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**DOPPLER**<sup>®</sup>

# DOPPLER

**Product Manual**

Doppler Electronic Technologies



# Scanners

## FC-01

### PA+TOFD Scanner

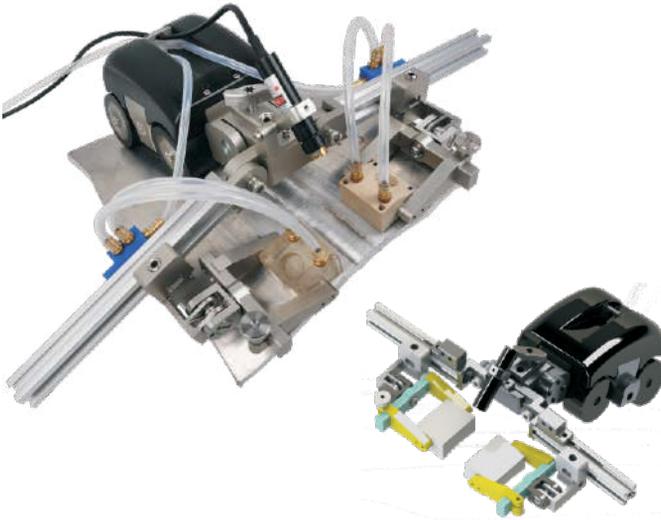
Doppler FC-01 Type PA+TOFD welds scanner is suitable for pipe butt weld inspection with diameter over 6"(150mm) by axial direction, and flat butt weld inspection. Combine with four probe clamps & one wheel type encoder. Free collocation of PA probes & TOFD probes by inspection needs.



Parameter	
Range	Circumferential: $\phi 6"$ (150mm)-Flat
Dimensions	426*110*125mm
Encoder Step	48Step/mm
IP Level	Ip67
Operating Temperature	-10°C~50°C

## MOS-40

### Dual Probes Spiral Welded Pipe Scanner (Axial or Girth Welding Compatible)



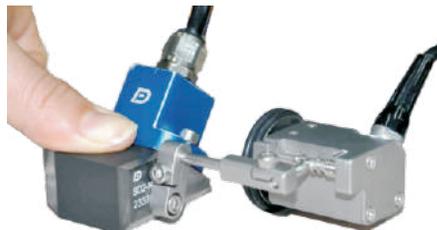
Doppler MOS-04 mouse-like dual probes scanner is mainly used to spiral welded pipe welding inspection, To perform dual PAUT probes encoded inspection or TOFD encoded inspection to Axial or Girth welding, also flat butt welding. Each probe angle is adjustable, mouse wheels are adjustable along with the pipe size. It's compact and easy to handle.

Parameter	
Range	Axial, Girth: OD $\geq\phi 200$ mm Spiral Welded: OD $\geq\phi 500$ mm
Dimensions	282*243*82mm
Encoder Step	32 Step/mm
IP Level	Ip64
Operating Temperature	-10°C~50°C
Wedge Width Range	22~48mm

## ENC-10

### Wheel Encoder

The Doppler ENC-10 wheel encoder is mainly used with single PA probe for pipe and plate welds inspection. The structure is simple and convenient, it can be directly connected to the wedge, and according to the detection process, the direction of the probe can be changed, which is capable to perform scan forward or backward on the left or right of welding.



## MOS-01

### Mouse Type Girth Weld Scanner

Doppler MOS-01 Mouse Type Scanner is designed for recordable inspection of circumferential above  $\phi 100\text{mm}$  Pipe Girth Welds and Plate Butt Welds by using Phased Array Probe.

