

TLC SCANNER

Model # HY-3

**ACCEPTS PAPER CHROMATOGRAMS, TLC PLATES,
AND ELECTROPHORESSES**

- SCANS UP TO SIX TRACES SIMULTANEOUSLY
- THREE DETECTOR TYPES FOR ANY NUCLIDE
BETAS: H-3, C-14, P-32, etc...
GAMMAS: Fe-55, I-125, Tc-99m, etc...
- HIGH PRECISION AT ALL SPEEDS DUE TO
DIGITAL DRIVE
- WILL DETECT LOWER LEVELS THAN ANY
PREVIOUS SCANNER

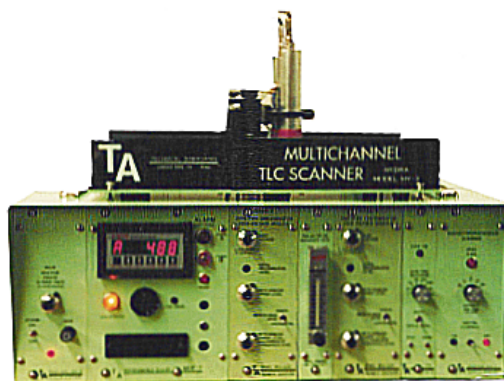


Figure 1: HY-3

APPLICATION: TRACER METHODOLOGY IN BIOCHEMISTRY, BIOMED AND CLINICAL LAB, RADIOPHARMACY AND NUCLEAR MEDICINE

The HY-3 allows samples and standards to be spotted on the same TLC and plotted together on the same strip chart, thus giving exact comparison between peak locations and heights in the samples and standards. It also allows up to six paper strips to be counted simultaneously, thus substantially decreasing the time as compared to serial paper strip counters. Use in electrophorogram scanning grants the same benefits.

Sensitivity is extremely broad. Travel increment and dwell time of the sample under the detector are controllable over a broad range. This system is useful for any isotope and allows unattended scanning of even very low level chromatograms.

GENERAL DESCRIPTION: The HY-3 series instruments are automatic scanners for TLC's, gels, paper chromatograms and electrophoreses. A moving 10" x 20" table carries two 20cm x 20 cm TLC's or other samples in controlled steps under a bridge, examines traces on the sample and transfers information to printer or strip chart recorder. Detectors are interchangeable. Normally supplied are TF-1212 gas flow detectors sensitive to all betas except tritium. Also available are the thin window scintillation detectors which are highly sensitive to low energy gammas (such as those from I-125, Tc-99m, etc...) and are also very sensitive to betas above 200KeV.

FEATURES:

- ULTRA-SENSITIVE - WILL DETECT:
80 picoCi of H-3
3 picoCi of C-14
1.5 picoCi of P-32
1.5 picoCi of I-131
- SPARTIAL RESOLUTION: 1MM
- LARGE 10" X 20" TABLE
- COMPLETELY AUTOMATIC
- GM or GAS FLOW or SCINTILLATION DETECTORS
- QUANTITATIVE - EASY INTEGRATION OF AREA UNDER PEAK
- MAY BE INTERFACED TO COMPUTER OR COMPUTING INTEGRATOR

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TECHNICAL ASSOCIATES

7051 ETON AVENUE * CANOGA PARK, CA 91303 TELEPHONE (818) 883-7043 * FAX(818) 883-6103

\$Revision: 1.2 \$

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A unique feature of the hydra series scanners is the digital **step control of movement**. The sample (as well as the strip chart) is advanced a preset distance (1, 2, 5, or 10mm), then counted for a time presettable from one second to 3000 seconds (1, 3, 10, 30, 100, 300, 1000, 3000 sec.), allowing variations from a very rapid scan to a slow scan for the greatest accuracy even in extremely low level samples. Readout may be via a **10" wide Chart Recorder** with all parallel samples presented on one chart, or may be as numbers in a **digital printer**, or interfaced with a **data processor or computer**.

Another unique feature of the hydra series scanners is the ability to read out digitally, in addition to, or instead of, chart recorder readout. With low activity samples, the count time may be as long as 3000 seconds per position. A set of collimators is furnished with each detector giving resolution from 1mm to the full 6mm diameter of the detector. Wider detectors for streak scanning are also available. The strip chart readout is presented in the form of a histogram allowing rapid quantitation so other type summation is not necessary. Also, the digital scaler which is an integrating strip chart recorder is available. The digital system utilizes the most frequently used fully computer compatible bus for direct hook-up to micro-processor, computing integrator or computer.

Each scanner consist of four primary functional sections:

1. The **moving table and its control mechanism** (all modular) together with the detector mounting bridge and locating mechanism.
2. The **modular electronics package** consisting of bias supplies for detectors, plus amplifiers, signal conditioners, ratemeters, and counters for detectors.
3. The **detectors** themselves, which may be sealed thin-end window GM tubes, gas flow counters, or thin window scintillators. The proper choice of detector allows excellent counting efficiency for practically all nuclides.
4. The **hard copy** presentation and its interface; consisting of multichannel strip chart recorder or digital printer or output to computer or data processor.

SPECIFICATIONS:

I. TABLE AND CONTROL MECHANISMS:

Samples accepted: one to two 20cm plates in series, one to six strips up to 40cm long in parallel, or up to 12 strips up to 20cm long.

Table Dimensions:	25.4cm x 50.8cm
Case Dimensions:	53cm x 30cm D x 30cm H
Weight:	20 kg.
Modules and Components:	MSP-5 Power Supply.
Housed in Table Transport	MCL-5 Motor Drive Control Logic
Cabinet:	MTM-5 Translator-Controller exactly synchronizes motors of table and chart recorder; step lengths 1, 2, 5, 10mm (equivalent table speeds are from 3mm/sec to 1.2mm/hr), or table can be moved manually in a continuous fashion. MTR-5 Digital Drive Motor. Table and Drive Chain. Detector Mounting Bridge. Case.

