

Applications
Brochure

ADVANCED WELD INSPECTION FOR CARBON STEEL PLATES & PIPES

The solution that's got you covered through thick or thin.

Discover the all-inclusive package delivering actionable data.

THE BEYOND CURRENT SOLUTION

Eddyfi Technologies offers a wide array of advanced weld inspection solutions tailored for industries typical applications. These solutions are adaptable to a diverse range of component materials, geometries, and weld specifications. Designed to meet present-day demands and anticipate future challenges, our phased array ultrasonic testing (PAUT) and time-of-flight diffraction weld inspection solutions empower you with enhanced capability.

- One-stop shop solutions driven by technical expertise
- Streamlined workflow for setup, acquisition, and reporting
- Full support for ultrasonic testing (UT) methods including PAUT, time-of-flight diffraction (TOFD), conventional UT, full matrix capture (FMC)/total focusing method (TFM), plane wave imaging (PWI) and phase coherance imaging (PCI)
- Standard and custom probes designed in-house by our technical experts
- The most advanced software analysis in the industry
- Cypher: The most powerful PAUT instrument on the market—complete multi-mode inspection in a single pass, no splitter required

Imagine a toolkit that includes not only a state-of-the-art inspection instrument and scanner, but also specialized probes and wedges for comprehensive assessment of carbon steel plates and pipes.

Our advanced technical experts have crafted dedicated packages for typical and niche weld inspection applications, delivering highly optimized solution kits and an enhanced user experience.

Combining Cypher with the automated solution brings a new level of autonomy, thanks to seamlessly integrated piloting control.

ADVANTAGES OF PAUT FOR WELD INSPECTION

PAUT is increasingly favored for weld inspection across industries due to its significant advantages over radiographic testing (RT). Unlike RT, phased array reduces personnel exposure to ionizing radiation and minimizes production disruptions by enabling simultaneous operations, thus lowering the indirect costs of inspection. Direct cost savings stem from enhanced productivity, allowing more welds or surface areas to be inspected in a single shift. Additionally, ultrasonic technology ensures accurate detection, sizing, and characterization of indications, meeting industry standards.

Our market-leading portable instruments, including the innovative Mantis™ and Cypher®, are versatile tools for in-service inspections or at manufacturing sites. These instruments utilize advanced ultrasonic techniques such as phased array, conventional UT, TOFD, FMC, TFM, PWI, and PCI, enabling efficient and effective inspections ranging from single-sided to complex multigroup weld examinations.

ADVANCED FEATURES FOR SEAMLESS INSPECTION

- Effortless setup with unique workflow
- Streamlined calibration with unique 3-click wizards
- PWI enables high-speed TFM imaging, typically four times faster than FMC-based TFM

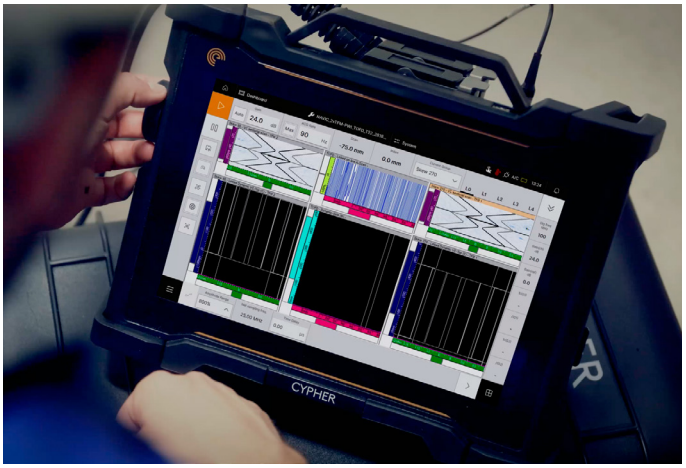

Figure 1: Unlock the fastest TFM available. Multi-group PAUT and TOFD for maximum productivity.

