



About Hytech Automation

Hytech Group, established in the year 1992 is a technology oriented manufacturing industry based in Pune, Maharashtra, India. Hytech group started as Hytech Hydraulics catering to hydraulics automation requirement for process industries. Now, there are Today, Hytech Group owns four verticals broadly classified as under -

- Hytech Automation
- Hytech Automation – Didactic Solutions
- Hytech Hydraulics
- Hytech Distribution

Hytech Automation

Hytech Automation is one of the channel partners for the integration of Fanuc Industrial Robots. Core activity of Hytech Automation is automation related solutions. This is a project oriented division that caters to industrial robotics integration as well as application oriented process integration. Few top clients include Maruti Suzuki, Indian Railways, LG India, etc.

Hytech Automation also manufactures special purpose machines required for technologically advanced applications. One of the most successful product is Laser assisted CNC Turning machine which was developed in collaboration with DRDO – INDIA and LZH – Germany. This specially designed CNC turning machine can machine components up to 78 HRC.

Hytech Automation – Didactic Solutions

Hytech Automation – Didactic Solutions mostly deals with the Automation and Application Engineering related Educational Solutions. These Didactic Solutions involve manufacturing of training kits as well as services such as ‘Syllabus Designing’ and ‘Train the Trainer Program’. There are four verticals in this division namely, CIM – Computer Integrated Manufacturing, Mechatronics, CNC Machines and Robotics.

With more than 20 years’ experience in the field of technological solutions, Hytech Automation – Didactic has acquired necessary expertise to provide industry oriented educational solutions which are relevant almost all over the world.

Hytech Automation is authorized channel partner for Fanuc Robots as well as Fanuc CNC related products. With client base in more than 25 countries, ‘Hytech Automation – Didactic Solution’ has more than 3000 active customers in educational as well as industrial sector. Few of the reputed customers include Maruti Suzuki - India, Bosch – India, Indian Navy, Mahindra and Mahindra, Myanmar Navy, Singapore Polytechnic, Khartoum University - Sudan, Palestine Technical University, etc.

Hytech Hydraulics

Hytech Hydraulics is the oldest vertical under Hytech umbrella. It caters to the hydraulic related automation as well as project requirements in process industry. Few top clients include Thyssen Krupp, Wonder Cement, Ambuja Cement, Dalmia Cement, etc. Hytech Hydraulics has supplied more than 300 kiln thrusters operating in 4 different continents. Few of the kiln thrusters are operational 24 x 7 for more than 22 years.

Hytech Hydraulics has designed and patented a fine flow control valve which is considered as a monopolistic product in the cement industry. More than 2000 such valves are operational in various cement plants all across the globe.

Hytech Distribution

Hytech Distribution is the trading arm of Hytech Group. Over the years, Hytech Group has established collaborations with few reputed manufacturers as well as service providers from all over the world. Hytech holds distributorship of BobCAD – CAM, Fanuc NC Guide, Fanuc Roboguide, Fanuc Simulator, Visual Components, IRAI – Automgen, etc.





Models

HYDRAULIC TRAINING KIT - BASIC



HYTECH
Since 1992
www.hytechautomation.in



HYDRAULIC TRAINING KIT - ADVANCE



HYTECH
Since 1992
www.hytechautomation.in



HYDRAULIC TRAINING KIT - PROPORTIONAL VALVE KIT



HYTECH
Since 1992
www.hytechautomation.in





Hytech – Hydraulic Training Kits

- Hytech Hydraulic Training kits are designed to provide complete training on Hydraulics where participants start from novice and are expected to reach the expert level with two available options (Basic and Advance).
- Basic Hydraulic Training Kit is designed to provide hands on experience on conventional hydraulic valves. Most of the commonly used hydraulic valves are provided along with Basic Hydraulic Training Kit. Students are expected to design and simulate the basic Hydraulic circuits on Simulation software and execute the same on basic Hydraulic training kit. Safety comes first in Hytech training kits. There are two pressure relief valves provided with each Hytech Hydraulic training kit. PRV mounted on the hydraulic powerpack is lockable while the one on the experiment table is used for experimentation purpose.
- Electrohydraulic training kit is provided with advanced level conventional valves, solenoid valves, pressure switch as well as the PLC. Participants are expected to operate advanced hydraulic valves in collaboration with PLC. All necessary accessories such as input and output modules are provided to make it easily operable for participants.
- Proportional Valve training kit has proportional pressure relief valve as well as proportional direction control valve along with control cards. Complete arrangement along with necessary accessories is provided to make sure that users can collect necessary data points to find the efficiency of proportional valves. Proportional Valve Training kit can be an isolated unit as well as a unit mounted on the back face of Advance Hydraulic Training kit. Proportional Valve Training kit can also be used as a kit to find out operational efficiency of various proportional valves.
- Automation modules can be connected with Basic as well as Advance training kits which give participants necessary hands on experience on industrial hydraulic applications where participants can relate the use of various hydraulic valves.





