)

Sensor near field of view (240mm)

Optimum viewing distance (300mm)

Horizontal measurement range at far field of view (180mm)

127

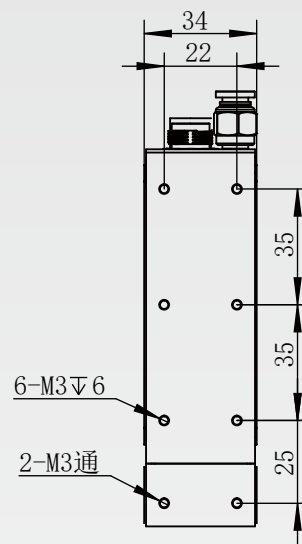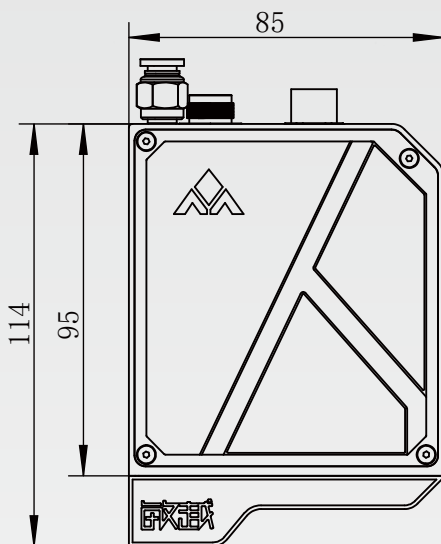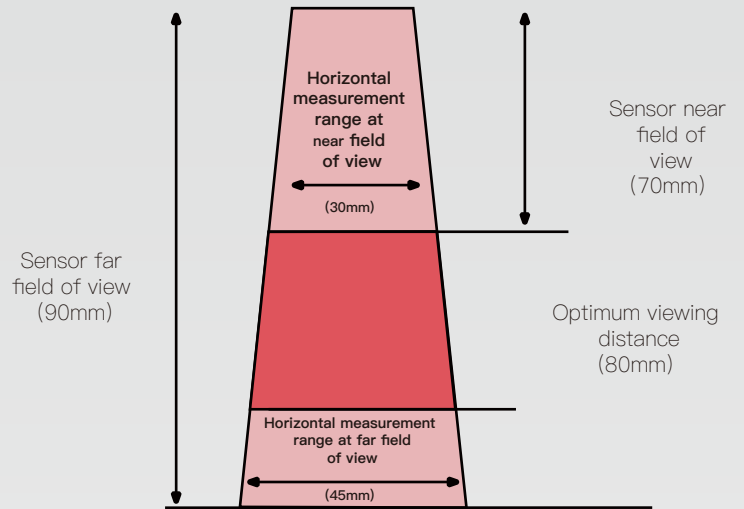116

196

R120

45

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35

97.5

6-M3▽6

2-Φ3.3

LDWM Long distance of vertical viewing, avoid interfering,suitable for long distance tracking

Mode	Sensor near field of view(mm)	Sensor far field of view(mm)	Optimum viewing distance (mm)	Horizontal measurement range at near field of view(mm)	Horizontal measurement range at far field of view(mm)	Detection cycle (ms)	Horizontal detection accuracy (mm)	Vertical detection accuracy (mm)	Narowest butt weld(mm)	Minimum lap weld (mm)	Weight (g)
LDWM	240	360	300	140	180	100	0.06	0.1	0.5	0.5	700

HAP–100

Sensor far field of view (90mm)

Horizontal measurement range at near field of view

(30mm)

Sensor near field of view (70mm)

Optimum viewing distance (80mm)