APPLICATIONS

- Perform inspections on welds ranging from 75mm (3in) to flat plate, covering thin, medium, and heavy walls, even at temperatures up to 350°C (662°F)
- Conduct inspections on butt welds, including circumferential and long seam configurations
- Inspect various weld types, such as single-V, double-V, TKY, and fillet welds
- Suitable for a range of industries including construction welding, shipbuilding, and wind turbine tower manufacturing

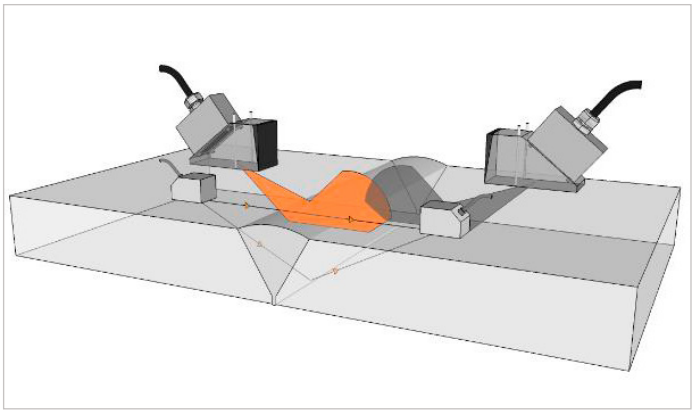

Figure 2: Multi-group setup for single-V butt weld.



Figure 3: Cypher: The most powerful PAUT instrument on the market—complete multi-mode inspection in a single pass, no splitter required.

WELD INSPECTION SOLUTIONS

Our instruments offer inspection techniques that can be implemented using manual encoded, semi-automated, or motorized (automated) scanners. Tailor your requirements - a variety of alternative scanners are available. Contact us for more information.

INSPECTION TECHNIQUES

Our scanners ensure accurate data acquisition along the weld length by providing constant and smooth encoding capability. This guarantees 100% coverage of the accessible weld, a high probability of detection (POD), precise positioning, and sizing.

Encoded solutions offer a safe inspection technique with complete coverage of a weld, including data storage for asset monitoring throughout its lifetime. The pulse echo phased array technique electronically generates multiple beam angles, similar to conventional UT, providing digital imaging for easier detection, positioning, and sizing.

TOFD can be used independently or in conjunction with phased array inspection. Both techniques complement each other effectively, maximizing the probability of detection and flaw characterization. Furthermore, FMC/TFM and PWI/TFM enhance phased array inspection for more precise defect characterization, resulting in optimal repair rates and costs without compromising inspection speed.

SEMI-AUTOMATED SOLUTION

A range of semi-automated scanner options are available to suit your requirements, offering a truly advanced, robust and versatile platform.

- From 100mm (4in) OD to flat
- Up to 4 PAUT/TOFD probes
- Easy operation and versatile
- Quick-release brakes
- Lightweight
- Option for high temperature operation up to 350°C (662°F)

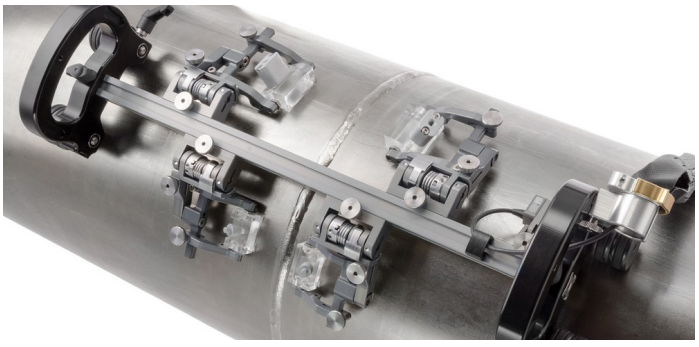

Figure 4: Circumferential scanning semi-automated carbon steel weld inspection.

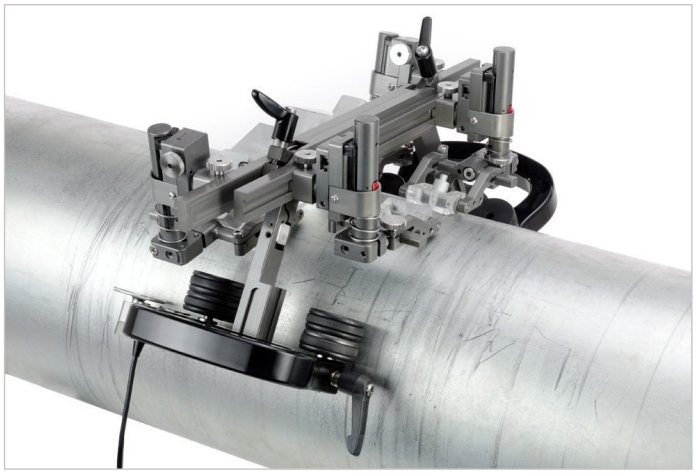

Figure 5: Long seam scanning semi-automated carbon steel weld inspection.