Parameter	
Range	Circumferential: $\phi 100\text{mm}$ ~Flat
Dimensions	95*85*65mm
Encoder Step	51.6 Step/mm
IP Level	Ip67
Operating Temperature	-10 $^{\circ}\text{C}$ ~ 50 $^{\circ}\text{C}$
Wedge Width Range	32~48mm

### Features

- Uses the imitation mouse ergonomics design, the operation is convenient and comfortable
- Encoder hidden in the "mouse" can prevent the encoder from slipping, resulting in data loss, but also enhance the life of the
- encoder "Mouse" is equipped with four strong magnetic wheels and torsion spring, which can make the phased array probe and the workpiece surface closely adhere to ensure the coupling effect
- It can change the clamping direction of the probe at 90 degrees, compatible with "left and right scan" and "front and back scan"



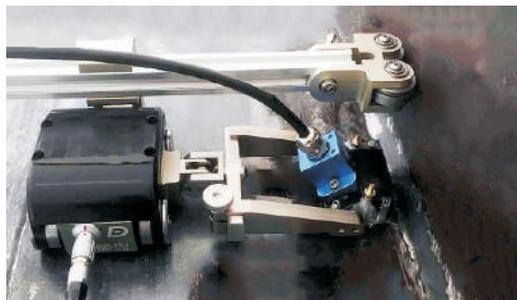
## MOS-02

### Mouse Type TKY Conner Weld Scanner

Doppler MOS-02 Mouse Type Scanner is designed for recordable inspection of TKY Conner Welds by using Single Phased Array Probe.

### Features

- Using Mouse Type Ergonomic Design, Smart and Comfort to
- Operate Conceal Design of Encoder, more beneficial to prevent data loss of encoder track-slipping, and extend the lifetime of encoder
- MOS-01 includes 4 strong magnetic wheels, combines pressure springs to make sure tightly closefit between Phased Array probe and workpiece surface, and make sure sufficient coupling effects
- The probe clamping is 90  $^{\circ}$  direction adjustable, to perform lateral scanning and vertical scanning



## MOS-03

### Mouse Type PA/TOFD Dual Probes Scanner

Doppler MOS-03 Mouse Type Scanner is designed for bilateral simultaneous inspection of Plate Butt Welds by using Dual Phased Array Probes, or single group of TOFD inspection. Equipped with a Laser Guide, to ensure when traveling along the weld center-line during inspection.

### Parameter

- Scope of Application: Plate Butt
- Welds Scanner Size: 350\*182\*43mm
- Encoder Step: 38 Pulses/mm
- Ingress Protection Rating: Ip67
- Wedge Clamping Width: 32~48mm



## Tool Free Assembly

### CRS-7

#### Chain Scanner for Small Pipes

Doppler CRS-7s Chain scanner is mainly used to inspect girth welding of pipes OD 0.8" (20mm) to 4.5" (114.3mm), one sided or two chains two sided are optional.

Parameter	
Range	φ0.8"(20mm)~φ4.5"(114.3mm)
Encoder Step	100 Step/mm
Width	55mm
Height	12mm
IP Level	Ip65
Operating Temperature	-10°C~50°C



The latest Patent design, tool free quick assembly.

## Narrow Chains with Quick Disassembly

### CRS-15

#### Chain Scanner for Small Diameter Pipes

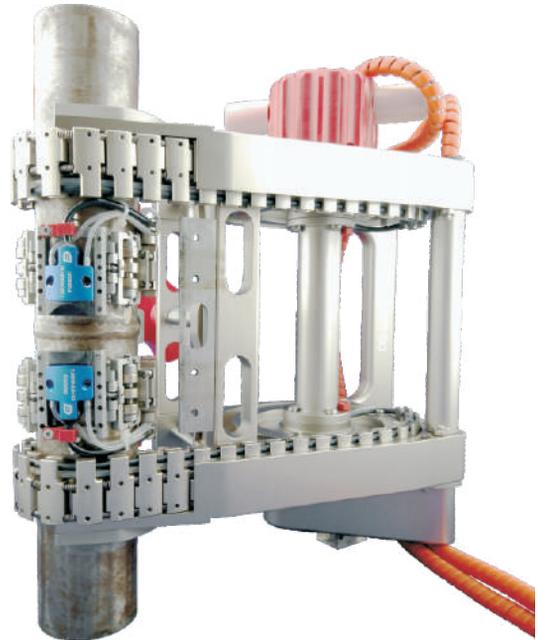
Doppler CRS-2s small piping scanner is mainly used to pipe OD 0.8" (20mm) to 4.5" (114.3mm) girth welding PAUT. Single or twin chains optional, width of each chain is only 34mm, which could be deployed to limited clearance with special probe.