Horizontal measurement range at far field of view

(45mm)
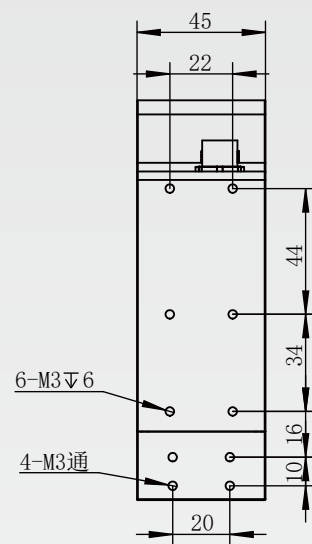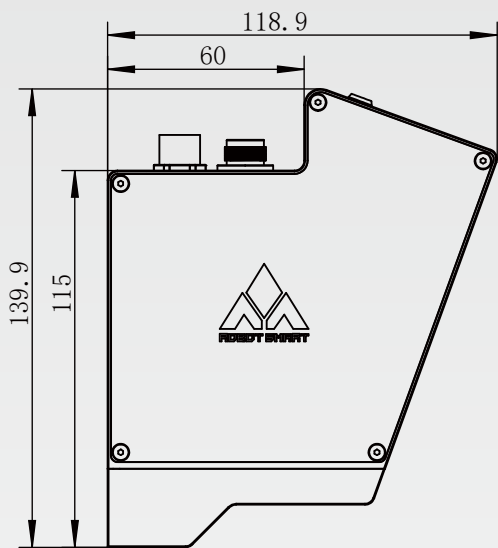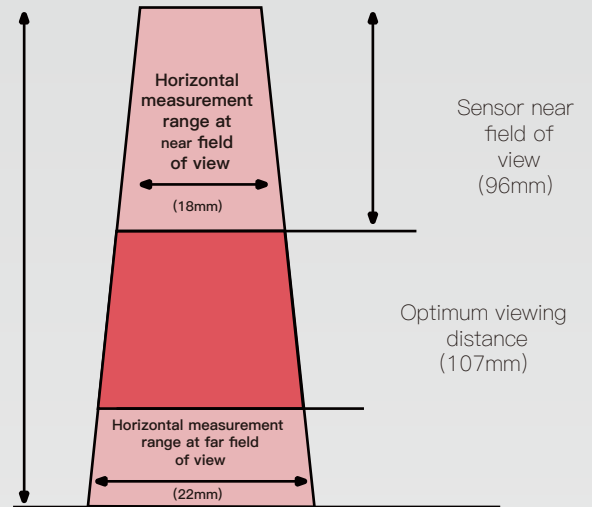
85

114

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6-M3▽6

2-M3通

HAP-100

High accuracy,IP67 rating, used in arc welding and narrow seam tracking

Mode	Sensor near field of view(mm)	Sensor far field of view(mm)	Optimum viewing distance (mm)	Horizontal measurement range at near field of view(mm)	Horizontal measurement range at far field of view(mm)	Detection cycle (ms)	Horizontal detection accuracy (mm)	Vertical detection accuracy (mm)	Narowest butt weld(mm)	Minimum lap weld (mm)	Weight (g)
HAP100	70	90	80	30	45	20	0.03	0.05	0.2	0.2	500
HAP100(B)	70	90	80	30	45	20	0.03	0.05	0.2	0.2	500

LHA-20

Sensor far field of view (117mm)

Horizontal measurement range at near field of view (18mm)

Sensor near field of view (96mm)

Optimum viewing distance (107mm)

Horizontal measurement range at far field of view (22mm)