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II. MODULAR COUNTING-ELECTRONICS PACKAGE:

- Dimensions:** 16cm for one channel to 43cm for six channels.
- Weight:** 10 kg. (depends on number of channels)
- Modules:** All modules are T/A's standard FM-5 modules as follows:
MVR-5R High Voltage bias supply continuously variable 0-2000 V exactly resettable, also supplies operating voltages for the various modules $\pm 12V$, $\pm 5V$.
MPT-5E times. Count times (same as table and recorder dwell times): 1, 3, 10, 30, 100, 300 1K, 3k seconds.
Additional optional FM-5 modules may be added:
MGA-5 single channel analyzer.
- Ratemeter Systems:** MAM-5 Ratemeter (one for each detector) ranges: 0-500, 5000, 50000, 500000 cpm full scale.
Time Constants: Continuous variable to 20sec.
- Digital Systems:** MSM-5 Scales (one for each detector) 5 digits plus overflow indicator; counts to 199,999.

III. DETECTORS:

- Three Basic Detector Types:** GM, Gas Flow, Scintillation.
- Mounting:** 1 to 6 detectors mount on detector bridge directly above chromatogram.
- Distance Above TLC:** Continuously and repeatable adjustability by screwdriver from 2cm down to contact between detector face and chromatogram.
- Lateral Position:** Continuously and repeatable adjustability along 26cm long linear track, and firmly held in place.

See Chart for complete Specifications.

IV. HARD COPY READOUTS:

Strip Chart Recorder - Model RCR-5

8" wide, digital drive, travel distance matches TLC traverse rate exactly, time shared if more than one counting head.

- Stepping Speeds:** Same as Sample Table.
- Dwell Time:** Same as Sample Table.
- Outputs:** Can drive additional distant meter or chart recorder. Pulse train information for a counter
Transfer pulses. Timing information.

Digital Printer for One or Two Channel System - Model MPM-5

- Date:** 4 digits plus overflow.
- Position:** 2 digits reads in mm.
- Outputs:** Rs-232 serial output.
Parallel Line BCD.
Pulse Train.
Pre-settable contact closure if peak exceeds a certain value.

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Digital Printer for Three to Six Channel System - Model MPD-40.

Complete Computer Analysis System:

Separate, independent counters for each detector on Data acquisition PC card. Complete data acquisition, analysis, display, recording, and printing.

OVERALL SYSTEM SPECIFICATIONS:

Shipping Weight: Depending on Model, 25-40kg.

Power Requirements: 50-60 hz 110 VAC (220 VAC optional).

MODEL:	T-1212	GF-1212	PGS-7
DETECTOR:	GM	Gas Flow*	Na(Tl) Scintillation
SENSITIVE DIAMETER: T-1212 T-1210	6mm ⁽¹⁾ 25mm	6mm ⁽¹⁾	6mm ⁽¹⁾
WINDOW THICKNESS:	1.5-2.0mg/cm ²	windowless	5mil Al; 35mg/cm ²
SENSATIVE MATERIAL:	Halogen Quenched Geiger Gas	Any Standard Proportional or Geiger Counting Gas ⁽²⁾	NaI(Tl): PGS-7, 2mm thick PGS-76, 6mm thick Better for gamma >200KeV
MAX # MOUNTABLE ON SINGLE BRIDGE:	6	6	4
TYPICAL BACKGROUND COUNT RATE IN .02mR/hr FIELD (very low): T-1212 T-1210	1/2 - 1cpm 20cpm	1/2 - 1cpm	PGS-7 140cpm PGS-76 400cpm
RADIATIONS DETECTED & MIN. ENERGIES:	Alpha, Beta (140KeV), Gamma <1% efficiency	Alpha, Beta (40KeV), Gamma <1% efficiency	Beta (200KeV), Gamma (5Kev)
TYPICAL NUCLIDES DETECTED:	C-14 Co-57 P-32 Ca-45	H-3 C-14 and all nuclides shown for T-1212.	Fe-55 I-125 Tc-99m I-131
COLLIMATORS AVAILABLE:	1mm dia. 2mm dia. 4mm dia. 1mm slot Other on Request	1mm dia. 2mm dia. 4mm dia. 1mm slot Other on Request	1mm dia. 2mm dia. 4mm dia. 1mm slot Other on Request
SHIELDING:	Available	Available	Available

*For Geiger or Proportional Use.

(1) Wider detectors with longer slot collimators are available for scanning streaked plates.

(2) Gases available from Technical Associates or any large gas company.



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ISOTOPE:	C-14	P-32	I-131	H-3**	C-14**	I-125	Tc-99m
APPROX. SYSTEM							
SENSATIVITY:	10-20%	38%	32%	1/2-3%	30-40%	15%	PGS-7: 5% PGS-76: 10%
APETURE MINIMUM QUANTITIES DETECTABLE IN picoCi:							
5mm ⁽³⁾	60-120	60	60	700-4200		1,200	1,600
1mm ⁽³⁾	1,200	600	600	7,000-42,000		2,000	2,600
5mm ⁽⁴⁾	3	1.5	1.5	80		150	100
1mm ⁽⁴⁾	0.01	0.005	0.005	0.3		0.45	0.3

**Self-absorption in the chromatography medium is the limiting factor in sensitivity for C-14 and Tritium.

⁽³⁾Minimum activity which can be **quantitatively measured with good accuracy** in an overnight scan.

⁽⁴⁾Minimum activity which can be **detected** with 95% confidence in an overnight scan.

GM - Betas: All betas that penetrate the window will count.

Gas Flow - Betas: All betas that go into the detector will count.



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