Parameter	
Range	φ0.8"(20mm)~φ4.5"(114.3mm)
Encoder Step	100 Step/mm
Width	34mm
Height	17mm
IP Level	Ip65
Operating Temperature	-10°C~50°C



## CRS-3 Bracelet Scanner

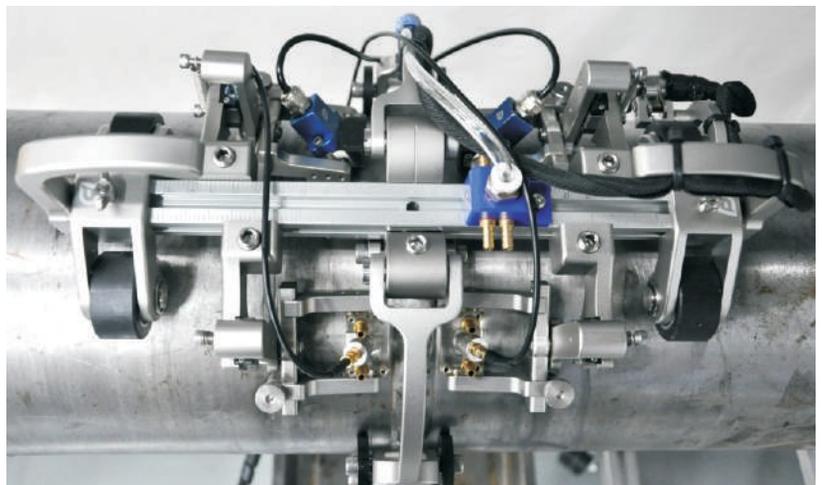
- Can perform rapid detection on small diameter pipe weld both sides
- Easy to assemble and use
- Suitable for pipe butt welds inspection with diameter between 46mm to 78mm
- Other specifications can be customized



## MOS-04 Chain Scanner for Large Pipelines

MOS-04 is suitable for circumferential circumferential weld detection of large diameter pipe. The scanner is easy to assemble and operate, and can be quickly disassembled. MS04 scanner can clamp two PA + two TOFD probes simultaneously for weld scanning. It is suitable for circumferential weld scanning of large pipes with diameter ranging from 8"(203mm) - 50"(1270mm).

Parameter	
Girth Range	Φ203mm - Φ1270mm
IP Level	IP65
Storage Temperature	-20°C - +60°C
Operating Temperature	-10°C - +50°C



# Scanners

## FC-02

### PA+TOFD Scanner

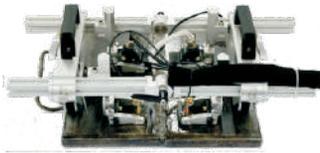


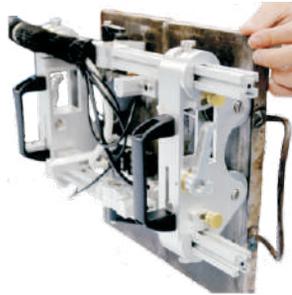
Plate Butt Weld



Pipeline Ring Weld



Pipeline Radial Weld(Outside)



Pipeline Radial Weld (Inside)

Brake Locking Device

PA/TOFD (FC02) Scanner support curvature adjustment, applicable to detection for pipe and plate in direction of circumferential and axial. Pressure regulator ensures wedge closely attach to work piece for an effective detection. By equipped with reliable brake device, the scanner can firmly stay at any position. By simple operation, most of scanning functions can be achieved manually.

Scanner can be assembled with 4 probes according to detection requirement (PA / UT), convenient assembly and disassembly.