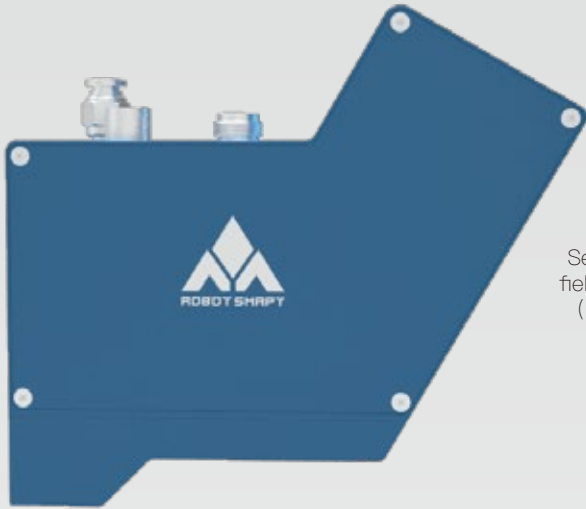118.9
60
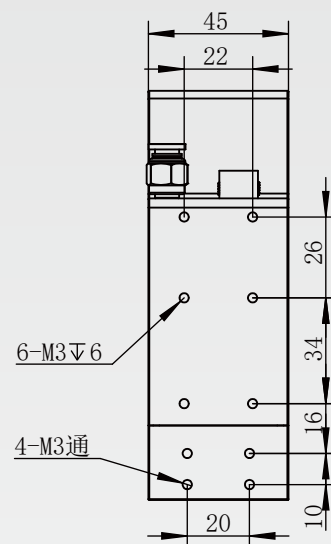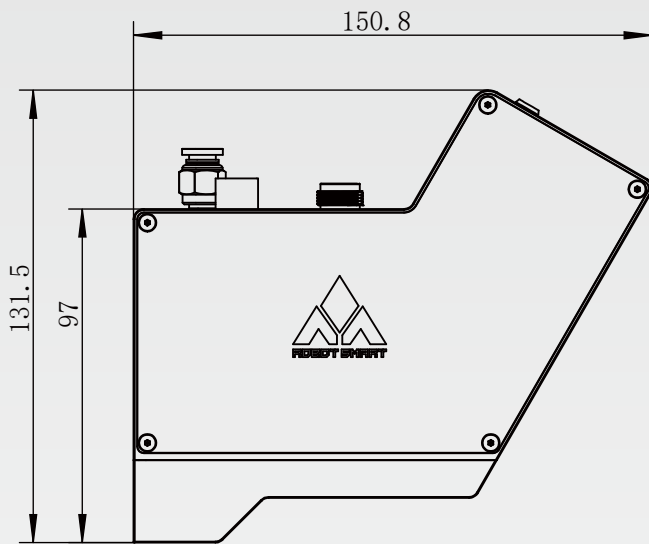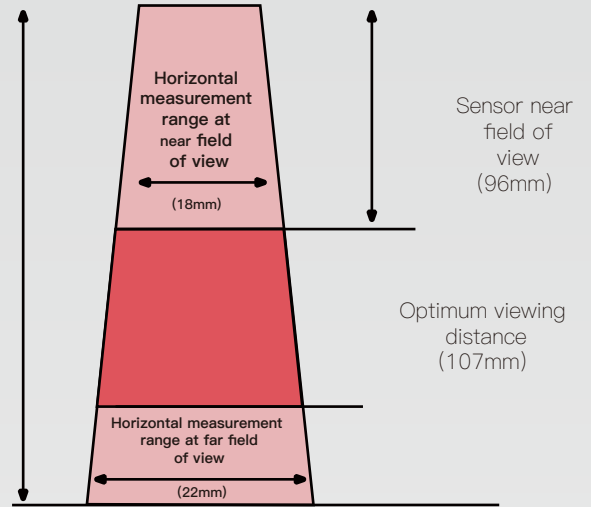139.9
115

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22
44
34
16
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20

6-M3▽6
4-M3通

LHA-20

Compact in size, high accuracy, fast response

Mode	Sensor near field of view(mm)	Sensor far field of view(mm)	Optimum viewing distance (mm)	Horizontal measurement range at near field of view(mm)	Horizontal measurement range at far field of view(mm)	Detection cycle (ms)	Horizontal detection accuracy (mm)	Vertical detection accuracy (mm)	Narowest butt weld(mm)	Minimum lap weld (mm)	Weight (g)
LHA-20	96	117	107	18	22	5	0.02	0.05	0.1	0.3	700

LHA−30

Sensor far
field of view
(117mm)

Horizontal
measurement
range at
near field
of view
(18mm)

Sensor near
field of
view
(96mm)

Optimum viewing
distance
(107mm)

Horizontal measurement
range at far field
of view
(22mm)