Hytech – Hydraulic Training Kit Models

Hydraulic Training

Basic

- Conventional Hydraulic Valves
- Circuit Design
- Circuit Simulation

Advance

- Advance Hydraulic Valves
- PLC Controlled training kit
- Online circuit simulation
- Circuit design and simulation with PLC ladder
- Computer controlled training kit

Proportional Kit

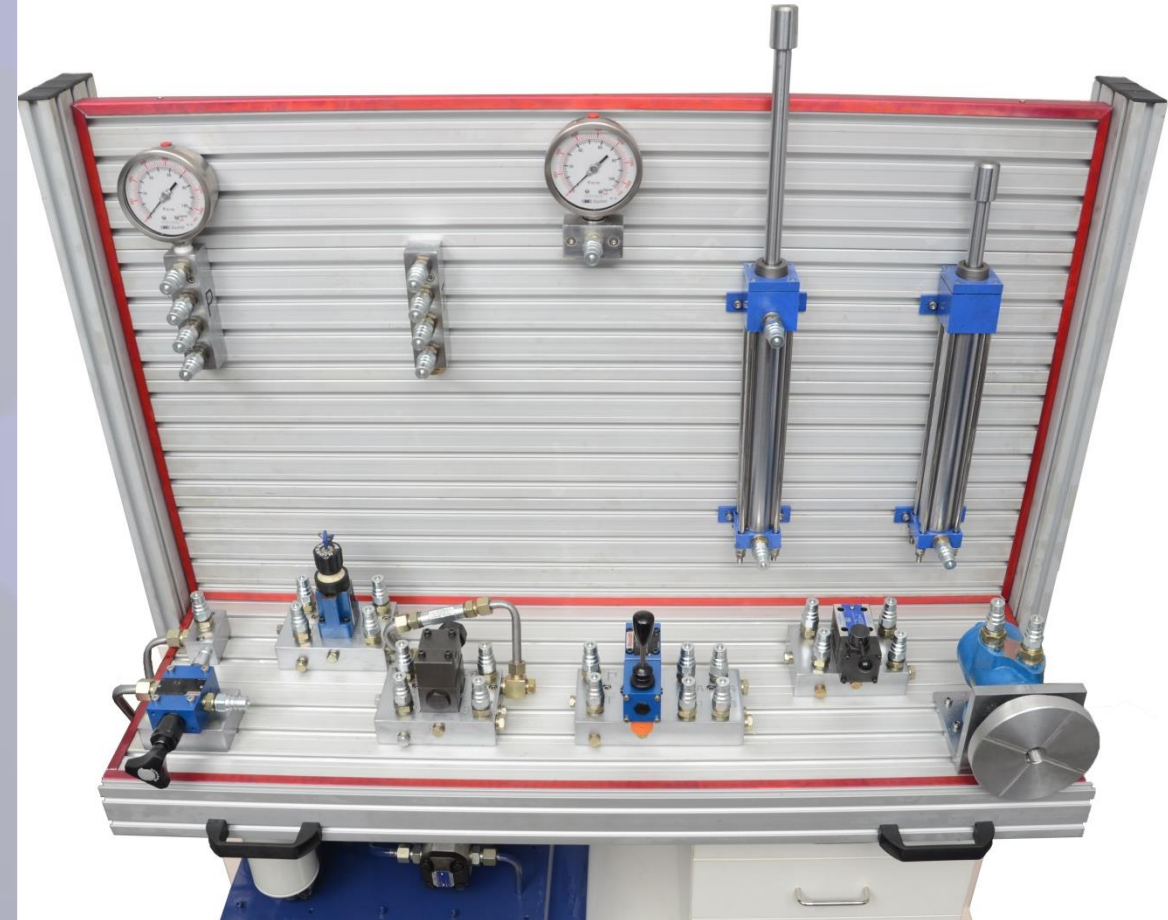
- Proportional PRV
- Proportional DCV
- Can be an individual kit or mounted on the back of advance hydraulic kit
- Pressure line high pressure filter with hard piping to avoid dust contamination





Hydraulic Training Kit – Basic

- 'Hytech' Hydraulic training kit is designed for educational purpose where students can easily operate the training kits to get necessary hands on experience.
- Safety is of utmost importance when it comes to operation by students and we have focused on the same aspect in both models of our hydraulic training kits.
- Hydraulic training kit (Model: Basic) is designed to provide hands on experience on conventional hydraulic valves. In other words, no valve in Basic Hydraulic training kit requires electrical supply to operate.
- There are two relief valves provided in the kit, one on the hydraulic powerpack and the other on the training kit. Participants can use the valve mounted on the training kit for experimental purpose. Valve mounted on the hydraulic powerpack decided the maximum operating pressure of the training kit.
- Basic Hydraulic kit comes with a licensed circuit design and simulation software.
- Participants are expected to design a circuit on simulation software (IRAI – AutomGen).
- Any component that is used in the Hytech – Hydraulic training kit is available in the software library.





Hydraulic Training Kit – Basic Key Features

- Sub plate mounted (CETOP 3) valves for better understanding
- Dedicated lockable PRV for hydraulic powerpack to avoid any accident
- Industrial hydraulic powerpack which can generate pressure up to 120 Bar. Tank capacity of 60 LTR
- Separate PRV on Experiment panel for conducting experiments
- Laser engraved P, T, A and B connections for better understanding
- Pressure gauge mounted Pressure manifold, Tank manifold as well as Testing manifold
- Anodised aluminum based Dual face training kit with P and T manifolds on each side
- Valves as well as actuators can be easily disengaged as well as engaged on the experiment panel
- Removable Oil tray below horizontal experiment table (Aluminum profile based)



