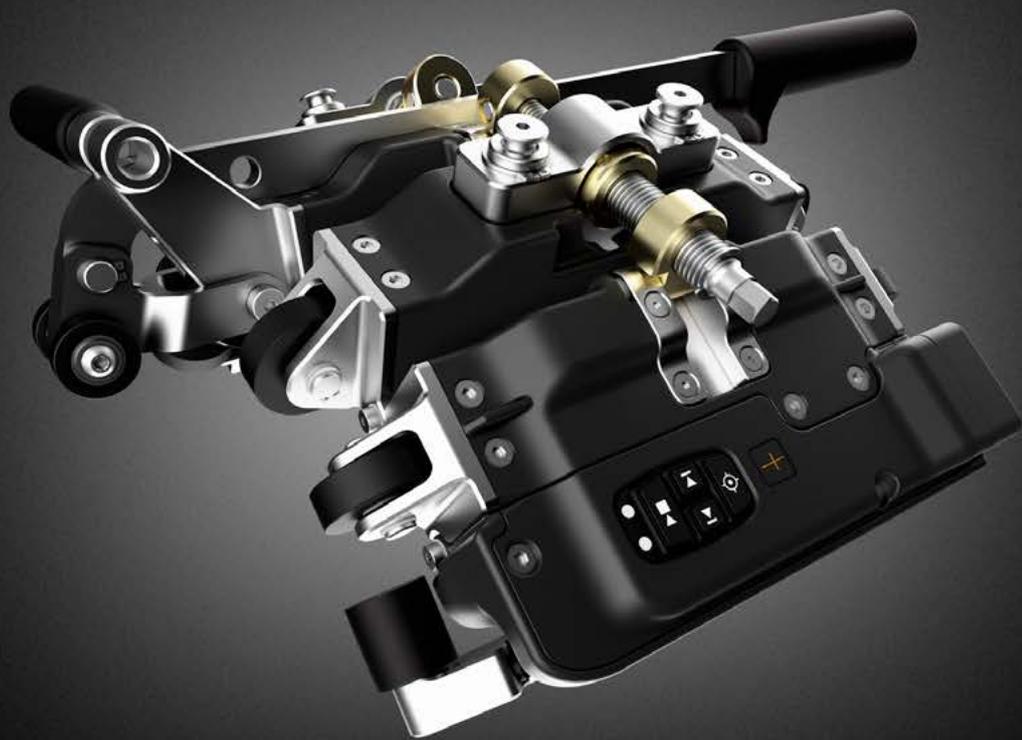


PIPESCAN HD & SWIFT M

MFL Data Acquisition Instrument



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1. WHAT'S IN THE BOX

Instrument Box

- Silverwing Swift-M
- 2x Rechargeable Smart Lithium Ion Battery 10.8V
- Power Supply 6.6A with Fischer connector
- Touchscreen microfiber cleaning cloth
- Stylus
- Documents