150.8

131.5
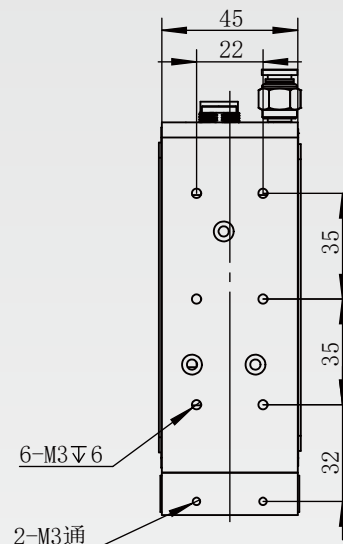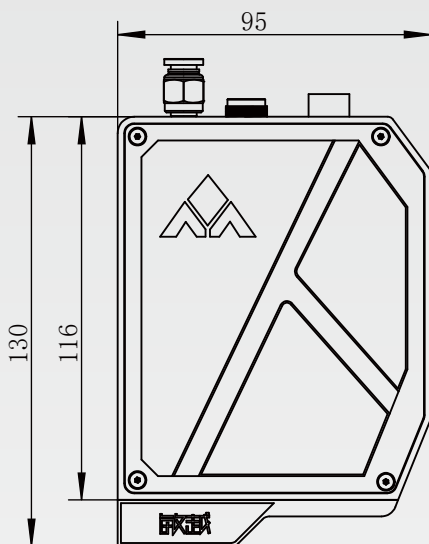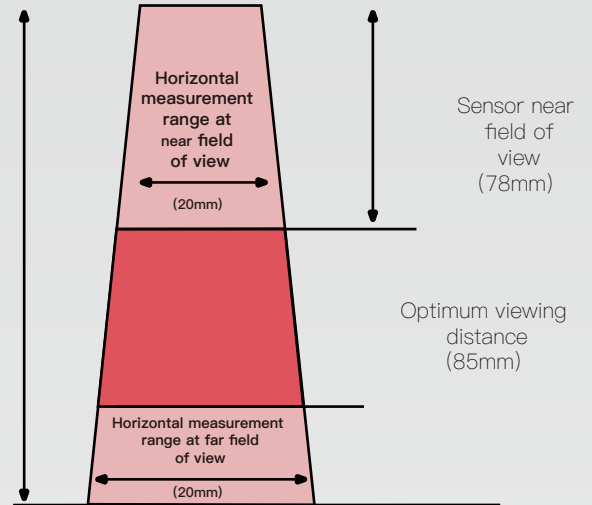
97

45

22

26

34

16

10

6−M3▽6

4−M3通

20

LHA-30

High accuracy in vertical vewing , fast speed

Mode	Sensor near field of view(mm)	Sensor far field of view(mm)	Optimum viewing distance (mm)	Horizontal measurement range at near field of view(mm)	Horizontal measurement range at far field of view(mm)	Detection cycle (ms)	Horizontal detection accuracy (mm)	Vertical detection accuracy (mm)	Narowest butt weld(mm)	Minimum lap weld (mm)	Weight (g)
LHA−30	96	117	107	18	22	5	0.02	0.03	0.1	0.2	700

SLHA–85

Sensor far field of view (93mm)

Horizontal measurement range at near field of view

(20mm)

Horizontal measurement range at far field of view

(20mm)

Sensor near field of view (78mm)

Optimum viewing distance (85mm)

95

130

116

45

22

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35

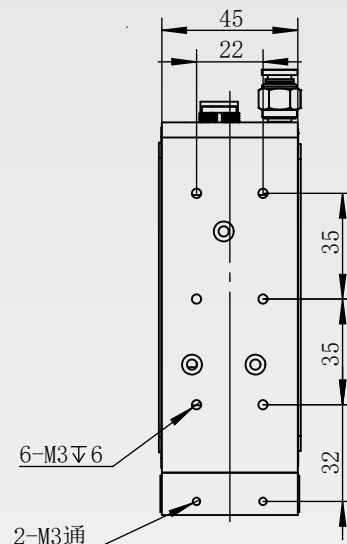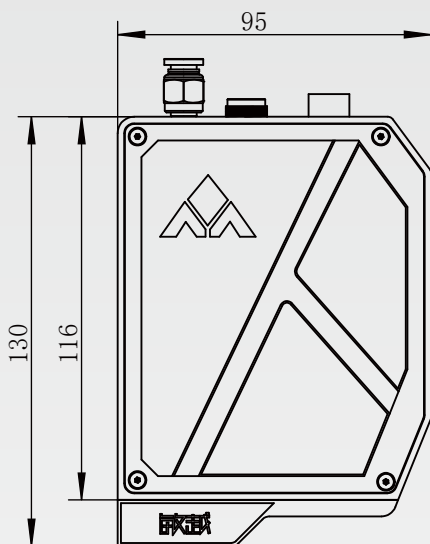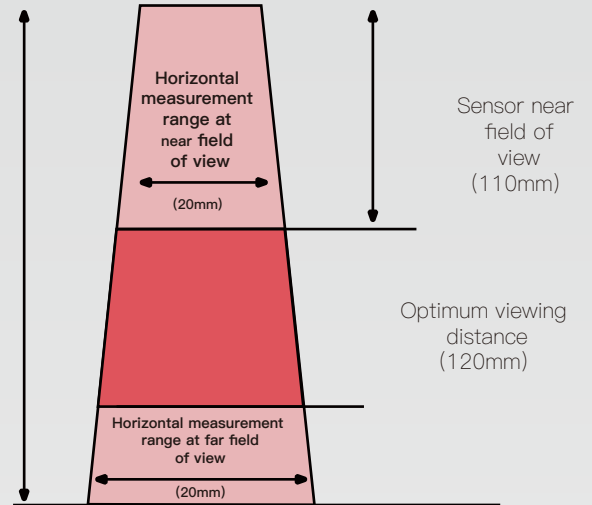32

