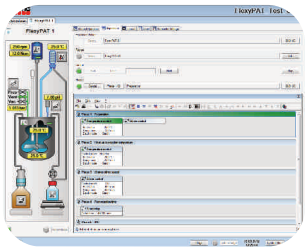
FlexyPAT

Covers all your automation needs

FlexyPAT stands for a modular and flexible process automation technology (PAT). In addition to customised all-in-one solutions, the modular concept facilitates the integration of existing customer-owned hardware. Not only does this reduce the cost but it also speeds up the automation process and increases user acceptance.

Your advantages

- Maximum possible availability for use thanks to intelligent interfacing
- Perfect for "on-demand" use thanks to plug & play philosophy
- Existing devices can be integrated
- Forward-looking thanks to easy, economically priced expansion options
- Up to 6 reactors can be controlled via a single PC



Typical areas of application

- Process development
- Process engineering
- Process Analytical Technology (PAT)
- Scale-up/Scale-down
- Kilo-lab/small-scale production
- Morphology
- Thermal-physical process technology

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The Tool

Turn-key

A standardised, automated lab reactor is also available as a product-based turn-key system (process automation tool) that is also ideally suited for use as an "on-demand" solution in rotating laboratories – for rotating users.

System Components

The FlexyPAT as a turn-key product contains the following components:

- Reactor frame with integrated electronics and docking mechanism for the mobile sub-frame
- FlexySys application software with basic functionality
- Computer with Windows 7 and MS Office [1]
- Mobile sub-frame for use in a floor-standing cubicle or for transport [1]
- 1 litre double-jacketed reactor, glass, complete [2]
- Heating/cooling thermostat for –20°C to 200°C, complete [2]
- Stirrer motor up to 2000 rpm [2]
- One function set for gravimetric metered addition, with pump and balance [2]

Applications

- Process development
- Process engineering
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[1] optional
[2] other ranges/volumes/materials on request

The Technology

Customized

FlexyPAT is a modular process automation technology that enables automated customer-specific lab reactor systems to be implemented in a very cost-effective manner, including with the integration of existing devices.

Functions/Options

- Temperature regulation, jacket or reactor
- Stirrer revolution speed measurement and regulation
- Stirrer torque measurement
- Gravimetric or volumetric controlled addition
- pH measurement and control
- Meticulous logging
- Automatic distillation with reflux divider and boiling point detection [1]
- Pressure/vacuum measurement and control [1]
- Hydrogenation function [1]
- Isothermal heat flow calorimetry [1]
- Automatic solubility curve calculation [1]
- Option to integrate online sensors (turbidity measurement, midIR FTIR, particle size measuring device, etc.) [1]

Modules

- UVM universal module
- 8x universal plug-in slot space for measuring input of temperature, voltage and current or measuring output of voltage, current, digital On/Off
- COM communication module
- 4x RS232 connections to communicate with peripheral devices
- NET network module
- 5x network connections for 10/100M Ethernet
- PSM power supply module

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Layouts

FlexyPAT Caddy as bench-top model

Operation using a tablet (Wi-Fi)

FlexyPAT Trolley

FlexyPAT modules

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FlexyPAT - the advantages

Smart Interfacing

FlexyPAT uses „$F_{connect}$“ connection technology. Its intelligent sensor identification function makes it easy to connect the required sensors and enables the universal use of the available inputs/outputs – a philosophy of high cost-efficiency combined with a high level of user-friendliness.

User-Friendly

The basic functions can be expanded in a great variety of ways

- A customer-specific, cost-efficient solution thanks to its modular concept
- A secure, forward-looking investment thanks to expandability at any time
- User-friendly thanks to built-in intelligent interfacing using „$F_{connect}$“

FlexyPAT Tool - technical specifications

Supply voltage	100 – 240V ±10%, 50 – 60Hz
Power consumption (max.)	2,400W (10A)
Power capacity (provided for stirrer, metered addition, scales, etc.)	2,000W
Temperature range	10 – 35°C
Humidity	80% (non-condensing)
Protection class	IP44
Surface finish	stainless electro-polished/powder-coated
Dimensions of FlexyPAT Tool (excl. mobile trolley)	550 mm (W) x 835 mm[1] (H) x 500 mm (D)
	Alternatives[2]: customised design, also for narrow space conditions
Weight	30 kg (depends on expansion stage)
Measuring input, temperature	x4, resolution 0.01 K, range −150°C – 400°C
Measuring input, voltage	x8[3], resolution 25 mV, range 0 – 10 V
Measuring input, current	x8[3], resolution 50 mA, range 0 (4) – 20 mA
Control output, voltage	x8[3], resolution 25 mV, range 0 –10 V
Control output, current	x8[3], resolution 50 mA, range 0 (4) – 20 mA
Control output, digital On/Off	x8[3], 24V, 2A
FlexyBUS expansion connections	x2
Network connections for 10/100M Ethernet	x2, RJ45, for CAT 5e cable
RS-232 connections (to communicate with stirrer, thermostat, scales, etc.)	x4

[1] Arch height and suspension mast can be dismantled if necessary, lower heights also available

[2] FlexyPAT in modular construction (see picture "FlexyPAT modules"; page 3) allows customized reactors and frame options, even for very tight spaces

[3] Two measuring inputs for current and voltage and three control outputs for current, voltage and “digital On/Off” are available for each socket. The number of inputs and outputs actually accessible when using preassembled cables (recommended) is smaller.

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