AUTOMATED SOLUTION

The automated, robust, field-proven NAV2 robotic scanner has been successfully deployed on various assets such as storage tanks, pressure vessels, pipelines, and other critical infrastructure.

- From 75mm (3in) to flat
- Up to 6 PAUT/TOFD probes*
- Ultra low profile
- Piloting capabilities with Cypher
- Battery operated
- Circumferential & longitudinal
- Max speed 250mm (9.8in)/sec
- Elevated temperatures up to 150°C (302°F)

*Enquire for customization



Figure 6: Automated solution featuring NAV2 scanner.

PHASED ARRAY PROBES AND WEDGES

Discover a new era of precision with Eddyfi Technolgies' high-quality NDT probes and transducers, offering a diverse range of frequencies, configurations, and connection styles: View PAUT Probe Catalog

- Eddyfi Technologies is the single-source solution for the complete PAUT inspection package
- Our probes seamlessly integrate with other Eddyfi components, ensuring optimal system performance
- We are committed to delivering high-quality products for reliable performance
- Eddyfi Technologies PAUT probes' competitive prices maximize the value for our customers
- Punctual deliveries ensure Beyond Current productivity

LINEAR ARRAY PROBES AND WEDGES

- **Thin welds:** Small footprint phased array probes (A10) for a short-approach to the weld cap
- **Medium welds:** Medium active aperture phased-array probe with the A32
- **Thick welds:** Medium and larger active aperture phased array probe (A32 and A5)

TOFD TRANSDUCERS AND WEDGES

- 5, 10, and 15MHz
- 3mm (0.12in) and 6mm (0.24in) diameter
- WST1-45L-IHC
- WST1-60L-IHC
- WST1-70L-IHC

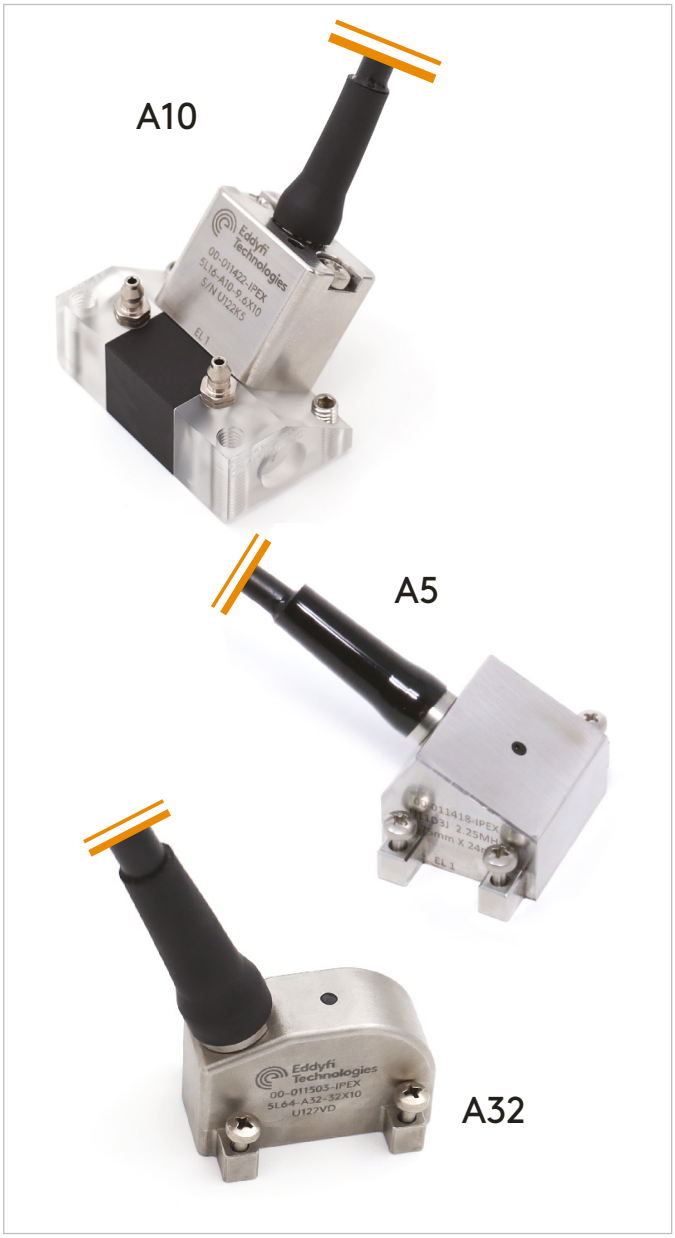

Figure 8: A10, A5, and A32 linear array probes.