Scanner Box

- Pipescan HD
- Adjustment tool
- Adjustment gauge

2. SWIFT M OVERVIEW

Front View

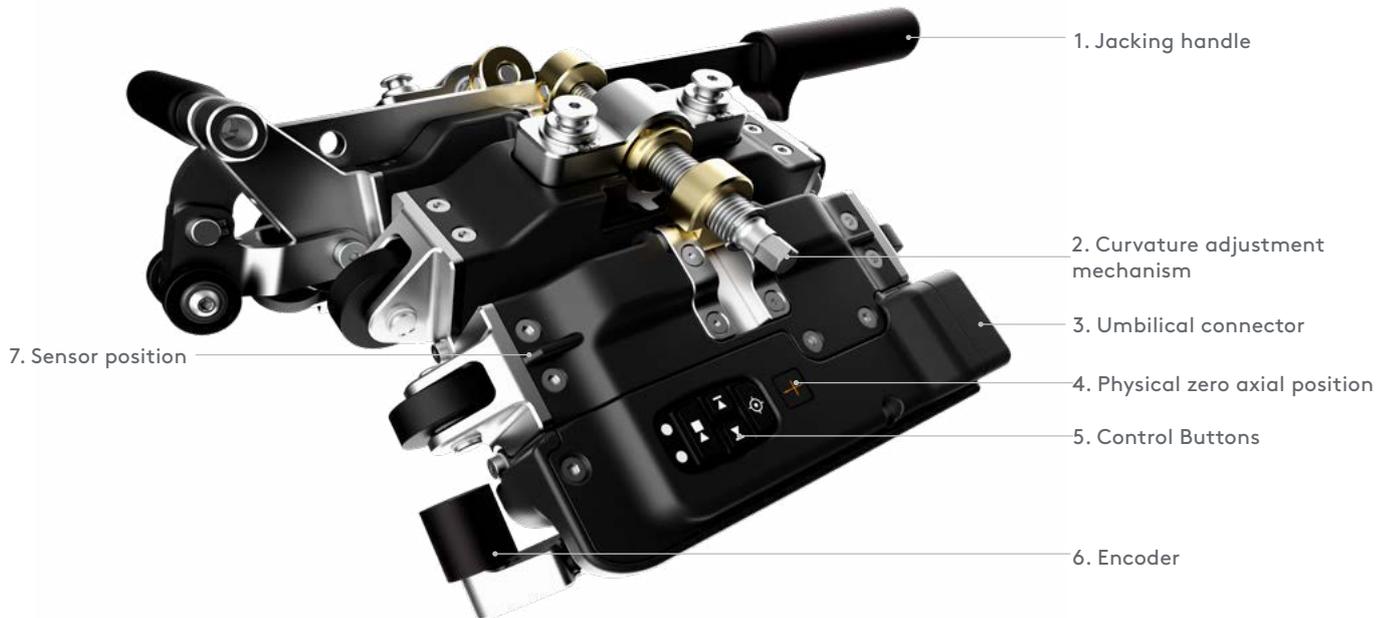


Connectors and Batteries



3. PIPESCAN HD OVERVIEW

Pipescan Head



- 1. Jacking handle, use upon deployment and removal of the Pipescan Head.
- 2. Curvature adjustment mechanism, used to adjust the curvature of Pipescan head to match the inspection surface outer diameter.

The Pipescan head should be adjusted to nominal OD while the head is not on the inspection surface. Adjusting the curvature while on the part could damage the mechanism due to the strength of the magnets being attracted by the surface. Final fine-tuning can be done on the inspected part.

- 3. Connector for detachable umbilical cable (not to be used as handle).
- 4. Label for scan direction and physical zero axial position.
- 5. Control buttons.
- 6. Detachable optical encoder.

- 7. Sensors positions, sensor #1 and #28 are indicated by the position of the fins on the first and last bridge).

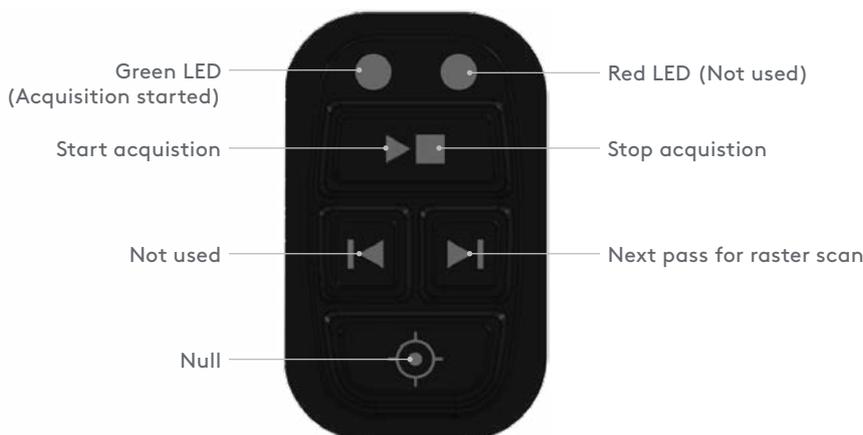
*The top of the C-Scan displayed on the instrument corresponds to the sensor closer to the electronic module of the head.