6–M3▽6

2–M3通

SLHA-85

High accuracy, applied to "zero distance" gap tracking

Mode	Sensor near field of view(mm)	Sensor far field of view(mm)	Optimum viewing distance (mm)	Horizontal measurement range at near field of view(mm)	Horizontal measurement range at far field of view(mm)	Detection cycle (ms)	Horizontal detection accuracy (mm)	Vertical detection accuracy (mm)	Narowest butt weld(mm)	Minimum lap weld (mm)	Weight (g)
SLHA–85	78	93	85	20	20	100	0.01	0.03	0.0	0.1	700

SLHA–120

Sensor far field of view (130mm)

Horizontal measurement range at near field of view (20mm)

Sensor near field of view (110mm)

Optimum viewing distance (120mm)

Horizontal measurement range at far field of view (20mm)
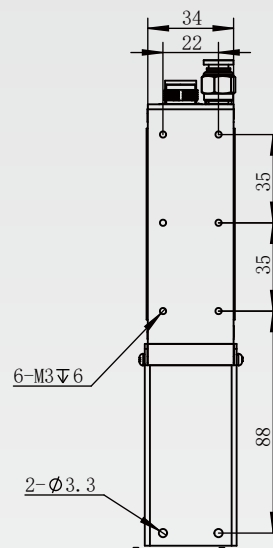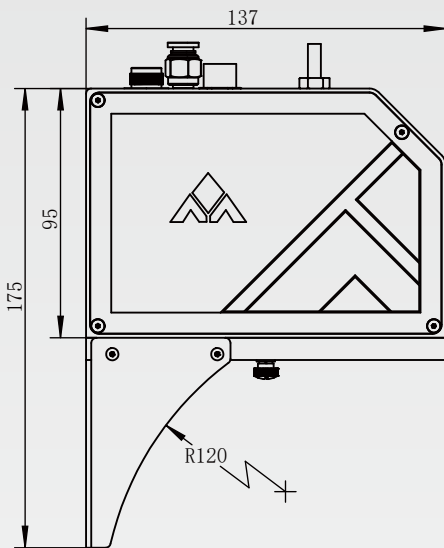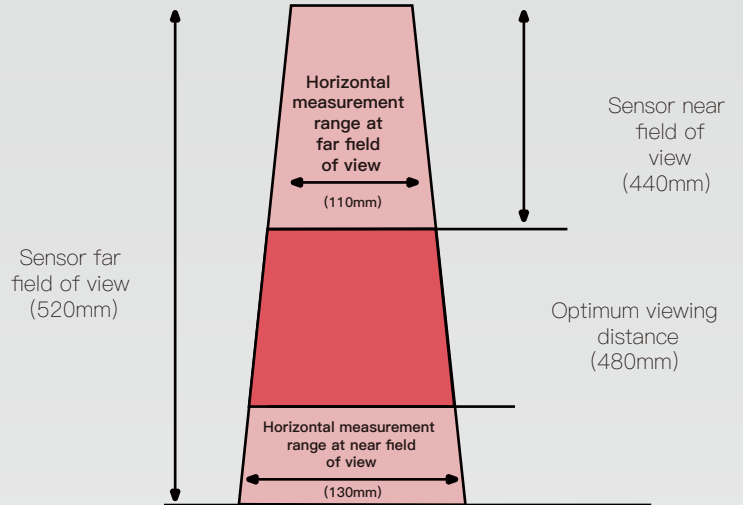
95

130

116

45

22

35

35

32

6−M3▽6

2−M3通

SLHA-120 High accuracy,applied to "zero distance" gap tracking

Mode	Sensor near field of view(mm)	Sensor far field of view(mm)	Optimum viewing distance (mm)	Horizontal measurement range at near field of view(mm)	Horizontal measurement range at far field of view(mm)	Detection cycle (ms)	Horizontal detection accuracy (mm)	Vertical detection accuracy (mm)	Narowest butt weld(mm)	Minimum lap weld (mm)	Weight (g)
SLHA–120	110	130	120	20	20	100	0.01	0.04	0.0	0.1	700

