

## HYDRAULIC TRAINING SYSTEM

MODEL: HYD15



### FEATURES

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- Compact, comprehensive, sturdy design
- Study of Hydraulic Circuits
- Modular design, easy to upgrade
- One-stop training solution for complete training of Oil Hydraulics, from basics to advanced

### DESCRIPTION

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NiYo Engineers' Hydraulic Training System is a comprehensive solution for all your training needs in Oil Hydraulics. By using Hydraulic Training System, you can fulfill your need right from classroom training, basic hands-on training, electro-hydraulic and PLC hands-on training, fault finding and troubleshooting practice to the most advanced training in designing and design validation.

Hydraulic Training System is modular, you can select the minimum configuration that suits your needs today and easily and quickly upgrade it to suit your future needs as and when it arises.

## List of Experiments

- Fundamental principles of hydraulics
- Application of hydraulics
- Study of symbols, schematic diagrams and standards
- Study of sources of hydraulic power
- Transmission and conditioning of oil
- Study of force pressure area and volume relationship
- Study of pressure measurement and control
- Study of direction control valve
- Study of hydraulic actuators
- Building of simple hydraulic circuits
- Building of advanced hydraulic circuits
- Building of electro-hydraulic circuits
- Study of PLC ladder logic programming
- Trouble shooting in hydraulic and electro-hydraulic circuits
- Study of safety aspects in hydraulic circuits

*\* List of experiment may vary depending on model selected. Some of the experiments are theoretical only.  
NOTE: Depending on the modules purchased, the experimental capabilities change*

## Class Room Training Material

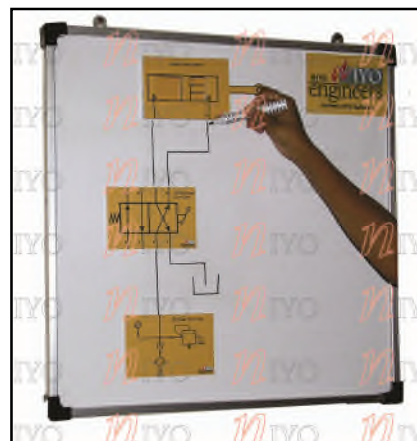
We provide a complete solution for your hydraulic lab. The first step in this is to impart classroom training. Products that aid your classroom training are:

- **Books**

This is a comprehensive compilation of data on oil hydraulic theory, applications, symbols and details of the components. Neat diagrams and presentation of information makes it an invaluable tool in classroom training.

- **Magnetic Symbol Set (Hydraulics)**

These magnetic symbols make it very easy to quickly draw various types of circuits, saving you the time and effort normally required to draw detailed symbols of components. Each symbol has magnetic strips on the rear, so that it can be fastened on any steel-backed white board. This makes it very easy to slide the symbols in and out, while explaining a circuit to students in the class. The symbols are constructed of long lasting white plastic sheet, with printed symbols and are neatly kitted in a wooden box.



- 4/3 Hand Lever Direction Control Valve
- 4/2 Hand Lever Direction Control Valve

- 4/2 Single Solenoid Direction Control Valve
- 4/2 Double Solenoid Direction Control Valve
- 4/3 Double Solenoid, Spring Cantered
- Direction Control Valve
- Non Return Valve
- Double Acting Cylinder 2 nos.
- Bi-Directional Motor
- Pilot Operated Non Return Valve
- Pressure Sequence Valve
- Uni-Directional Flow Control Valve
- Pressure Gauge
- Hydraulic Power Pack



### Understanding Hydraulic Component Construction and Design

Once the basic concepts of hydraulic components and its symbols are understood, the trainees are now ready to move a step ahead by learning the construction of hydraulic components used in industry.

There are two options available for the trainers to achieve this goal.

- **Cut Section Components**

We provide a complete set of cut section components that will help trainees gain a better understanding of the parts and the functioning of various components. Our cut section components are manufactured using actual, real-life components that have been sectioned and painted to clearly delineate the working of each component.

Component	Qty	Component	Qty
4/2 Way Valve Lever Operated Spring Return	1 no.	4/3 Way lever Operated 3 position Valve	1 no.
3/2 Way valve lever Operated	1 no.	Sequence Valve	1 no.
Uni-Directional Flow Control Valve	1 no.	Non Return Valve	1 no.
Single Solenoid Valve	1 no.	Double Solenoid Valve	1 no.
Pressure Reducing Valve	1 no.	Pressure Relief Valve	1 no.
Bi-Directional Flow Control Valve	1 no.	Shut off valve	1 no.