WARNING

Pinch Hazards & Powerful Manets. The Pipescan system utilises powerful magnets and as such presents an inherent trap risk. Care must always be taken when handling and using the Pipescan system.

Removal/Deployment jacking handle. Due to the powerful magnets involved, the handle used to deploy and remove the Pipescan head from the surface can exhibit a strong force and present a finger trap. It is recommended to only use the black handles on the removal/deployment handle when attempting to remove or deploy the Pipescan.

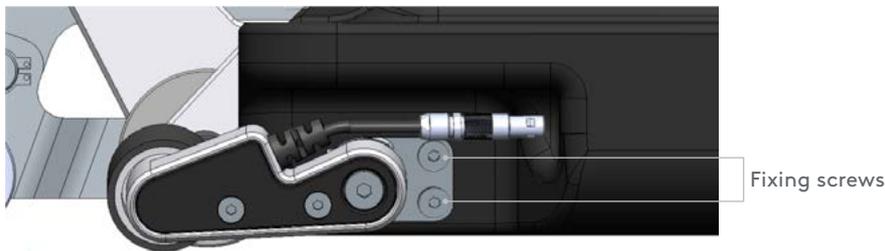
Control Buttons



Detachable optical encoder



How to install and remove from scanning head



The encoder is fastened to the Pipescan on the side of the electronic module.

Install the encoder prior to deploying the head on the part to inspect to have easy access to the slot.

To do so, position the encoder's fixation bracket in its slot and fasten using the two allen screws (1), as shown.

Connect the encoder's connector. Make sure that red dots on connector and receptacle are aligned when doing so.

To remove, simply disconnect the connector and remove the two allen screws.

Cable



Maintenance of Scanning Heads

Magnets attract dirt. When deemed necessary during inspection or after an inspection, clean the reading surface and magnet with soft cloth.

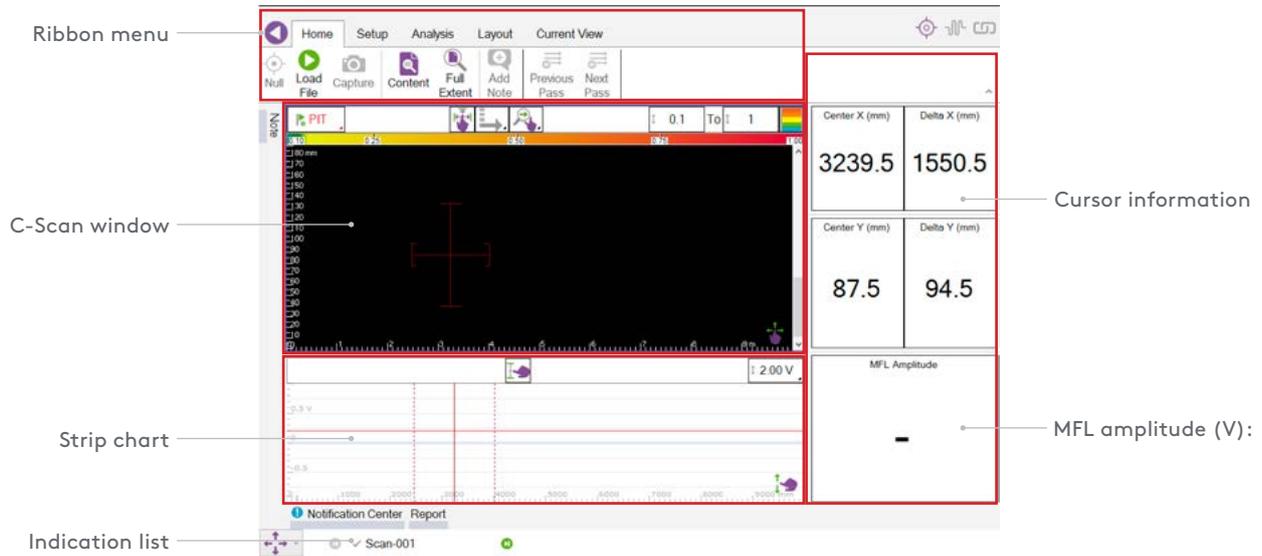
Do not immerse Pipescan HD.

