PRX-300

AUTOMATED DC PROXIMITY PROBE TESTER

DATASHEET · REV 4
ISF · DSL · PASS / FAIL
API 670 computation basis
Runs on the AT-2040 touchscreen



The PRX-300 checks a proximity transducer system across its whole linear range, automatically. The probe is clamped in a fixed holder and a motorised AISI 4140 target steps away from it in 10 mil increments. At every point the AT-2040 reads the driver's DC output, and at the end it reports the incremental scale factor of every segment, the deviation from straight line and a PASS / FAIL verdict against API 670 limits – with a PDF test report for the calibration record.

MEASUREMENT

Measured quantity	Proximity driver DC output vs. probe gap
Test range	0 to 90 mil in ten 10 mil steps (10 points), starting at the -1 V reference gap
Reference gap	Found automatically – the target finds the probe and settles at the -1 V point
Per-point sequence	Each point is read only after the target has fully settled, and averaged
Voltage input	AT-2040 DC input reading the driver output directly – no external DMM or PC
Probe reach	Long target travel, so short probes set far back in the holder are still found

COMPUTATION – API 670 BASIS

Incremental scale factor (ISF)	mV/mil for every 10 mil segment, 0-10 through 80-90 mil. **Every segment is judged on its own** – an average cannot hide a bad one
Average scale factor	Least-squares slope over 10-90 mil, reported and judged against the same tolerance
Deviation from straight line (DSL)	Worst point deviation from a line of nominal slope placed by the minimax rule, in mil, over 10-90 mil
Acceptance presets	1-5 m systems: ISF ±5 %, DSL ±1 mil. 9 m systems: ISF ±6.5 %, DSL ±1.5 mil. Nominal ISF (default 200 mV/mil) and limits adjustable; last settings remembered
Verdict	PASS / FAIL with the failing criterion and segment named

MOTION AND PROTECTION

Homing	The target homes before every test, so a carriage moved by hand during probe set-up cannot affect the result
Travel protection	Travel limits are enforced in the motion controller, so the target cannot be driven past the end of its stroke
Screw slip check	After every test the target returns to its home reference and the controller checks that it arrives where it should. Any slip of more than 0.5 mil during the test fails the result

MEASURED REPEATABILITY (Agate data, see note 2)

Segment ISF, same set-up	±1.2 mV/mil (±0.6 %) at 95 %, worst segment
Segment ISF, probe re-seated	±1.5 mV/mil (±0.75 %) at 95 %, worst segment
Average ISF	±0.35 mV/mil (±0.17 %) at 95 %
Point repeatability	0.01 – 0.04 mil (1 sigma) per gap point
Screw slip, return to home	0.0001 – 0.0004 mm on every run

RESULTS AND RECORDS

On screen	PASS / FAIL banner with Max ISF, Average ISF and DSL tiles; output-vs-gap plot, DSL chart and per-segment table
Test report	PDF for every test: verdict, test information, criteria, results, plots, point table and signature line. Export PDF or raw CSV to a USB drive from the Reports screen
Calibration record	Probe, driver and cable serial numbers, cable length and technician, entered before the run

PHYSICAL AND ORDERING

Host	AT-2040 test system (touchscreen, DC input, report storage and export)
Controller link / power	Serial link to the AT-2040; 12 V via USB-C Power Delivery
Probe holder	Adjustable V-block clamp for probe bodies from 5 mm to 19 mm (3/16 to 3/4 in) diameter, metric or imperial, threaded or smooth; height-adjustable to centre the probe on the target
Target	Supplied with an AISI 4140 steel target, the API 670 reference material (0.99 in diameter, black oxide, 1/4-28 stud). Other target materials available on request: 4340 and 1018 / 1045 carbon steel, 410, 416 and 17-4 PH stainless, 304 / 316 stainless and Inconel 718, or a sample of your own shaft material
Size	240 x 60 x 107 mm (9.4 x 2.4 x 4.2 in) on rubber feet
Weight	900 g (2.0 lb), tester only
Supplied with	PRX-300 tester, 12 V supply, steel target, calibration certificate, Pelican 1400 case with custom foam

1 API 670 is a standard of the American Petroleum Institute. The PRX-300 computes ISF and DSL using its definitions; it is not certified or endorsed by API. **2** Repeatability measured by Agate on 2026-10-30: 10 runs on one 8 mm 9 m system, including removing and re-seating the probe and holder. These are repeatability figures, not a full measurement-uncertainty statement. **3** The proximity system's own tolerance (for example ±6.5 % ISF on a 9 m system) includes the interchangeability of probe, cable and driver; test each set as it will be used. Specifications subject to change.