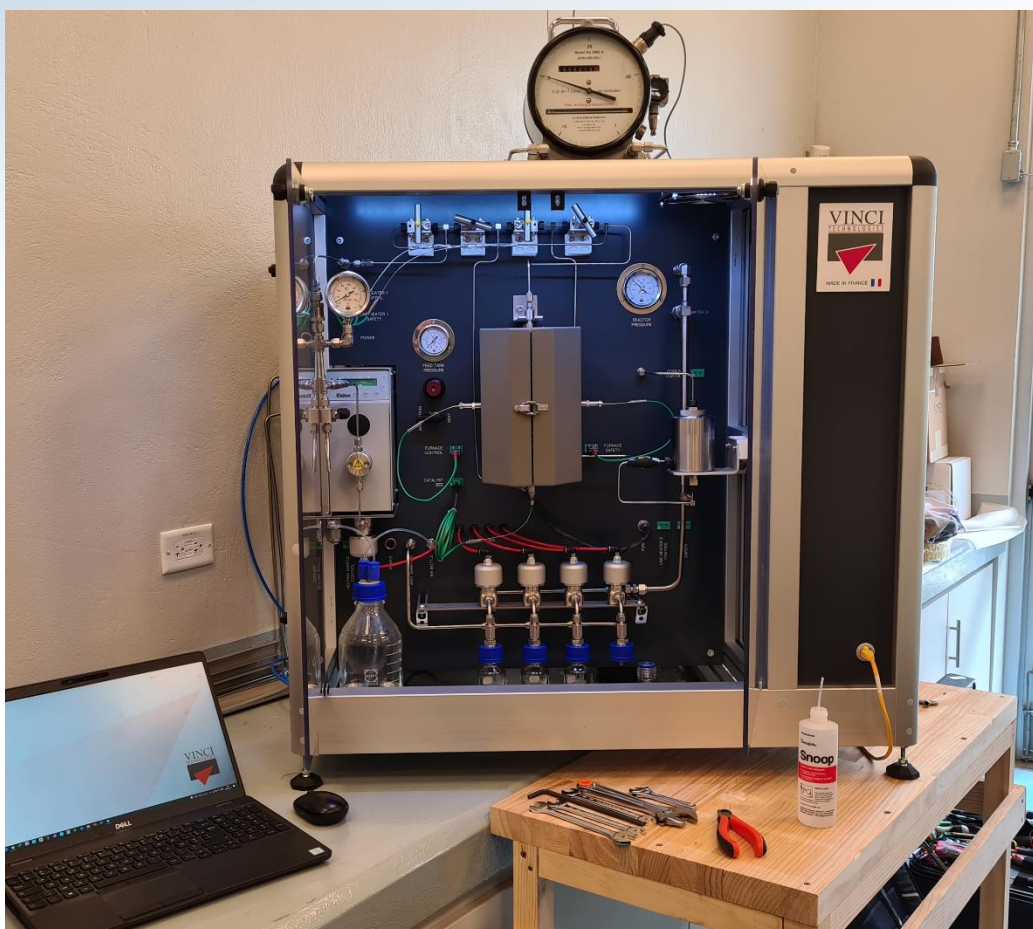


MICRO BENCH SCALE UNIT

The Micro Catalyst Bed (MCB) unit is a reactor system specifically designed to meet the needs of academic, public, or small industrial laboratories for catalyst evaluation and process development.

It provides an automatic and user friendly operation, a high level of safety, easy start-up and simple maintenance. It brings to the laboratory level the long experience of Vinci-Technologies in the refining and petrochemical industries.

MCB equipment could be CE marked, compliant to all of the legal requirements of the EU legislation, and more precisely with the European Pressure Equipment Directive (PED) 2014/68/EU.



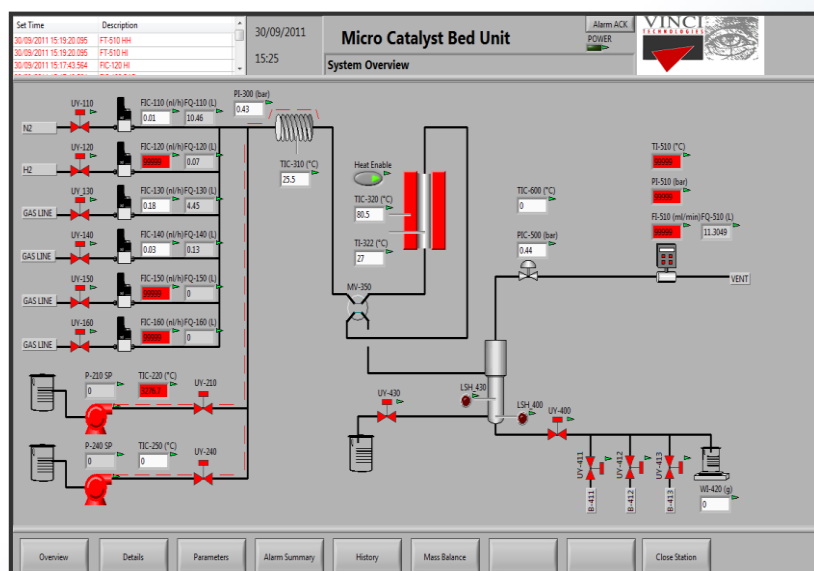
▼ MCB – Main Features

MCB is a bench scale automatic unit based on a mini reactor of about 10ml with its associated furnace. A wide range of available options allows customization of the unit to meet the customer's exact needs. With its simple modular construction, MCB is suitable for many reactions such as: hydrotreating, hydrocracking, hydrogenation, HDS, HDT, oxidation...

The system is operated by remote control based on TCP/IP interface with a computer and provides data recording and processing.

MCB – Supported reactions (non exhaustive list)

	Reaction	P (bar)	T (°C)	Feed	Products	Remarks
MCB Design		200	550			
Hydrocracking	HDS, HDN, HCK	200	450	DSV	Middle distillates, gasoline	Trickle bed
Hydrotreating	Hydroconversion	200	450	VR	Low sulfur VR	Trickle bed
	HDS	50	350	Diesel	5ppmS Diesel	Trickle bed
	HDS	30	250	Naphta	5ppmS Naphtha	gas reaction
	hydrogenation aromatics (HDA)	100	360	Diesel, LCO	Low aromatic fuel	Trickle bed
	HDN	100	450	DSV - RA	Hydrocracking feed	Trickle bed
	HDM			RSV-RA		
Isomerization	PT/AL ₂ O ₃ chlorated	30	160	nC ₅ -C ₇	iC ₅ -C ₇	sensitive to oxygen and water. Drying required. Liquid phase
	Zeolite	30	260	nC ₅ -C ₇	iC ₅ -C ₇	No drying required. Gas phase
	Aromatics	50	550	xylene, ethylbenzene	xylene, ethylbenzene	Gas phase
Alkylation	Aromatics	50	450	benzene, toluene	alkyl benzene, alkyl toluene	Gas or Liquid phase
Catalytic reforming	Dehydrogenation, cyclization, isomerization	30	525	C6-C10	H ₂ / reformat	Gas phase
Oxidation	Selective	10	450	Propane, propene, butane, butene	oxygenated HC's	Gas phase



Computer interface : supervision and control software

MCB – Available options

1. Additional gas lines
2. Liquid lines
3. Heated liquid lines
4. Preheater and mixer
5. Upflow / downflow valve
6. Automatic sampling system
7. Mass balance
8. Gas counting system
9. Connections to GC (online analysis)

Installation and commissioning
Training