Always follow general precautions and safety precautions during maintenance of the probe.

Wheels can also be replaced if required. If needed, spare parts can be ordered directly from Eddyfi Technologies.

4. SOFTWARE OVERVIEW

Home Screen



Setup Menu



1. **New:** Setup a new inspection.
2. **Probe:** Select probe/scanner from library.
3. **Scan:** Setup scan option, eg raster, length and data view.
4. **Indication:** Editable list of indication classifications
5. **Defect Indication:** Indication information.

Analysis Menu



1. **Previous:** Move backward through C-Scan indications.
2. **Next:** Move forward through C-Scan indications.
3. **Report Detections:** Add all indication above threshold to report.
4. **Remove Detections:** Remove all indications above threshold to report.
5. **No defect:** Classifying an indication as not a defects.
6. **Review:** N/A.
7. **Add Note:** Add general note to C-Scan.
8. **Capture:** Screen shot of current view.

Layout



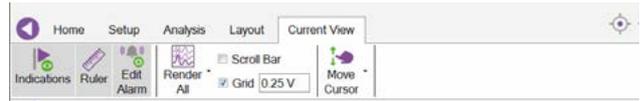
1. **Resize:** Size select window.
2. **Data:** Provides the user will information relating to the inspection and display the list of datafiles (acquired or to be acquired if list created beforehand).
3. **Report:** This option allows the suser to see the report table as the inspection is compiled.
4. **Notification:** This option displays the notification centre (sse at the bottom of the screen in the image above).
5. **Note:** Allows the user to attach notes to the C-Scan

Current View C-Scan



1. **Adjust cursor:** Centres cursor.
2. **True Proportions:** Removes any zoom application.
3. **Content:** Shows the entire content of the captured data.
4. **Palette:** Allows entry to colour palette controls that affect C-Scan image.
5. **Ruler:** Displays vertical and horizontal axes.
6. **Scroll bar:** Displays scroll bar to allow user to locate and analyze all captured data.
7. **Indications:** Allows indications above threshold to be automatically identified.
8. **Show Palette controls:** Display the colour pallet settings.
9. **Move Cursor:** Change of cursor position and size.
10. **X axis :** N/A

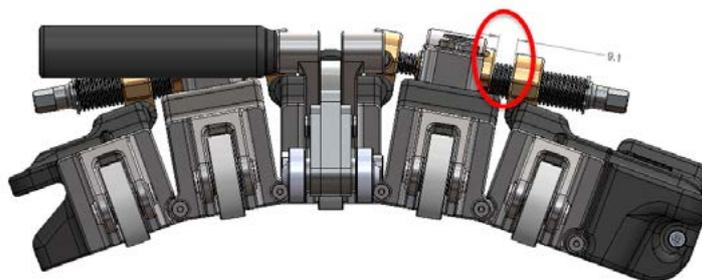
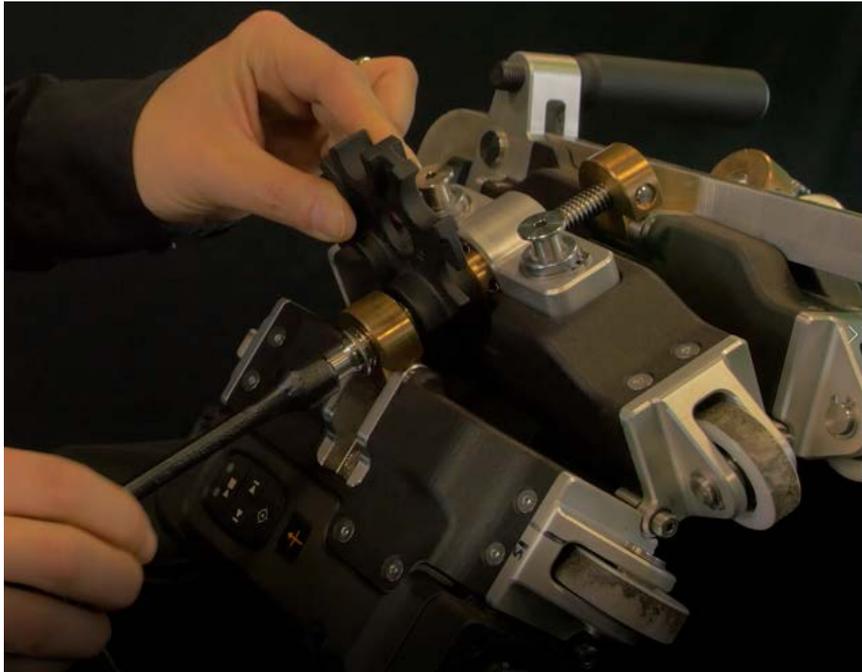
Current View Stripchart



