MiniPro

Pilot scale or Small scale GMP manufacturing from a benchtop

Configurable for pilot or small scale production

Designed for easy cleaning and maintenance

Configured for simultaneous in-line dilution and gradient operations for high performance and reduced cost

User-friendly software meets U.S. FDA 21 CFR Part 11 requirements

Includes complete documentation for regulatory submission

The MiniPro system by VERDOT combines versatility, precision and rock-solid performance in a benchtop chromatography system.

The system is configurable as:
- Pilot scale with flow range 1-60 LPH
- Small scale GMP manufacturing processes with flow range 5-120 LPH

MiniPro chromatography system in Process configuration

Complete System

The MiniPro system by VERDOT Ips² includes all hardware and software necessary in a stand-alone system. A standard laptop PC presents the complete user interface in a graphical, easy to learn system. SCADA software is used to run the chromatography process, to collect batch data (audit trail) and to communicate with the PLC.

The stainless steel cabinet with closed design allows easy cleaning in the process environment.

Modular Concept

The flexibility of VERDOT Ips² design offers the possibility to adapt the MiniPro chromatography system to multiple processes. In addition to the standard configuration, the following options are available (see Fig.1):

- 4 additional outlet valves
- Pressure sensor (after column)
- Air sensor (after bubble trap)
- Additional pH conductivity and temperature sensors (before column)
- Additional refractometer can be installed as an option
- Integration possible with fraction collector

Each option includes the required combination of hardware and software modules.

All standard and optional components have been validated on the VERDOT Ips² test platform.

Wide flow range

The flexible design of the equipment allows to work with multiple flow rates and column diameters, with pilot or process configuration, as shown in Table 1.

With pilot configuration, the pumps are volumetric and can achieve high precision flowrate with no need of flowmeter control.
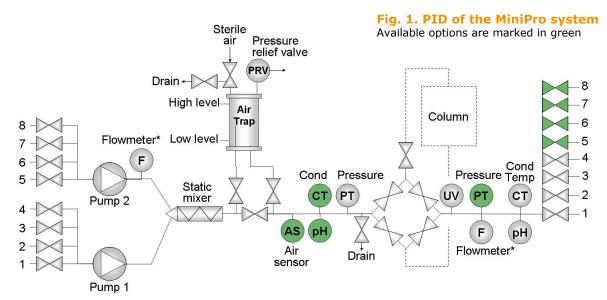
With process configuration, the membrane technology pumps can achieve high precision flowrate with flowmeters control.

Table 1. MiniPro System vs Standard PilMod columns by VERDOT

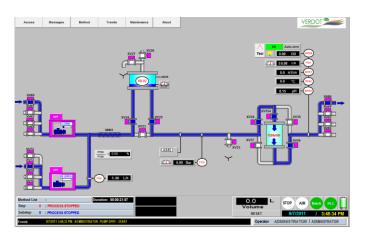| Column diameter, mm	Linear speed, cm/hr	
	With pilot configuration	With process configuration
100	13-764	64-1528
140	6-390	32-780
200	3-191	16-382

Fig. 1. PID of the MiniPro system

* Flowmeters are only implemented with process configuration. The volumetric pumps of the pilot configuration don't require flowmeters

System controller screen

User-friendly software

The system controller employs a simple, user-friendly interface for data input and programming commands.

The process system is password protected (four customizable access levels), and all events and actions are recorded in accordance with cGMP guidelines.

The software allows the system to be operated in manual or automatic mode. The automatic mode includes:

- Multiple steps
- Configurable fluid paths
- Control of valves
- Multiple end-of-step conditions
- Pausing and halting alarms
- Interactive pausing steps
- Compliant with 21 CFR Part 11

The standard equipment includes full trend review, printing and data export from the system.

Pre-programmed routine for testing and calculating Asymmetry and HETP values is included.

Key data can be monitored remotely through OPC UA.

Specifications

Nominal Flow rate	Pilot: 1.5-60 L/h
	25-1000 mL/min
	Process: 5–120 L/h
	83.3-2000 mL/min
Operating pressure	Up to 6 bar at column inlet
Flowmeter accuracy	± 2% of the measured value
Dilution accuracy	± 3% of the measured value
Tubing after pumps	ID 4.8 mm
Temperature range	2ºC–30ºC (60ºC for CIP)
Pumps	Pilot: Piston pumps
	Process: Membrane pumps
UV wavelength range	190–500 nm
Conductivity range	0–500 mS/cm 0–14
pH range	0–14
Pressure sensor	-1 to 9 bar
Bubble trap	50mL (pilot) / 200mL (process) with:
	• 2 level capacitive sensors
	• drain & air injection valves
Valves	Pneumatic membrane valves
Static Mixer	Stainless steel
Air sensor	Optical fiber technology
Fittings	Sanitary fittings
Material and certificates	Plastic parts: PEEK, PFA, FEP
	Elastomers: EPDM, PTFE
	Stainless steel: 316 L
	Bubble trap: Glass
	Gasket: FDA compliants, USP Class VI
Surface finish	Ra<0.4 µm
Degree protection	IP54
Weight	135 kg
Dimensions (H x W x D)	808 x 646 x 1060 mm
Power supply	220V-1p-50/60Hz (or 115V-1p-50/60Hz)
Air supply	6 bar
Control	PLC: OMRON
	SCADA: iFIX 5.8 on Laptop
Support	4 feet, installation on a lab table

www.verdotips2.com • support@verdotips2.com