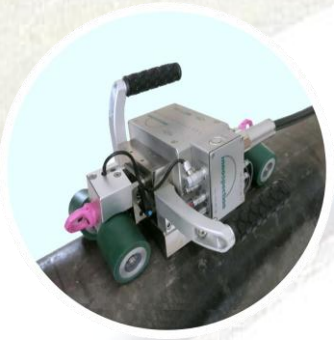
Pipeline & Pressure Vessel Inspection

MEC-Pipescanners



Key Features & Benefits

- High defect detection sensitivity in pipes
  - with diameter ranging from 1" to flat surfaces
  - with wall thickness up to 19mm
  - coating thickness up to 8mm
  - experience with temperatures up to 170 deg C
- High inspection speed of approx. 20m/min
- Average accuracy of +/- 10%
- Detection capability for internal and external defects from < 10% wall loss depending on wall thickness and defect size from Ø 3mm
- Ability to inspect different steel materials (carbon, stainless, duplex and super duplex)
- Ability to detect pitting, cracks and various types of corrosion like CO_2, microbiological and ammonium chloride salt corrosion, under deposit corrosion
- Ability to detect internal and external defects in both horizontal and vertical pipes and vessels
- Minimal surface preparation prior to inspection

MEC-Pipescanner

The range of MEC-Pipescanners is designed and built for the high speed and high performance inspection of pipelines and pressure vessels. Based on the Magnetic Eddy Current (MEC) technique which is the next generation and a further development of the fast corrosion mapping SLOFEC™ technique, the MEC-Pipescanners enable the detection of internal and external defects, including very small diameter and volume isolated internal pits with wall loss from 10% onwards.

The MEC technique is dynamic electromagnetic technique that operates on a high frequency Eddy Current field with a controlled direct current magnetic field and specially developed sensors to achieve a very high sensitivity in defect detection. The Eddy Current signal analysis within the multiple sensors enables not only the higher defect detection capability but also the direct sizing of topside and underside defects at a higher wall thickness and coating thickness range.

The MEC-Pipescanners provide clear distinction between internal and external defects. They are able to inspect carbon steel, stainless steel and duplex steel materials, including through non-magnetic coatings such as GRP, rubber and paint. Direct surface coupling is not necessary due to its electromagnetic principle. With its comprehensive reporting software, accurate, reliable and repeatable inspection results are provided in real time. The advanced colour condition mapping report provides an analysis of both the detected external and internal defects in terms of size, wall loss severity and location.

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Technical Specifications

	MEC-P9	MEC-P13	MEC-P19
GENERAL SPECIFICATIONS			
Dimensions (L x W x H) mm (without handgrips)	318 x 431 x 121 318 x 190 x 113	381 x 531 x 141 NA	427 x 293 x 189 427 x 217 x 124
Weight	11 kg	23 kg	33 kg
No. of sensors	4	4	8
Sensor width	22.4 mm	20 mm	18.7 mm
Scanning width	90 mm	100 mm	150 mm
Typical wall thickness range *[1]	0 – 9 mm	0 – 13 mm	0 – 19 mm
Use for diameter	1" – flat	4" – flat	4" – flat
Magnetisation Unit	Permanent Magnet System		Electromagnetic System
SIGNAL CABLE			
Max. cable length *[2]	40 metres	40 metres	40 metres
Weight	0.3 kg/m	0.3 kg/m	0.3 kg/m
EDDY CURRENT UNIT, COMPUTER & POWER SUPPLY UNIT			
Electronic	EddyIQ 3.0 advanced multiple channel eddy current electronic system with power supply unit		
Computer	Industrial laptop system connected via TCP/IP port to electronic system station with laptop based separately and connected via the scanner umbilical		
TYPICAL FAR SIDE DEFECT DETECTION SENSITIVITY AT MID WT RANGE			
Typical smallest defect size *[3]	~ Ø 3 – 5 mm	~ Ø 3 – 5 mm	~ Ø 4 – 6 mm
Typical smallest defect depth *[4]	From 10% - 20%	From 10% - 20%	From 10% - 20%
Max. stand-off / coating	3– 5 mm	4 – 6 mm	6 – 8 mm

*[1] Refers to the typical wall thickness range of standard material; may vary depending on material quality.

*[2] The length of cable is divided into sections of 20m; extended cable length available on request.

*[3] Refers to possible detectability, depending on scanner stand-off, quality of material and general surface condition.

*[4] Refers to possible detectability, depending on general surface condition.

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Advantages of MEC Technique

The MEC technique is a dynamic electromagnetic technique that operates on high frequency magnetic field controlled Eddy Current in combination with specially developed sensors able to generate a higher density Eddy Current field. As a result, the MEC technique offers the following advantages over MFL.

- **Lower Direct Current magnetic field**
  The MEC technique generates a lower direct current magnetic field than MFL which enables the following:
  - Higher wall thickness inspection
  - Larger stand-off inspection
  - Less influence from the inspection surface
  - Higher detection of small and shallow defects on either side of the pipe or vessel surface

- **Higher frequency Eddy Current**
  The high frequency Eddy Current that the MEC technique operates on offers the following advantages:
  - Differentiating and mapping internal / external defects separately
  - Discriminating defects and non-defect indications such as inclusions and laminations through the use of the signal phase
  - Very low influence of the defect shape on the defect detection
  - High defect detection sensitivity of > 3mm pits from 10% wall loss
    - With a POD of > 90% for defects Ø > 5mm and > 20% wall loss
    - Accuracy of defect sizing of +/- 10% for onsite reporting and +/- 5% for special offline analysis

- **Direct assessment of detected defects**
  The MEC technique enables the direct sizing of the defects without the need for Ultrasonic verification

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