

# PAUT Solution for Long-Distance Pipeline Welding



As special equipment, long-distance oil and gas pipelines are widely used in petroleum, petrochemical and chemical industries.

## Difficulties

- X-Ray testing: Difficult to detect planar defects parallel to ray direction, such as unfused root; high cost and harmful to human bodies.
- Ultrasonic testing : Affected by human subjective factors; indirect defect indications; test results cannot be saved.
- Magnetic particle detection: Mainly for testing surface and near-surface weld defects, but unable to detect internal defects.

## Solution

The PAUT inspection system consists of six parts, including PA ultrasonic flaw detector, PA/TOFD probes& wedges, crawler, analysis software, water irrigation device, calibration and simulation test block.

By using special software for the PA ultrasonic flaw detector, drafting of testing process, probe calibration, and data acquisition and analysis can be easily completed. The configured chain crawler adopts the chain plus magnetic guide design, which achieve high-precision probe walking trace and stable movement, and reduce repeated scanning. The weld inspection will be achieved quickly by using the whole system.

PAUT

PA technology can cover effective welding area to ensure rapid detection of flaws.

TOFD

Accurate measurement of defect height. Unaffected by flaw orientation.

PAUT+TOFD inspection

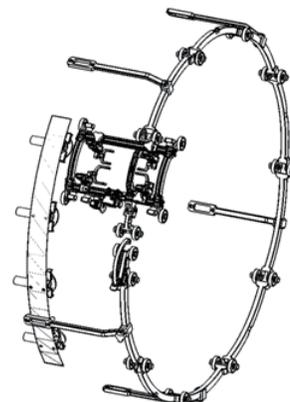
PAUT+TOFD simultaneous testing can improve testing speed & defect detection rate significantly.

Color image

Intuitive test result, without environmental pollution.

## Crawler CPS-01

- Adaptable to welds of long-distance oil and gas pipeline with thickness 12mm-40mm, nominal diameter 1000~1300mm.
- Chain plus magnetic guide design, 4 probes (2 PA probes and 2 TOFD probes) can be driven simultaneously for testing, single-side and double-side scanning of welds.
- Crawler chain links contact pipeline through high elastic rubber wheels, so as to achieve stable smooth probe moving and improve stability of probe walking.
- High-strength aluminum alloy material, strong and lightweight.
- Manual or automatic water irrigation device, maintaining uniform water output and improving coupling stability.



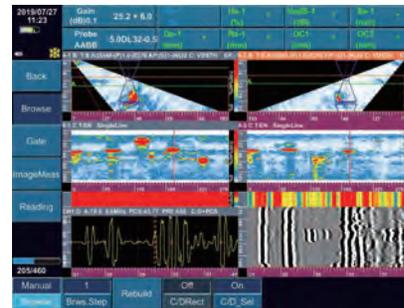
## Automatic module AUS-01

The AUS-01 is designed to work with crawler CPS-01 to perform automatic scanning on pipeline.

- Safety: Emergency stop switch and battery indicator.
- Easy to use: It is operated by simple button remote control.
- Variable speeds: 7 different scan speeds from 1m/min ~ 3.5m/min.
- Ingress Protection Rating: IP67.

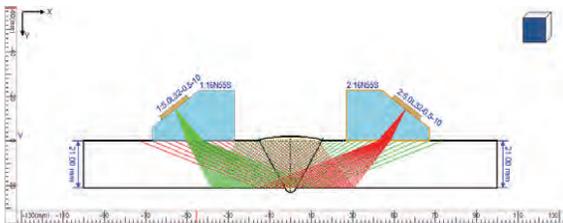


Crawler CPS-01 with AUS-01 for automatic scanning



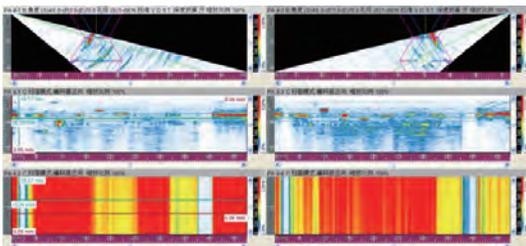
Test Result

## Data Analysis Software



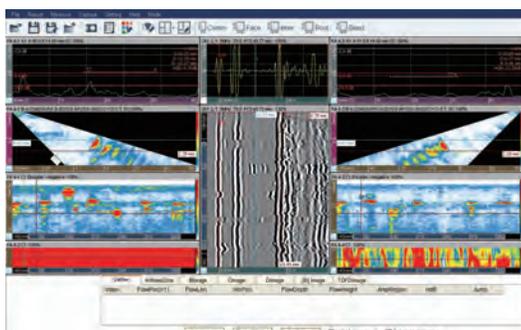
### Beam Coverage Simulation

The system software can be used for beam simulation and obtain focal laws. Beam simulation before testing ensures full coverage of the desired test area without missed testing.



### Coupling Monitoring

Probe coupling is monitored real time by system software during travelling.



### SuporUp

SuporUp can analyze and measure acquired PA and TOFD data. Rich management, measurement and analysis functions in the software are available for data playback of A, B, C, D scans and TOFD data, digital gain adjustment, imaging mode switch and multi-gate measurement, etc. Based on the measured results, a test report is generated automatically by one-press.

## On-site Application



## Ordering Information

Description	Model	Quantity
PA ultrasonic flaw detector	SyncScan/ SyncScan 2	1 unit
PA probe	5MHz probe	2 pcs
PA wedge	Angle wedge	2 sets
TOFD probe	10MHz probe (Recommended thickness < 14.5mm)	2 pcs
	7.5MHz probe (Recommended thickness < 20mm)	2 pcs
	5MHz probe (Recommended thickness > 20mm)	2 pcs
TOFD wedge	45° wedge	2 sets
	60° wedge	2 sets
	70° wedge	2 sets
TOFD probe cable	LEMO 00-LEMO 00-XX	2 sets
Crawler (Including Encoder)	CPS-01	1 set
Adapter	TQ-A006/ TQ-A020	1 set
Automatic module	AUS-01	1 set
Irrigation device	IH-05/IA-02	1 set
Analysis software	SuporUp	1 set

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