- **Transparent Components**

A transparent component is identical to an industrial real life component, but with a transparent acrylic body. Spools and other internal parts can be moved easily. This helps trainees understand the parts of a component and its functioning. These components are for demonstration purpose only, can not be used for making circuits.

- Transparent 4/2 Way Valve Lever Operated Spring Return
- Transparent Sequence Valve
- Transparent Uni-Directional Flow Control Valve
- Transparent Non-Return Valve
- Transparent Pressure Reducing Valve
- Transparent Pressure Relief Valve
- Transparent Bi-Directional Flow Control Valve
- Transparent Shut off valve





## Hands on Experience

Having built a solid foundation with the study of symbols, component construction and its working, the trainees are now ready for hand-on experience. Using our Hydraulic Training System, trainees can build their own hydraulic circuits, ranging in complexity. They can then operate these circuits to verify the required operation. We also have add-on kits that can enhance training capabilities of the trainer kit.

- Base Station
- Storage station
- Basic Hydraulic components
- Add-on advanced hydraulic components
- Add-on Electro hydraulic components
- Add on PLC Trainer Kit Components
- Hydraulic and Electro Hydraulic Fault Kit
- Add on HPLF/LPHF circuit components

## Base Station

Base Station provides a working area to build and test various hydraulic circuits. The Base Station consists of

- Power pack
- 5 way distributor with pressure gauge
- Electronic Panel

Base station comes in two different design,

- R Model: This is a floor standing unit. Hose hanging arrangement and powerpack are mounted on this structure. Work surface is Aluminium profile plate with slots to mount components
- S Model: This is a floor standing unit. Hose hanging arrangement and powerpack are mounted on this structure. Work surface is an SS grid to mount components



### Storage Station

The components that are not being used on Base Station at the moment can be stored in storage station.

Two different types of storage station are available

- Open type: Here the components are mounted on the surface the same way it is mounted on the work surface area.
- Drawer Unit: This is lockable. It has wheels. The drawer unit can be mounted in the Base Station or it can be kept separately.
  - Drawer dimensions: (Outer): 400mm (L) X 450mm (D) X 725mm (H)
  - Drawers: Two drawers, one free area.
  - Handle & single lock



### Basic hydraulic components

These components are supplied with quick coupling. Components can be quickly mounted using appropriate PCS plates that suits selected Base Station model, R or S type.

Component	One sided operation	Two-sided operation	Component	One sided operation	Two-sided operation
Double Acting Cylinder	2 nos	4 nos	One Way Flow Control Valve	2 nos	4 nos
Hydraulic Motor	1 no	2 nos	Non-return Valve	1 no	2 nos
4/2 Way Stem Actuated Valve	1 no	2 nos	Measuring Container	1 no	2 nos
4/2 Way Hand Lever Valve	1 no	2 nos	Hoses with Hose Line with Quick Coupling, 1500 mm	2 nos	4 nos
Flow Control Valve	1 no	2 nos	Hoses with Hose Line with Quick Coupling, 1000 mm	3 nos	6 nos
Pressure Gauge	1 no	2 nos	Pressure Relief Unit	1 no	2 nos
4/3 Way Hand Lever Valve with G spool	1 no	2 nos	Shut-Off Valve	1 no	2 nos
T-Connector	2 nos	4 nos			

### Add-on Advance hydraulic components

These components are supplied with quick coupling. Components can be quickly mounted using appropriate PCS plates that suits selected Base Station model, R or S type.

These Add-On components enhances level of learning from basic to advanced.

Component	One sided operation	Two-sided operation	Component	One sided operation	Two-sided operation
Double Acting Cylinder	1 no	2 nos	Weight + Protection Hood	1 no	2 nos
4/3 Way Hand Lever Valve, H spool	1 no	2 nos	3/2 Way Hand Lever Valve	1 no	2 nos
Counter balance valve	1 no	2 nos	Non-return Valve, Piloted	1 no	2 nos
T-Connector	2 nos	4 nos	Pressure Relief / Sequence Valve	1 no	2 nos
Diaphragm Accumulator	1 no.	2 nos.	Hoses with Hose Line with Quick Coupling, 1500 mm	2 nos	4 nos
Hoses with Hose Line with Quick Coupling, 1000 mm	3 nos	6 nos			



### Add-on Electro hydraulic components

These components are supplied with quick coupling. Components can be quickly mounted using appropriate PCS plates that suits selected Base Station model, R or S type.