	Parameter
Range	Circumferential: $\Phi 6''(150\text{mm})$ -Flat Axial: $\Phi 17''(425\text{mm})$ -Flat
Dimensions	446*182*128mm
Encoder Step	48 Pulses/mm
IP Level	Ip67
Operating Temperature	-10°C~50°C
Clamp Width of Wedge	32~48mm

## Features

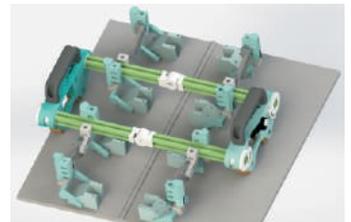
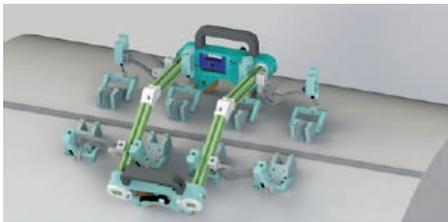
- Assembly of 4 probes, probe clamping arms can be disassembled unilateral manually;
- Two horizontal bars can be folded to adjust curvature, manual adjustment can realize detection from 7 inch pipe to plate in direction of axial;
- Two horizontal bars can be rotated, manually adjust a pair of probe clamping arms can realize detection from 6 inch pipe to plate in direction of circumference;
- Both sides have a brake device, scanner can stay at any position; Inner water distribution device , save more space;
- Space of walking wheel adjustable, freely work on short work piece; Clamp wedge for different size, strong adaptability.

## Standard Kits

- Two brackets (including angle adjusting block, handle and brake device);
- Two foldable horizontal bars with total length of 446mm; One encoder with 2.8m cable;
- Four probe clamping arms;
- One water distribution device;
- Carrying case and other accessories.

## FC-02+

### PA+TOFD Scanner



	Parameter
Range	Circumferential: $\Phi 6''(150\text{mm})$ -Flat Axial: $\Phi 17''(425\text{mm})$ -Flat
Dimensions	446*476*139mm
Encoder Step	48 Step/mm
IP Level	Ip67
Operating Temperature	-10°C~50°C
Clamp Width of Wedge	32~48mm

## Features

Features: FC-02+ Scanner is based on the model: FC-02, with extra 1~4 probe clamps, allows to clamp maximum 8 Phased Array or TOFD probes, which is suitable for multi-groups of Phased Array or TOFD inspection requirements.

## Parameter

- Scope of Application: Same as FC-02
- Standard Configuration: Added Four Variable Angle Probe Clamps

## DSC-06

### Corrosion Scanner

- Material or corrosion inspection for large pipe and plate
- Can use 64 or 128 elements PA probe, water filling as a wedge
- Wheel encoder to record data
- Optional magnetic wheel or rubber wheel
- Probe height adjustable

DSC-06 Scanner Parameters	
Circumferential motion	Φ127mm-flat
Encoder IP Level	IP65
Storage Temperature	-20° C - +60° C
Operating Temperature	-10° C - +50° C



## DSC-09

### Corrosion Scanner

- Material or corrosion inspection for large pipe and plate
- Can use 5L32 PA probe, water filling as a wedge
- Wheel encoder to record data
- Optional magnetic wheel or rubber wheel
- Other types of probe can be customized



## Encoder for Cobra Scanner

Size: L35. 7\*W22. 2\*H12  
 IP level: 66  
 Resolution: 52step/mm  
 Operation Temperature: -10°C~50°C