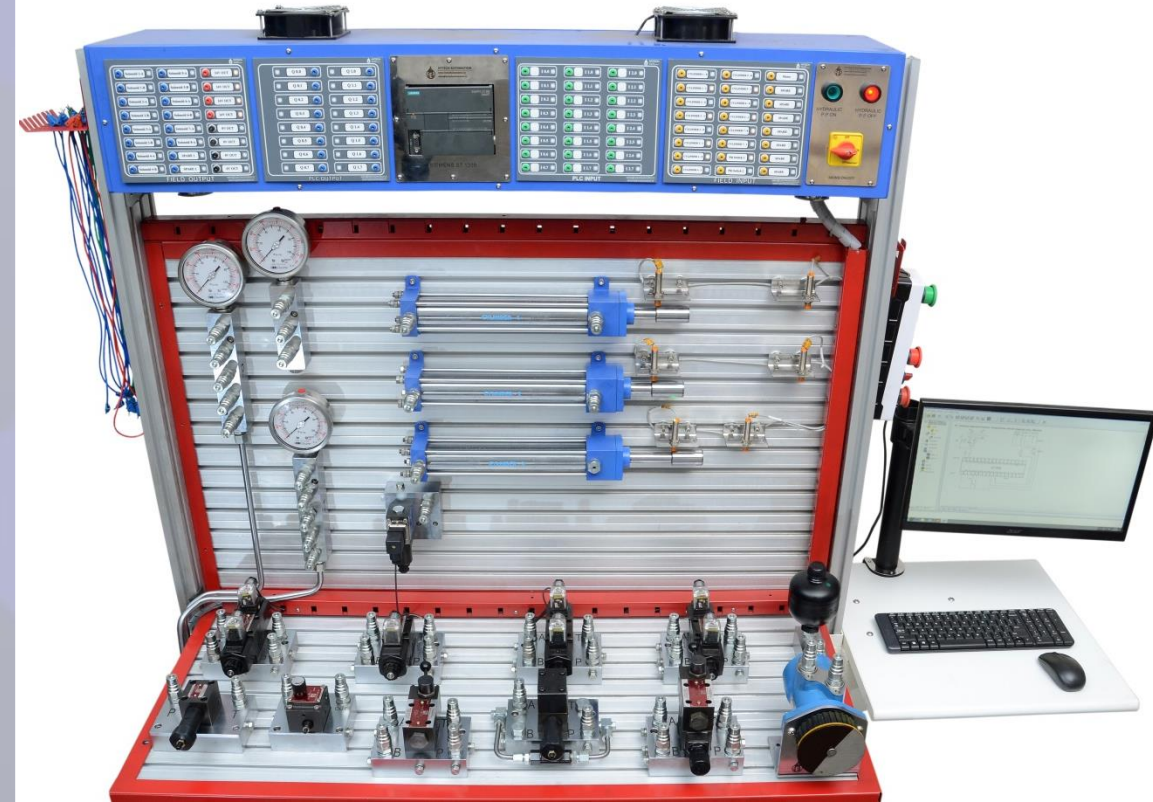


Hydraulic Training Kit – Advance

- 'Hytech' Hydraulic training kit is designed for educational purpose where students can easily operate the training kits to get necessary hands on experience.
- Safety is of utmost importance when it comes to operation by students and we have focused on the same aspect in both models of our hydraulic training kits.
- Hydraulic training kit (Model: Advance) is a level above Basic Hydraulic training kit. Before operation Advance training kit, participants are expected to have knowledge about Basic Hydraulics. Advance Hydraulic training kits consists of almost all hydraulic valves which are provided in Basic Hydraulic Training kit.
- In this training kit, participants are expected to design complex hydraulic circuits on IRAI Automgen software and execute them on the hardware kit.
- Industrial starter (MPCB) with variable overload protection for hydraulic powerpack
- Remote input switches for PLC start signal

Advance Hydraulic training kit provides hands on experience on following:

- Design and simulation of hydraulic circuits with solenoid operated valves
- Design and updation of PLC ladder diagram
- Execution of hardware kit directly from PLC
- Hands on experience on various advance hydraulic valves
- Hands on experience on basic hydraulic valves





Hydraulic Training Kit – Advance Key Features

- Sub plate mounted (CETOP 3) valves for better understanding
- Hard piped connections up to Pressure and Tank manifolds on each side of double faced Aluminum profile based training kit
- Basic Valves on back face of the training kit and advance valves on front side of the training kit. At a time, 6 students can work on the training kit
- PLC operated training kit with PLC and Field input – output modules
- Online circuit design and simulation software with online PLC ladder updation. Computer controlled training kit.
- Mobile hose trolley
- Workstation with Licensed PLC ladder design software
- Indigenously designed hydraulic valve plates with parallel A and B ports for dynamic pressure monitoring
- Provision to connect proportional valve training kit with PLC and HMI as well as workstation integration





