



#### Technical Details

- Reactor Column : Material Borosilicate Glass  
capacity 1.2 Ltrs approx.
- Packing : Rasching Rings, Material Borosilicate  
Glass. Size 8-10mm (approx)
- Feed Tank : Material Stainless Steel,  
Capacity - 20 Ltrs.
- Piping : Stainless Steel and Silicon pipe
- Flow Measurement : Peristaltic Pumps (1No)  
Computer controlled for different RPM
- Product Analysis : By using Electronic Sensor,  
Output 4-20 mA.
- Arrangement is done to inject tracer into the lower end of reactor
- An ENGLISH instruction manual consisting of experimental  
procedures, block diagram etc. will be provided along with the  
Apparatus.
- The whole set-up is well designed and arranged on a rigid structure  
painted with industrial PU Paint.

#### Description

Axial diffusion and dispersion of fluid in packed beds are important for design and operation of separation equipment and Chemicals reactors. The tracer technique, the most widely used method for the study of axial dispersion. In stimulus response experimentation, we perturb the system using pulse input of tracer and then see how the system reacts or responds to this stimulus. The analysis of the response gives the desired information about the system.

The setup consists of a glass column packed with Rasching Rings and one feed tank. Water is fed to the reactor through liquid distributor, fitted at the bottom of the column. Peristaltic Pump is provided to measure the flow of water. For understanding the R.T.D. characteristics, a special arrangement to inject tracer into the lower end of reactor, using a syringe, is provided. Samples can be taken periodically from the top outlet of reactor.

The present set-up has a facility to interface the system with computer which enables to log the experimental data using computer. The educational software and data-logging package has been developed for unit. The software environment base is of Lab view of NATIONAL INSTRUMENTS, USA. This software is compatible to interfacing unit designed by K. C. Engineers. This software package provides a comprehensive educational software environment within which the investigations can be performed. This software is capable to tabulate the sample readings according to the requirement of experiment under study and results obtained can be compared. The real time data acquisition can be done by interfacing the set-up with computer using software. Software allows the user to have control on data logging, printing the stored data, preparing spread sheets in Excel etc.

#### Experimentation/Learning Objectives

- To plot RTD curve for Packed Bed Reactor.
- To determine the Dispersion No.

#### Utilities Required

- Electricity Supply: Single Phase, 220 V AC, 50 Hz, 5-15 Amp combined socket with earth connection. Earth voltage should be less than 5 volts.
- Water Supply & drain
- Instruments, Laboratory Glassware and Chemicals required for analysis as per the system adopted.
- Computer System: i-3 processor with DVD Drive, Windows 7/8, MS-Office pre-loaded. One USB slot required in PC for Data Acquisition Card.