# Scanners

## GECKO DSC-03

### Automated Crawler Scanner

#### Specification

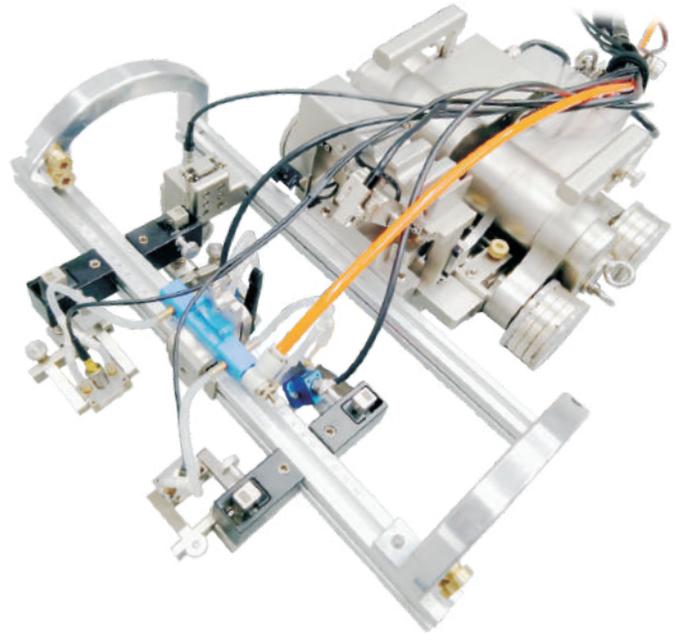
- Real-time acquisition of working environment images
- Displacement Reciprocating Accuracy Error  $\leq \pm 1\text{mm}$
- Speed accuracy error  $< 5\%$
- When the wall thickness of bare metal magnetic workpiece in vertical direction is more than 20 mm, it can carry 20KG
- Circumferential motion applicable range 800mm-plane, axial motion applicable range 500mm-plane
- Measuring the Thickness of Workpiece ( $> 5\text{mm}$ )
- Crawler speed range 20mm/s-120mm/s
- Motion speed of power arm is 10 mm/s-130 mm/s
- mm/s Motion control mode:
  - Free Motion Model
  - Displacement motion mode
- Two-axis scanning mode: raster scanning/sawtooth scanning

#### Application Filed

- Weld Detection of Large Tank
- Flat plate weld detection
- Base Material Testing
- Corrosion detection
- Ultrasound Thickness Measurement

#### Features

- Phone WIFI + wired remote controller
- 360° real time monitoring camera
- Support all orientation movements, with cruise
- control Multi-probe clamp modes, welds compatible
- Base material & corrosion
- inspections Battery working up to 5 hours on-site

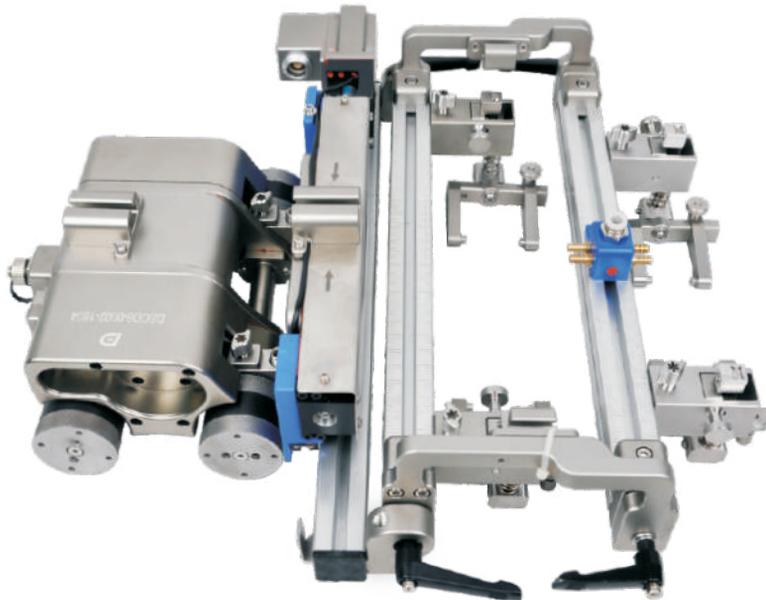


# DSC-08

## Multi-function Automated Scanner

DSC-08 Multi-functional automatic crawler is suitable for pipes which OD are greater than 6", or pipe welding. 64 or 128 element water column probes are optional to perform corrosion / basic material inspection. 32-16 element probes are optional to perform girth welding two-sided inspection. Remote control available to move forward and backward, as well as to control the guide screw to move to left and right(500mm).