1. **Indications:** Allows indications above threshold to be automatically identified.
2. **Ruler:** Displays vertical and horizontal axes.
3. **Edit Alarm:** Allows user to set alarm position to identify indications.
4. **Render All:** Displays the signal response from each sensor.
5. **Scroll Bar:** Displays scroll bar to allow user to locate and analyze all captured data.
6. **Grid:** Displays horizontal grid lines across the stripchart.
7. **Move Cursor:** Allows change of cursor position and size.

5. PIPESCAN SETUP

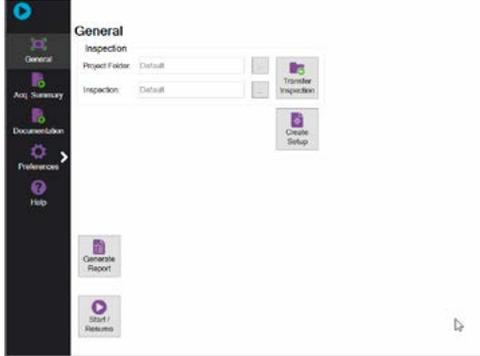
1. Adjust the head curvature to the desired diameter. Always make the initial adjustment away from the inspection surface to ensure longevity of the curvature mechanism.
 - 1.1 **Adjustment using the gauge** included with the system: Place the gauge between the outer posts and tighten until the posts touches the gauge. Repeat on the other side of the system.
 - 1.2 **Adjustment using a ruler**: If you can't find the gauge or if the diameter needed is not on it, use a ruler and adjust the system. The measurement must be taken between the outer posts, on each side of the system. Refer to the table below for the adjustment details.
2. Place the scanner on the inspection surface and fine tune the fitting so that all the wheels rotate when being pushed.



3. Ensure the encoder is making contact to the inspection surface.
4. Connect the umbilical to the Pipescan.
5. Connect the other end of the umbilical to the instrument.