Hydraulic Training Kit – Proportional Valve Training Kit

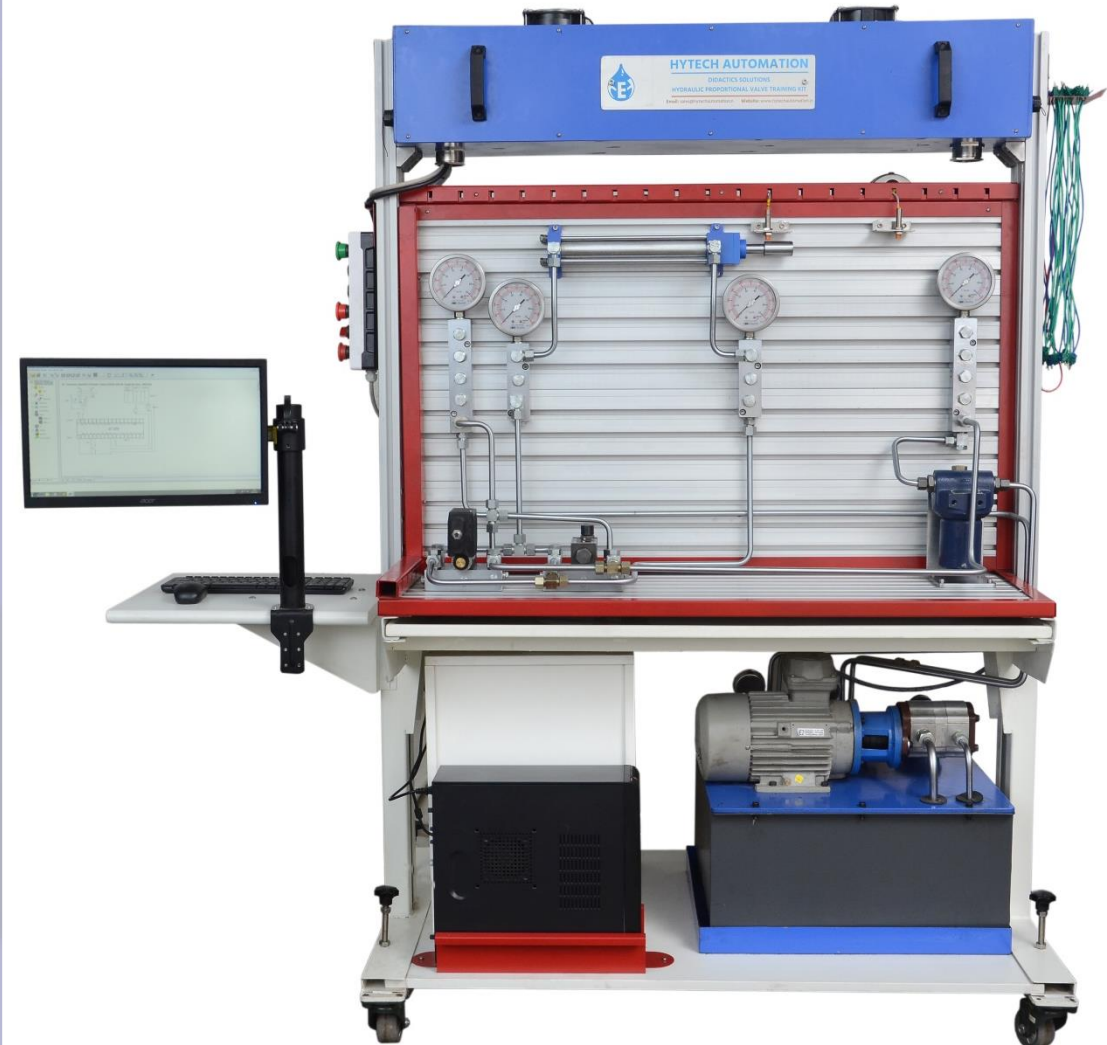
- Proportional Valve Training kit can be an individual unit or an unit mounted on the back face of Hydraulic training kit – Advance
- High pressure filter to avoid dust contamination
- Pressure and Tank lines are hard piped. No removable components / joints to make sure that the entire system is dust / contamination free
- Necessary counters and timers synchronized with the end limits of hydraulic cylinder to make sure that user can collect all required data points.
- In a proportional valve training kit mounted on an Advance Hydraulic training kit, entire system can be run with HMI and PLC which makes it very easy to collect as well as store datapoints required to draw the proportional valve efficiency graphs.





Hydraulic Training Kit – Proportional Valve Training Kit

- Proportional valves respond to variations in current applied to the solenoid by delivering a corresponding variable flow output. They are becoming a popular choice for machine and device builders desiring more flexibility in flow or pressure output from a PLC based on the conditions of the machine or making the machine "more flexible for the customers automation needs."
- Proportional Valve Training is becoming more and more important in collaboration with PLC control.
- Hytech Proportional Valve training kit is either supplied on the back face of Electrohydraulic training kit (Model: Advance) or separately as an individual unit. Control cards for proportional valves are also supplied along with the training kit.



Hydraulic Training Kit – **BASIC** THE PROCESS

- Basic Hydraulic Training kit is designed to provide hydraulic training to participants from 'NOVICE' level
- Participants are expected to understand the basic hydraulic valves, their symbols, their function, operations as well as industrial applications. They are also expected to understand the basic difference in the operation as well as application of hydraulic systems and Hydraulic systems.
- The process starts with a basic circuit design on a 'CIRCUIT PAPER', designing the circuit on 'CIRCUIT DESIGN and SIMULATION SOFTWARE', simulating the circuit on 'CIRCUIT DESIGN and SIMULATION SOFTWARE', and finally executing the same on 'HARDWARE TRAINING KIT'.

The **PROCESS**:

- **CIRCUIT PAPER:** This is a printed paper on which valves are printed exactly as per their location on hardware kit. Participants are expected to design a circuit by drawing a circuit connecting printed valves and actuators. Pressure as well as tank line manifolds are also provided to make sure that entire circuit is designed properly
- **CIRCUIT DESIGN and SIMULATION SOFTWARE:** This is a circuit design and simulation software from IRAI France in which students can design the circuit by importing necessary valves and actuators from the library. In this software, circuit design is done with the ISO symbols. Participants are expected to simulate the circuit operation which is drawn on the 'CIRCUIT PAPER'
- **HARDWARE TRAINING KIT:** The circuit which is designed on 'CIRCUIT PAPER' and simulated on 'CIRCUIT DESIGN and SIMULATION SOFTWARE' is finally executed on the hardware kit.



Hydraulic Training Kit - **ADVANCE** THE PROCESS

- Advance HYDRAULIC Training kit is designed to provide advance hydraulic training to participants with focus on operation in collaboration with PLC.
- For this training kit, participants are expected to have basic knowledge of Hydraulics as well as PLC operation. Ideally Basic level courses on Hydraulics and PLC training should be completed before participants enter into Advance Electrohydraulic training course.
- Advance Electrohydraulic training kit is a double sided kit.
- Advance Circuit design and simulation software from IRAI (AutomGen) is supplied along with ADVANCE ELECTROHYDRAULIC training kit with which participants can design and simulate advance electrohydraulic circuits. Participants can upload the designed PLC ladder without the use of any third party software.
- Advance Electrohydraulic Training kit is a complete training kit in which following courses can be conducted:
 1. Basic Hydraulic Training
 2. Basic PLC Training
 3. Advance Electrohydraulic Training
 4. Proportional Valve Training Kit (Optional)