LDWEM

Sensor far field of view (520mm)

Horizontal measurement range at far field of view (110mm)

Sensor near field of view (440mm)

Optimum viewing distance (480mm)

Horizontal measurement range at near field of view (130mm)

137

9.5

175

R120

34

22

35

35

88

6−M3▽6

2−Ø3.3

LDWEM

Long distance of vertical viewing, avoid interfering, suitable for long distance tracking

Mode	Sensor near field of view(mm)	Sensor far field of view(mm)	Optimum viewing distance (mm)	Horizontal measurement range at near field of view(mm)	Horizontal measurement range at far field of view(mm)	Detection cycle (ms)	Horizontal detection accuracy (mm)	Vertical detection accuracy (mm)	Narowest butt weld(mm)	Minimum lap weld (mm)	Weight (g)
LDWEM	440	520	480	110	130	10	0.06	0.1	0.8	0.3	600
LDWEM(B)	440	520	480	110	130	10	0.06	0.1	0.8	0.3	600

special machine weld tracker

XY- table

insulating plate

laser sensor
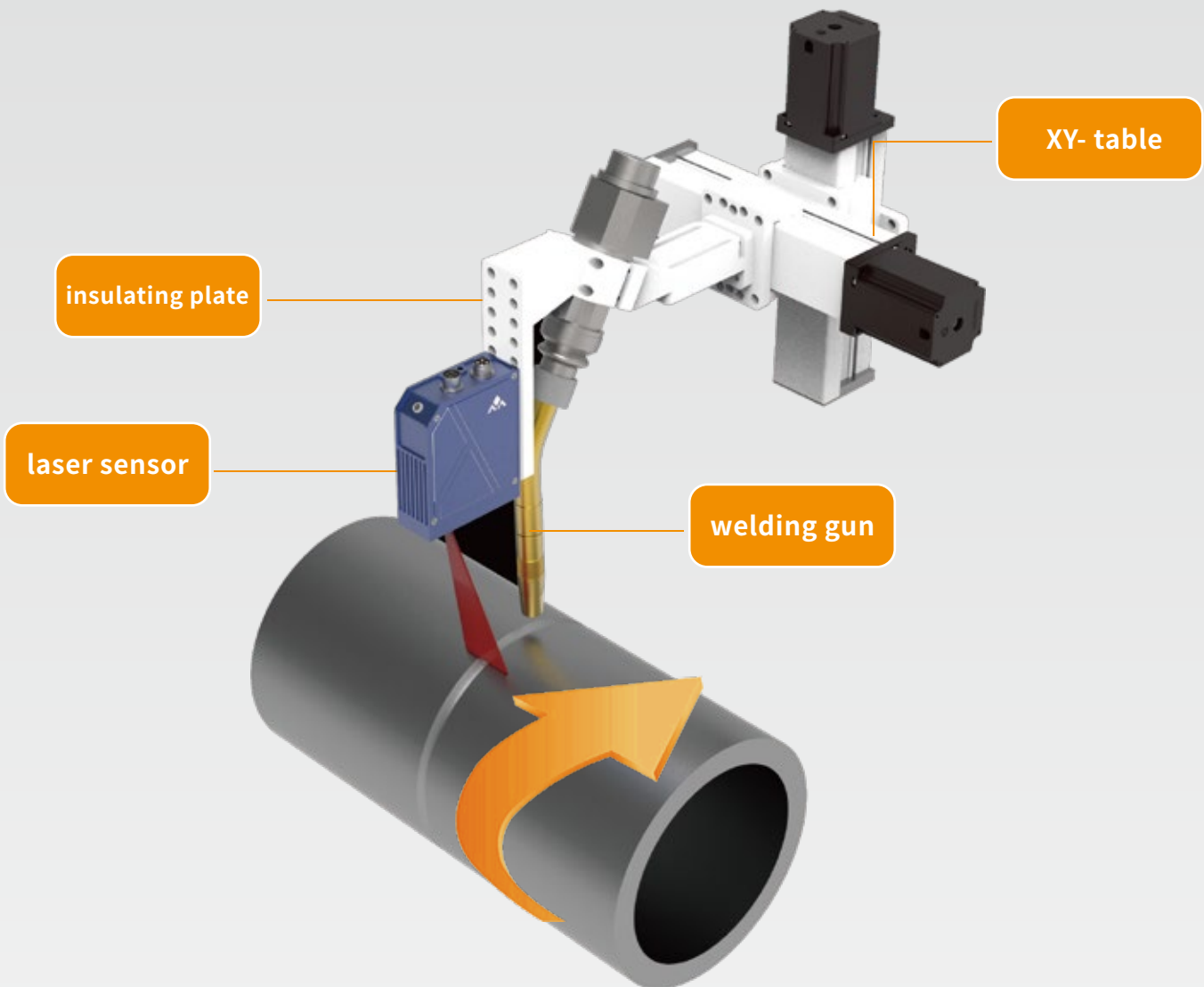
welding gun

apply to girth welding and straight line welding;support Mitsubishi, Siemens,Xinje,etc;PLC can support laser welding,argon arc welding gas shielded arc welding and submerged arc welding

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Parts list

Control host