6. WORK FLOW - SOFTWARE

1. Power on the instrument.
2. Enter inspection details:
 - 2.1 Project Folder
 - 2.2 Inspection

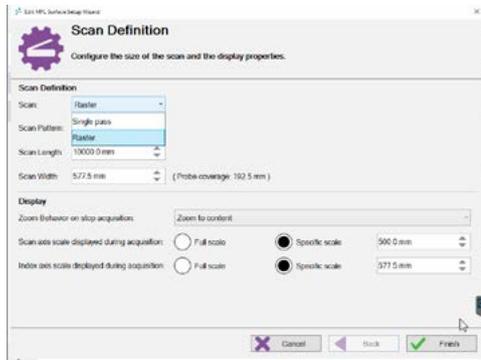


3. Select Create Setup

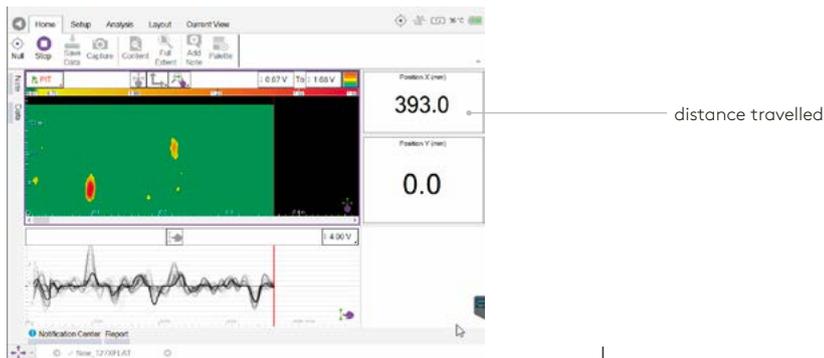
3.1 Select Probe



3.2 Configure Scan definition



4. When the Probe is ready to perform the first (Setup scan) scan press the Acquire button  then push the scanner.



5. When the scan is complete press the Stop button 

6. The image on the screen should now represent the scanned area.

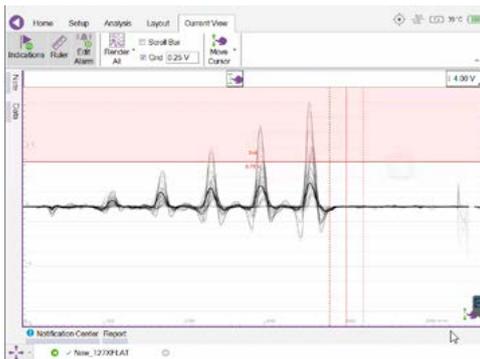


- current position of the cursors in the C-scan (X-axis)
- width of the cursors in the C-scan in the scan (X-axis)
- current position of the cursors in the C-scan (Y-axis)
- height of the cursors in the C-scan in the index axis (Y-axis)
- signal amplitude measured in the MFL C-scan at the cursor position.

7. After the first scan there are three main set up requirements.

- 7.1 **Cursor:** Size the cursor to the required size. To change the size of the cursor the user can select either  or use the hardware button capability option on the bottom left hand side of the Screen.
- 7.2 **C-Scan colour palette:** Change the color palette to Filter out unwanted data. To use the colour palette select the Palette button in the ribbon.
- 7.3 **Strip chart alarm:** There maybe a requirement to set an alarm in the strip chart meaning any indications above this alarm are automatically 'tagged' as indications of interest. To set the alarm.
 - i Select the strip chart (user will see a purple perimeter around the strip chart viewing pane)
 - ii Select Current view (last tab available)
 - iii Select Edit alarm

The user can then move the red alarm line as desired.

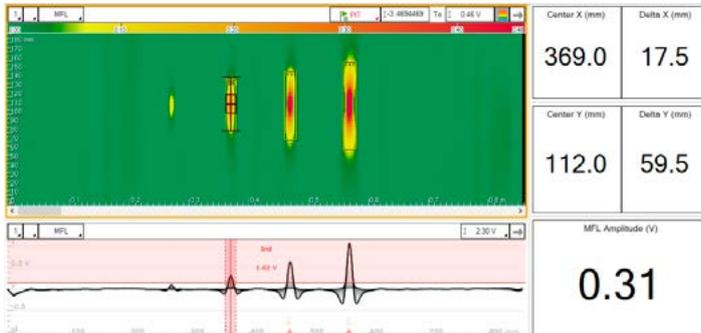


8. When these requirements are as desired the system is ready to Acquire inspection data.

7. ANALYSIS AND REPORTING

At the end of the job, a report listing all the indication is generated, providing information on their position in a comprehensive table.

The below datafile shows 4 indications with a diameter of 22 mm and a depth of 20%, 40%, 60% and 80% of the wall thickness. The threshold line has been adjusted so that the 20% indication is not reported, only what has a greater volume will be highlighted in the C-scan.