The PROCESS:

- **HYDRAULIC CIRCUIT PAPER:** This is a printed paper on which valves are printed exactly as per their location on hardware kit. Participants are expected to design a circuit by drawing a circuit connecting printed valves and actuators. Corresponding inputs and outputs are marked wherever necessary for PLC ladder design.
- **PLC CIRCUIT PAPER:** Participants are expected to design PLC ladder on this paper. All necessary symbols and their meanings are printed on the paper to make it easier for participants to design the ladder. The PLC CIRCUIT PAPER is designed as per the PLC used in the Electrohydraulic Kit (SIEMENS / MITSUBISHI / Allen Bradley)

There are two ways in which the circuit can be executed on electrohydraulic training kit. One is to operate the kit directly from IRAI software which is directly communicating with PLC through Ethernet protocol. Ladder can be designed as well as uploaded directly through software. Second method is to

- **CIRCUIT DESIGN and SIMULATION SOFTWARE:** This is a circuit design and simulation software from IRAI France in which students can design the circuit by importing necessary valves and actuators from the library. In this software, circuit design is done with the ISO symbols. Participants are expected to simulate the circuit operation which is drawn on the 'CIRCUIT PAPER'
- **CIRCUIT DESIGN with PLC SOFTWARE:** Participants can design various ladders with PLC software such as Siemens / Mitsubishi corresponding to PLC used in trainer kit.
- **HARDWARE TRAINING KIT:** The circuit which is designed on 'CIRCUIT PAPER' and simulated on 'CIRCUIT DESIGN and SIMULATION SOFTWARE' is finally executed on the hardware kit.

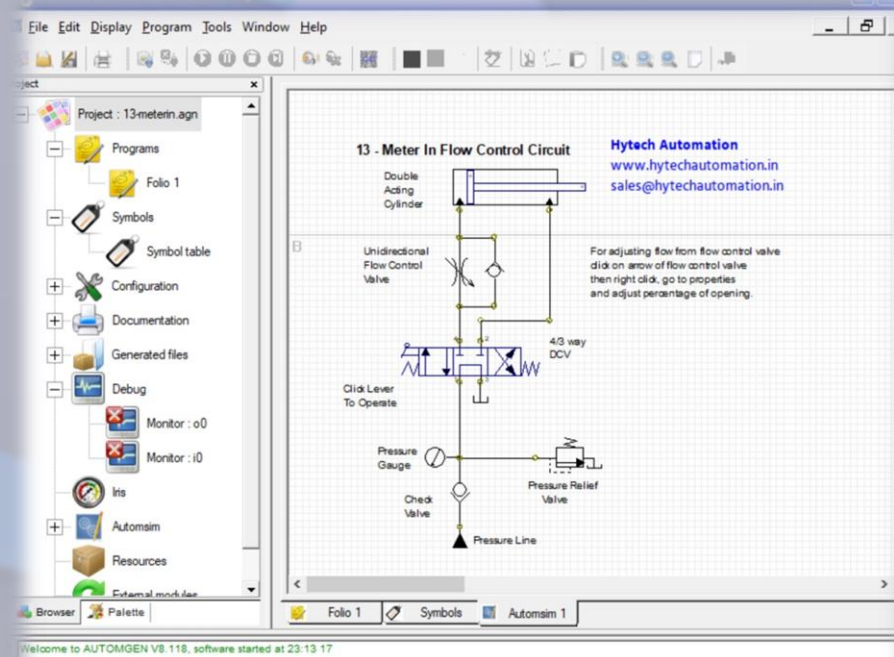
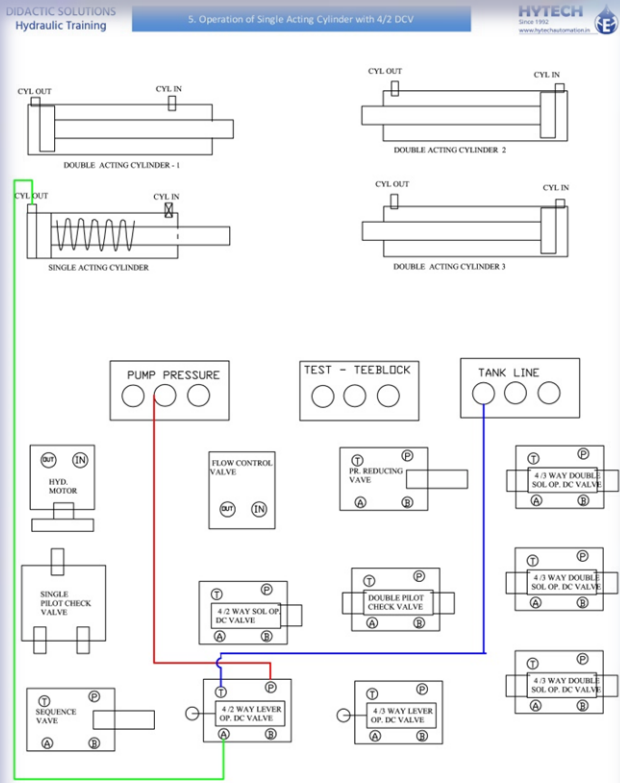


Hydraulic Training Kit - THE PROCESS

CIRCUIT PAPER

CIRCUIT DESIGN AND SIMULATION ON AUTOMGEN

EXECUTION ON HARDWARE KIT



• INPUT Modules:

Input modules consist of PLC input module and Field input module. All PLC inputs (24 inputs) are hardwired with PLC input module. There is a provision for input override for participants to manually switch ON the input. Each connection is done with an individual connector which makes it easy for maintenance as well as replacement. Desired PLC input is connected with Field input with patch cord. LED indication is provided to display the current status of inputs on both PLC as well as Field input modules.