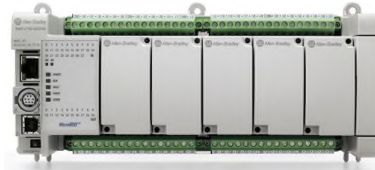
These Add-On components help learning interfacing of electronics with oil hydraulics. In order to use these components Base Station with Electronic Panel is required.

Component	One sided operation	Two-sided operation	Component	One sided operation	Two-sided operation
24V DC Power Supply Unit	1 no	2 nos	Electrical Cables	1 set	2 set
Relay Unit	2 nos	4 nos	Indicator and Distributor Unit	2 nos	4 nos
Pressure Switch	1 no	2 nos	Signal Input Unit (3 Push Button – DPDT)	1 no	2 nos
4/2 Way Single Solenoid Valve	2 nos	4 nos	3/2 Way Single Solenoid Valve	1 no	2 nos
4/2 Way Double Solenoid valve	2 nos	4 nos	4/3 Way Double Solenoid Valve with G spool	1 no	2 nos
Limit Switch, Left Actuated	2 nos	4 nos	Limit Switch, Right Actuated	2 nos	4 nos
Inductive Sensor	2 nos	4 nos	Capacitive Sensor	1 no	2 nos
Hoses with Hose Line with Quick Coupling, 1000 mm	3 nos	6 nos	Hoses with Hose Line with Quick Coupling, 1500 mm	2 nos	4 nos
Time Delay Unit	1 no	2 nos			

### Add-on PLC Components

These Add-On components help learning interfacing of electronics and PLC with oil hydraulics. Trainees can learn how to write ladder logic, how to interface input and output of PLC with various hydraulic components. In order to use these components Base Station with Electronic Panel is required.

- PLC, 1 no
- Programming cable, 1no
- Ladder logic programming software, 1no.



### Add-On Hydraulic and Electro Hydraulic Fault Finding Kit

Our Hydraulic and Electro-Hydraulic Fault Kit is the perfect tool for the practical and application-oriented testing of all the knowledge the trainees have gained so far. By deliberately introducing faulty components in the circuit, we stimulate the trainees to think and logically diagnose and solve common faults in hydraulic circuits. This honing of their core engineering and problem-solving skills goes a long way in making them industry-ready and giving them a competitive edge in the job market.

These components are supplied with quick coupling. Components can be quickly mounted using appropriate PCS plates that suits selected Base Station model, R or S type.

Component	Qty	Component	Qty
One Way Flow Control Valve	1 no	4/2 Way Hand Lever Valve	1 no.
Inductive Sensor	1 no.	Limit Switch, Left Actuated	1 no.
4/3 Way Hand Lever Valve with Re-circulating Mid-position	1 no.	4/2 Way Single Solenoid Valve	1 no.
Non-return Valve	1 no.		





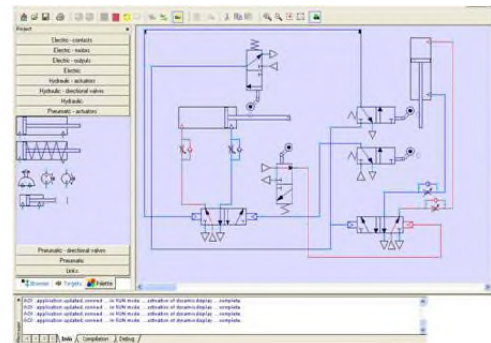
### Add-On HPLF/LPHF Application

These Add-On components help learn commonly used but difficult to understand High Pressure Low Flow/Low Pressure High Flow applications, for example in big Hydraulic Press. These components are supplied with quick coupling. Components can be quickly mounted using appropriate PCS plates that suits selected Base Station model, R or S type.

