

Technical Specifications Equivalent to Teledyne ISCO System Components

1. Equivalent to Teledyne ISCO Optical Unit Type 11

The Type 11 Optical Unit is a fixed-wavelength absorbance optical unit designed for use with the Teledyne ISCO UA-6 Absorbance Detector.

It provides reliable UV detection for analytical and preparative chromatography as well as density-gradient fractionation with high sensitivity and stability for detecting 146S particles.

Technical Specifications:

- Light Source: Mercury vapor lamp
- Wavelengths: 254 nm and 280 nm standard; optional filters up to 660 nm
- Flow Cell: Slip-in quartz flow cells with removable windows, 5mm pathlength
- 254 nm & 280 nm source screens and filters
- Mounting: Compatible with UA-6 detector socket and cabling
- Operating Conditions: As per UA-6 detector environmental specifications
- Accessories: Spare filters, mercury lamp, and quartz flow cells

2. Equivalent to Teledyne ISCO UA-6 UV/VIS Absorbance Detector

The UA-6 Detector provides precise dual-beam absorbance measurements over the UV/VIS range.

It is equipped with interchangeable wavelength filters and supports chart recording and slope detection for fraction collection.

Technical Specifications:

- Detection Type: Dual-beam, fixed-wavelength absorbance detector
- Wavelength Range: 214 nm to 660 nm via filters
- Sensitivity: 0.002 AU full-scale; up to 2.0 AUFS
- Linearity at 254nm: Error ± 1.5 % of full scale (maximum deviation measured at midpoint of 2.0 absorbance range)

- Noise Specifications for the Type 11 Optical Unit: $\pm 10 \times 10^{-5}$ AU - 254 nm (Reference 8×10^{-5} ASTM)
- Accuracy: $\pm 3\%$ of full-scale, all ranges
- Range-to-Range Tracking: $\pm 2\%$ of reading
- Noise Filter: Bessel (time delay) type. Selectable 0.5, 1.5, and 5.0 seconds RISE TIME settings (10 to 90% full-scale response)
- Stability (baseline drift after 8-hour warm-up at constant ambient temperature): 2×10^{-3} AU maximum in 4 hours, 254 or 280 nm wavelengths. 4×10^{-3} AU maximum in 4 hours, all wavelengths
- Integrator Output: 1.0 VDC/Absorbance unit; $\pm 3\%$ of scale plus $\pm 2\%$ of reading
- Flow Cells: Dual flow cells with quartz windows
- Tubing: Different sizes for different connections, tubing connectors, connector nuts, and ferrules
- Maintenance: Replaceable lamp and filters

3. Peristaltic Pump

A laboratory-grade peristaltic pump is required for delivering the chase solution in density-gradient fractionation and to maintain a stable flow through the optical system.

Technical Specifications:

- Type: Bench-top peristaltic pump with three channels
- Flow Rate Range: 0.1 mL/min to 25 mL/min with adjustable flow rate
- Pressure: Up to 0.2 MPa (30 psi)
- Tubing: Compatible with 1/16" and 1/8" PTFE or silicone tubing
- Control: Manual and remote control (analog or TTL start/stop)
- Power: 110/230 V selectable
- Glassware: 3 x 1000 ml Teledyne glass bottles

4. Brandel Tube Piercer

The Brandel Tube Piercer enables bottom-piercing of centrifuge tubes for controlled upward displacement of gradients.

It integrates with the Teledyne ISCO optical system for continuous absorbance monitoring during fractionation.

Technical Specifications:

- Construction: Stainless steel piercer tip with replaceable components
- Automatic/semi-automatic piercing mechanism for ultracentrifuge tubes
- Compatibility: Compatible with standard Beckman polypropylene ultracentrifuge tubes (1/2 X 2 in or 13 X 51 mm)
- Connections: PTFE/silicone tubing interfaces to peristaltic pump and detector
- Mounting: Adjustable tube stand, with piercer holder/needle table, retaining unit, tube piercer ring and collar
- Direct connection to the pump and optical unit
- Accessories: Replacement tips, O-rings, and ferrule kits

5. Computer, Software and Data Acquisition requirements

The system should include a PC and compatible software for real-time data acquisition and control. The software enables capture of absorbance traces, quantification in µg/mL, and electronic record storage.

Technical Specifications:

- PC with Windows 11
- Connectivity with Ethernet

Software

- Data Capture: Real-time acquisition (≥ 10 Hz sampling rate)
- Peak Detection: Integration with UA-6 slope-sensing output or software algorithm for quantitative analysis
- Compatibility: Windows 10/11 compatible; USB/serial interface
- Export Formats: CSV, PDF, or standard chromatogram formats

- Cable: Banana cable with start button cable
- Compliance: Supports user login, method logging, and audit trail functions
- Support: Vendor-provided updates and technical support

6. Recommended Accessories and Spares

- The stand for the system
- Reference cell
- Spare mercury lamps and wavelength filters (254 nm, 280 nm)
- Quartz flow cells and O-ring kits for the Type 11 optical unit
- Brandel piercer tips and tubing sets
- Peristaltic pump tubing kit (1/16" and 1/8")
- Vendor installation, IQ/OQ validation, and training support

7. Services Required

- Delivery and installation at the site
- IQ/OQ documentation support (if available) and user manuals
- User training for operators
- Minimum of 12 months warranty

8. Supplier Response

- Compliance statement (Yes/No) for each requirement
- Technical datasheets for quoted items
- Quotation including pricing, delivery time, and warranty terms
- Service and maintenance support details