1. Go to the backstage, general tab then select Generate Report.
2. In the Table profile drop-down menu, select Surface screening.
3. Go back to the frontstage.
4. Once the threshold position is confirmed, go in the Analysis ribbon.
5. Click on Report Detections. This will add all indication highlighted by a yellow box in the report.
6. Open the report (In the Layout ribbon, make sure that the Report is activated, then open the report by clicking on the small Report tab at the bottom of the screen).



The report provides the following information:

- Filename: indication from all files of the inspection folder can be added in the same report.
- Index: Numerical increment for each indication added to the report (automatically generated by the software, cannot be modified).
- Code: All indications automatically detected by Magnifi will be called Ind. If defects are manually added to the report, the code name will be the one selected by the analyst when adding the entry.
- Channel/C-scan: Indicates from which view the indication comes from.
- X pos. (mm): Gives the center position of the indication in the scan direction, from the zero position of the scan.
- Y pos. (mm): Gives the center position of the indication on the index axis, from the zero position of the scan.
- X length (mm): Gives the width of the indication box.
- Y length (mm): Gives the height of the indication box.
- Comments: This field is editable. Operators or analysts can type comments if needed (e.g. add depth value after UT proofing).

Note: The screenshot function is not available for the indications that are automatically reported by software. To be able to use the screenshot function, the indications shall be converted into defects by adding defects manually in the report.

8. USEFUL INFORMATION

PIPESCAN PERFORMANCE

| | PS-HD-MFL-127XFLAT | PS-HD-MFL-73X127 | PS-HD-MFL-48X63 |
|--------------------------------|---------------------------------|------------------------------------|-----------------------------------|
| OD range (real value) | 127 mm to flat (5.0 in to Flat) | 73 mm to 127 mm (2.875 in to 5 in) | 48 mm to 64 mm (1.9 in to 2.5 in) |
| Max recommended wall thickness | Up to 12.7 mm (0.5 in) | Up to 8.56 mm (0.337 in) | Up to 6.05 mm (0.238 in) |
| Maximum coating thickness | 6 mm (non magnetic material) | | |
| Number of channels | 27 | 17 | 9 |
| Channel spacing | 7 mm (0.27 in) | | |
| Maximum surface temperature | 60°C (140°F) | | |

SETUP GUIDE

| Model | Pipe nominal OD | Real OD | Distance between posts on pipescan head | |
|--------------------|------------------|--------------|---|------------|
| | NPS | (in/mm) | (in/mm) | |
| PS-HD-MFL-48X63 | 1.5 | 1.9/48.26 | To max open position | |
| | 2.0 | 2.375/60.33 | 0 | |
| | PS-HD-MFL-73X127 | 2.5 | 2.875/73.03 | 0.543/13.8 |
| | | 3.0 | 3.5/88.90 | 0.378/9.6 |
| | | 3.5 | 4.0/101.6 | 0.276/7.0 |
| PS-HD-MFL-127XFLAT | 4.0 | 4.5/114.3 | 0.189/4.8 | |
| | 4.5 | 5.0/127.0 | 1.15/29.2 | |
| | 5 | 5.563/141.30 | 1.067/27.1 | |
| | 6 | 6.625/168.28 | 0.937/23.8 | |
| | 7 | 7.625/193.68 | 0.839/21.3 | |
| | 8 | 8.625/219.08 | 0.76/19.3 | |
| | 9 | 9.625/244.48 | 0.697/17.7 | |
| | 10 | 10.75/273.05 | 0.634/16.1 | |
| | 12 | 12.75/323.85 | 0.547/13.9 | |
| | 24 | 24.0/609.6 | 0.319/8.1 | |
| | 36 | 36.0/914.4 | 0.224/5.7 | |
| Vessel | 6ft | 72.0/1828.8 | 0.130/3.3 | |
| | 4ft | 96.0/2438.4 | 0.106/2.7 | |
| | 10ft | 120.0/3048 | 0.091/2.3 | |

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