Component	Qty	Component	Qty
Manifold block with cartridge components and pressure gauge	1 no	Hoses with Hose Line with Quick Coupling, 2000 mm	4 nos
Pushbutton switch panel	1 no	Attachment for hydraulic motor to apply variable load	4 no
Minimesse hose	1 no.	<i>NOTE: Powerpack with Radial piston double pump and accessories is required for this Add-On attachment. Select product code carefully</i>	

### Simulation Software

One of the very exciting, cutting-edge features that we offer is our simulation software. This software has a huge library of hydraulic and electro-hydraulic components. Various circuits can be built and simulated using the components present in the trainer kit, as well as ones not included in the kit. This software is extremely beneficial for training in automation technologies, as it allows the trainee to try his / her programs on a virtual system. It is the ideal complement to our training equipment and enables a more efficient use of the laboratory. The software provides dynamic design and simulation plus control of 2D and 3D virtual machines. This includes a virtual PLC to control the circuits / models under simulation and allows communication with our range of training systems.



### Instruction Manual

Self-explanatory operating manual are supplied with each equipment. This contains step-by-step method of practical exercises along with safety and others aspects.

### Services Required

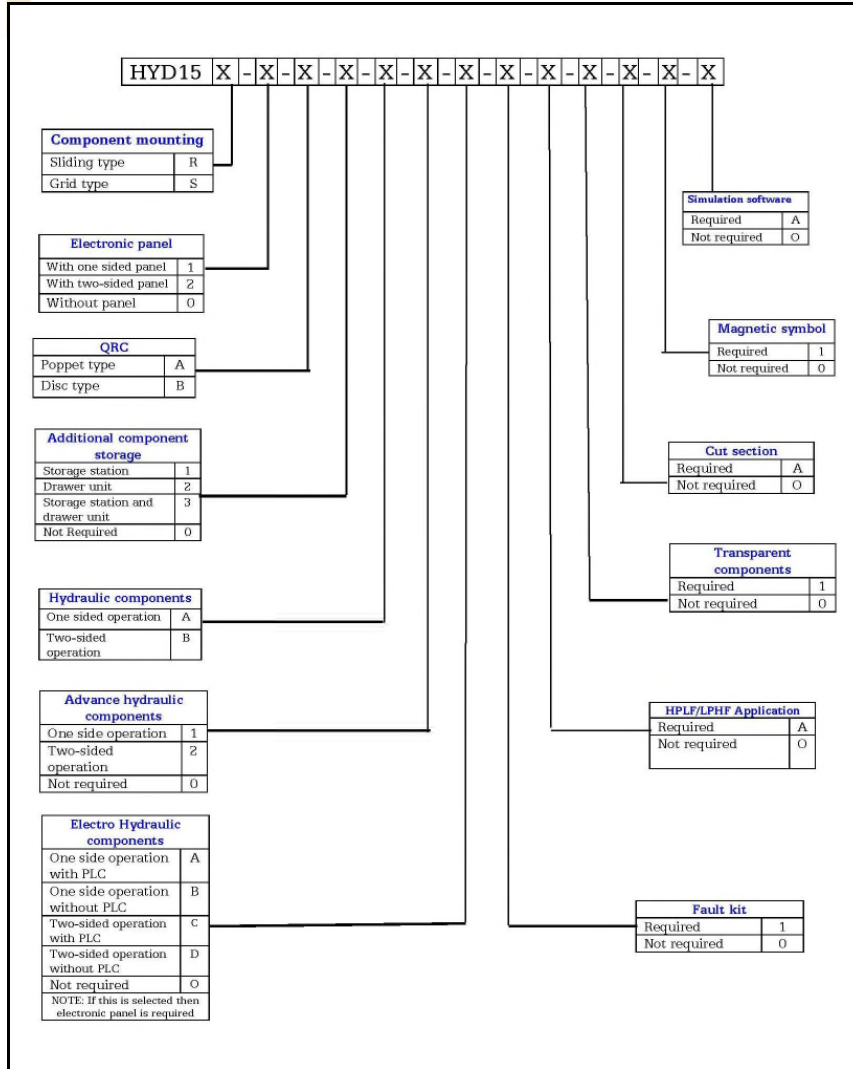
- Electric Supply



### Weight and dimensions:

Model	Bare weight	Dimensions
Base station R model (without valve)	180 kg	1000 X 800 X 1950mm (H)
Base station S model (without valve)	150 kg	1000 X 800 X 1950mm (H)
Storage station open type R model	60 kg	800 X 800 X 1310 mm (H)
storage station open type S model	50 kg	830 X 800 X 1220 mm (H)
Storage station drawer unit	40 kg	460 X 400 X 700 mm (H)

### Models selection chart



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- (1) Since research and development is an on-going activity, the specifications mentioned herein are subject to change without notice
- (2) Photographs are indicative only