Parameter	
Circumferential motion	$\Phi 6''$ (152.4mm)-flat
Encoder Step	28.3
IP Level	pulses/mm
Storage Temperature	-20°C- +60°C
Operating Temperature	-10°C- +50°C
Maximum speed	39 mm/s
Minimum speed	8 mm/s
Maximum load on the vertical plane	6kg
Axial motion	$\Phi 1500\text{mm}$ -flat

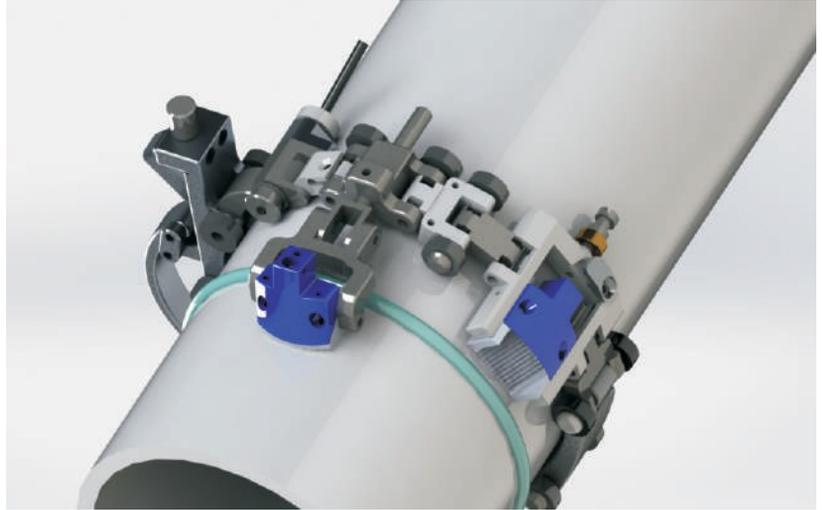


# Scanners

## CRS-25

### Chain Scanner

Applicable range OD50mm-OD500 middle and small diameter circumferential butt girth weld phased array detection, can choose a single PA probe detection and two PA probe bilateral detection according to the detection requirements; chain section can be quickly disassembled and assembled, easy to operate.



## FS-04

### Corrosion Scanner

- 7.5S64-1.0\*10 flexible phased array probe+water jacket, small pipe corrosion detection, water jackets need to
  - based on pipe OD, water jacket application range OD $\pm$ 3mm; Suitable for corrosion detection of small diameter pipe
  - OD40mm-150mm;
  - The scanner is equipped with encoder, and the magnetic wheel
  - absorbs the steel pipe with stable coupling and simple operation;
- Strong applicability. only need to change water jacket for different pipe diameter, no need to change probe.



## FS-05

### Corrosion Scanner

- 7.5C64-1.0\*10 ultrasonic phased array concave probe+ tubular corrosion detection water jacket. Water jacket change according to pipe OD, and water jacket application range
- OD $\pm$ 3mm; Suitable for corrosion detection of small diameter pipe OD40mm-150mm;
- The scanner is equipped with encoder, and the magnetic wheel absorbs the steel pipe with stable coupling and simple operation.



# FC-XY02-DD

## XY Dual-axis Automated Scanner

- Doppler XY dual-axis electric sucker automatic scanner can be used for automatic detection of composite plate, aluminium plate and steel plate by ultrasonic phased array;
- The scanner uses four vacuum suckers, easy to operate, stable and reliable;
- Two DC motors drive scanning axis and stepping axis to do two-dimensional scanning, which can set scanning step and scanning area to realize automatic scanning quickly;
- 64 or 128 element probes can be selected with wedge or water jacket for base metal detection, X/Y dual-axis encoder can do two-dimensional C-scan imaging;
- Effective scanning area 800mm\*300mm, can customize different effective scanning areas according to specific inspection needs.

## Characteristic

- Applicable for composite plate, aluminium plate and steel plate; 64 or 128 element probes can be selected with wedge or water jacket for base metal detection;
- Effective scanning area 800mm\*300mm, can customize different effective scanning areas according to specific inspection needs;
- Use vacuum suckers, easy to operate, stable and reliable; Can set scanning step and scanning area to realize automatic scanning quickly;
- X/Y dual-axis encoder can do two-dimensional C-scan imaging.



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