ORDERING INFORMATION

Thin Wall Inspection Kit (3-10mm / 0.12-0.4in)

ITEM	DESCRIPTION
Solution kit is compatible with the following instruments: Mantis™, Cypher®, Emerald, Panther™	
10L32-A10-10X7-5-IPEX	32-element linear array probe - 10MHz - Active aperture of 10mm x 7 mm - Pitch: 0.31mm - Elevation: 7 mm - A10 casing - 5m cable - IPEX connector
WSA10-55S-FLAT-IHC	Standard wedge for A10 phased array probe - Designed for azimuthal scanning from 40 to 70 degree using SW - 55deg SW nominal angle - Irrigation, probe holder fixtures & carbides
WSA10-55S-KIT-AOD4.5-12.75-IHC	Standard wedge kit for A10 phased array probe - Designed for azimuthal scanning from 40 to 70 degree using SW - 55deg SW nominal angle – Includes one flat wedge + 6 curved wedges contoured for 4.5" to 12.75" - Irrigation, probe holder fixtures & carbides. Full range of radius wedges available
SCAN-STIX-4PA-LE	Semi-Automated weld inspection scanner. Includes 40cm rail, 4mm irrigation kit, 4 x slip joint toolposts - 8mm & 5mm mounting pins, 5m lemo Encoder cable.
BLOCK-19675-CS	Calibration block – Type ISO 19675 – Carbon Steel
COUPLANT-GLYCERIN-90ML	Couplant, liquid. Blue color. No air bubble. Quantity: 90ml - bottle.
SCAN-MANUAL-PUMP-7.9L	Manual water pump - 7.9 L - Compatible with SCAN-IRRIG-KIT-4MM & SCAN-IRRIG-KIT-6MM. Supplied as a Pump only. STIX, ROTIX and MICROBE scanners supplied with Irrigation

Thin Wall Inspection Kit (5-20mm/0.2-0.8in)

ITEM	DESCRIPTION
Solution kit is compatible with the following instruments: Mantis™, Cypher®, Emerald, Panther™	
5L16-A10-9.6X10-5-IPEX	16-element linear array probe - 5MHz - Active aperture of 9.6mm x 10mm - Pitch: 0.60mm - Elevation: 10mm - A10 casing - 5m cable - IPEX connector
WSA10-55S-FLAT-IHC	Standard wedge for A10 phased array probe - Designed for azimuthal scanning from 40 to 70 degree using SW - 55deg SW nominal angle - Irrigation, probe holder fixtures & carbides
WSA10-55S-KIT-AOD4.5-12.75-IHC	Standard wedge kit for A10 phased array probe - Designed for azimuthal scanning from 40 to 70 degree using SW - 55deg SW nominal angle – Includes one flat wedge + 6 curved wedges contoured for 4.5" to 12.75" - Irrigation, probe holder fixtures & carbides. Full range of radius wedges available.
TOFD transducers	TOFD15-3-ST1-LEMO00 -- TOFD Probe 15 MHz - 3mm diameter – M10 thread diameter TOFD10-3-ST1-LEMO00 -- TOFD Probe 10 MHz - 3mm diameter – M10 thread diameter TOFD5-6-ST1-LEMO00 -- TOFD Probe 5 MHz - 6mm diameter – M10 thread diameter
TOFD wedges	WEDGE-TOFD-45LW-ST1-IHC / WEDGE-TOFD-60LW-ST1-IHC / WEDGE-TOFD-70LW-ST1-IHC Wedges for TOFD probe, Longitudinal Wave in Carbon Steel, Rexolite, M10 thread, IHC included, Hole diameter 5mm, Fits LYNCS & Stix scanners - Full range of radius wedges available.
SCAN-STIX-4PA-LE*	Semi-Automated weld inspection scanner. Includes 40cm rail, 4mm irrigation kit, 4 x slip joint toolposts - 8mm & 5mm mounting pins, 5m lemo Encoder cable. DE15 connector available for TOPAZ.
BLOCK-19675-CS	Calibration block – Type ISO 19675 – Carbon Steel
TOFD-CBL-LEMO00toLEMO00-Pair-5M	Coaxial cables for TOFD - LEMO00 male to LEMO00 male - 5m long - Includes one double cable
COUPLANT-GLYCERIN-90ML	Couplant, liquid. Blue color. No air bubble. Quantity: 90ml - bottle.
SCAN-MANUAL-PUMP-7.9L	Manual water pump - 7.9 L - Compatible with SCAN-IRRIG-KIT-4MM & SCAN-IRRIG-KIT-6MM. Supplied as a Pump only. STIX, ROTIX and MICROBE scanners supplied with Irrigation