Receive sensor data, calculate and send robot control motion trajectory in real time

Laser sensor

Real-time message-collect for product contour features

Laser sensor communication cable

Communication control between industrial computer and Smarteye sensor

Laser sensor power cable

The control host supplies power to the laser sensor(smarteye)

Anti−splash glass

Protects lasers from arc and spatter damage

Fixture

Fix laser sensor

*Water cooling plate

Protects lasers from arc and spatter damage

Softdog

Software Encryption Protection on control host

*Calibration plate

Calibrate the coordinates of the laser sensor

Screws

Used for fixture installation
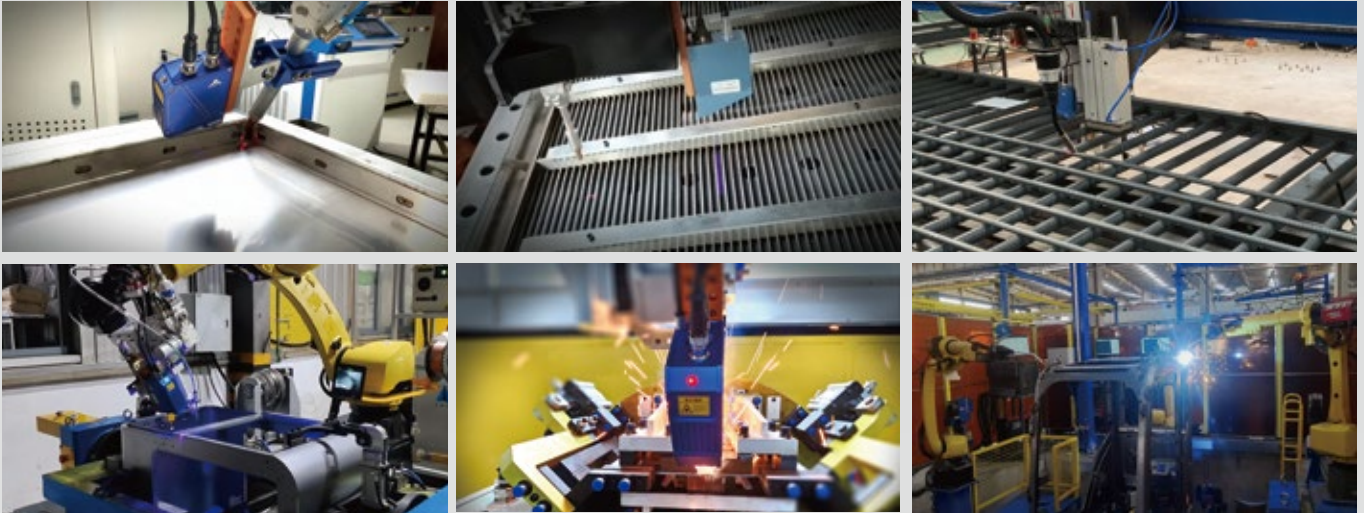
Insulating plate

Installation for laser sensor

Standard fixture

Connection between welding torch and laser sensor

Note: Accessories marked with "*" are optional products

Projects

Compatible Models

FANUC	**KUKA**	**ABB**	**YASKAWA**	**Panasonic**
SIASUN 新松	STEP	CROBOTP	ESTUN ROBOTICS	iNexBot Motion Control
MOKA 摩卡	CHAIFU 柴孚	CHI 昌泓机器人	robotmeta	SIEMENS 西门子
KEYENCE 基恩士	MITSUBISHI ELECTRIC	Kawasaki Robotics	GSK 广州数控	OMRON 欧姆龙

Compatible with various robot brands, as shown above, and the list is continuously expanding

ROBOT SMART

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