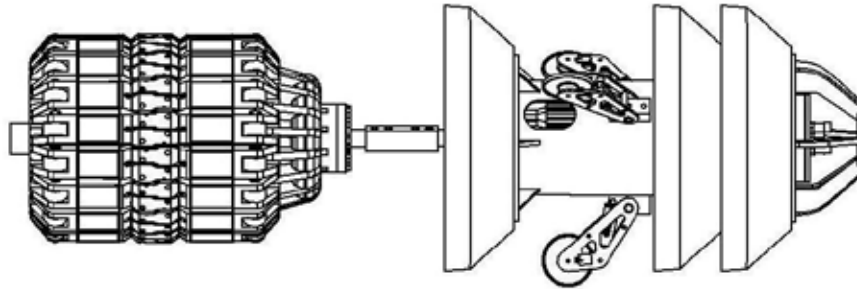


## 20" Magnetic Flux Leakage Inspection Tool



General		
Pipeline size	20	inch
Tool length	1654	mm
Weight	390	kg
Number of bodies	2	
Inertial unit	3d mapping standard accuracy <sup>1</sup>	
Maximum runtime	24 <sup>(expandable)</sup>	hrs
Transmitter time		hrs

Pipeline specifications		
Maximum pipe length	230 <sup>(expandable)</sup>	km
Minimum bore	390	mm
Minimum bend radius	1.5D	
Velocity range <sup>2</sup>	0.1-4	m/s
Temperature range <sup>3</sup>	0 - 60	°C
Maximum pressure <sup>4</sup>	300	bar
Minimum back pressure	20	bar
Required differential launch pressure	2	bar

Measurement specifications		
Direction of magnetisation	Axial	
Direction of magnetisation	Tri-axial hall	
Maximum wall thickness for accurate measurement	19	mm
Magnetisation level at maximum wall thickness	10	kA/m
Axial sampling frequency, variable	1600	Hz
Circumferential sensor spacing	4	mm
Internal / External discrimination	Eddy current based	
Pressure measurement accuracy	± 1	bar
Temperature measurement accuracy	± 2	°C

Location accuracy		
Marker System	Time benched GPS	
Odometers	3 channels	
Location accuracy <sup>5</sup>	0.1	%
Accuracy to girth weld	0.1	m
Clock position resolution	± 5	°

<sup>1</sup> refer to 3D & inertial datasheet, GPS mapping available on request

<sup>2</sup> recommended operating range is 0.2-1.5 m/s

<sup>3</sup> higher temperatures available on request

<sup>4</sup> higher pressures available on request

<sup>5</sup> relative to closest above ground marker

Sizing accuracy is dependent on external factors, such as contamination of pipeline and operational conditions or heavily patterned seamless pipe. The following table specifies the sizing accuracy in terms of percentage of wall thickness (t) at 80% confidence level for welded pipe and seamless pipe.

### Sizing accuracy in welded pipe

<i>Feature</i>	<i>Minimum depth at 90% POD</i>	<i>Depth sizing accuracy</i>	<i>Length sizing accuracy</i>	<i>Width sizing accuracy</i>
General metal loss	5%	± 10%	± 10mm	± 10mm
Pitting	10%	± 10%	± 10mm	± 10mm
Axial grooving	10%	± 10%	± 10mm	± 10mm
Circumferential grooving	10%	± 10%	± 10mm	± 10mm
Axial slotting	20%	± 10%	± 10mm	± 10mm
Circumferential slotting	10%	± 10%	± 10mm	± 10mm
Corrosion near girth welds	20%	± 10%	± 10mm	± 20mm

### Sizing accuracy in seamless pipe

<i>Feature</i>	<i>Minimum depth at 90% POD</i>	<i>Depth sizing accuracy</i>	<i>Length sizing accuracy</i>	<i>Width sizing accuracy</i>
General metal loss	15%	± 10%	± 10mm	± 10mm
Pitting	15%	± 10%	± 10mm	± 10mm
Axial grooving	15%	± 10%	± 10mm	± 10mm
Circumferential grooving	15%	± 10%	± 10mm	± 10mm
Axial slotting	20%	± 20%	± 10mm	± 10mm
Circumferential slotting	15%	± 10%	± 10mm	± 10mm
Corrosion near girth welds	20%	± 20%	± 10mm	± 20mm

The minimum defect size for internal and external discrimination at 80% confidence level.

### Internal/External discrimination minimum defect sizing

Detection threshold	2 mm
Minimum Defect length L	24 mm
Minimum Defect width W	30 mm

**Identification of features**

<i>Feature</i>	<i>Yes POI &gt;90%</i>	<i>No POI &lt;50%</i>	<i>Possibly 50%&lt;POI&lt;90%</i>
Internal / external discrimination <sup>6</sup>			■
Metal loss feature in body of pipe	■		
Metal loss feature in weld area	■		
Metal loss pipe mill feature	■		
Mid wall feature			■
Grinding	■		
Gouging	■		
Dent / Dent with metal loss	■		
Spalling			■
Axial crack		■	
Circumferential crack			■
Eccentric pipeline casing	■		
Fitting	■		
Sleeve	■		
Valve	■		
Tee	■		
Bends (5D or less)	■		
Close metal object	■		
Clock position of longitudinal seam weld	■		
Girth weld	■		
Patch	■		

<sup>6</sup> Reduced accuracy nearby welds