*Variety of options available including - SCAN-STIX-COMPLETE for non-ferrous chain scanner and magnetic circumferential weld scanning.
For manual encoded or automated options swap (*) items

ORDERING INFORMATION

Medium Wall Inspection Kit (15-35mm/0.6-1.4in)

ITEM	DESCRIPTION
Solution kit is compatible with the following instruments: Mantis-16:64PR, Cypher® with or without TFM, Emerald, Panther™	
5L32-A32-32X10-5-IPEX	32-element linear array probe - 5MHz - Active aperture of 32mm x 10mm - Pitch: 1.00mm - Elevation: 10mm - A32 casing - 5m cable - IPEX connector
WSA32-55S-FLAT-IHC	Standard wedge for A32 phased array probe - Designed for azimuthal scanning from 40 to 70 degree using SW - 55deg SW nominal angle - Irrigation, probe holder fixtures & carbides
WSA32-55S-KIT-AOD4.5-12.75-IHC	Standard wedge kit for A32 phased array probe - Designed for azimuthal scanning from 40 to 70 degree using SW - 55deg SW nominal angle – Includes one flat wedge + 6 curved wedges contoured for 4.5" to 12.75" - Irrigation, probe holder fixtures & carbides. Full range of radius wedges available.
TOFD transducers	TOFD15-3-ST1-LEMO00 -- TOFD Probe 15 MHz - 3mm diameter – M10 thread diameter TOFD10-3-ST1-LEMO00 -- TOFD Probe 10 MHz - 3mm diameter – M10 thread diameter TOFD5-6-ST1-LEMO00 -- TOFD Probe 5 MHz - 6mm diameter – M10 thread diameter
TOFD wedges	WEDGE-TOFD-45LW-ST1-IHC / WEDGE-TOFD-60LW-ST1-IHC / WEDGE-TOFD-70LW-ST1-IHC Wedges for TOFD probe, Longitudinal Wave in Carbon Steel, Rexolite, M10 thread, IHC included, Hole diameter 5mm, Fits LYNCS & Stix scanners - Full range of radius wedges available.
SCAN-STIX-4PA-LE*	Semi-Automated weld inspection scanner. Includes 40cm rail, 4mm irrigation kit, 4 x slip joint toolposts - 8mm & 5mm mounting pins, 5m lemo Encoder cable. DE15 connector available for TOPAZ.
BLOCK-19675-CS	Calibration block – Type ISO 19675 – Carbon Steel
TOFD-CBL-LEMO00toLEMO00-Pair-5M	Coaxial cables for TOFD - LEMO00 male to LEMO00 male - 5m long - Includes one double cable
COUPLANT-GLYCERIN-90ML	Couplant, liquid. Blue color. No air bubble. Quantity: 90ml - bottle.
SCAN-MANUAL-PUMP-7.9L	Manual water pump - 7.9 L - Compatible with SCAN-IRRIG-KIT-4MM & SCAN-IRRIG-KIT-6MM. Supplied as a Pump only. STIX, ROTIX and MICROBE scanners supplied with Irrigation.

*Variety of options available including - SCAN-STIX-COMPLETE for non-ferrous chain scanner and magnetic circumferential weld scanning.
For manual encoded or automated options swap (*) items.

ORDERING INFORMATION

Thick Wall Inspection Kit (25+mm/1+in)