• OUTPUT Modules:

Output modules consist of PLC output module and Field output module. All PLC outputs (16 outputs) are hardwired with PLC output module. Each connection is done with an individual connector which makes it easy for maintenance as well as replacement. Desired PLC output is connected with Field output with patch cord. LED indication makes it easier to understand the status of outputs.





Hydraulic Training Kit Automation Modules

- **Hydraulic Press**

This is an industrial Press Application module which can be used with Basic as well as Advance Hydraulic training Kit. Module consists of a hydraulic press which can be utilized for bearing assembly purpose. Necessary arrangements are provided with which the assembled bearings can be disassembled.

Limit switches are provided to have the press stroke position.

Participants can make use of pressure compensated as well as non pressure compensated flow control valves to understand the difference.

Participants can also make use of various valves as well as circuits to understand the difference as well as operational advantages of these valves.

This application module is made up of MS and SS with approximate weight of 20 KG. It can be easily lifted and placed on Hytech Hydraulic training kit for effective operation.





Hydraulic Training Kit Automation Modules

• Hydraulic Excavator

This application module replicates the hydraulic excavator which can be operated through PLC. There are four solenoid valves mounted on the excavator through which each of four axes are controlled.

First axis of this excavator is a rotary axis actuated through hydraulic motor. Other three axes are provided with Clevis joints wherever necessary.

Participants can design a PLC ladder program for automatic excavation process with incremental depth excavation.

Effective use of flow control valves can make the whole process more efficient.

This application unit is an individual unit which can be connected to ADVANCE Hydraulic training kit through 12 Pin industrial connectors. It is mounted on a mobile trolley with approximate dimensions of 800mm x 600mm.

