

# ProMAC™ Multi-Arm Caliper Tools



Available with either HD (High-speed Digital) or PTX telemetry, the ProMAC Multi-Arm Caliper tools are the latest generation of Probe electromechanical cased hole logging instruments for measuring the internal profile of the tubing, casing and completion assembly.

A multi-finger caliper log of the inside of a completion enables operators to cost-effectively plan work-over and remedial operations, and to keep historical records of the general condition of tubing and casing in order to assess any problems associated to corrosion, wear or mechanical deformation through the life of the well.

A series of independent radial measurements provided by the caliper arms, also commonly referred to as “fingers”, yields a detailed image of the inspected well that can be presented in various formats, including a cross-section of the casing and a 3-dimensional, color-enhanced visualization for tubulars ranging from 1¾-in. to 13½-in. internal diameter.

The ProMAC series tools are currently only available in the 24-finger configuration with an extended range of measurement. The tool has an overall 1-11/16 in (43.0 mm) O.D. to be able to traverse completions ranging from 1.75 to 7.0 in I.D. (44.5 to 177.8 mm). Caliper tools in 40 and 60-finger configurations will also be available in 2020.

As a ProMAC tool logs the internal profile of the completion, the actuation of each finger is converted to an individual electrical signal. The signal is converted into a calibrated radial measurement that is transmitted in a data frame that consists of a frame identifier, individual finger channels, electronics temperature data and a checksum, at a rate of 50 frames per second on HD (or at 10 frames per second on PTX). Directional data is acquired simultaneously and can also be included in the log presentation.

ProMAC tool data can be acquired in real-time on surface read-out with the standard Warrior™ cased-hole logging panel, or in memory mode (memory only available on HD). In either case downhole data can be plotted and processed using Warrior™ software.



	MAC24	MAC40 <sup>(1)</sup>	MAC60 <sup>(1)</sup>
<b>Mechanical Specifications</b>			
Outside diameter, in [mm]	1.69 [43]	2.75 [69.85]	3.75 [95.25]
Length, ft [m]	5.1 [1.55]	5.3 [1.62]	7.46 [1.66]
Weight, lb [kg]	25 [11.3]	80 [36.3]	135 [61.2]
Temperature rating, °F [°C]	350 [177]	350 [177]	350 [177]
Pressure rating, psi [MPa]	15,000 [103]	20,000 [138]	20,000 [138]
Number of fingers	24	40	60
Casing Range, in [mm]	Standard fingers: 1.75 – 7.0 [44.45 – 177.8]	Standard fingers: 3.0 – 9.63 [76.2 – 244.6]	Standard: 4.0 – 11.75 [101.6 – 298.4]
<b>Measurement Specifications</b>			
Output	Primary: Internal casing radii, inclination and rotation Secondary: Head voltage, internal temperature		
Logging speed, ft/min [m/min]	Recommended: 30 [9.14], Maximum: 60 [18.28]		
Radial resolution, in [mm]	0.001 [0.025]		
Radial accuracy, in [mm]	0.02[0.5]		
<b>Electrical Specifications</b>			
Sensor Type	DVRT		
Power, W	2-3		
	<b>PTX</b>	<b>HD</b>	
Voltage, VDC	120	18-50	
Vertical resolution, in [mm] (at recommended logging speed)	0.6 [15.2]	0.12 [3.0]	
Sampling rate (frames per second)	10	50	

NOTES: (1) MAC40 and MAC60 commercial launch planned for 2020, some specifications may change