ITEM	DESCRIPTION
Solution kit is compatible with the following instruments: Cypher® with or without TFM, Emerald, Panther	
5L32-A32-32X10-5-IPEX	32-element linear array probe - 5MHz - Active aperture of 32mm x 10mm - Pitch: 1.00mm - Elevation: 10mm - A32 casing - 5m cable - IPEX connector
WSA32-55S-FLAT-IHC	Standard wedge for A32 phased array probe - Designed for azimuthal scanning from 40 to 70 degree using SW - 55deg SW nominal angle - Irrigation, probe holder fixtures & carbides
WSA32-55S-KIT-AOD4.5-12.75-IHC	Standard wedge kit for A32 phased array probe - Designed for azimuthal scanning from 40 to 70 degree using SW - 55deg SW nominal angle – Includes one flat wedge + 6 curved wedges contoured for 4.5" to 12.75" - Irrigation, probe holder fixtures & carbides. Full range of radius wedges available.
5L32-A5-19.2X20-5-IPEX	32-element linear array probe - 5MHz - Active aperture of 32mm x 10mm - Pitch: 1.00mm - Elevation: 10mm - A32 casing - 5m cable - IPEX connector
WSA5-55S-FLAT-IHC	Standard wedge for A5 phased array probe - Designed for azimuthal scanning from 40 to 70 degree using SW - 55deg SW nominal angle - Irrigation, probe holder fixtures & carbides
TOFD transducers	TOFD15-3-ST1-LEMO00 -- TOFD Probe 15 MHz - 3mm diameter – M10 thread diameter TOFD10-3-ST1-LEMO00 -- TOFD Probe 10 MHz - 3mm diameter – M10 thread diameter TOFD5-6-ST1-LEMO00 -- TOFD Probe 5 MHz - 6mm diameter – M10 thread diameter
TOFD wedges	WEDGE-TOFD-45LW-ST1-IHC / WEDGE-TOFD-60LW-ST1-IHC / WEDGE-TOFD-70LW-ST1-IHC Wedges for TOFD probe, Longitudinal Wave in Carbon Steel, Rexolite, M10 thread, IHC included, Hole diameter 5mm, Fits LYNCS & Stix scanners - Full range of radius wedges available.
SCAN-STIX-4PA-LE*	Semi-Automated weld inspection scanner. Includes 40cm rail, 4mm irrigation kit, 4 x slip joint toolposts - 8mm & 5mm mounting pins, 5m lemo Encoder cable. DE15 connector available for TOPAZ.
BLOCK-19675-CS	Calibration block – Type ISO 19675 – Carbon Steel
TOFD-CBL-LEMO00toLEMO00-Pair-5M	Coaxial cables for TOFD - LEMO00 male to LEMO00 male - 5m long - Includes one double cable
COUPLANT-GLYCERIN-90ML	Couplant, liquid. Blue color. No air bubble. Quantity: 90ml - bottle.
SCAN-MANUAL-PUMP-7.9L	Manual water pump - 7.9 L - Compatible with SCAN-IRRIG-KIT-4MM & SCAN-IRRIG-KIT-6MM. Supplied as a Pump only. STIX, ROTIX and MICROBE scanners supplied with Irrigation.

*Variety of options available including - SCAN-STIX-COMPLETE for non-ferrous chain scanner and magnetic circumferential weld scanning.
For manual encoded or automated options swap (*) items

ORDERING INFORMATION

Manually Encoded

ITEM	DESCRIPTION
SCAN-ODI-1PA-LE	ODI scanner - 1 probe - LEMO 16 Encoder connector - Cable length 2.5m - Max Clamp Width: 55mm - Encoder Resolution: 16.0 counts/mm
SCAN-ODI-2PA-LE	ODI II scanner - 2 probes - LEMO 16 Encoder connector - Cable length 2.5m - Max Wedge Width: 45mm - Encoder Resolution: 16.0 counts/mm - Pivot button 8mm.

NOTE: DE15 connector available for TOPAZ. Recommended to add SCAN-PIVOT-BTN-KIT for ODI-2PA.

Automated

ITEM	DESCRIPTION
NAV2-SYSTEM-5M*	Automated, battery operated and remotely controlled crawler system – Includes base crawler, control box, 2 x batteries, umbilical, irrigation, cable management, joystick plus accessories. For diameters 3"+.
AUTO-WELD-KIT-4TP-STD**	Standard frame kit for Weld Inspection. Includes: Standard frame – 40cm (15.7in), 4 x Toolposts compatible with NAV2-System for circumferential inspections.
NAV2-WELD-OPT-GUIDE	Battery powered optical guide for weld inspection
SCAN-MOTORIZED-PUMP-*	The motorized couplant pump is a powered pumping unit used for supplying couplant fluid to the scanning surface. Output: 690 kPa (100 psi), 3.8 L/min (1.0 GPM). Max fluid viscosity 100 cSt. FCC, ISED, CE and UKCA Certified. NA/EU/UK Plug options.
AUTO-WELD-TRACKER	Optional - Auto Crawler Weld Tracker - providing laser-guided, automated scanning solution

*Available in 5m/15m/30m lengths - Add medium temperature kit for surface temperatures above 50°C (122°F).
**Other variants available - recommended to add SCAN-PIVOT-BTN-KIT
Camera bolt-on option available

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Beyond current