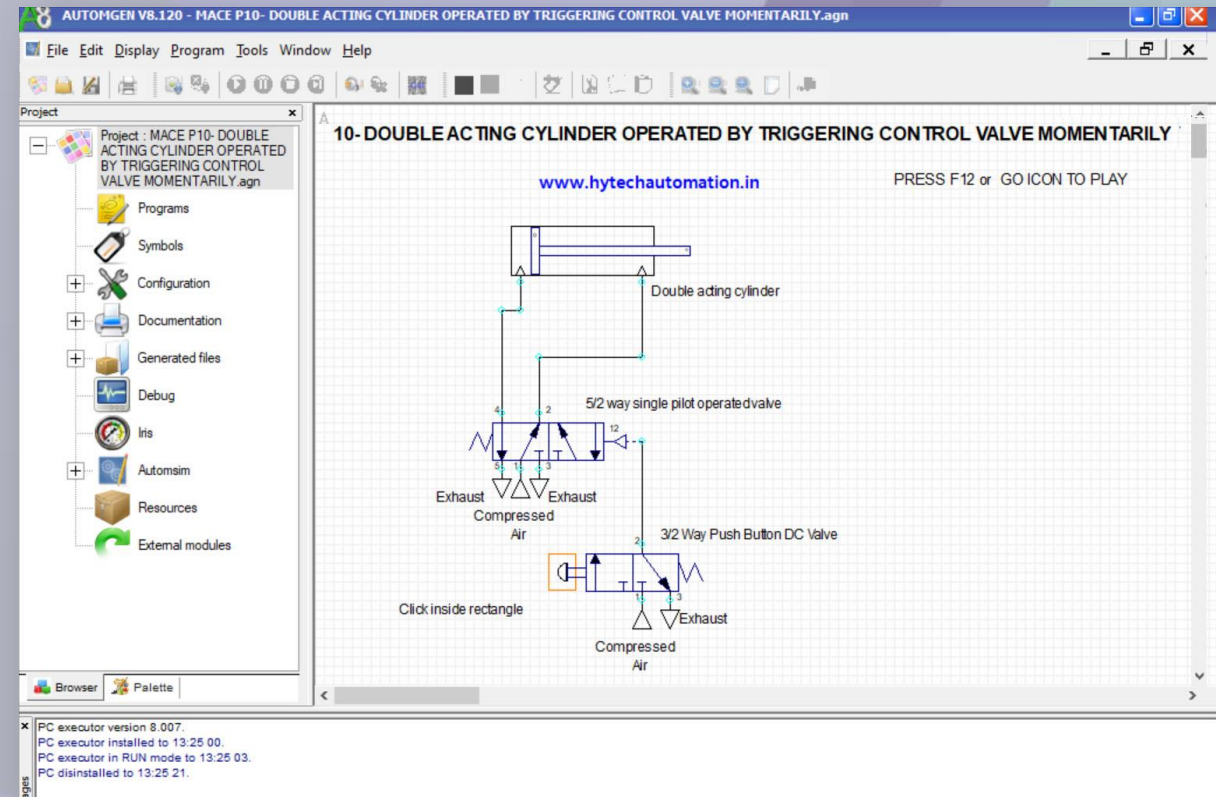


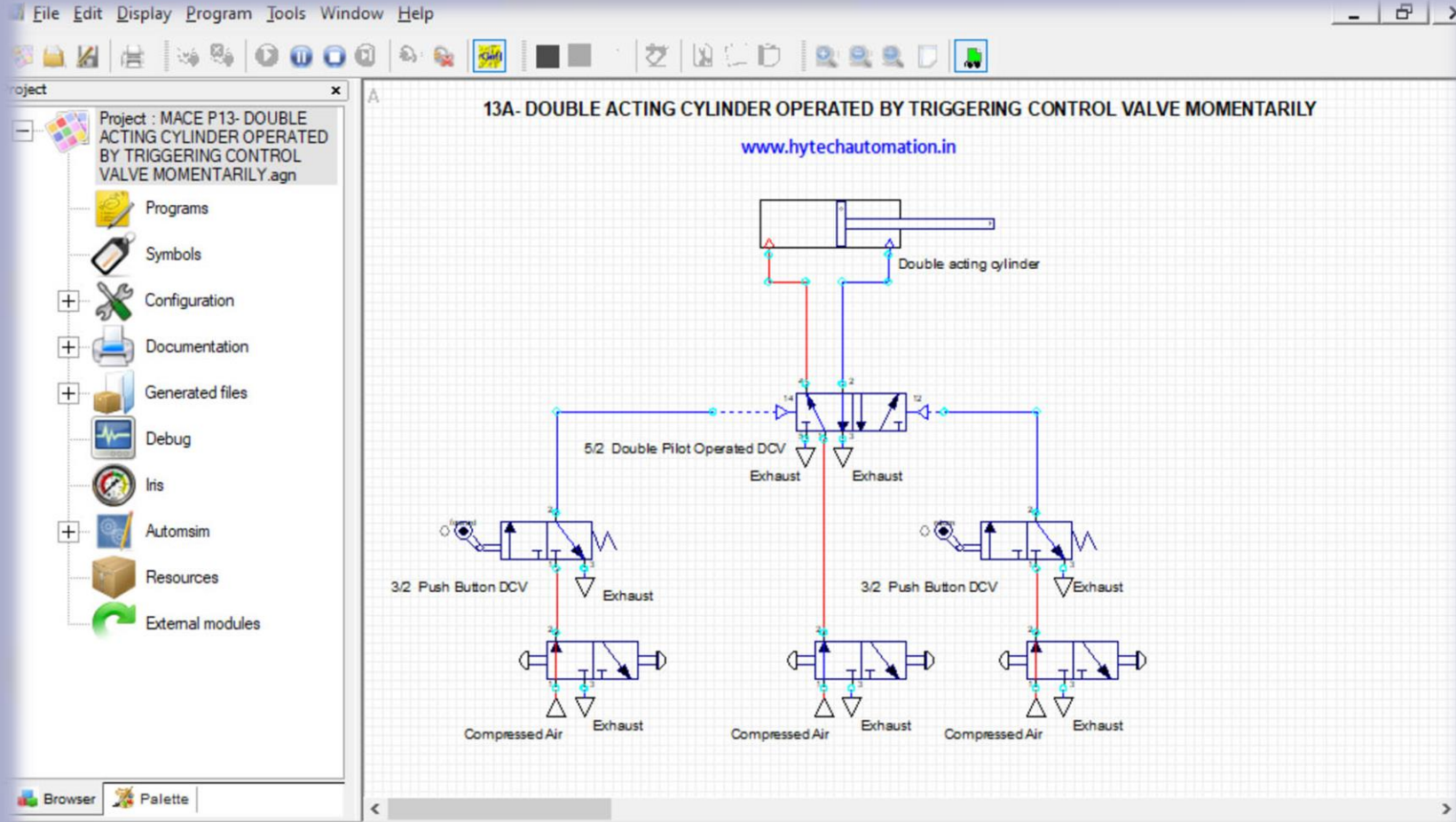


Autosim – BASIC

Hydraulic Circuit Design and Simulation software

- AutomSIM (Premium - Academic) can be used to design hydraulic, Hydraulic as well as electrical circuits
- More than 200 basic Hydraulic components in the library
- Any Hydraulic component, presently being used in industry is available in the library
- Circuit design based on symbols
- Any circuit that can be executed on HYTECH BASIC Hydraulic TRAINING KIT can be designed and simulated on this software
- EXE file can be generated which can simulate the circuit without the licensed software. Students can operate the circuits individually without the licensed software
- Not expensive : 1/5 of the price of the competitor software





Video Link
<https://youtu.be/Gu8aj94P4Ek>

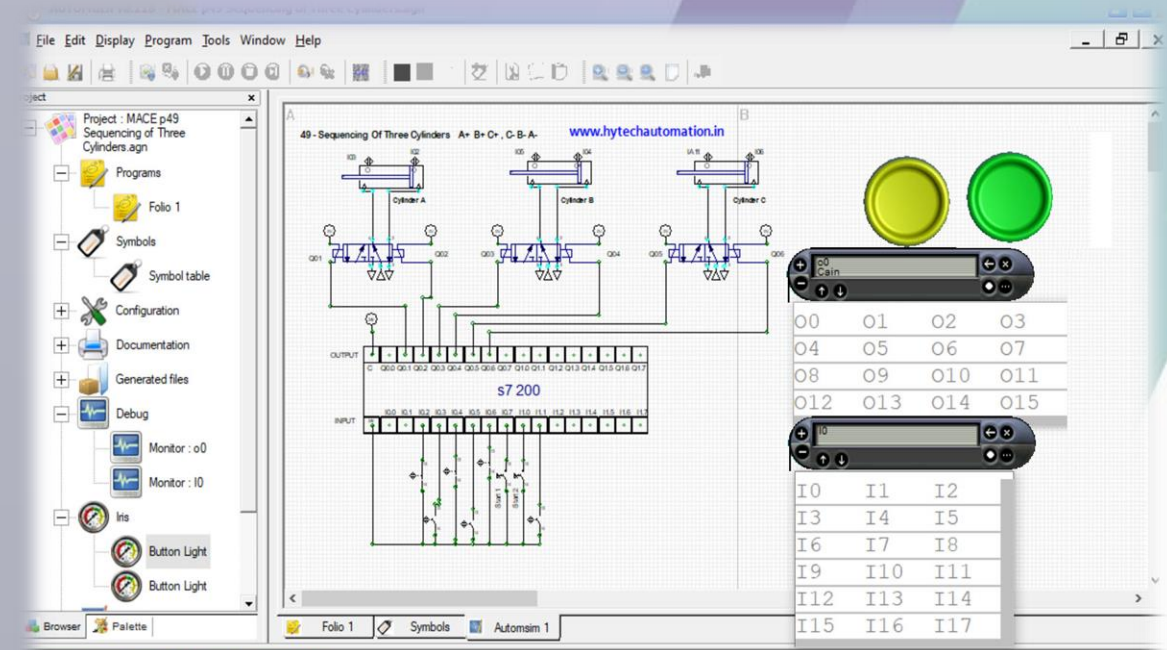
Welcome to AUTOMGEN V8.120, software started at 14:17 24
GO! : application updated, connect ... in RUN mode ... activation of dynamic display ... complete.
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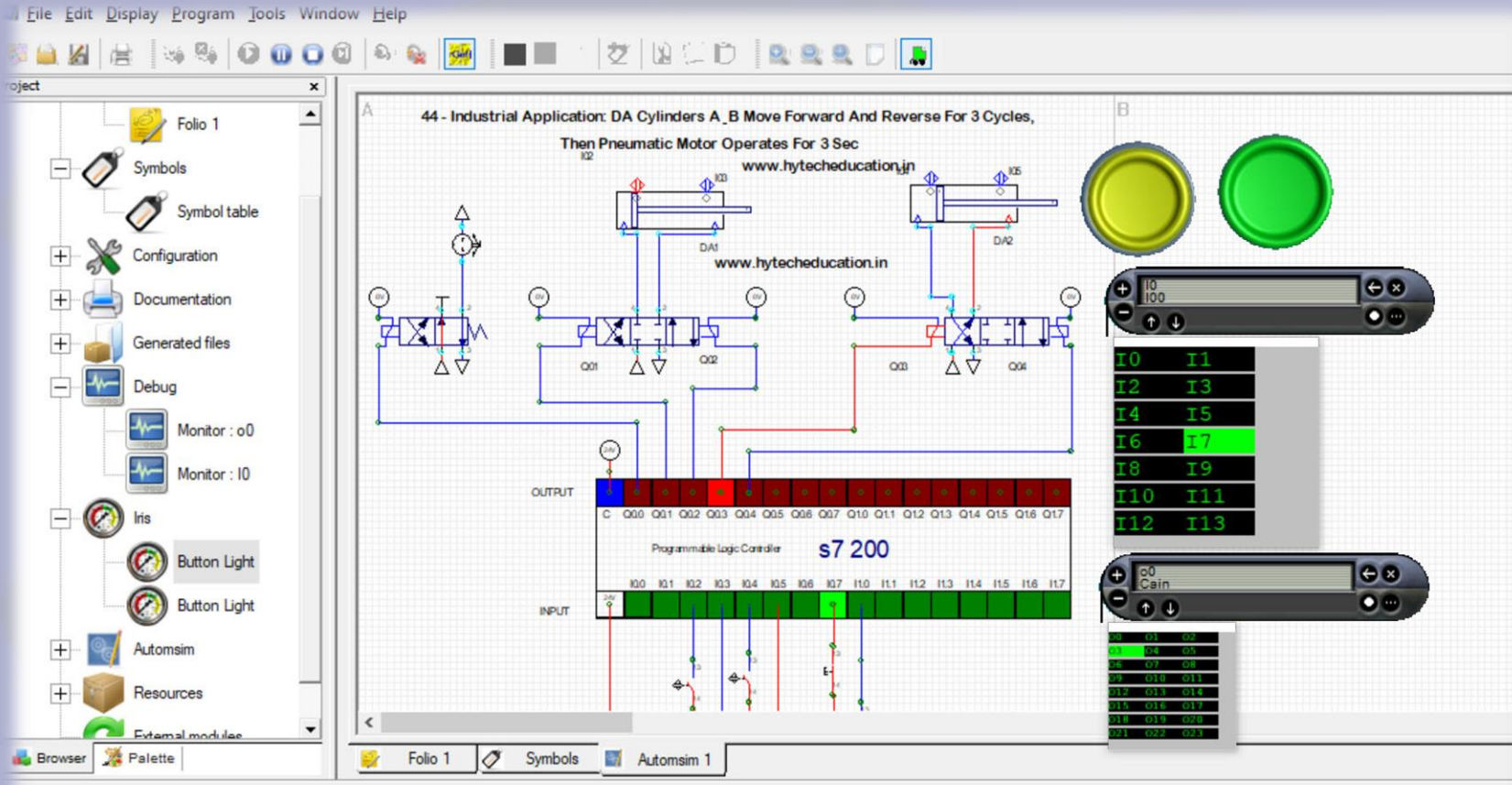


Automgen – ADVANCE

Advance ElectroHydraulic Circuit Design and Simulation software

- AutomGen (Academic) can be used to design Pneumatic, Hydraulic as well as electrical circuits with PLC
- More than 200 basic Hydraulic components in the library
- Any Hydraulic component, presently being used in industry is available in the library
- **PLC ladder can be designed in collaboration with Hydraulic circuits and with proper referencing, Hydraulic circuit on the hardware kit can be directly operated from the IRAI AUTOMGEN Software. No third party software is required to download the PLC ladder diagram. Hydraulic circuit on hardware kit can be operated with dynamic simulation of the same in the software**
- Circuit design based on symbols
- Any circuit that can be executed on HYTECH ADVANCE ELECTROHydraulic TRAINING KIT can be designed and simulated on this software
- EXE file can be generated which can simulate the circuit without the licensed software. Students can operate the circuits individually without the licensed software
- Not expensive : 1/5 of the price of the competitor software





Video Link
<https://youtu.be/UsFZDDKpf3o>

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 GO! : application updated, connect ... in RUN mode ... activation of dynamic display ... complete.
 GO! : application updated, connect ... in RUN mode ... activation of dynamic display ... complete.



Thank You!

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